



Ministry
of Defence

Defence Standard 01-005

Issue 19

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Fuels, Lubricants and Associated Products

Section 1

Foreword

Defence Standard Structure

Section 1 (Generated by the StanMIS toolset)

- Revision Note
- Historical Record
- Warning
- Standard Clauses

Section 2 (Technical information provided by Subject Matter Expert)

- Title
- Introduction
- Table of Contents
- Scope
- Technical Information to include Tables and Figures
- Annexes

Section 3 (Generated by StanMIS toolset)

- Normative References
- Definitions
- Abbreviation

REVISION NOTE

Standard updated to align with changes in STANAG 1135.

Removal of obsolescence products and additions of new products.

Reformatting the document to the new Defence Standard format.

HISTORICAL RECORD

This standard supersedes the following:

Def Stan 01-005 Issue 18 dated August 2016

Def Stan 01-005 Issue 17 dated March 2011

Def Stan 01-005 Issue 16 dated March 2009

Def Stan 01-005 Issue 15 dated March 2007

Def Stan 01-005 Issue 14 dated February 2005

Def Stan 01-005 Issue 13 dated January 2002

Def Stan 01-005 Issue 12 dated December 1999

Def Stan 01-005 Issue 11 dated September 1996

Def Stan 01-005 Issue 10 dated November 1993

Def Stan 01-005 Issue 9 dated November 1991

Def Stan 01-005 Issue 8 dated November 1989

Def Stan 01-005 Issue 7 dated April 1988

Def Stan 01-005 Issue 6 dated November 1985

DEF STAN 01-005 Issue 19

Def Stan 01-005 Issue 5 dated August 1983
Def Stan 01-005 Issue 4 dated August 1981
Def Stan 01-005 Issue 3 dated August 1979
Def Stan 01-005 Issue 2 dated December 1977
Def Stan 01-005 Issue 1 dated February 1976
DG-12-A (BR 1336/73) dated December 1973
DG-12 reprinted December 1972
DG-12 dated July 1968

WARNING

The Ministry of Defence (MOD), like its contractors, is subject to both United Kingdom and European laws regarding Health and Safety at Work. Many Defence Standards set out processes and procedures that could be injurious to health if adequate precautions are not taken. Adherence to those processes and procedures in no way absolves users from complying with legal requirements relating to Health and Safety at Work.

STANDARD CLAUSES

- a) This standard has been published on behalf of the Ministry of Defence (MOD) by UK Defence Standardization (DStan).
- b) This standard has been reached following broad consensus amongst the authorities concerned with its use and is intended to be used whenever relevant in all future designs, contracts, orders etc. and whenever practicable by amendment to those already in existence. If any difficulty arises which prevents application of the Defence Standard, DStan shall be informed so that a remedy may be sought.
- c) Please address any enquiries regarding the use of this standard in relation to an invitation to tender or to a contract in which it is incorporated, to the responsible technical or supervising authority named in the invitation to tender or contract.
- d) Compliance with this Defence Standard shall not in itself relieve any person from any legal obligations imposed upon them.
- e) This standard has been devised solely for the use of the MOD and its contractors in the execution of contracts for the MOD. To the extent permitted by law, the MOD hereby excludes all liability whatsoever and howsoever arising (including, but without limitation, liability resulting from negligence) for any loss or damage however caused when the standard is used for any other purpose.

Section 2

Fuels, Lubricants and Associated Products

Introduction

This Defence Standard (Def Stan) lists the standardized products in current use by the Ministry of Defence (MOD). In order that fuels, lubricants and associated products are available in all theatres of operations under active service conditions, it is essential that a minimum number of standardized products are specified to meet the requirements of service equipment.

Although many proprietary products may be readily available during the manufacture of equipment, the re-supply of these to users would present unacceptable logistic problems. Furthermore, it is the policy of the MOD to use competitive tendering whenever possible and to ensure that all products purchased are of the quality and standard required. This policy is negated if proprietary items are specified rather than standardized products.

If a proprietary product must be substituted for any of the products listed in this Def Stan the Service Authority shall be consulted. The appropriate contracts branch shall also be advised of the reason for the use of a proprietary item.

Authorities responsible for specifying fuels, lubricants and associated products for current and future applications are to select products from those listed in this Standard. Exceptionally, there may be instances where new products must be introduced during the development of materiel, in which case reference shall be made to the appropriate Service Authority in order that an existing MOD Standard may be amended, or a new Standard introduced.

Scope

This Def Stan provides guidance on the characteristics and uses of fuels, lubricants and associated products for the MOD.

List of Contents

Introduction	2-1
Scope	2-1
List of Contents	2-1
Technical Content	2-4
1. Notes for Guidance	2-4
1.1. Source Organisations for Normative References	2-4
1.2. Service Authorities	2-4
1.3. Technical Acceptable Products List (TAPL).....	2-5
1.4. Characteristics	2-5
1.5. Technical Terms & Abbreviations	2-5
1.6. Standardized Products.....	2-5
1.7. New, Obsolete & Obsolescent Products.....	2-5
1.8. Services Stores Numbers	2-6
1.9. NATO Stock Numbers.....	2-6
1.10. NATO Product Codes	2-6

DEF STAN 01-005 Issue 19

1.11.	Specifications	2-6
2.	Joint Service Designation (JSD) Products	2-7
2.1.	Class Definitions	2-7
2.2.	Product List	2-7
3.	Hazard Information	2-12
3.1.	Product Safety Data Sheets	2-12
3.2.	Use of Hazardous Liquids, Solids & Gases	2-12
4.	International Standardization Agreements	2-14
4.1.	NATO STANAGs	2-14
4.2.	Air & Space Interoperability Committee (ASIC) Air Standards	2-15
5.	Classification of Products	2-16
5.1.	Joint Service Designations (JSD)	2-16
5.2.	Viscosity Classifications	2-16
5.3.	SAE Viscosity Classifications	2-16
5.4.	Engine Oils	2-17
5.5.	Gear Oils	2-17
5.6.	ACEA (European Automobile Manufacturers Association) Engine Oil Classifications	2-18
5.7.	API (American Petroleum Institute) Vehicle Lubricant Classifications	2-18
5.8.	NLGI Classifications	2-19
5.9.	Classification of Fuels (Motor)	2-19
5.10.	Dangerous Goods Classifications	2-19
5.11.	United Nations Classification Criteria for Flammable Liquids (UN Class 3)	2-20
5.12.	IP Flash Point Classifications	2-20
6.	Alternative Fuels	2-24
6.1.	Biofuels	2-24
6.2.	Synthetic Fuels	2-24
7.	Product Application Guide	2-25
8.	Product Life	2-26
8.1.	Minimum Shelf Life	2-26
8.2.	Dormant Stocks	2-26
8.3.	Inspection	2-26
9.	Specifications Used by the UK	2-30
10.	Obsolete Products / Standards, Reference Fuels & Amended Designations	2-34
10.1.	Products Obsolete in the UK	2-34
10.2.	Obsolete Reference Fuels	2-39
10.3.	Amended Designations	2-39
10.4.	Specifications Obsolete in the UK since 1964	2-40
10.5.	Obsolete NATO Codes	2-45

Annexes

Annex A: Lubricating Oils, Compounded – OC	2-A-1
Annex B: Lubricating Oils, Extreme Pressure – OEP.....	2-B-1
Annex C: Lubricating Oils, Mineral – OM	2-C-1
Annex D: Lubricating Oils, Heavy Duty Engine – OMD.....	2-D-1
Annex E: Lubricating Oils, Fluids – OX	2-E-1
Annex F: Greases – XG	2-F-1
Annex G: Specialities – ZX.....	2-G-1
Annex H: Corrosion Preventives – PX.....	2-H-1
Annex I: Fluids, WTA & White Spirit – AL	2-I-1
Annex J: Fuels – Aviation Gasolines	2-J-1
Annex K: Fuels – Aviation Turbine Fuels	2-K-1
Annex L: Fuels – Automotive Gasolines.....	2-L-1
Annex M: Fuels – Diesels	2-M-1
Annex N: Fuels – Heating & Lighting.....	2-N-1
Annex O: NATO Standardized Products (Fuels, Lubricants & Associated Products).....	2-O-1
Annex P: Viscosity / Temperature Characteristics Charts.....	2-P-1

Figures

Figure 1: Viscosity Characteristics: Fuels.....	2-P-3
Figure 2: Viscosity Characteristics: OEP Oils	2-P-4
Figure 3: Viscosity Characteristics: OM Oils	2-P-5
Figure 4: Viscosity Characteristics: OMD Oils.....	2-P-6
Figure 5: Viscosity Characteristics: OX Oils	2-P-7

Technical Content

1. Notes for Guidance

1.1. Source Organisations for Normative References

Document	Source
British Standards	British Standards Institute BSI Customer Services, 389 Chiswick High Road, LONDON W4 4AL www.bsi-global.com/british_standards
Defence Standards DEF Specifications DGS DTD STANAG	UK Defence Standardization DStan Helpdesk, Kentigern House, 65 Brown Street, GLASGOW G2 8EX www.dstan.mod.uk (STANAGS may also be obtained from http://nsa.nato.int/nsa/)
DEF (AUST)	Australian Army Senior Standardization Representative Directorate General Development and Doctrine, Trenchard Lines, Upavon, Pewsey, Wilts Tel: 01980 615 234
AIR STANDARDS	NATO Military Standardization Team (NMST) Zone D, MOD Main Building, Whitehall, LONDON, SW1A 2HB Tel: 0207 2180721
ASTM	ASTM American Technical Publishers, 27-29 Knowle Piece, Wilbury Way, Hitchin, Hertfordshire, SG4 0SX www.astm.org
DOD MIL	US Military Specification, US Department for Defence http://assist.daps.dla.mil/quicksearch/
GP	Canadian Government Specification Board Canadian Department of Defence
JSP	Defence Storage & Distribution Agency (DSDA) Forms and Publications Department, Ploughley Road, Lower Arncliffe, Bicester, Oxon, OX25 2LD
IP	Energy Institute 61 New Cavendish Street, LONDON W1G 7AR www.energyinst.org.uk
SAE	SAE American Technical Publishers, 27-29 Knowle Piece, Wilbury Way, Hitchin, Hertfordshire, SG4 0SX
VV	US Federal Specifications, US Department of Defence. http://assist.daps.dla.mil/quicksearch/
NOTE: Users may find further useful listing of Civilian and military Standards Bodies at the following web address: http://www.dstan.mod.uk/s_b_list.htm	

1.2. Service Authorities

Service Authorities to be consulted on specifications and the use of products listed in this Standard:

Service	Navy	Army / Air Force
Authority	DES Ships MSS-MX-FS2-SE2	Defence Strategic Fuels Authority
Address	FS2-SE2 Fuels Group, Marine Systems Support, Abbey Wood,	Larch 3B, NH2, Abbey Wood Bristol BS34 8JH

DEF STAN 01-005 Issue 19

	Bristol BS34 8JH	
Civ Tel	030679 - 33373	Army – 030679-83591 Air Force – 030679-83593
Mil Tel	9679-33373	Army – 9679-83591 Air Force – 9679-83593

Inventory Managers to be consulted regarding fuel, lubricant or packed stock demand enquiries for products listed in this standard:

Commodity	Oils, Lubricants & Greases	Aviation & Ground Fuels	Marine Fuels
Inventory Manager	Team Leidos	DSFA SO2 OPS	Deputy Marine Fuel Manager
Address	Building 8, Monarch Court, Emerson Green, Bristol BS16 7FH	Larch 3B, NH2, Abbey Wood, Bristol BS34 8JH	Log & Infr Div, Leach Building, Whale Island, Portsmouth PO2 8BY
Civ Tel	0117 3328724	030 679 83588	02392 625964
Mil Tel		9 679 83588	9 383 25964
Email	LEIDOS-TVS-OLG- MULTIUSER@mod.gov.uk		

1.3. Technically Acceptable Products List (TAPL)

Some specifications, generally those for products used in aircraft, require Product Conformity Certification (PCC) of products, and where applicable this is indicated on the relevant product page. Technically acceptable products are shown on a Technically Acceptable Product List (TAPL) which is available from the relevant Service Authority. Qualified Products Lists (QPLs) for MOD UK specifications have been cancelled and are no longer available.

WARNING: Products used in submarines are subject to toxicity assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to the Navy Service Authority for advice and clarification on the required procedures for toxicity assessment. Any specification for a product used in a submarine will also require Product Conformity Certification and will be shown on a Technically Acceptable Product List.

1.4. Characteristics

Only the main characteristics of products are given. Whenever possible an indication is given of the temperature range applicable to the use of the product, or where relevant, the operating temperature range of the equipment. The full specification and appropriate authority shall be consulted when further details are required.

1.5. Technical Terms & Abbreviations

The glossary of technical terms and abbreviations, Clause 11, is one of simplicity and brevity and is intended to assist users unfamiliar with the subject. For scientifically exact information the appropriate text books should be consulted.

1.6. Standardized Products

Internationally agreed products used by NATO, Australia and New Zealand, and the degree of standardization are shown in Annex O. Only in the case of fully standardized products can it be assumed that the products of all countries are interchangeable.

1.7. New, Obsolete & Obsolescent Products

The introduction into Service use of new product types should, whenever possible, be at the expense of existing product types.

DEF STAN 01-005 Issue 19

Obsolete products are not included in Annexes A to N but are listed separately in Clauses 10.1, 10.2 & 10.3. Obsolete specifications are listed in Clause 10.4. Obsolete NATO Codes are listed in Clause 10.5.

Obsolescence is a stage in the removal of a product from Service use, it does not mean that a product is no longer available. While there is an equipment requirement, that obsolescent product will continue to be procured and may continue to be used. However, any obsolescent product identified in Annexes A to N should not be specified or used in new applications or equipment.

1.8. Service Stores Numbers

Service Store or Stock Numbers normally consist of the Service Domestic Management Code (DMC) followed by the last seven digits of the NATO Stock Number (NSN). In the case of the RAF the NSN is not hyphenated. To avoid unnecessary repetition of these numbers, only the DMC is shown in the relevant Service column opposite the appropriate NATO Stock Number, but it must be understood that the full-Service Stores Number will include the complete NATO Stock Number. Some single Service products may be accounted for by a domestic number during the introductory period.

1.9. NATO Stock Numbers

NATO Stock Numbers quoted on product pages are those current at the date of going to print of this Standard. Each NATO Stock Number and/or its equivalent Service Stores Number relates to a product in a particular size of container. These container sizes are nominal and in practice the quantity in the container is specified. A double dash sign -- in a Service column indicates that the product is not stocked by that Service. A double plus sign ++ in a Service column indicates that the product is stocked by the Service but has not been allocated a Service Management Code. Aviation products may not be held by all Army depots.

1.10. NATO Product Codes

NATO Codes are allocated to NATO Standardized Products by the Military Agency for Standardization, NATO. They consist of an index letter followed by a number, e.g. O-134. The NATO Code is enclosed in a rectangle when applied as an identification marking on containers, dispensing equipment and installations.

1.11. Specifications

One specification may cover several closely related products. Specifications currently used by the UK are listed in Clause 9. The current validity of any specification can only be ascertained by consulting the relevant Service Authority (see Clause 1.2 Service Authorities). The use of proprietary products in the Services is defined by various Service Authorities. See the appropriate Product Page or refer to the relevant Service Authority listed in Clause 1.2.

2. Joint Service Designation (JSD) Products

2.1. Class Definitions

Class	Description
OC Compounded Oils	Blends of mineral and vegetable oils only
OEP Extreme Pressure Oils	Gear oils containing additives which enhance their ability to withstand extreme gear tooth pressures.
OM Mineral Oils	Straight mineral oils or those containing additives intended to improve their performance.
OMD Mineral Detergent Oils	Mineral oil and synthesised hydrocarbon-based lubricants containing detergent or dispersant additives primarily designed for use in internal combustion engines.
OX Miscellaneous Oils	Mineral oil and synthesised hydrocarbon-based lubricants containing detergent or dispersant additives primarily designed for use in internal combustion engines.
XG Greases	Greases made using thickeners such as those based on calcium, clay or lithium. They may be based on mineral oils, vegetable oils or synthetic fluids and can contain additives such as solid lubricants to improve their performance.
ZX Specialities	Lubricants, damping fluids and compounds designed for specific applications.
PX Protective Miscellaneous	Corrosion preventatives used primarily for the prevention of corrosion to metal equipment and are easily removable.
AL Fluids	Fluids used for engine thrust augmentation, anti-freeze protection, de-icing, cooling, cleaning or similar miscellaneous applications. They are mostly water soluble.

2.2. Product List

For standardized alternatives with NATO Codes, see Annex O. The Service Authority is also shown in bold on the product pages.

JSD	NATO Code	Title	Service Authority	Page No.
OC-160		Lubricating Oil Compounded: Naval	FS2-SE2	2-A-2
OC-300		Lubricating Oil, Gear, Compounded	FS2-SE2	2-A-3
OC-600		Lubricating Oil, Gear, Compounded	FS2-SE2	2-A-4
OEP-30	O-153	Lubricating Oil, Gear: Aircraft, light grade	DFTA	2-B-2
OEP-38	O-186	Lubricating Oil, Gear: Extreme pressure, Grade SAE 75W, API GL-5	DFTA	2-B-3
OEP-70	O-155	Lubricating Oil, Gear: Aircraft, medium grade	DFTA	2-B-4
OEP-71	O-136	Lubricating Oil, Aircraft Turbine Engine: Petroleum, extreme pressure	DFTA	2-B-5
OEP-80		Lubricating Oil, Steam Turbine & Gear: Extreme pressure	FS2-SE2	2-B-6
OEP-215		Lubricating Oil, Gear: Helicopter	DFTA	2-B-7
OEP-220	O-226	Lubricating Oil, Gear: Extreme pressure, Grade SAE 80W-90, API GL-5	DFTA	2-B-8
OEP-240		Lubricating Oil, Gear: Extreme Pressure, Limited slip, Grade SAE 80W-90	DFTA	2-B-9
OEP-250		Lubricating Oil, Gear: Extreme Pressure, Grade SAE 80W-140	DFTA	2-B-10

DEF STAN 01-005 Issue 19

JSD	NATO Code	Title	Service Authority	Page No.
OM-11	O-135	Lubricating Oil, Aircraft Turbine Engine: Petroleum	DFTA	2-C-2
OM-12	O-142	Lubricating Oil, General Purpose: Low temperature	DFTA	2-C-3
OM-15	H-515	Hydraulic Fluid, Petroleum: Superclean	DFTA	2-C-4
OM-16	S-756	Insulating Oil: Electrical	DFTA	2-C-5
OM-17		Lubricating Oil: White	DFTA	2-C-6
OM-22		Insulating Oil, Electrical: Low pour point	DFTA	2-C-7
OM-24		Flushing Oil	FS2-SE2	2-C-8
OM-33	H-576	Hydraulic Fluid, Petroleum: Anti-Wear	FS2-SE2	2-C-9
OM-58		Lubricating Oil, Petroleum: Compressor, light	DFTA	2-C-10
OM-65	H-572	Hydraulic Fluid, Petroleum: Uninhibited	FS2-SE2	2-C-11
OM-70	O-285	Lubricating Oil, Refrigerant Compressor: Uninhibited	FS2-SE2	2-C-12
OM-71	O-138	Lubricating Oil, Aircraft Turbine Engine: Petroleum	DFTA	2-C-13
OM-100	O-240	Lubricating Oil, Gear: Light service	FS2-SE2	2-C-14
OM-150		Lubricating Oil, Aircraft Controls: Antifreezing	DFTA	2-C-15
OM-160		Lubricating Oil, Petroleum: Compressor medium	DFTA	2-C-16
OM-170		Lubricating Oil, Aircraft Piston Engine: Grade SAE 40	DFTA	2-C-17
OM-180		Lubricating Oil, Petroleum: Multistage Air Compressor	FS2-SE2	2-C-18
OM-270		Lubricating Oil, Aircraft Piston Engine: Grade SAE 50	DFTA	2-C-19
OM-750	O-252	Lubricating Oil, Steam Cylinder: Saturated	FS2-SE2	2-C-20
OM-1300	O-258	Lubricating Oil, Steam Cylinder: Superheated	FS2-SE2	2-C-21
OMD-23		Lubricating Oil, Engine: Two stroke	DFTA	2-D-2
OMD-55	O-1178	Lubricating Oil, Engine: Severe duty, diesel low temperature, SAE 5W-30	DFTA	2-D-3
OMD-90	O-1176	Lubricating Oil, Engine: Severe duty, diesel, extended service, SAE 10W-30	DFTA	2-D-4
OMD-113	O-278	Lubricating Oil, Naval Diesel: Severe service	FS2-SE2	2-D-5
OMD-140		Lubricating Oil, Engine: Diesel two-stroke, Heavy Duty, Monograde, Grade SAE 40	DFTA	2-D-6
OMD-160		Lubricating Oil, Aircraft Piston Engine: Dispersant base mineral oil, Grade SAE 40	DFTA	2-D-7
OMD-162		Lubricating Oil, Multigrade, Aircraft Piston Engine Dispersant, Grade SAE 15W-50	DFTA	2-D-8
OMD-250		Lubricating Oil, Aircraft Piston Engine: Dispersant base mineral oil, Grade SAE 50	DFTA	2-D-9
OMD-370		Lubricating Oil, Aircraft Piston Engine: Dispersant base mineral oil, Grade SAE 60	DFTA	2-D-10
OX-7		Lubricating Oil, Aircraft Turbine Engine: Synthetic 3 cSt	DFTA	2-E-2
OX-8	H-542	Brake Fluid, Automotive	DFTA	2-E-3
OX-9	O-148	Lubricating Oil, Aircraft Turbine Engine: Synthetic 3 cSt	DFTA	2-E-4
OX-14	O-147	Lubricating Oil, Instrument: Synthetic	DFTA	2-E-5
OX-16		Damping Fluid: Silicone base	DFTA	2-E-6
OX-18	O-190	Lubricating Oil, General Purpose Preservative, Light	DFTA	2-E-7

DEF STAN 01-005 Issue 19

JSD	NATO Code	Title	Service Authority	Page No.
OX-19	H-537	Hydraulic Fluid, Synthetic, Fire Resistant	DFTA	2-E-8
OX-20		Hydraulic Fluid, Phosphate Ester Base	DFTA	2-E-9
OX-24	O-157	Lubricating Oil, Weapons, Small Arms and Light Calibre Weapons	DFTA	2-E-10
OX-26	O-160	Lubricating Oil, Aircraft Gas Turbine Engine: Synthetic 5 cSt	DFTA	2-E-11
OX-27	O-156	Lubricating Oil, Aircraft Gas Turbine Engine: Synthetic 5 cSt	DFTA	2-E-12
OX-30	H-584	Hydraulic Fluid, Petroleum: Emulsifying	FS2-SE2	2-E-13
OX-38	O-149	Lubricating Oil, Aircraft Gas Turbine Engine: Synthetic 7.5 cSt	DFTA	2-E-14
OX-40		Hydraulic Fluid Aqueous Polyglycol Based: Fire resistant	FS2-SE2	2-E-15
OX-64		Semi-fluid grease, helicopter transmission	DFTA	2-E-16
OX-70	S-1735	Molybdenum Disulphide Lubricating Oil: Silicone base	DFTA	2-E-17
OX-75	H-548	Hydraulic Fluid, Automatic Transmission	DFTA	2-E-18
OX-79		Transmission Fluid TO-4 (SAE 10W)	DFTA	2-E-19
OX-80		Transmission Fluid TO-4 (SAE 30)	DFTA	2-E-20
OX-85		Transmission Fluid	DFTA	2-E-21
OX-90	O-1180	Lubricating Oil, Engine: Severe duty, diesel, extended service, SAE 10W-40	DFTA	2-E-22
OX-95		Lubricating Oil, Compressor: Synthetic	FS2-SE2	2-E-23
OX-125		Helicopter Transmission Lubricant	DFTA	2-E-24
OX-135		Lubricating Oil, Refrigerant Compressor: Synthetic Ester Based	FS2-SE2	2-E-25
OX-152	O-152	Lubricating Oil, Gas Turbine Engine, Corrosion Inhibiting Synthetic 5 cSt	FS2-SE2	2-E-26
OX-165		Lubricating Fluid, Gear: Synthetic	DFTA	2-E-27
OX-300		Lubricating Oil, Stern Tube: Emulsifying	FS2-SE2	2-E-28
OX-538	H-538	Hydraulic Fluid, Fire Resistant: Low temperature Synthetic Hydrocarbon Base, Aircraft and Missile	DFTA	2-E-29
XG-235	G-363	Grease, Plug Valve, Hydrocarbon Resistant	DFTA	2-F-2
XG-250	S-736	Silicone Compound: Electrical insulating	DFTA	2-F-3
XG-261		Grease, Silicone	FS2-SE2	2-F-4
XG-264	G-412	Grease, Graphite: Medium	DFTA	2-F-5
XG-269	G-392	Grease, Aircraft: Synthetic, pneumatic system	DFTA	2-F-6
XG-273		Grease: Synthetic, graphite	DFTA	2-F-7
XG-276	G-353	Grease: Synthetic, molybdenum disulfide	DFTA	2-F-8
XG-279	G-403	Grease, Automotive and Artillery	DFTA	2-F-9
XG-284	G-366	Grease, Aircraft: Helicopter oscillating bearing	DFTA	2-F-10
XG-285	G-355	Grease, Aircraft: Graphite	DFTA	2-F-11
XG-286	G-460	Grease, Sea Water Resisting	FS2-SE2	2-F-12
XG-287	G-354	Grease: Multipurpose, low temperature range	DFTA	2-F-13
XG-291	G-421 G-382	Grease: Multipurpose, heavy duty	DFTA	2-F-14
XG-293	G-395	Grease, Aircraft: Multipurpose	DFTA	2-F-15
XG-294	G-1352	Grease: Multipurpose elevated temperature range	DFTA	2-F-16
XG-300	G-372	Grease, Aircraft: Synthetic, high temperature	DFTA	2-F-17

DEF STAN 01-005 Issue 19

JSD	NATO Code	Title	Service Authority	Page No.
XG-305		Grease, Molybdenum Disulfide	DFTA	2-F-18
XG-315	G-394	Grease: Silicone, metal to rubber	DFTA	2-F-19
XG-380		Grease, Pumpable Calcium Base	FS2-SE2	2-F-20
XG-460		Grease, Naval: Graphite	FS2-SE2	2-F-21
ZX-9		Cutting Fluid, Soluble, Biostable	DFTA	2-G-2
ZX-13	S-720	Anti-Seize Compound: Graphite	DFTA	2-G-3
ZX-24	S-718	Anti-Seize Compound: Aircraft, oxygen system	DFTA	2-G-4
ZX-30		Lubricant, Solid Film: Unbonded, graphite dispersion	FS2-SE2	2-G-5
ZX-34	S-1738	Lubricant, Solid Film: Heat cured	DFTA	2-G-6
ZX-35	S-740	Molybdenum Disulfide Powder, Lubricating	DFTA	2-G-7
ZX-36		Lubricant, Electrical Slewing	DFTA	2-G-8
ZX-38	S-722	Anti-Seize Compound: Molybdenum disulfide	DFTA	2-G-9
ZX-40		Grease, Stern Tube: Emulsifying	FS2-SE2	2-G-10
ZX-43	S-1716	Damping Fluid: Dimethyl silicone 20 cSt	DFTA	2-G-11
ZX-44	S-1718	Damping Fluid: Dimethyl silicone 50 cSt	DFTA	2-G-12
ZX-45	S-1720	Damping Fluid: Dimethyl silicone 100 cSt	DFTA	2-G-13
ZX-46		Damping Fluid: Dimethyl silicone 500 cSt	FS2-SE2	2-G-14
ZX-47		Damping Fluid: Dimethyl silicone 1000 cSt	FS2-SE2	2-G-15
ZX-51		Damping Fluid: Dimethyl silicone 60000 cSt	DFTA	2-G-16
ZX-54		Compound: Rust penetrating oil	DFTA	2-G-17
ZX-55	S-749	Lubricant: Solid film air drying corrosion inhibiting	DFTA	2-G-18
PX-1	C-614	Corrosion Preventive Compound: Soft film, cold application	DFTA	2-H-2
PX-4	C-642	Corrosion Preventive Oil: Thin film	DFTA	2-H-3
PX-6		Petrolatum, Technical: Hard	FS2-SE2	2-H-4
PX-7	S-743	Petrolatum, Technical	FS2-SE2	2-H-5
PX-11		Corrosion Preventive: Soft film, hot application	DFTA	2-H-6
PX-15		Corrosion Preventive: Hard film, hot application	FS2-SE2	2-H-7
PX-24	C-634	Corrosion Preventive: Water displacing	DFTA	2-H-8
PX-26	C-635	Corrosion Preventive: Hydraulic system	DFTA	2-H-9
PX-27	C-615	Corrosion Preventive Oil, Aircraft Engine: Piston metallic	DFTA	2-H-10
PX-28		Corrosion Preventive: Undersealing	DFTA	2-H-11
PX-31		Corrosion Preventive Compound: Hard film, cold application	DFTA	2-H-12
PX-32		Corrosion Preventive: Aircraft structures, hard film, transparent, cold application	DFTA	2-H-13
PX-36		Corrosion Preventive: Weapon cleaner, lubricant	DFTA	2-H-14
AL-5	S-745	De-icing, Defrosting Fluid: Aircraft surfaces, in flight	DFTA	2-I-2
AL-11	S-737	Isopropanol, Technical	DFTA	2-I-3
AL-14	S-747	Methanol, Technical	DFTA	2-I-4
AL-20		Ethenediol, Technical	DFTA	2-I-5
AL-28	S-1744	Methanol/Water: 44/56	DFTA	2-I-6
AL-34	S-1746	De-icing, Defrosting Fluid: Aircraft surfaces, ground use	DFTA	2-I-7
AL-36		Windscreen washing fluid: Aircraft	DFTA	2-I-8
AL-39	S-757	Antifreeze, Inhibited Ethenediol	DFTA	2-I-9
AL-40		Methanol/water: Hydrogen generators	DFTA	2-I-10

DEF STAN 01-005 Issue 19

JSD	NATO Code	Title	Service Authority	Page No.
AL-41	S-1745	Fuel System Icing Inhibitor: High flash type	DFTA	2-I-11
AL-48		Mixture of Fuel System Icing Inhibitor AL-41 and Lubricity Improving Additive AL-61	DFTA	2-I-12
AL-61	S-1747	Lubricity Improving Additive for Aviation Turbine Fuels	DFTA	2-I-13
AL-71		Cooling System Corrosion Inhibitor: Diesel Engines	FS2-SE2	2-I-14
AL-342	S-1719	De-icing/anti-icing Non-Newtonian Fluid: Aircraft Surfaces, Ground Use	DFTA	2-I-15
NOx REDUCTION AGENT	S-1764	Aqueous Urea solution	DFTA	2-I-16
WTA	S-1739	Water, Thrust Augmentation: Demineralized	DFTA	2-I-17
WHITE SPIRIT	S-752	Hydrocarbon Solvent	DFTA	2-I-18
AVGAS-100LL	F-18	Gasoline, Aviation: Grade 100/130 Low Lead	DFTA	2-J-2
AVTAG/FSII	F-40	Turbine Fuel, Aviation: Wide cut type with FSII	DFTA	2-K-2
AVCAT/FSII	F-44	Turbine Fuel, Aviation: High flash type with FSII	FS2-SE2	2-K-3
AVTUR	F-35	Turbine Fuel, Aviation: Kerosene type	DFTA	2-K-4
AVTUR/FSII	F-34	Turbine Fuel, Aviation: Kerosene type with FSII	DFTA	2-K-5
ULGAS	F-67	Gasoline, Automotive: Unleaded	DFTA	2-L-2
DIESO MT	F-54	Diesel Fuel, General Purpose MT	DFTA	2-M-2
DIESO UK		Diesel Fuel, General Purpose	DFTA	2-M-3
DIESO F-76	F-76	Fuel, Naval Distillate	FS2-SE2	2-M-4
KERO/A	F-58	Kerosene: Flueless burner, Class C1	DFTA	2-N-2
STOVE NAPHTHA		Naphtha for Cooking Stoves	DFTA	2-N-3

3. Hazard Information

3.1. Product Safety Data Sheets

For Product Safety Data Sheets (SDS) see JSP 515, the MOD Hazardous Stores Information System (HSIS). For MOD staff, this is available online at <http://www.transportsafety.dii.r.mil.uk> and for further policy see the following related documents:

Document Title
Health and Safety at Work, etc Act 1974
The Environmental Protection Act 1990
The Chemical Hazard Information & Packaging for Supply Regulations (CHIP) 2002
IRIS Manual – Accident Reporting System
JSP 317 Safety Regulations for the Storage and Handling of Fuels and Lubricants
JSP 375 MOD Health and Safety Handbook
JSP 418 Sustainable Development & Environment Manual
JSP 437 Personal Protective Equipment Catalogue
JSP 800 Defence Movements & Transportation Regulations:
• Vol 3 – Manual of Movements • Vol 4a – Dangerous Goods by Air Regulations • Vol 4b – Dangerous Goods by Road, Rail and Sea • Vol 5 – Road Transport

For further information contact HSIS Management:

Authority	Hazardous Stores Information System DE&S Supply Chain Management (DG&HS Policy)
Address	Mail Point #3246, Cedar 2b, Neighbourhood 3 Abbey Wood (South) Bristol BS34 8JH
Civ Tel	030 679 80991 / 80984
Mil Tel	9679 80991 / 80984
Civ Fax	0117 91 38950
Mil Fax	9352 38950
Email	DES SCM-PolComp-DGHSISCMgtSO3

3.2. Use of Hazardous Liquids, Solids & Gases

The Dangerous Engineering Substances Advisory Team (DESAT) provides advice to all levels of the MOD on the use of hazardous liquids, solids and gases (except explosives). This advice extends to safety data sheet interpretation and recommendations regarding health and safety matters, personal and respiratory protective equipment and the compilation of risk and COSHH assessments for all products referenced in this publication. For further information contact:

Authority	DESAT
Address	Occupational and Environmental Medicine Wing RAF Centre of Aviation Medicine RAF Henlow HENLOW Bedfordshire SG16 6DN
Civ Tel	01462 851515 Ext 7660

DEF STAN 01-005 Issue 19

Mil Tel	95381 Ext 7660
Email	hlw-cam-desatfs@henlow.raf.mod.uk or naldera435@henlow.raf.mod.uk

4. International Standardization Agreements

4.1. NATO STANAGs

Product Specifications complying with the STANAG are indicated by an asterisk and footnote on the appropriate Product Page. The list below is not comprehensive but includes those STANAG'S considered to be of main interest to users of this Standard. Please refer to Section 3 further details on the STANAGs and their associated Allied Publications.

STANAG No	Title	Remark
1059	Letter Codes for Geographical Entities	See Annex O
1110	Allowable Deterioration Limits for NATO Armed Forces Fuels, Lubricants and Associated Products	
1135	Interchangeability of Fuels, Lubricants and Associated Products, used by the Armed Forces of the NATO Nations	Annex C is reflected in Annex O of this Defence Standard
1385	Guide Specification (Minimum Quality Standards) for Naval Distillate Fuels (F-75 and F-76)	Implemented by Def Stan 91-04
1414	Guidelines to Ensure that Contractors Design and Supply New Equipment Capable of using Standardized Fuels, Lubricants and Associated Products	
1425	Guide Specifications (Minimum Quality Standards) for Lubricating Oil, Steam Turbine and Gear, Light Service (O-240 and O-253)	Implemented by Def Stan 91-25 (O-240)
2115	Fuel Consumption Units	
3149	Minimum Quality Surveillance of Fuels	Implemented by Service Instructions
3390	Guide Specifications and Inspection Standards for Fuel Soluble Lubricity Improvers (S-1747)	Implemented by Def Stan 68-251
3713	Determination of Particulate Matter in Aerospace Hydraulic Fluids Using a Particle Size Analyser	
3747	Guide Specification, (Minimum Quality Standards) for Aviation Turbine Fuels (F-34, F-35, F-40, F-44)	Implemented by Def Stans 91-87 (F-34), 91-91 (F-35), 91-88 (F-40), and 91-86 (F-44)
3748	Guide Specifications for Hydraulic Fluids, Petroleum, (H-515, H-520 and C-635) and Polyalphaolefin (H-537, H-538 and H-544)	Implemented by Def Stans 91-48 (H-515) and 80-142 (C-635), by MIL-PRFs 83282 (H-537), and 87257 (H-538)
4362	Fuels for Future Ground Equipment using Compression Ignition or Turbine Engines.	This STANAG is also the implementing document for the NATO Single Fuel Policy.
4596	Guide Specification for Lubricating Oil, Naval Diesel Engine, Severe Service, Grade 40 (O-278)	Implemented by Def Stan 91-22
4601	Guide Specification for Hydraulic Fluids for Naval Applications (H-573, H-574, H-576)	Implemented by Def Stan 91-39 (H-576)
4616	Capabilities of National/Military Laboratories of NATO and Partner Nations (AFLP-8)	
4714	Minimum Quality Surveillance of Lubricants and Associated Products	
7036	Fuels to be Introduced into and Delivered by the NATO Pipeline System (NPS)	
7063	Methods of Detection and Treatment of Fuels Contaminated by Micro Organisms	

DEF STAN 01-005 Issue 19

STANAG No	Title	Remark
7071	Design and Performance Criteria for Aviation Fuel Additive Injection Equipment	
7090	Guide Specification for NATO Ground Fuels (F-54, F-58, F-63, F-67)	Implemented by BS EN 590 (F-54), BS 2869 Class C1 (F-58), and BS EN 228 (F-67)
7091	Guide Specifications for NATO Land System Oils for Engines and Transmissions (O-185, O-186, O-226, O-228, O-236, O-1178, O-1179, O-1180).	Implemented by SAE 75W (O-186), SAE 80W-90 (O-226), ACEA E3 (O-1178), ACEA E6, and E7 (O-1180)
7093	Guide Specifications for NATO Land Systems Automotive Fluids (H-542, H-548, S-750, S-757, S-759).	Implemented by SAE J1704 (H-542), GMN 10055 (H-548), and 68-127 (S-757)
7101	Guide Specification for Greases (G-403, G-414, G-460)	Implemented by Def Stans 91-27 (G-403), and 91-34 (G-460)

4.2. Air & Space Interoperability Committee (ASIC) Air Standards

ASIC No	Title	Remark
15/3	Minimum Quality Surveillance for Petroleum Products	Implemented by Service Instructions
15/4	Allowable Deterioration Limits for Fuels, Lubricants and Allied Products	
15/6	Guide specification (Minimum Quality Standards) for Aviation Fuels: NATO F-34, F35, F-40 and F-44	
15/7	Guide Specification for Petroleum Base (H-515, H-520 and C-635) and Polyalphaolefin base (H-537, H-538 and H-544) Aviation Hydraulic Fluids	
15/9	Interchangeability Chart of Standardized Fuels, Lubricants and Allied Products	Implemented by Service Instructions

5. Classification of Products

5.1. Joint Service Designations (JSD)

5.1.1. Joint Service Designations (JSDs) are allocated to products by DStan (SPM3) and consists of a group of two or three letters followed by a number. The letter groups have been previously defined in Clause 2.1 Class Definitions.

5.1.2. In some instances, the JSD for oils indicates the approximate viscosity at 40°C in millimetres squared per second, centistokes, mm²/s (cSt); thus OM-33 indicates a mineral oil of 33 mm²/s (cSt) at 40°C.

5.1.3. Designations for fuels give some indication of the use for which the product is intended or may be an approved abbreviation of the product name.

5.2. Viscosity Classifications

5.2.1. The International System of Units, SI, classification of viscosity is based on a rationalized form of the metric system. The SI unit for kinematic viscosity equivalent to the centistoke (cSt) is millimetres squared per second (mm²/s). Where appropriate, both units are shown in this Standard, for example:

Property	Value
Viscosity at 40°C	70–75 mm ² /s (cSt)

5.2.2. The ISO classification of viscosity is issued by the International Organisation for Standardization (ISO) as International Standard ISO 3448, BS 4231. The system classifies industrial lubricating oils into ranges by their nominal kinematic viscosity at 40°C. Each range is identified by an ISO VG (viscosity grade) number which corresponds to the mid-point viscosity of its range in centistokes:

ISO viscosity grade number (ISO VG)	Midpoint viscosity at 40°C, cSt	Kinematic viscosity at 40°C, cSt	
		Min.	Max.
2	2.2	1.98	2.42
3	3.2	2.88	3.52
5	4.6	4.14	5.06
7	6.8	6.12	7.48
10	10.0	9.00	11.00
15	15.0	13.50	16.50
22	22.0	19.80	24.20
32	32.0	28.80	35.20
46	46.0	41.40	50.60
68	68.0	61.20	74.80
100	100.0	90.00	110.00
150	150.0	135.00	165.00
220	220.0	198.00	242.00
320	320.0	288.00	352.00
460	460.0	414.00	506.00
680	680.0	612.00	748.00
1000	1000.0	900.00	1100.00
1500	1500.0	1350.00	1650.00

5.3. SAE Viscosity Classifications

5.3.1. The American SAE (SAE J-300) Classifications of Engine and Gear Oils are made based on viscosity characteristics only, they consist of numerical series, one for engine oils and another for gear oils. The two series are not related and are such that an engine oil and a gear oil that have the same viscosity when measured by a Standard Method will have a totally different SAE number.

DEF STAN 01-005 Issue 19

5.3.2. Where the SAE number includes the letter W (Winter grade), limiting values for viscosity are given. Maximum viscosity values for tests at specified lower temperatures are detailed together with a minimum viscosity at the specified higher temperature.

5.3.3. When an SAE classification is shown with two numbers eg, SAE 10W-30, this indicates that the oil is a multigrade and has the viscosities equivalent to the "W" grade when determined at the lower temperatures and the viscosity characteristics of the non "W" grade at operating temperatures.

5.3.4. In some circumstances, SAE numbers are used incorrectly to classify other types of lubricating oil. This practice should not be followed as the oil so classified may not necessarily meet all the viscosity requirements for the given number. Lubricating oils other than automotive oils should be classified in accordance with the ISO VG Classification as shown in Clause 5.2 Viscosity Classifications.

5.4. Engine Oils

SAE No	Viscosity Range			
	Low Temperature Cranking Viscosity	Low Temperature Pumping Viscosity with No Yield Stress	Low Shear Rate Kinematic Viscosity at 100°C	
	Centipoise Max	Centipoise Max	Centistokes Min	Centistokes Max
0W	6,200 @ -35°C	60,000 @ -40°C	3.8	—
5W	6,600 @ -30°C	60,000 @ -35°C	3.8	—
10W	7,000 @ -25°C	60,000 @ -30°C	4.1	—
15W	7,000 @ -20°C	60,000 @ -25°C	5.6	—
20W	9,500 @ -15°C	60,000 @ -20°C	5.6	—
25W	13,000 @ -10°C	60,000 @ -15°C	9.3	—
16	—	—	6.1	< 8.2
20	—	—	6.9	< 9.3
30	—	—	9.3	<12.5
40	—	—	12.5	<16.3
50	—	—	16.3	<21.9
60	—	—	21.9	<26.1

5.5. Gear Oils

SAE Viscosity Grade	Maximum Temperature for Viscosity of 150,000cP ^(1, 2)	Kinematic Viscosity at 100°C, cSt ⁽³⁾ Minimum ⁽⁴⁾	Kinematic Viscosity at 100°C, cSt ⁽³⁾ Maximum
70W	-55 ⁽⁵⁾	4.1	—
75W	-40	4.1	—
80W	-26	7.0	—
85W	-12	11.0	—
80	—	7.0	<11.0
85	—	11.0	<13.5
90	—	13.5	<24.0
140	—	24.0	<41.0
250	—	41.0	—

NOTE:

Unit conversion – 1 cP = 1 mPa.s; 1cSt = 1 mm²/s

- Using ASTM D 2983
- Additional low-temperature viscosity requirements may be appropriate for fluids intended for use in light-duty synchronized manual transmissions
- Using ASTM D 445
- Limit must also be met after testing in CEC L-45-T-93, Method C (20 h).

5. The precision of ASTM D 2983 has not been established for determinations made at temperatures below -40°C.

5.6. ACEA (European Automobile Manufacturers Association) Engine Oil Classifications

5.6.1. This system specifies performance levels of a lubricant in spark and compression ignition engines and is generally in the form of a two-character code.

5.6.2. It comprises three classes of engine oil lubricants covering:

Description	Class
Gasoline & light duty diesel	A/B
Gasoline & light duty diesel + chemical limits	C
Heavy duty diesel	E

5.6.3. Within each of the classes there are several categories reflecting different performance requirements and are identified by a number:

Description	Class
Gasoline & light duty diesel	A1/B1, A3/B3, A3/B4, & A5/B5
Gasoline & light duty diesel + chemical limits	C1, C2, C3 & C4
Heavy duty diesel	E4, E6, E7 & E9

5.6.4. As older test engines become unavailable, newer engines are allowed as alternatives or replacements in the test sequences and a year code is used to identify the specific test sequences.

5.6.5. It is the responsibility of the engine manufacturer to identify the appropriate lubricant performance requirement for each engine.

5.7. API (American Petroleum Institute) Vehicle Lubricant Classifications

The system defines a level of performance of a lubricant in spark and compression ignition engine vehicles for both engine oils and gear oils.

5.7.1. API Engine Service Classification System

- This system rates Crankcase Oils in relation to their performance in selected engines operated under controlled conditions.
- The details of the system and classification are published in the API Bulletin 1509 – “Engine Oil Licensing and Certification System”. The classification is divided into two series: S for mainly gasoline engines e.g. SM and C for mainly diesel engines eg CJ-4. The performance level for each series is identified by a second letter. In cases where an oil has a joint classification the letter grouping for the primary application is given first, e.g. CI-4/SL would be a lubricant formulated for diesel application (4-stroke engines) but suitable for use in gasoline engines up to SL service requirements.
- It is the responsibility of the engine manufacturer to identify the appropriate API engine lubricant performance requirement for each engine.

5.7.2. API Service Designation for Automotive Gear Oils

- The API gear oil service designation covers five groups of products for use in axles and manual transmissions only ranging from GL-1 for very lightly loaded gears through to GL-5 for hypoid transmissions.
- The various types and applications are fully described in the API Bulletin No. 1560 – “Lubricant Service Designations for Automotive Manual Transmissions, Manual Transaxles, and Axles”.

DEF STAN 01-005 Issue 19

- c. It is the responsibility of the vehicle manufacturer to identify the appropriate lubricant performance requirement for each transmission system.

5.8. NLGI Classifications

The NLGI classification of greases is issued by the American National Lubricating Grease Institute. It indicates the consistency, ie the degree of hardness of greases, in terms of their worked penetration at 25°C. (The penetration increases with increasing softness of the grease).

NLGI Number	Worked penetration at 25°C (mm/10)
000	445–475
00	400–430
0	355–385
1	310–340
2	265–295
3	220–250
4	175–205
5	130–160
6	85–115

5.9. Classification of Fuels (Motor)

5.9.1. The British Standard Institute publishes two specifications which cover the classification of unleaded motor gasoline.

5.9.2. Unleaded gasoline is classified in BS EN 228. BS EN 228 covers both premium and regular grades, as well as high octane (super) grade. The high octane (super) grade was specified in BS 7800, which is withdrawn, and is now adopted in BS EN 228. The minimum anti-knock values in terms of RON and MON values are given below.

Grade	RON	MON
High Octane (super unleaded)	97	86
Premium	95	85

5.9.3. Leaded gasoline is no longer generally available under EU Directive and few supply outlets for Lead Replacement Petrol (LRP) now exist. There is no formal specification for LRP, however the UK petroleum industry have agreed to supply unleaded fuel with an exhaust valve seat protection additive and with the following Research Octane Number (RON) and Motor Octane Number (MON) requirements:

Grade	RON	MON
LRP	97	86

5.10. Dangerous Goods Classifications

Hazardous substances and articles are classified, by suppliers, according to their main characteristics and properties that may adversely affect health, environment and property. There are two classification methods used.

5.10.1. CHIP. The EU Chemical Hazard Information & Packaging for Supply Regulations (CHIP) which is designed to warn people of the hazards presented by chemical substances and preparations by identifying the hazard(s) and providing adequate safety information in the form of supply labels and Safety Data Sheets (SDS) or Material Safety Data Sheets (MSDS).

5.10.2. UN Number. United Nations (UN) Number identifies either a specific material or a generic group of materials and enables the hazards presented by dangerous chemicals, equipment and articles during transport operations to be identified. Under this system Dangerous Goods (DG) are classified into nine hazard classes and are assigned packaging, marking, labelling, placarding, documentation, and segregation requirements relevant to the mode(s) of transport used.

DEF STAN 01-005 Issue 19

5.11. United Nations Classification Criteria for Flammable Liquids (UN Class 3)

Flammable liquids are liquids, or mixture of liquids or liquids containing solids in solution or suspension, which have closed flash points less than 60.5°C (65.6°C open cup test). Flammable liquids (UN Class 3) are assigned, based on their closed flashpoint and boiling point, to one of three Packaging Groups which indicates the degree of danger they present, as shown in the table below.

UN Packaging Group	Danger Level	Closed Flashpoint	Initial Boiling Point
I	Great danger (Extremely Flammable).	-	≤ 35°C
II	Medium danger (Highly Flammable)	< 23°C	> 35°C
III	Low danger (Flammable)	≥ 23°C & < 60°C	> 35°C

5.12. IP Flash Point Classifications

The IP flash point classifications are classified as follows according to their closed flash point. These classes are based on the “IP Model Code of Safe Practice Part 15: Area Classification Code for Installations Handling Flammable Fluids” published by Energy Institute, reflecting both the metrication of the UK oil industry and membership of the EU.

IP Class	Descriptions
I	Products having a closed flash point below 21°C
II	Products having a closed flash point from 21°C to 55°C, inclusive
III	Products having a closed flash point above 55°C up to and including 100°C
Unclassified (UC)	Products having a closed flash point above 100°C

IP Flash Point Classifications of Products:

JSD	NATO Code	IP Class	UN No
AL-5	S-745	III	na
AL-11	S-737	I	1219
AL-14	S-747	I	1230
AL-20	-	UC	na
AL-28	S-1744	II	1230
AL-34	S-1746	UC	na
AL-36	-	UC	na
AL-39	S-757	UC	na
AL-40	-	I	1230
AL-41	S-1745	III	na
AL-48	-	UC	na
AL-61	S-1747	UC	3082
AL-71	-	UC	na
AL-342	S-1719	UC	na
OC-160	-	UC	na
OC-300	-	UC	na
OC-600	O-208	UC	na
OEP-30	O-153	UC	na
OEP-38	O-186	UC	na
OEP-70	O-155	UC	na
OEP-71	O-136	UC	na
OEP-80	-	UC	na
OEP-215	-	UC	na
OEP-220	O-226	UC	na

DEF STAN 01-005 Issue 19

JSD	NATO Code	IP Class	UN No
OEP-240	-	UC	na
OEP-250	-	UC	na
OM-11	O-135	UC	na
OM-12	O-142	UC	na
OM-15	O-515	III	na
OM-16	S-756	UC	na
OM-17	-	UC	na
OM-22	-	UC	na
OM-24	-	UC	na
OM-33	H-576	UC	na
OM-58	-	UC	na
OM-65	H-572	UC	na
OM-70	O-285	UC	na
OM-71	O-138	UC	na
OM-100	O-240	UC	na
OM-150	-	UC	na
OM-160	-	UC	na
OM-170	-	UC	na
OM-270	-	UC	na
OM-750	O-252	UC	na
OM-1300	O-258	UC	na
OMD-23	-	III	na
OMD-55	O-1178	UC	na
OMD-90	O-1176	UC	na
OMD-113	O-278	UC	na
OMD-140	-	UC	na
OMD-160	-	UC	na
OMD-162	-	UC	na
OMD-250	-	UC	na
OMD-370	-	UC	na
OX-7	-	UC	na
OX-8	H-542	III	na
OX-9	O-148	UC	na
OX-14	O-147	UC	na
OX-16	-	UC	na
OX-18	O-190	UC	na
OX-19	H-537	UC	na
OX-20	-	UC	na
OX-24	O-157	UC	na
OX-26	O-160	UC	na
OX-27	O-156	UC	na
OX-30	H-584	UC	na
OX-38	O-149	UC	na
OX-40	-	UC	na
OX-64	-	UC	na
OX-70	S-1735	UC	na
OX-75	H-548	UC	na
OX-79	-	UC	na
OX-80	-	UC	na

DEF STAN 01-005 Issue 19

JSD	NATO Code	IP Class	UN No
OX-85	-	UC	na
OX-90	-	UC	na
OX-95	-	UC	na
OX-125	-	UC	na
OX-135	-	UC	na
OX-165	-	UC	na
OX-300	-	UC	na
OX-538	H-538	UC	na
PX-1	C-164	II	1993
PX-4	C-642	UC	1564
PX-6	-	UC	na
PX-7	S-743	UC	na
PX-11	C-628	UC	na
PX-15	-	UC	na
PX-26	C-635	III	na
PX-27	C-615	UC	na
PX-28	-	II	1993
PX-31	-	II	1993
PX-32	-	II	1993
PX-36	-	III	na
XG-235	G-363	UC	na
XG-250	S-736	UC	na
XG-261	-	UC	na
XG-264	G-412	UC	na
XG-269	G-392	UC	na
XG-273	-	UC	na
XG-276	G-353	UC	na
XG-279	G-403	UC	na
XG-284	G-366	UC	na
XG-285	G-355	UC	na
XG-286	G-460	UC	na
XG-287	G-354	UC	na
XG-291	G-421	UC	na
XG-293	G-395	UC	na
XG-294	G-1352	UC	na
XG-300	G-372	UC	na
XG-305	-	UC	na
XG-315	G-394	UC	na
XG-380	-	UC	na
XG-460	-	UC	na
ZX-9	-	III	na
ZX-13	S-720	UC	na
ZX-24	S-718	UC	na
ZX-30	-	I	1263
ZX-34	S-1728	I	1992
ZX-35	S-740	UC	na
ZX-36	-	UC	na
ZX-38	S-722	UC	na
ZX-40	-	UC	na

DEF STAN 01-005 Issue 19

JSD	NATO Code	IP Class	UN No
ZX-42	S-1714	UC	na
ZX-44	S-1718	UC	na
ZX-45	S-1720	UC	na
ZX-46	-	UC	na
ZX-47	-	UC	na
ZX-51	-	UC	na
ZX-54	-	II	1268
ZX-55	S-749	I	1993
AVGAS/100LL	-	I	1203
AVTAG/FSII	F-40	I	1203
AVCAT/FSII	F-44	III	1863
AVTUR	F-35	II	1863
AVTUR/FSII	F-34	II	1863
ULGAS	F-67	I	1203
DIESO MT	F-54	III	1202
DIESO UK	-	III	1202
DIESO F-76	F-76	III	1202
KERO/A	F-58	II	1223
STOVE-NAPHTHA	-	I	1268
WHITE SPIRIT	S-752	II	1300
WTA	S-1739	UC	na
NOx REDUCTION AGENT	S-1764	UC	na

NOTE:

1. na – not applicable. Considered non-dangerous for carriage.
2. The UN numbers quoted are a guide for carriage purposes only. The relevant transport regulations detailed in Clause 3 Hazard Information shall be consulted for the current requirements.

6. Alternative Fuels

Whilst conventional hydrocarbon-based fuels will continue to be available for many years to come, the use of alternative fuels will increase. Fuels will be based in part or fully on biofuels or may incorporate or be based fully on synthetic fuels.

6.1. Biofuels

6.1.1. Biodiesel

- a. Biodiesel is produced from plant oils or animal fats and can be used in a neat form or, more usually, as a blend in conventional diesel fuel. The feedstocks for biodiesel are commonly palm, sunflower and rapeseed oils. These oils are subjected to esterification, a chemical process, to produce FAME (Fatty Acid Methyl Ester). FAME intended for use as an automotive fuel for diesel engines must meet the requirements of BS EN 14214.
- b. BS EN 590 the current specification for both civilian road diesel fuel and for DIESO MT, permits up to 7% FAME to BS EN 14214 to be incorporated into the fuel. A biodiesel fuel containing 7% FAME will typically be described as a B7 Fuel.

6.1.2. Bioethanol

- a. Bioethanol is mainly produced by a fermentation process that converts sugars from plant-based material such as sugar beet, sugar cane, corn, maize, wheat crops, waste straw or willow to ethanol. There is also ongoing research and development into the use of municipal solid wastes to produce ethanol fuel.
- b. BS EN 228 permits the use of up to 5% ethanol in gasoline to be used in automotive fuels and such fuel containing 5% Bioethanol will typically be described as an E5 Fuel.

6.2. Synthetic Fuels

Synthetic fuels are currently mostly derived from coal or natural gas and have the potential to replace fuels derived from crude oil. They may be thought of as direct replacements for conventional hydrocarbon fuels and be compatible with current equipment and infrastructure. They will however offer some significant advantages compared to conventional hydrocarbon fuels.

Some fuels based on 100% synthetic components are already approved for use in UK F-34 and F-35 fuels as permitted in Def Stan 91-91 (refer to the latest version for more information). However, the largest future use for synthetic fuel is likely to be as a component of automotive diesel fuel.

7. Product Application Guide

Products listed below have been grouped by their main function to provide guidance on the selection of products to equipment manufacturers and authorised service departments. Some products listed are multi-functional, for example OMD-90, which may also be used as a transmission fluid and in hydraulic applications in addition to its principle function as a piston engine lubricant. Further advice should be sought from the service authority shown in Clause 1.2 Service Authorities.

Product Category		Product Code / Name
Propulsion Lubricants	Piston Engine	OM-170, OM-270, OMD-23, OMD-55, OMD-90, OMD-113, OMD-140, OMD-160, OMD-162, OMD-250, OMD-370 & OX-90
	Gas Turbine	OM-11, OM-71, OX-7, OX-9, OX-22, OX-26, OX-27, OX-38 & OX-152
	Steam Cylinder	OM-750 & OM-1300
Transmission Lubricants		OC-160, OC-300, OC-600, OM-100, OEP-30, OEP-38, OEP-70, OEP-71, OEP-80, OEP-215, OEP-220, OEP-240, OEP-250, OX-75, OX-79, OX-80, OX-85, OX-125, OX-165 & OX-300
Hydraulic Fluids		OM-15, OM-33, OM-65, OX-8, OX-19, OX-20, OX-30, OX-40 & OX-538
Compressor Lubricants		OM-58, OM-70, OM-160, OM-180, OX-95 & OX-135
Greases		OX-64, XG-235, XG-250, XG-261, XG-264, XG-269, XG-273, XG-276, XG-279, XG-284, XG-285, XG-286, XG-287, XG-291, XG-293, XG-294, XG-300, XG-305, XG-315, XG-380, XG-460 & ZX-40
Solid Lubricants & Anti-seize Compounds		OX-70, ZX-13, ZX-24, ZX-30, ZX-34, ZX-35, ZX-38 & ZX-55
Corrosion Preventives		PX-1, PX-4, PX-6, PX-7, PX-11, PX-13, PX-15, PX-24, PX-26, PX-27, PX-28, PX-31, PX-32 & PX-36
Coolants		AL-20, AL-39, AL-40 & AL-71
Cleaning Products & Release Agents		OX-18, AL-36, ZX-54 & White Spirit
Cleaners, Lubricants & Protectives (CLP)		OX-24, PX-24 & PX-36
Damping Fluids		OX-16, ZX-43, ZX-44, ZX-45, ZX-46, ZX-47 & ZX-51
De-icers		AL-5, AL-11 & AL-34
Transformer Oils		OM-16 & OM-22
Miscellaneous		OM-12, OM-17, OM-24, OM-150, OX-14, ZX-9 & ZX-36
Fuels	Aviation Gasolines	AVGAS/100LL (F-18)
	Aviation Turbine Fuels	AVTAG/FSII, AVCAT/FSII, AVTUR & AVTUR/FSII
	Aviation Fuel Additives	AL-41, AL-48 & AL-61
	Thrust Augmentation Fluids	AL-14, AL-28 & WTA
	Automotive Gasolines	ULGAS
	Automotive Diesel Fuels	DIESO MT & DIESO UK
	Naval Diesel Fuels	DIESO F-76
	Heating and Lighting Fuels	KERO/A (F-58) & STOVE NAPHTHA
	Automotive Diesel Fuel Additives	NOx REDUCTION AGENT (S-1764)

8. Product Life

8.1. Minimum Shelf Life

Minimum shelf life, in months, for the storage and use of the packaged or dormant products listed in this Standard are shown below. The test periods for products bearing a NATO Code are those shown in STANAG 3149, Minimum Quality Surveillance for Fuels, and NATO STANDARD AFLP 4714, Minimum Quality Surveillance for Lubricants and Associated Products. However, it must be noted that from December 2010 re-life testing will only be carried out by exception.

8.2. Dormant Stocks

Dormant stocks are stocks of products held in bulk of which there have been no receipts during the period concerned, irrespective of whether there have been any issues during the same period.

8.3. Inspection

Active and dormant fuel stocks in non-permanent or mobile storage installations including Tanks Fabric Collapsible (TFC), Air Portable Fuel Containers (APFC), Refuellers, Tankers and Unit Bulk Refuelling Equipment (UBRE) shall also be re-inspected but the frequency should be half those detailed below.

Joint Service Designation	NATO Code	Visual Test Frequency	Re-inspection Frequency	Remarks
AL-5	S-745	12	24	
AL-11	S-737	12	48	
AL-14	S-747	12	48	
AL-20	-	12	36	
AL-28	S-1744	6	24	
AL-34	S-1746	12	24	12 in bulk
AL-36	-	12	24	
AL-39	S-757	12	48	
AL-40	-	12	36	
AL-41	S-1745	-	18	
AL-48	-	-	6	
AL-61	S-1747	12	36	
AL-71	-	-	48	
AL-342	S-1719	12	24	12 in bulk
OC-160	-	12	60	36 in bulk
OC-300	-	12	36	
OC-600	-	12	36	
OEP-30	O-153	12	48	
OEP-38	O-186	12	48	
OEP-70	O-155	12	48	
OEP-71	O-136	12	48	
OEP-80	-	12	60	36 in bulk
OEP-215	-	12	36	
OEP-220	O-226	12	48	
OEP-230	-	12	36	
OEP-240	-	12	36	
OEP-250	-	12	36	
OM-11	O-135	12	48	
OM-12	O-142	12	48	
OM-15	H-515	12	24	
OM-16	S-756	-	48	

DEF STAN 01-005 Issue 19

Joint Service Designation	NATO Code	Visual Test Frequency	Re-inspection Frequency	Remarks
OM-17	-	12	48	
OM-18	-	12	36	
OM-22	-	-	48	
OM-24	-	12	60	36 in bulk
OM-33	H-576	12	60	36 in bulk
OM-58	-	12	48	
OM-65	H-572	12	60	36 in bulk
OM-70	O-285	12	60	36 in bulk
OM-71	O-138	12	48	
OM-100	O-240	12	60	36 in bulk
OM-150	-	12	48	
OM-160	-	12	48	
OM-170	-	12	48	
OM-180	-	12	48	
OM-270	-	12	48	
OM-750	O-252	12	60	36 in bulk
OM-1300	-	12	60	36 in bulk
OMD-23	-	-	36	
OMD-55	O-1178	12	60	
OMD-90	O-1176	12	60	
OMD-113	O-278	12	60	36 in bulk
OMD-140	-	12	36	
OMD-160	-	12	48	
OMD-162	-	12	48	
OMD-250	-	12	48	
OMD-330	-	12	36	
OMD-370	-	12	48	
OX-7	-	12	48	
OX-8	H-542	12	48	
OX-9	O-148	12	48	
OX-14	O-147	12	48	
OX-16	-	12	48	
OX-18	O-190	12	48	
OX-19	H-537	12	24	
OX-20	-	12	36	
OX-24	O-157	12	48	
OX-26	O-160	12	48	
OX-27	O-156	12	48	
OX-30	H-584	12	60	36 in bulk
OX-38	O-149	12	48	
OX-40	-	12	60	
OX-50	-	12	36	
OX-64		12	24	
OX-70	S-1735	12	-	
OX-75	H-548	12	48	
OX-79		12	36	
OX-80		12	36	
OX-85	-	12	36	
OX-90	-	12	60	

DEF STAN 01-005 Issue 19

Joint Service Designation	NATO Code	Visual Test Frequency	Re-inspection Frequency	Remarks
OX-95	-	-	36	
OX-125	-	12	36	
OX-135	-	-	24	
OX-152	O-152	12	48	
OX-165	-	-	36	
OX-300	-	12	60	36 in bulk
OX-538	H-538	12	24	
PX-1	C-614	12	48	
PX-4	C-642	12	48	
PX-6	-	-	48	
PX-7	S-743	12	48	
PX-11	-	12	48	
PX-13	C-613	-	36	
PX-15	-	-	48	
PX-19	-	-	48	
PX-24	C-634	-	48	
PX-26	C-635	-	48	
PX-27	C-615	-	48	
PX-28	-	-	48	
PX-31	-	-	48	
PX-32	-	-	48	
PX-36	-	-	36	
XG-235	G-363	6	36	
XG-250	S-736	12	60	Aerosols, 12 months visual check
XG-261	-	12	36	
XG-285	G-355	12	36	
XG-264	G-412	12	36	
XG-269	G-392	12	36	
XG-271	G-382	12	36	
XG-273	-	-	36	
XG-276	G-353	12	36	
XG-279	G-403	12	36	
XG-284	G-366	12	36	
XG-285	G-355	12	36	
XG-286	G-460	12	48	
XG-287	G-354	12	36	
XG-291	G-421	12	36	
XG-293	G-395	12	36	
XG-294	-	12	36	
XG-300	G-372	12	36	
XG-305	-	12	36	
XG-315	G-394	12	36	
XG-380	-	12	36	
XG-460	-	12	36	
ZX-9	-	-	48	
ZX-13	S-720	12	48	
ZX-24	S-718	12	-	
ZX-30	-	12	36	
ZX-34	S-1738	6	12	

DEF STAN 01-005 Issue 19

Joint Service Designation	NATO Code	Visual Test Frequency	Re-inspection Frequency	Remarks
ZX-35	S-740	12	48	
ZX-36	-	12	60	
ZX-38	S-722	12	36	
ZX-40	-	12	60	
ZX-43	S-1716	12	60	
ZX-44	S-1718	12	60	
ZX-45	S-1720	12	60	
ZX-46	-	12	60	
ZX-47	-	12	60	
ZX-51	-	12	60	
ZX-54	-	-	48	Aerosols, 12 months visual check
ZX-55	S-749	6	24	Aerosols, 12 months visual check
AVGAS/100LL	F-18	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
AVCAT/FSII	F-44	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
AVTAG/FSII	F-40	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
AVTUR	F-35	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
AVTUR/FSII	F-34	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
ULGAS	F-67	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
DIESO MT	F-54	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
DIESO UK	-	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
DIESO F-76	F-76	-	-	Refer to JSP 317 Pt 2: Guidance, Vol 3, Annex L
KERO/A	F-58	-	12	6 months in deployable storage media and 3 months if the storage is in a humid and warm climate.
STOVE NAPHTHA	-	-	12	
WHITE SPIRIT	S-752	12	48	
WTA	S-1739	6	24	
NOx REDUCTION AGENT	S-1764	-	-	Prolonged transportation or storage above 30°C should be avoid. Shelf-life could be up to 12 months if stored under 30°C

9. Specifications Used by the UK

For standardized alternatives which have NATO codes, see Annex O.

Specification		Page	JSD	NATO Code	Remarks
ACEA	E3	2-D-3	OMD-55	O-1178	
	E6/E7	2-E-22	OX-90	O-1180	
ASTM	D7450	2-B-3	OEP-38	O-186	API GL-5, SAE 75W
		2-B-8	OEP-220	O-226	API GL-5, SAE 80W-90
		2-B-9	OEP-240	-	API GL-5, Limited Slip (LS), SAE 80W-90
		2-B-10	OEP-250	-	API GL-5, SAE 80W-140
BS	148	2-C-7	OM-22	-	Class II
	245	2-I-18	WHITE SPIRIT	S-752	Type A
	506-1	2-I-4	AL-14	S-747	
	1595-1	2-I-3	AL-11	S-737	
	2626	2-C-12	OM-70	O-285	Type A, Grade 68
	2869	2-M-3	DIESO UK	-	Class A2
		2-N-2	KERO/A	F-58	Class C1
	4475	2-C-8	OM-24	-	Grade CS-22
		2-C-11	OM-65	H-572	Grade CS-68
		2-C-20	OM-750	O-252	Grade CS-680
		2-C-21	OM-1300	O-258	Grade CS-1000
	EN 228	2-L-2	ULGAS	F-67	
	EN 590	2-M-2	DIESO MT	F-54	
	EN 60296	2-C-5	OM-16	S-756	
	ISO 22241-1	2-I-16	NOx REDUCTION AGENT	S-1764	
Def Stan	68-10	2-H-8	PX-24	C-634	Please refer to Section 3 for Def Stan details
	68-62	2-G-7	ZX-35	S-740	
	68-69	2-F-3	XG-250	S-736	
	68-108	2-I-5	AL-20	-	
	68-127	2-I-9	AL-39	S-757	
	68-129	2-I-10	AL-40	-	
	68-150	2-I-12	AL-48	-	
	68-251	2-I-13	AL-61	S-1747	
	68-252	2-I-11	AL-41	S-1745	
	68-253	2-I-6	AL-28	S-1744	
	80-34	2-H-3	PX-4	C-642	
	80-80	2-G-3	ZX-13	S-720	
	80-81	2-G-9	ZX-38	S-722	
	80-83	2-H-11	PX-32	-	
	80-142	2-H-9	PX-26	C-635	
	80-143	2-H-13	PX-28	-	
	80-217	2-H-2	PX-1	C-614	
	91-04	2-M-4	DIESO F-76	F-76	

DEF STAN 01-005 Issue 19

Specification	Page	JSD	NATO Code	Remarks
91-06	2-F-2	XG-235	G-363	
91-18	2-F-5	XG-264	G-412	
91-21	2-A-2	OC-160	-	
91-22	2-D-5	OMD-113	O-278	
91-25	2-C-14	OM-100	O-240	
91-27	2-F-9	XG-279	G-403	
91-34	2-F-12	XG-286	G-460	
91-35	2-E-13	OX-30	H-584	
91-38	2-H-4	PX-6	-	
	2-H-5	PX-7	S-743	
91-39	2-C-9	OM-33	H-576	
91-42	2-C-10	OM-58	-	
	2-C-16	OM-160	-	
91-47	2-C-3	OM-12	O-142	
91-48	2-C-4	OM-15	H-515	
91-49	2-E-5	OX-14	O-147	
91-51	2-F-10	XG-284	G-366	
91-52	2-F-15	XG-293	G-395	
91-53	2-F-13	XG-287	G-354	
91-54	2-F-11	XG-285	G-355	
91-56	2-F-19	XG-315	G-394	
91-57	2-F-8	XG-276	G-353	
91-64	2-F-18	XG-305	-	
91-65	2-A-3	OC-300	-	
	2-A-4	OC-600	-	
91-70	2-G-2	ZX-9	-	
91-71	2-E-27	OX-165	-	
91-72	2-G-17	ZX-54	-	
91-74	2-B-6	OEP-80	-	
91-85	2-F-7	XG-273	-	
91-86	2-K-3	AVCAT/FSII	F-44	
91-87	2-K-5	AVTUR/FSII	F-34	
91-88	2-K-2	AVTAG/FSII	F-40	
91-90	2-J-2	AVGAS/100LL	F-18	
91-91	2-K-4	AVTUR	F-35	
91-94	2-E-2	OX-7	-	
91-98	2-E-14	OX-38	O-149	
91-99	2-C-2	OM-11	O-135	
91-100	2-E-11	OX-26	O-160	
91-101	2-E-12	OX-27	O-156	
91-102	2-E-10	OX-24	O-157	
91-103	2-H-14	PX-36	-	
91-105	2-F-14	XG-291	G-382 / G-421	
91-106	2-F-16	XG-294		
91-110	2-E-15	OX-40	-	
91-111	2-F-20	XG-380	-	
91-112	2-B-2	OEP-30	O-153	
	2-B-4	OEP-70	O-155	
91-113	2-D-4	OMD-90	O-1176	

DEF STAN 01-005 Issue 19

Specification		Page	JSD	NATO Code	Remarks
	91-114	2-C-15	OM-150	-	
DTD	406B	2-I-2	AL-5	S-745	
DTD 900	4042A	2-G-4	ZX-24	S-718	
	4386A	2-E-6	OX-16	-	
	4639	2-G-5	ZX-30	-	
	4877A	2-G-8	ZX-36	-	
	4881D	2-E-9	OX-20	-	
	4907	2-I-7	AL-34	S-1746	
	4939B	2-I-8	AL-36	-	
MIL / DOD	G-25013E	2-F-17	XG-300	G-372	
	L-23398D	2-G-18	ZX-55	S-749	Type 2
	DTL-25681	2-E-17	OX-70	S-1735	
	PRF-7808L	2-E-4	OX-9	O-148	
	PRF-23699	2-E-26	OX-152	O-152	
	PRF-32033	2-E-7	OX-18	O-190	
	PRF-83282D	2-E-8	OX-19	H-537	
	PRF-87257B	2-E-29	OX-538	H-538	
Proprietary & OEM	AFS 990C	2-F-4	XG-261	-	
	Caterpillar TO-4	2-E-19	OX-79	-	SAE 10W
		2-E-20	OX-80	-	SAE 30
	Detroit Diesel 7SE 270	2-D-6	OMD-140	-	
	Ford ESEN-M2C 86B & M-F CMS M1135	2-E-21	OX-85	-	
	GMN 10055	2-E-18	OX-75	H-548	
SAE	J 1899	2-D-7	OMD-160	-	Grade 40
		2-D-8	OMD-162	-	Multigrade
		2-D-9	OMD-250	-	Grade 50
		2-D-10	OMD-370	-	Grade 60
	J 1966	2-C-17	OM-170	-	Grade 40
		2-C-19	OM-270	-	Grade 50
	J 1704	2-E-3	OX-8	H-542	
	J 2360	2-B-8	OEP-220	O-226	
	AMS 1428	2-I-15	AL-342	S-1719	Type II
	AMS-G-4343	2-F-6	XG-269	G-392	
STANAG	AS 5272	2-G-6	ZX-34	S-1738	Type I
	1385	2-M-4	DIESO F-76	F-76	Please refer to Section 3 for STANAG details and their associated Allied Publications.
	1425	2-C-14	OM-100	O-240	
	3390	2-I-13	AL-61	S-1747	
	3747	2-K-5	AVTUR/FSII	F-34	
		2-K-4	AVTUR	F-35	
		2-K-2	AVTAG/FSII	F-40	
		2-K-3	AVCAT/FSII	F-44	
	3748	2-C-4	OM-15	H-515	
		2-E-8	OX-19	H-537	
		2-E-29	OX-538	H-538	
	4596	2-D-5	OMD-113	O-278	

DEF STAN 01-005 Issue 19

Specification		Page	JSD	NATO Code	Remarks
	4601	2-C-9	OM-33	H-576	
	7090	2-M-2	DIESO MT	F-54	
		2-L-2	ULGAS	F-67	
	7091	2-E-22	OX-90	O-1180	
		2-D-3	OMD-55	O-1178	
		2-B-8	OEP-220	O-226	
		2-B-3	OEP-38	O-186	
	7093	2-E-3	OX-8	H-542	
		2-E-18	OX-75	H-548	
		2-I-9	AL-39	S-757	
		2-H-9	PX-26	C-635	
	7101	2-F-9	XG-279	G-403	
		2-F-12	XG-286	G-460	
Other UK Specs	UK Mineral Hydrocarbons in Food (SI 1966 / 1073)	2-C-6	OM-17	-	
Other Non-UK Specs	Belgian BA-PO-103B	2-B-5	OEP-71	O-136	
		2-C-13	OM-71	O-138	
	French Air 1503	2-H-10	PX-27	C-615	
	NMMA TC-W3	2-D-2	OMD-23	-	
	Air Standard ACS-4035	2-E-24	OX-125	-	
	Hughes/McDonnell Douglas HMS20-1155	2-E-16	OX-64	-	

10. Obsolete Products / Standards, Reference Fuels & Amended Designations

10.1. Products Obsolete in the UK

Any queries as to the use of obsolete products should be referred to the appropriate Service Authority, see Clause 1.2 Service Authorities.

Product	Replacement	Remarks
AL-1	-	No further Service use
AL-2	-	No further Service use
AL-3	-	No further Service use
AL-4	-	No further Service use
AL-6	AL-34	-
AL-7	-	No further Service use
AL-8	AL-11	-
AL-9	AL-14	-
AL-10	-	-
AL-15	-	No further Service use
AL-16	AL-34	-
AL-17	-	No further Service use
AL-19	-	No further Service use
AL-23	-	No further Service use
AL-24	-	No further Service use
AL-26	-	No further Service use
AL-27	AL-26, obsolescent	See Annex I
AL-29	-	No further Service use
AL-30	AL-34	-
AL-31	AL-41	No further Service use
AL-32	-	No further Service use
AL-33	-	No further Service use
AL-35	-	-
AL-38	AL-48	No further Service use
LG-60	-	No further Service use
LG-190	XG-279	-
LG-280	XG-286	No further Service use
LG-320	Proprietary	RO PLC sole use product
LG-380	XG-380	Re-named
LG-420	XG-287	-
LG-450	-	No further Service use
OC-28	-	No further Service use
OC-33	-	No further Service use
OC-35	-	No further Service use
OC-58	-	No replacement
OC-65	-	No further Service use; BR no longer allow wick-fed axle boxes on Rolling Stock.
OC-68	-	No further Service use
OC-100	-	No replacement
OC-135	OM-160	-
OC-208	-	No further Service use
OC-310	OC-300	-
OC-338	OC-300	-
OEP-14	-	No further Service use

DEF STAN 01-005 Issue 19

Product	Replacement	Remarks
OEP-69	OEP-80	No further Service use
OEP-90	OEP-69 now obsolete	-
OEP-110	OEP-38 or OEP-220	Depending on temperature
OEP-230	OEP-220	-
OEP-740	OEP-215	In specified applications
OF-3	OX-8	-
OF-4	OX-87	-
OF-5	-	-
OF-16	OX-14	See Annex E
OF-20	OX-8	-
OF-21	OX-8	-
OF-22	OX-14	See Annex E
OF-24	OX-8	-
OF-30	-	No replacement
OF-35	-	No further Service use
OF-39	Proprietary	RO PLC sole use product
OF-285	OC-600	-
OF-300	Proprietary	
OF-301	-	Designation originally applied to an ingredient of OF-20 and PX-12, no longer used
OM-1	-	No further Service use
OM-3	-	No further Service use
OM-6	-	No further Service use
OM-10	-	No further Service use
OM-13	OM-11	-
OM-14	-	No further Service use
OM-17	-	Refer to Design Authority
OM-18	OM-15	-
OM-21	-	-
OM-31	-	No further Service use
OM-32	-	No further Service use
OM-34	Proprietary	RO PLC sole use product
OM-35	OM-33	-
OM-36	-	No further Service use
OM-39	-	No further Service use
OM-41	Proprietary	RO PLC sole use product
OM-42	OM-33	-
OM-43	-	No further Service use
OM-51	-	No further Service use
OM-52	OM-58	-
OM-60	-	Designation originally applied to the base oil of OMD-60, no longer used
OM-62	-	No further Service use
OM-81	Proprietary	RO PLC sole use product
OM-88	OM-100	-
OM-90	OM-160	-
OM-101	-	No further Service use
OM-108	-	RO PLC sole use product
OM-110	Proprietary	Designation originally applied to the base oil of OMD-110, no longer used

DEF STAN 01-005 Issue 19

Product	Replacement	Remarks
OM-111	-	RO PLC sole use product
OM-125	Proprietary	No further Service use
OM-260	-	Base oil for OMD-260, both now obsolete
OM-490	Proprietary	
OM-650	-	No further Service use
OM-800	OM-750	-
OMD-29	OMD-30	-
OMD-30	OMD-55	No further Service use
OMD-40	OMD-80	-
OMD-43	-	No further Service use
OMD-45		No further service use; For outboard motors only use OMD-23
OMD-60	-	-
OMD-75	OMD-80	Upgrading of oil
OMD-80	OMD-80X	Upgrading of oil
OMD-80X	OMD-90	Upgrading of oil
OMD-85	-	No further Service use
OMD-109	-	-
OMD-110	OMD-80 or OMD-113	Subject to application
OMD-111	OMD-113	-
OMD-112	OMD-113	-
OMD-115	-	No further Service use
OMD-120	OMD-80 or OMD-113	Subject to application
OMD-170	OMD-270	-
OMD-175	-	No further Service use
OMD-260	-	No further Service use
OMD-270	-	No further Service use
OMD-280	-	No replacement
OMD-330	OEP-220, OMD-113 or OX-85	Depending on application
OX-10	OX-14	No further Service use
OX-12	-	No further Service use
OX-13	OX-18	-
OX-15	PX-26	-
OX-18	OX-24 for gun applications	For other applications, consult Service authorities
OX-21	-	No further Service use
OX-22	OX-152	-
OX-23	OX-27	-
OX-28	OX-152	No further Service use
OX-29	-	No further Service use
OX-35	Proprietary	RO PLC sole use product
OX-50	-	No replacement
OX-52	OX-18 or PX-4	According to use
OX-72	Benjamin Vickers Hydrox 550	
OX-87	-	No further Service use
OX-160	OM-13	In new and modified mechanisms
OX-250	OM-320	-
OX-270	Proprietary	-
OX-275	PX-27	-

DEF STAN 01-005 Issue 19

Product	Replacement	Remarks
OX-320	-	No further Service use
OX-335	PX-27	-
OX-520	-	No further Service use
PX-2	PX-31	-
PX-3	PX-32 or PX-28	-
PX-5	PX-15, obsolescent	See Annex H
PX-8	PX-11	-
PX-9	PX-28	-
PX-10	PX-24	See Annex H
PX-12	XG-250	In specified applications
PX-13	Proprietary Products	-
PX-14	PX-4	-
PX-16	-	No further Service use
PX-19	XG-380	-
PX-23	-	No further Service use
PX-25	-	No further Service use
PX-29	PX-24	See Annex H
PX-30	-	No further Service use
SG-230	-	No further Service use
SG-240	XG-271	-
SG-250	-	No further Service use
SG-260	-	No further Service use
SG-330	-	No further Service use
XG-190	-	No further Service use
XG-220	-	No further Service use
XG-265	XG-293	See Annex F
XG-266	XG-276	See Annex F
XG-270	XG-293	See Annex F
XG-271	XG-291	See Annex F
XG-272	XG-284	See Annex F
XG-274	XG-291	No further Service use
XG-275	XG-287	-
XG-277	XG-293	-
XG-278	XG-287	-
XG-280	XG-264	-
XG-281	-	Not taken up
XG-283	-	No further Service use
XG-290	XG-287 or XG-293	For new equipment XG-287; Limited application in obsolete equipment use
XG-292	XG-293	XG-293
XG-295	XG-287	-
XG-310	XG-286	-
XG-320	-	-
XG-329	XG-293	No further Service use
XG-330	XG-285	-
XG-333	XG-279	See Annex F
XG-340	XG-264	-
XG-344	-	No longer available
XG-345	XG-287	-
XG-350	XG-271	-

DEF STAN 01-005 Issue 19

Product	Replacement	Remarks
XG-410	XG-235	See Annex F
XG-430	-	-
XG-450	-	No further Service use
XG-480	-	No further Service use
XG-485	Proprietary	-
XG-490	-	No further Service use
ZX-1	ZX-9	No further Service use
ZX-2	-	-
ZX-3	ZX-9	-
ZX-4	-	-
ZX-5	-	-
ZX-6	-	-
ZX-7	Proprietary	No further Service use
ZX-8	Proprietary	-
ZX-10	-	-
ZX-11	XG-286	No further Service use
ZX-12	-	-
ZX-14	XG-235	No further Service use
ZX-15	-	-
ZX-16	Proprietary	-
ZX-17	-	No further Service use
ZX-20	-	No further Service use
ZX-21	-	No further Service use
ZX-22	ZX-32, obsolete	No replacement
ZX-25	ZX-30	No replacement
ZX-26	-	-
ZX-27	Proprietary	No further Service use; RO PLC sole use product
ZX-28/G	ZX-38	-
ZX-28/P	-	No further Service use
ZX-29	PX-24	-
ZX-31	-	No further Service use
ZX-32	-	No further Service use
ZX-33	-	No further Service use
ZX-41	-	No further Service use
ZX-42	-	No further Service use
ZX-48	-	No further Service use
ZX-49	-	No further Service use
ZX-50	-	No further Service use
ZX-52	-	No further Service use
ZX-53	-	No further Service use
45/30 DIESO	-	No further Service use
3/50 FFO	-	No further Service use
36/50 FFO	-	No further Service use
50/50 FFO	-	No further Service use
125/50 FFO	-	No further Service use
370/50 FFO	-	No further Service use
73 NL AVGAS	-	No further Service use
74 MTGAS	CIVGAS F-50	No further Service use
75/50 FFO	-	No further Service use

DEF STAN 01-005 Issue 19

Product	Replacement	Remarks
80 NL AVGAS	-	No further Service use
80/Z MTGAS	-	No present Service use
CIVGAS F-50	-	-
3500 SECOND FFO	370/50 FFO	-
AVCAT	AVCAT/FSII	-
AVCAT/40	-	-
AVCAT/48	-	-
AVGAS 100	-	No further Service use
AVGAS 80	-	No further Service use
AVGAS 115	-	No further Service use
AVPIN	-	No further Service use
AVTUR/40	AVTUR	-
AVTUR/50	AVTUR	-
Cold Starting Fuel, Diesel Engine	-	No further Service use
DIESO MILITARY	DIESO MT	-
DIESO SUBZERO	-	No further Service use
HTP	-	No further Service use
KERO/B	KERO/A	No Supply
MTGAS	-	No further Service use
NL GAS	-	No further Service use
VAPO	-	No further Service use
Z COMBATGAS	-	No further Service use
COMBATGAS	-	No further Service use
CIVGAS	MTGAS	-

10.2. Obsolete Reference Fuels

Any queries as to the use of obsolete products should be referred to the appropriate Service Authority, see Clause 1.2 Service Authorities.

Product	Replacement / Remarks
Aircraft Turbine Engine, AVTAG Type	No further Service use
74 Octane, Low Vapour Pressure, MT	See Clause 6 Alternative Fuels
Reference Diesel Fuel, Low Temperature	See Clause 6 Alternative Fuels
Reference Diesel Fuel, 47 Cetane	No further Service use
Reference Gasoline, High Lead	No further Service use
Reference Gasoline, Low Lead	See Clause 6 Alternative Fuels
74 Octane, High Vapour Pressure, MT	See Clause 6 Alternative Fuels
80 Octane, MT	See Clause 6 Alternative Fuels
Diesel Fuel, 47 Cetane	No further Service use
Reference Diesel Fuel, 1% Sulfur	No further Service use

10.3. Amended Designations

Any queries as to the use of obsolete products should be referred to the appropriate Service Authority, see Clause 1.2 Service Authorities.

DEF STAN 01-005 Issue 19

Old Designation	New Designation	Remarks
LG-380	XG-380	-
100/130 AVGAS	AVGAS 100	No further Service use
115/145 AVGAS	AVGAS 115	No further Service use
47/20 DIESO	DIESO (UK)	-
47/20 DIESO, MT	DIESO (UK (MT))	-
47/20 DIESO, RN	DIESO F-76	-
47/20 DIESO NAVAL	DIESO F-76	-
47/0 DIESO	DIESO F-75	Not normally available in UK
47/0 DIESO, NAVAL	DIESO F-75	Not normally available in UK
47/0 DIESO, CEPS	DIESO MILITARY	-
47/0 DIESO, REGULAR	DIESO MILITARY	-
40/40 DIESO	DIESO SUBZERO	No further Service use
40/55 DIESO	DIESO SUBZERO	No further Service use
DIESO (UK)	DIESO UK	-
DIESO (UK (MT))	DIESO MT	-

10.4. Specifications Obsolete in the UK Since 1964

All issues of the specification are cancelled, unless otherwise stated.

Cancelled Specification	Product	Remarks
BR	665	OC-65, obsolete
	1336	Fuels, Lubricants & Associated Products
BS	148	OM-16
CS	1033	PX-2, obsolete
	1250	OC-35, obsolete
	1419	OX-320, obsolete
	1485	AL-23, obsolete
	1496	OM-17
	1653	XG-280, obsolete
	2060	PX-10, obsolete
	2298	PX-12, obsolete
	2486B	PX-15
	2592	XG-340, obsolete
	2842	OX-13, obsolete
		OX-52, obsolete
	2868	ZX-27, obsolete
	2902	OM-41, OM-81, OM-111
	2906	OF-3, 24, obsolete
	2908	AL-17, obsolete
	2911	XG-220, obsolete
	2976	OF-39, obsolete
	2985	LG-190, obsolete
		LG-280, LG-320, obsolete
	2994	OMD-30
	2997	ZX-1, ZX-2, obsolete
	3014	OM-34, obsolete
	3000	OEP-38, OEP-220

DEF STAN 01-005 Issue 19

Cancelled Specification		Product	Remarks
	3033	OM-108, obsolete	Was Def Stan 91-15; now cancelled
	3106	OX-8	Now TS 10145
	3107	XG-279	Now Def Stan 91-27
	3108	OEP-14, obsolete	No further Service use
	3121	ZX-34	Now SAE AS 5272 Type I
	3122	ZX-29, obsolete	Now Def Stan 91-72 for ZX-54
DEF	58	AL-8, obsolete	Now BS 1595: Part 1 for AL-11
	2001	OM-13, obsolete	Now Def Stan 91-99 for OM-11
	2002	OM-21, obsolete	Now BS 4475/Grade TLS 22
	2003	OM-750, OM-1300	Now BS 4475/Grade CSB 680, CSB1000
	2004	OM-58, OM-160	Now Def Stan 91-42
	2006	OM-70	Now BS 2626/Grade 68
	2007	OM-33	Now Def Stan 91-39
	2008	OM-100	Now Def Stan 91-25
	2101	OMD-40, 60, 110 & 330, obsolete	Was Def Stan 91-43; now Def Stan 91-113 for OMD-90
	2121	OC-160, obsolescent	Now Def Stan 91-21
	2122	OC-600	Now Def Stan 91-65
	2181	OX-275, obsolete	Was Def Stan 91-40; now French Air 1503 for PX-27
	2182	OX-10, obsolete	No further Service use
	2221	LG-380	Now Def Stan 91-111
	2261	XG-271, obsolete	Was Def Stan 91-12; now Def Stan 91-105 XG-291
	2301	ZX-5, obsolete	No further Service use
	2301	ZX-6, obsolete	Was Def Stan 91-26; now cancelled
	2302	ZX-7, ZX-8, obsolete	Replaced by proprietary products
	2303	ZX-1, ZX-2, obsolete	Was Def Stan 91-23; now Def Stan 91-70 for ZX-9
	2304	ZX-35	Now Def Stan 68-62
	2331	PX-1	Now Def Stan 80-217
	2332	PX-4	Now Def Stan 80-34
	2333	PX-6, PX-7	Now Def Stan 91-38
	2334	PX-11	Was Def Stan 80-85; now proprietary
	2401	CIVGAS, COMBATGAS, obsolete	Was Def Stan 91-13; now cancelled
	2401	Z COMBATGAS, obsolete	No further Service use
	2402	DIESO MILITARY, obsolete	Was Def Stan 91-9/3; now cancelled
		47/20 DIESO, obsolete	Was Def Stan 91-09; now cancelled
		40/-40 DIESO, obsolete	Was Def Stan 91-09; now cancelled
	2403	KERO/A, obsolescent	Now BS 2869, Class C1
		KERO/B	Now BS 2869, Class C2
	2404	VAPO, obsolete	Was Def Stan 91-03; now cancelled
	2405	Reference Fuels, obsolete	Was Def Stan 91-07; now cancelled
	2406	Furnace Fuel Oils, obsolete	Was Def Stan 91-05; now cancelled
Def Stan	59-10/2	XG-250	Now Def Stan 68-69
	68-7/1	ZX-33	No further Service use
	68-11/1	PX-10	Now Def Stan 68-10 for PX-24
	68-61	AL-26, obsolete	No further Service use
	68-218/1	PX-29	Now Def Stan 68-10 for PX-24
	80-85/1	PX-11	Now Proprietary
	80-145/1	PX-15	Now Proprietary
	80-186/1	PX-31	Now Proprietary
	91-3/1	VAPO, obsolete	No further Service use
		3/50 FFO	Now BS 2869, Class D

DEF STAN 01-005 Issue 19

Cancelled Specification	Product	Remarks
	36/50 FFO, obsolescent	Now BS 2869, Class E
91-5/1 & 2	50/50 FFO, 75/50 FFO 125/50 FFO, 370/50 FFO	No further Service use Now BS 2869, Class F, Class G
91-7/2, 3 & 4	Reference Gasoline, High Lead	No further Service use
	Reference Gasoline, Low Lead	No further Service use
	Reference Diesel Fuel, High Sulfur	No further Service use
91-8/1	XG-220	No further Service use
91-9/1 & 2	47/0 DIESO Regular, obsolete	Was Def Stan 91-9/3; now cancelled
	47/-55 DIESO, obsolete	No further Service use
	UK DIESO	Now BS 2869, Class A2
	UK, MT, DIESO	Now BS 2869, Class A1
	DIESO MILITARY, obsolete	Was Def Stan 91-9/3; now cancelled
	DIESO SUBZERO, obsolete	No further Service use
91-9/3	DIESO MILITARY	Now BS EN 590
91-10/1	OC-35, obsolete	No further Service use
91-11	OF-39, obsolete	No further Service use
91-12	XG-271, obsolete	Now Def Stan 91-105 XG-291
91-13	F-46 COMBATGAS, obsolete	No further Service use
	F-50 CIVGAS, obsolete	No further Service use
91-14	OM-34, obsolete	No further Service use
91-15	OM-108, obsolete	No further Service use
91-17/1	LG-280, LG-320, obsolete	Now Def Stan 91-34 for XG-286
91-23/1	ZX-1, ZX-2	Now Def Stan 91-70 for ZX-9
91-26/1	ZX-6, obsolete	No further Service use
91-28/1	XG-274, obsolete	Now Def Stan 91-105 for XG-291
91-30/1	OX-320, obsolete	No further Service use
91-33/2	OM-24	Now BS 4475/CS ISO 22
91-36/1	OM-17, obsolete	No further Service use
91-40	PX-27	Now French Air 1503
91-43/1	OMD-40, obsolete	Now Def Stan 91-113 for OMD-90
91-43/2	OMD-330, obsolete	No further Service use
91-44/1	OM-13, obsolete	Now Def Stan 91-99 for OM-11
91-46/2	ZX-41 to ZX-53	Now proprietary
91-50/1	PX-11	Was Def Stan 80-85/1; now proprietary
91-55/2	XG-300	Now MIL-G-25013
91-59/2	OEP-38, OEP-220	Now API GL-5
91-60/1	OM-70	Now BS2626 Type A Grade 68
91-68/1	OMD-55	Now ACEA E3
91-76/1	CIVGAS	Was BS 4040, now cancelled
91-77/1	STOVE NAPHTHA	Now proprietary
91-78/1	PX-19, obsolete	Now Def Stan 91-111 for XG-380
91-81/2	OX-8	Now SAE J 1704
91-93	OX-22, obsolete	No further Service use
91-97	OEP-71, OM-71	Now Belgian specification BA-PO-103B
91-101 (partial)	OX-28 only	No further Service use; replaced by OX-152
91-104	OMD-23	Now NMMA TC-W3
91-107/1	OMD-80X	Now Def Stan 91-113 for OMD-90
96-1	ZX-20, obsolete	No further Service use

DEF STAN 01-005 Issue 19

Cancelled Specification		Product	Remarks
DERD	2450	OMD-160, OMD-250, OMD-370	Now SAE J 1899
	2451	FSII (AL-41)	Now Def Stan 68-252
	2452	AVCAT/FSII (F-44)	Now Def Stan 91-86
	2453	AVTUR/FSII (F-34)	Now Def Stan 91-87
	2454	AVTAG/FSII (F-40)	Now Def Stan 91-88
	2458	OX-22, obsolete	Was Def Stan 91-93; now cancelled
	2461	S-1747	Now Def Stan 68-251
	2468	OX-7	Now Def Stan 91-94
	2472	OMD-270, OM-170, OM-270	Now SAE J 1966
	2475	AVGAS/100LL	Now Def Stan 91-90
	2479	OEP-71	Was Def Stan 91-97, now Belgian specification BA-PO-103B
	2485	AVGAS/80 & 100LL	Now Def Stan 91-90
	2486	AVTAG, obsolete	No further Service use
	2487	OX-38	Now Def Stan 91-98
	2490	OM-11	Now Def Stan 91-99
	2491	AL-9, obsolete	Now BS 506 for AL-14
	2492	AVPIN, obsolete	Was Def Stan 91-89; now cancelled
	2494	AVTUR, JET A-1	Now Def Stan 91-91
	2497	OX-26	Now Def Stan 91-100
	2498	AVCAT F-43	Now Def Stan 91-86
	2499	OX-27, OX-28	Now Def Stan 91-101
DGS	145	OM-24	Was Def Stan 91-33; now BS 4475/CS ISO 22
	218	XG-310, obsolete	Now Def Stan 91-34 for XG-286
	200/1047C	ZX-40	Now Proprietary
	200/1048C	OX-72	Now Proprietary
	200/1049	OM-490	Now Proprietary
	200/1101B	OX-300	Now Proprietary
	200/1102B	OX-29	Now Proprietary
	200/1110A	OX-40	Now Def Stan 91-110
	327	XG-286	Now Def Stan 91-34
	338	OX-30	Now Def Stan 91-35
	6920	OEP-69, obsolete	Was Def Stan 91-32; now cancelled
	6921	XG-274, obsolete	Was Def Stan 91-28; now Def Stan 91-105 for XG-291
	6922	OM-65	Now BS 4475/Grade CSB 68
	6923	OMD-112, obsolete	Now Def Stan 91-22 for OMD-113
	6924	OM-36, obsolete	No further Service use
DTD	72	OF-300	No further Service use
	143C	PX-3, obsolete	Now Def Stan 80-83 for PX-32
	279	Anti-freezing Grease, obsolete	No further Service use
	388	OF-35, obsolete	No further Service use
	392	ZX-13	Now Def Stan 80-80
	417	OM-150	Now Def Stan 91-114
	548	OM-14, obsolete	Now Def Stan 91-48 for OM-15
	561	OX-12, obsolete	No further Service use
	577	XG-290, obsolete	Now Def Stan 91-53 for XG-287 for new equipment

DEF STAN 01-005 Issue 19

Cancelled Specification	Product	Remarks
581C	OEP-30, OEP-70	Now Def Stan 91-112
585	OM-15	Now Def Stan 91-48
663	PX-9, obsolete	Now TS 10131 for PX-28 in certain applications
791	PX-13	Now proprietary
804	PX-14, obsolete	Now Def Stan 80-34 for PX-4
806	XG-285, obsolescent	Now Def Stan 91-54
822	OX-14	Now Def Stan 91-49
825	XG-275, obsolete	Now Def Stan 91-53 for XG-287
844	XG-278, obsolete	Now Def Stan 91-53 for XG-287
866	XG-295, obsolete	Now Def Stan 91-53 for XG-287
878	XG-277, obsolete	Now Def Stan 91-52 for XG-293
896	OX-23, obsolete	Was DERD 2499 for OX-27; now Def Stan 91-101
897	XG-315	Now Def Stan 91-56
5527	XG-276	Now Def Stan 91-57
5530	ZX-28/G, obsolete	Now Def Stan 80-81 for ZX-38
	ZX-28/P, obsolete	No further Service use
5578	OM-12	Now Def Stan 91-47
5579	XG-292, obsolete	Now Def Stan 91-52 for XG-293
5581	Damping Fluids: Dimethyl Silicone	Was Def Stan 91-46 & re-designated ZX-41 to ZX-53; now Proprietary
5585	XG-300	Was Def Stan 91-55; now MIL-G-25013
5586	AL-26, obsolete	Was Def Stan 68-61; now cancelled
5598	XG-287	Now Def Stan 91-53
5601	XG-293	Now Def Stan 91-52
5609	XG-284	Now Def Stan 91-51
5610	XG-269	Was MIL-G-4343; now SAE-AMS-G-4343
5617	ZX-38	Now Def Stan 80-81
DTD 900	4031	AL-6, obsolete
	4205	OM-12
	4222	XG-265, obsolete
	4276	OM-1
	4298	XG-250
	4309	XG-344
	4310	AL-15, obsolete
	4351	AL-16, obsolete
	4361	OM-3, obsolete
	4402	ZX-26, obsolete
	4408	XG-273
	4420	XG-276
	4422	ZX-14, obsolete
	4439	XG-276
	4513	OEP-740, obsolete
	4609	XG-284
	4651	XG-460
		Was DTD 900/4907; now proprietary product for AL-34
		Now Def Stan 91-47
		Now Def Stan 91-52 for XG-293
		Now MIL-L-5020
		Was Def Stan 59-10/2; now Def Stan 68-69
		Was DTD 900/4872; no further Service use
		No further Service use
		Was DTD 900/4907; now proprietary product for AL-34
		No further Service use
		No further Service use
		Was DTD 900/4914; now Def Stan 91-85
		Now Def Stan 91-57
		Now Def Stan 91-06 for XG-235
		Now Def Stan 91-57
		Was DTD 900/4981 for OEP-215; now proprietary, no specification
		Now Def Stan 91-51
		Now proprietary, no specification

DEF STAN 01-005 Issue 19

Cancelled Specification		Product	Remarks
	4662	XG-261	Now proprietary, no specification
	4667	XG-266, obsolete	Now Def Stan 91-57 for XG-276
	4671	ZX-32, obsolete	No further Service use
	4695	OM-22, obsolescent	Now BS 148, special grade with max pour point -45°C
	4725	OX-50, obsolete	Not available in UK
	4804	AL-32, obsolete	No further Service use
	4809	XG-329, obsolete	Now Def Stan 91-52 for XG-293
	4872	XG-344, obsolete	No further Service use
	4906	AL-33, obsolete	No further Service use
	4914	XG-273	Now Def Stan 91-85
	4938	PX-16, obsolete	No further Service use
	4941	OX-20	Now DTD 900/4881 (obsolescent)
	4955	OX-20	Now DTD 900/4881 (obsolescent)
	4963	AL-34	Now DTD 900/4907 (obsolescent)
	4965	OX-20	Now DTD 900/4881 (obsolescent)
	4981	OEP-215	Now proprietary, no specification
	5540B	PX-26	Now Def Stan 80-142
	6103	OX-87, obsolete	No further Service use
E-in-C	O-2	OM-65	Now BS4475/Grade CSB-68
	O-3	OM-100	Now Def Stan 91-25
	O-5	OM-112, obsolete	Now Def Stan 91-22 for OMD-113
	O-9	OM-36, obsolete	No further Service use
MIL	G-4343	XG-269	Now SAE-AMS-G-4343
	L-5020	OM-1, obsolete	No further Service use
	T-5542	ZX-32, obsolete	No further Service use
	C-6529d	ZX-21, obsolete	No further Service use
	L-46000C	XG-485, obsolete	No further Service use
TS	321	ZX-29, obsolete	Now Def Stan 91-72 for ZX-54
	325	PX-19, obsolete	Was Def Stan 91-78/1; now Def Stan 91-111 for XG-380
	331	AL-26, obsolete	Was Def Stan 68-61; now cancelled
	333	Diesel Starter Fuel, obsolete	No further Service use
	337	ZX-11, obsolete	Now Def Stan 91-34 for XG-286
	10003	47/0 DIESO/CEPS, obsolete	Was Def Stan 91-9 for DIESO MILITARY; now BS EN 590
	10033	OMD-30, obsolete	Was Def Stan 91-68; now ACEA E3 for OMD-55
	10033E	OMD-80, obsolete	Was Def Stan 91-107; now Def Stan 91-113 for OMD-90
	10035	PX-25, obsolete	No further Service use
	10042	OMD-115, obsolete	No further Service use
	10067	AL-38, obsolete	Was Def Stan 68-128; now Def Stan 68-150 for AL-48
	10111A	OMD-45, OMD-175, obsolete	Was Def Stan 91-104; now cancelled
	10131	PX-28	Now Def Stan 80-143
	10134	OX-165	Now Def Stan 91-71
	10145	OX-8	Was Def Stan 91-81; now SAE J 1704

DEF STAN 01-005 Issue 19

Cancelled Specification	Product	Remarks
10151	PX-29, obsolete	Was Def Stan 68-218; now Def Stan 68-10 for PX-24
10164	PX-31	Was Def Stan 80-186; now proprietary
10165	OM-18	Now Def Stan 91-48
10177	AL-39	Now Def Stan 68-127
10180	PX-30, obsolete	No further Service use
10184A	Stove Naphtha	Was Def Stan 91-77; now proprietary
10188	AL-40	Now Def Stan 68-129

10.5. Obsolete NATO Codes

The UK Joint Service Designation (JSD) of several products listed in this table were amended during their existence. These are shown in chronological order in the Joint Service Designation of UK Replacement columns.

NATO Code	Joint Service Designation (JSD)	Remarks	JSD of UK Replacement
C-612	-	Heavy oil type preservative compound	-
C-613	-	Corrosion preventive oil aircraft piston engine	-
C-617	-	Aircraft engine, metallic, preservative compound	-
C-618	PX-3, obsolete	Corrosion preventive compound, hard film, cold application. Superseded by PX-32 or PX-28. No NATO Code.	PX-32 or PX-28
C-619	-	Aircraft engine, metallic, preservative compound. Superseded by C-610, corrosion preventive oil, aircraft engine, turbine.	-
C-622	ZX-21, obsolete	Aircraft engine, non-metallic, preservative compound, Type I. Superseded by C-608.	ZX-21, obsolete
C-623	-	Aircraft engine, non-metallic, preservative compound, Type II. Superseded by C-609.	Proprietary
C-624	ZX-17, obsolete	Aircraft engine, non-metallic, preservative compound, Type III. Superseded by C-610, no further UK Service use.	No replacement
C-626	-	Hard film preservative compound. Superseded by C-632, corrosion preventive compound, hard film, cold application.	-
C-627	-	Corrosion Preventive Compound: Soft Film Hot Application	-
C-628	PX-11	Corrosion Preventive Compound: Soft Film Hot Application	-
C-629	-	Corrosion Preventive Compound: Hard Film Cold Application	-
C-636	ZX-15, obsolete	Thrust augmentation fluid, soluble oil	No replacement
C-637	-	Hydraulic equipment, preservative compound	-
C-639	-	Corrosion preservative oil, gas turbine: Synthetic base	-
C-644	-	-	-
C-654	-	Corrosion preventive, soft film, hot application	NATO Code deleted
F-12	-	Leaded aviation gasoline, grade 80/87	-
F-13	73 NL AVGAS	Nonleaded aviation gasoline, grade 73	-

DEF STAN 01-005 Issue 19

NATO Code	Joint Service Designation (JSD)	Remarks	JSD of UK Replacement
F-14	80 NL AVGAS	Nonleaded aviation gasoline, grade 80	-
F-15	91/96 AVGAS	Aviation gasoline, grade 91/96	-
F-20	AVTAG/FSII	Turbine fuel, aviation, wide cut type, plus FSII	AVTAG/FSII F-40
F-22	115/145 AVGAS	Aviation gasoline, grade 115/145.	-
F-30	AVTUR	Turbine engine fuel. Superseded by F-34 AVTUR subsequently allocated F-35	AVTUR/50
	AVTUR/40		AVTUR
			AVTUR/FSII
F-32	-	Turbine engine fuel, kerosene type	-
F-33	-	Turbine engine fuel, kerosene type	-
F-42	AVCAT/40	Turbine engine fuel, high flash, kerosene type. Superseded by F-44. AVCAT subsequently allocated F-43.	AVCAT/FSII
	AVCAT/48		
	AVCAT		
	AVCAT/FSII		
F-43	AVCAT	Turbine engine fuel, superseded by F-44	AVCAT/FSII
F-45	AVTAG	Turbine engine fuel, wide cut gasoline type. Superseded by F-40.	AVTAG, now obsolete
F-46	-	Gasoline, Automotive: Military, 91 RON	-
F-47	-	Gasoline, 80 octane	-
F-48	80/Z MT GAS	Gasoline, 80 octane, artic. Superseded by F-53, now also obsolete.	Z COMBATGAS, no present UK Service use
	Z COMBATGAS		
F-49	-	-	-
F-50	CIVGAS	-	No further Service use
F-52	-	Diesel fuel, 47 cetane. Superseded by F-54	DIESO MILITARY
F-53	Z COMBATGAS, obsolete	Gasoline, automotive, combat, subzero	No further UK Service use
F-55	-	Diesel fuel, 40 cetane	-
F-56	DIESO 45/-30	Diesel fuel, subzero	DIESO SUBZERO
	DIESO 45/-40		DIESO SUBZERO
	DIESO 45/-55		No further Service use
	DIESO SUBZERO		
F-59	-	Kerosene. Superseded by F-58.	KERO/B
F-60	-	-	-
F-62	-	Fog oil	-
F-64	-	Fog oil, high viscosity type	-
F-65		50/50 DRSO Fuel & Kerosene Mix	Replaced by F-34 (SFP)
F-77	50/50 FFO	Fuel, residual light viscosity boiler.	No further Service use
F-78	47/0 DIESO	Diesel fuel, naval, zero pour. Superseded by F-75.	47/0 DIESO NAVAL
			DIESO F-75, not normally available in UK
F-79	47/20 DIESO, RN	Diesel fuel, naval 20 pour. Superseded by F-76.	47/20 DIESO NAVAL
	47/20 DIESO, NAVAL		DIESO F-76
F-82	75/50 FFO	-	75/50 FFO
F-84	75/50 FFO	Fuel oil, naval, boiler, 75/50	No further Service use
F-85	-	Diesel fuel, naval, zero pour. Superseded by F-75	DIESO F-75, not normally available in UK
G-350	XG-275, obsolete	Grease, aircraft, synthetic, general purpose. Superseded by G-354	XG-278, obsolete
			XG-287
G-352	XG-295	Grease, aircraft, synthetic, extreme low temperature. Superseded by G-354	XG-278, obsolete
			XG-287
G-357	XG-273	Grease, aircraft, synthetic, graphite. Product still used by UK.	XG-273
G-364	XG-410, obsolete	Hydrocarbon resistant grease. Superseded by G-363.	XG-235
G-400	LG-190, obsolete	Grease, automotive, water pump.	XG-279

DEF STAN 01-005 Issue 19

NATO Code	Joint Service Designation (JSD)	Remarks	JSD of UK Replacement
G-402	-	Wheel bearing grease, temperate climate. Superseded by G-403	XG-279
G-404	LG-280	Grease, temperate climate, general purpose. Product still used by UK, Marine applications only	XG-286
G-405	LG-320, obsolete	Grease, temperate climate, wheel bearings. Product still used by UK.	Proprietary
G-406	LG-380	Grease, general purpose, low temperature. Product still used by UK.	XG-380
G-407	-	Grease, graphite, soft	-
G-409	-	-	-
G-410	-	-	-
G-413	-	Grease, automotive and weapons, soft.	-
G-414	-	Grease, automotive and weapons, hard.	-
G-450	XG-274, obsolete	Grease, naval, general purpose Ball and Roller bearing superseded by G-421	XG-291
G-1352	-	-	-
H-520	-	-	-
H-532	OF-35, obsolete	Hydraulic fluid, type OF-35.	No further Service use
H-533	-	Hydraulic fluid, castor oil base.	-
H-534	OF-4, obsolescent	Hydraulic fluid, castor oil base. Product still used by UK.	OF-4, obsolete
H-535	-	Hydraulic fluid, petroleum, missile	-
H-536	-	-	-
H-543	-	Brake fluid	-
H-545	-	Heavy shock absorber fluid	-
H-546	-	Heavy shock absorber fluid	-
H-570	-	Hydraulic fluid, petroleum, inhibited, high, VI. Superseded by H-573, Hydraulic fluid, petroleum, inhibited.	-
H-581	-	-	-
H-582	-	Hydraulic fluid, synthetic, fire resistant.	-
O-112	-	Synthetic oil, special purpose.	-
O-113	-	Lubricating oil, aircraft piston engine, grade SAE 30	NATO Code deleted
O-115	OM-170, obsolescent	Lubricating oil, aircraft piston engine, grade 1080. Product still used by UK	OM-170, obsolescent
O-117	OM-270	Lubricating oil, aircraft piston engine, grade SAE 50	NATO Code deleted
O-123	OMD-160	Lubricating oil, aircraft piston engine, dispersant base mineral oil, grade SAE 40	NATO Code deleted
O-125	OMD-250	Lubricating oil, aircraft piston engine, dispersant base mineral oil, grade SAE 50	NATO Code deleted
O-127	OMD-270	Lubricating oil, aircraft piston engine, grade D-1110, detergent. Product still used by UK	OMD-270, obsolescent
O-128	OMD-370	Lubricating oil, aircraft piston engine, dispersant base mineral oil, grade SAE 60	NATO Code deleted
O-132	-	Lubricating oil, aircraft turbine engine, grade 1005.	-
O-140	OM-150, obsolescent	Lubricating oil, aircraft controls, antifreezing. Product still used by UK	OM-150, obsolescent
O-158	XG-485	Grease Aircraft semi-fluid	XG-485, obsolete
O-162	OMD-162	Lubricating oil, aircraft piston engine dispersant, grade SAE 15W-50	NATO Code deleted
O-176	-	-	-

DEF STAN 01-005 Issue 19

NATO Code	Joint Service Designation (JSD)	Remarks	JSD of UK Replacement
O-177	OMD-40, obsolete	Heavy duty engine oil, grade 10. Superseded by O-176.	OMD-80
O-178	-	-	-
O-180	OMD-75, obsolete	Lubricating oil, engine, moderate duty diesel engine service, multigrade.	OMD-80
O-182	OMD-330	Lubricating oil, engine, grade SAE 50	NATO Code deleted
O-183	OMD-30	Lubricating oil engine, moderate duty.	No further Service use
O-184	OEP-220	Lubricating oil, gear, extreme pressure, grade 90. Superseded by O-226.	OEP-220
O-188	OEP-14, obsolete	Lubricating oil, gear, extreme pressure, sub-zero	No further Service use
O-194	-	Armament cleaning oil	NATO Code deleted
O-196	-	Lubricating oil, general purpose, light	NATO Code deleted
O-197	-	Lubricating oil, exposed gear, light.	-
O-198	-	-	-
O-199	-	-	-
O-200	-	-	-
O-202	-	Lubricating oil, exposed gear, light.	-
O-203	-	-	-
O-205	-	Lubricating oil, railway bearing.	-
O-206	-	Lubricating oil, railway traction.	-
O-208	OC-600	Lubricating oil, gear, compounded	-
O-214	ZX-1	Cutting fluid - soluble	ZX-9
O-216	-	Cutting fluid, compounded	NATO Code deleted
O-218	OX-320	Lubricating oil, colloidal graphite	No further Service use
O-219	OEP-220	Extreme pressure gear oil, grade 90. Superseded by O-184, now also obsolete. Superseded by O-26.	OEP-220
O-220	OEP-38	Extreme pressure gear oil, grade 75. Superseded by O-186.	OEP-38
O-222	OEP-14, obsolete	Extreme pressure gear oil, subzero. Superseded by O-188, now also obsolete.	No further Service use
O-224	-	Lubricating oil, type diesel service, grade 10. Superseded by O-237. Lubricating oil, engine, severe duty diesel engine service, grade 10W.	-
O-225	-	Lubricating oil, type diesel service, grade 10. Superseded by O-238. Lubricating oil, engine, severe duty, diesel engine service, grade 30.	-
O-227	-	Lubricating oil, gear, multipurpose, grade 30. Superseded by O-226	OEP-220
O-229	-	Lubricating oil, jewel bearing instruments	-
O-230	-	Lubricating oil, internal combustion engine, heavy duty, grade 10. Superseded by O-237, Lubricating oil, engine service, grade 10W	-
O-232	-	Lubricating oil, internal combustion engine, heavy duty, grade 30. Superseded by O-238, Lubricating oil, engine, severe duty, diesel engine service, grade 30.	-
O-234	-	Lubricating oil, internal combustion engine, grade 50. Superseded by O-239, Lubricating oil, engine, severe duty, diesel engine service, grade 50.	-
O-235	-	Lubricating oil, multigrade, artic grade.	-

DEF STAN 01-005 Issue 19

NATO Code	Joint Service Designation (JSD)	Remarks	JSD of UK Replacement
O-236	OMD-85, obsolete	Lubricating oil, engine, severe duty, diesel engine service, multigrade 15W/40.	No further Service use
O-242	-	Lubricating oil, engine, naval diesel, grade 10. Superseded by O-272, Lubricating oil, naval, diesel, moderate service, grade 10.	-
O-243	-	Lubricating oil, engine, naval diesel, grade 20. Superseded by O-273, Lubricating oil, naval diesel, moderate service, grade 30.	-
O-244	-	Lubricating oil, engine, naval diesel, grade 30. Superseded by O-274, Lubricating oil, naval diesel, moderate service, grade 30.	-
O-245	-	Lubricating oil, engine, naval diesel, grade 40. Superseded by O-275, Lubricating oil, naval diesel, moderate service, grade 40, now also obsolete.	-
O-246	-	-	-
O-247	OMD-109, obsolete	Lubricating oil, engine, naval diesel, grade 30. Superseded by O-180. O-180 subsequently reallocated to OMD-75.	OMD-110, obsolete
O-248	OMD-112, obsolete	Lubricating oil, engine, naval diesel grade 30. Superseded by O-276.	OMD-113
O-249	OEP-69, obsolete	Lubricating oil, steam turbine and gear, extreme pressure	OEP-80
O-254	OC-160, obsolescent	Lubricating oil compounded	OC-160
O-256	OM-750	Steam engine lubricating oil, SSC. Superseded by O-252.	OM-750
O-258	-	-	-
O-260	OM-1300	Steam engine lubricating oil, SSC. Superseded by O-258.	OM-1300
O-263	-	Lubricating oil, compounded, naval. Superseded by O-254.	OC-160, obsolescent
O-272	-	-	-
O-273	-	Lubricating oil, Naval Diesel: Moderate service.	-
O-275	-	Lubricating oil, engine, naval diesel, grade 40, severe conditions.	-
O-276	-	Lubricating oil, Naval Diesel: Moderate service.	-
O-277	OMD-113	Lubricating oil, engine, naval diesel. Superseded by O-278.	OMD-113
O-280	OM-36, obsolete	Lubricating oil, refrigerant compressor, uninhibited.	No further Service use
O-282	-	Lubricating oil, refrigerant compressor, uninhibited.	-
O-284	-	Lubricating oil, refrigerant compressor, uninhibited.	-
O-286	-	No information	-
O-287	-	No information	-
O-288	OM-36, obsolete	Lubricating oil, refrigerant compressor, uninhibited. Superseded by O-280, now also obsolete.	No further Service use
O-289	OM-70	Lubricating oil refrigerant compressor, uninhibited. Superseded by O-285.	OM-70
S-712	OM-1	Compass fluid, aircraft petroleum.	No further Service use
S-714	-	Compass fluid, aircraft, alcohol.	-

DEF STAN 01-005 Issue 19

NATO Code	Joint Service Designation (JSD)	Remarks	JSD of UK Replacement
S-719	ZX-12, obsolete	Antiseize compound, oxygen systems. Superseded by S-717.	No further Service use
S-723	-	No information	-
S-724	-	No information	-
S-725	-	Antiseize compound, white lead. Superseded by S-716. Antiseize compound, lead free.	-
S-726	-	Pigmented varnish jointing compound, DTD 369A. No longer classified as a fuels and lubricants item, but still used by UK.	-
S-727	-	Antiseize and jointing compound. Superseded by S-725, Antiseize compound, white lead, now also obsolete. Superseded by S-716, Antiseize compound, lead free.	-
S-728	-	No information	-
S-729	-	No information	-
S-730	-	No information	-
S-733	-	-	-
S-734	-	No information.	-
S-735	AL-3	Antifreeze Aircraft Engine	-
S-739	AL-34	Deicing and defrosting fluid. Superseded by AL-30. No NATO Code which in turn was superseded by S-1746.	AL-34
S-744	AL-16, obsolete	Deicing and defrosting fluid. Superseded by AL-30. No NATO Code which in turn was superseded by S-1746.	AL-34
S-746	-	-	-
S-748	AL-31	Fuel System icing inhibitor superseded by S-1745.	AL-41
S-754	-	Potentiometer oil.	-
S-755	-	No information	-
S-759	-	-	-
S-762	-	Windscreen washing liquid	NATO Code deleted
S-1722	-	Damping fluid, dimethyl silicone, 350 cSt.	-
S-1730	-	Damping fluid, dimethyl silicone, 101.000 cSt. Superseded by S-1728.	ZX-52
S-1734	-	Damping fluid, dimethyl silicone, 214.000 cSt. Superseded by S-1732.	ZX-53, obsolete, no further Service use
S-1740	AL-24, obsolescent	Methanol/water, 60/40. Product still used by UK.	AL-24, obsolescent
S-1741	-	Methanol/water, 60/40 +1% C-630	-
S-1742	-	Methanol/water, 50/50	-
S-1743	-	Methanol/water, 50/50 +1% C-630	-
P-913	-	-	-
P-914	-	-	-
P-915	-	-	-
P-916	-	-	-
P-917	-	-	-
P-918	-	-	-
P-919	-	-	-
P-921	-	-	-

ANNEX A: LUBRICATING OILS, COMPOUNDED – OC

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OC-160	
Description	LUBRICATING OIL COMPOUNDED: Naval	
Specification	Def Stan 91-21	
Composition	Mineral oil	90%wt
	Blown rape seed oil	10%wt
Characteristics	Viscosity @ 40°C	145–155 mm ² /s (cSt)
	Pour point, max	-18°C
	Flash point, closed cup, min	180°C
	Saponification number, min	20.5
Examples of Uses	For external parts of reciprocating steam engines where emulsification with water is required. Lubrication of radar equipment & stern tubes in work boats.	
Standardized Alternatives	See Annex O	
Remarks	The specification includes tests for acidity, emulsification properties & stability of emulsion.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause .1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-942-3148	25 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OC-300	
Description	LUBRICATING OIL, GEAR, COMPOUNDED	
Specification	Def Stan 91-65, includes OC-600	
Composition	Refined mineral oil blended with unblown rape seed oil in the following proportions.	
	Refined mineral oil	90%wt
	Blown rape seed oil	10%wt
Characteristics	Viscosity @ 40°C	260–300 mm ² /s (cSt)
	Viscosity @ 100°C	20–24 mm ² /s (cSt)
	Pour point, max	-24°C
	Flash point, closed cup, min	176°C
	Saponification number, min	20.5
Examples of Uses	Naval torpedoes & certain Naval & worm reduction gears operated over the temperature range above -20°C.	
Standardized Alternatives	None	
Remarks	The specification includes tests for density, ash, acidity, copper corrosion, saponification & low temperature stability.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause .1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-943-7238	25 ltr	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OC-600	
Description	LUBRICATING OIL, GEAR, COMPOUNDED	
Specification	Def Stan 91-65, includes OC-300	
Composition	Refined mineral oil blended with unblown rape seed oil in the following proportions.	
	Refined mineral oil, %wt	94
	Blown rape seed oil, %wt	6
Characteristics	Viscosity @ 40°C	550–600 mm ² /s (cSt)
	Viscosity @ 100°C	27–32 mm ² /s (cSt)
	Pour point, max	0°C
	Flash point, closed cup, min	240°C
Examples of Uses	Vehicle transmissions, general gear applications & chassis lubrication, operated over the temperature range above 0°C.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for density, ash, acidity, copper corrosion, saponification & low temperature stability. • This lubricant is not suitable for use with hypoid gears, in automatic transmissions or torque converter drives. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-910-0536	25 ltr	OL3	0475	+ +	34D

ANNEX B: LUBRICATING OILS, EXTREME PRESSURE – OEP

DEF STAN 01-005 Issue 19

NATO Code	O-153	
JSD Code	OEP-30	
Description	LUBRICATING OIL, GEAR: Aircraft, light grade	
Specification	Def Stan 91-112, includes OEP-70	
Composition	Mineral oil with extreme pressure additives. It may also contain a technically acceptable pour point depressant.	
Characteristics	Viscosity @ 40°C	28.8–35.2 mm ² /s (cSt)
	Viscosity index, min	80
	Pour point, max	-39°C
	Flash point, closed cup, min	126°C
	Mean Hertz load, min	50 kg
Examples of Uses	Certain aircraft gearboxes & aircraft cannon.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for corrosion of copper, steel, additive elements, acid number, base number & storage stability.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-179-7833	5 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	O-186		
JSD Code	OEP-38		
Description	LUBRICATING OIL, GEAR: Extreme pressure, Grade SAE 75W, API GL-5		
Specification	SAE 75W, API GL-5, ASTM D7450		
Composition	Mineral oil with extreme pressure additives. It may also contain a technically acceptable pour point depressant.		
Characteristics	Viscosity @ 100°C, min	4.1 mm²/s (cSt)	
	Viscosity @ -40°C, max	150,000 mPa.s (cP)	
	Viscosity index, min	85	
	Flash point, closed cup, min	150°C	
Examples of Uses	Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, steering gear units, & fluid lubricated universal joints. It is a substitute for OEP-220 for cold temperature operations below -15°C.		
Standardized Alternatives	See Annex O		
Remarks	• This product implements STANAG 7091. • This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. • If the bulk temperature of the oil exceeds 130°C, there is a risk that some decomposition of EP additives may occur.		
Warning			

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-910-0538	25 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	O-155	
JSD Code	OEP-70	
Description	LUBRICATING OIL, GEAR: Aircraft, medium grade	
Specification	Def Stan 91-112, includes OEP-30	
Composition	Mineral oil with extreme pressure additives. It may also contain a technically acceptable pour point depressant.	
Characteristics	Viscosity @ 40°C	61.2–74.8 mm ² /s (cSt)
	Viscosity index, min	80
	Pour point, max	-30°C
	Flash point, closed cup, min	141°C
	Mean Hertz load, min	50 kg
Examples of Uses	Certain aircraft gearboxes & translation unit bearings in contra-rotating propellers operated over the temperature range of -30°C to +120°C.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for corrosion of copper, steel, additive elements, acid number, base number & storage stability.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-910-0539	25 ltr	OL2	- -	+ +	34B
9150-99-477-3152	5 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	O-136	
JSD Code	OEP-71	
Description	LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: petroleum, extreme pressure	
Specification	Belgian Specification BA-PO-103B, includes OM-71	
Composition	Pure refined mineral oil containing an extreme pressure additive. May also contain technically acceptable pour point depressants.	
Characteristics	Viscosity @ 100°C	8.7–9.3 mm ² /s (cSt)
	Viscosity index, min	100
	Pour point, max	-29°C
	Flash point, open cup, min	210°C
Examples of Uses	Gearboxes on certain aircraft & aircraft cannon.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for copper corrosion, saponification value, ash acidity, & additive content.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-910-0540	25 ltr	OL?	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OEP-80	
Description	LUBRICATING OIL, STEAM TURBINE & GEAR: Extreme pressure	
Specification	Def Stan 91-74	
Composition	Mineral oil with extreme pressure additives & pour point depressant.	
Characteristics	Viscosity @ 100°C, min	8.0 mm ² /s (cSt)
	Viscosity @ 40°C	61.2–74.8 mm ² /s (cSt)
	Pour point, max	-6°C
	Flash point, closed cup, min	165°C
Examples of Uses	In HM Ships propulsion units which have high gear tooth loading, associated main & auxiliary steam turbines, certain gas turbines hydraulic equipment, air compressors & general lubrication equipment.	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for demulsibility & foaming characteristics. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-793-6720	25 ltr	OL3	0475	- -	34D
9150-99-793-6719	200 ltr	OL1	0475	- -	- -
9150-99-793-6718	Bulk	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OEP-215	
Description	LUBRICATING OIL, GEAR: Helicopter	
Specification	Proprietary	
Composition	Mineral oil with extreme pressure additives & pour point depressants	
Characteristics	Viscosity @ 100°C	16.3–17.4 mm ² /s (cSt)
	Viscosity index, min	85
	Pour point, max	-18°C
	Flash point, open cup, min	177°C
Examples of Uses	Lubricant for gearboxes in certain helicopters	
Standardized Alternatives	None	
Remarks	The specification includes tests for corrosion of copper & steel, a channelling test at -18°C, thermal stability & foaming characteristics.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-7928	20 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	O-226	
JSD Code	OEP-220	
Description	LUBRICATING OIL, GEAR: Extreme pressure, Grade SAE 80W-90, API GL-5	
Specification	SAE 80W-90, API GL-5, ASTM D7450, SAE J 2360	
Composition	Mineral oil with extreme pressure additives it may also contain a technically acceptable pour point depressant.	
Characteristics	Viscosity @ 100°C	13.5–24 mm ² /s (cSt)
	Viscosity @ -26°C, max	150,000 mPa.s (cP)
	Flash point, open cup, min	165°C
Examples of Uses	Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, steering gears & fluid lubricated universal joints of automotive equipment, operating over the temperature range of -15°C to +130°C	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 7091. • This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. If the bulk temperature of the oil exceeds +130°C, there is a risk that some decomposition of EP additives may occur.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-220-1477	5 ltr	OL1	0475	+	-
9150-99-910-0542	25 ltr	OL3	0475	+	34D
9150-99-224-7728	200 ltr	OL3	0475	+	34D
9150-99-740-4516	Bulk	OL3	-	+	-

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OEP-240	
Description	LUBRICATING OIL, GEAR: Extreme pressure, limited slip, Grade SAE 80W-90, GL-5 LS	
Specification	SAE 80W-90, API GL-5 LS, ASTM D7450	
Composition	Mineral &/or synthetic hydrocarbon oils containing friction modifiers & other additives	
Characteristics	SAE viscosity classification	80W-90
	Other SAE classifications covered	85W-90, 90
	Viscosity @ 100°C	13.5–24 mm ² /s (cSt)
	Viscosity @ -26°C, max	150,000 mPa.s (cP)
	Pour point, typical	-30°C
	Flash point, closed cup, typical	165°C
Examples of Uses	Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, steering gears & fluid lubricated universal joints of automotive equipment where limited slip properties are required, operated over the temperature range of -15°C to +140°C.	
Standardized Alternatives	None	
Remarks	- The specification also includes tests for corrosion of copper & foaming characteristics. - This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. - If the bulk temperature of the oil exceeds +140°C, there is a risk that some decomposition of EP additives may occur.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-788-6207	25 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OEP-250	
Description	LUBRICATING OIL, GEAR: Extreme pressure, Grade SAE 80W-140, GL-5	
Specification	SAE 80W-140, API GL-5, ASTM D7450	
Composition	Mineral &/or synthetic hydrocarbon oils with additives	
Characteristics	Viscosity @ 100°C	24.0–41.0 mm ² /s (cSt)
	Viscosity @ -26°C, max	150,000 mPa.s (cP)
	Pour point, typical	-26°C
	Flash point, closed cup, typical	180°C
Examples of Uses	Lubrication of automotive hypoid gear units, heavy duty industrial type enclosed gear units, & fluid lubricated universal joints of automotive equipment operated over the temperature range of -25°C to +140°C	
Standardized Alternatives	None	
Remarks	- The specification also includes tests for the corrosion of copper & foaming characteristics. - This oil may not be suitable for use in systems containing gears or bearings made from copper alloys. - If the bulk temperature of the oil exceeds +140°C, there is a risk that some decomposition of EP additives may occur.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-906-5726	5 ltr	OL3	- -	+ +	34D
9150-99-615-2815	25 ltr	OL3	- -	+ +	34D

ANNEX C: LUBRICATING OILS, MINERAL – OM

DEF STAN 01-005 Issue 19

NATO Code	O-135	
JSD Code	OM-11	
Description	LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum	
Specification	Def Stan 91-99	
Composition	Light mineral oil containing 0.05–0.10%vol of stearic acid	
Characteristics	Viscosity @ 40°C, min	12 mm ² /s (cSt)
	Viscosity @ -25°C, max	1250 mm ² /s (cSt)
	Pour point, max	-45°C
	Flash point, closed cup, min	144°C
Examples of Uses	In certain early marks of aircraft turbo-jet engines, eg Avon Mk 1, & also Rover gas turbines. Inhibiting oil in stored aircraft systems. General purpose hydraulic fluid, buffer oil under temperate conditions in vehicles & land-based equipment, & also for the lubrication of lightly loaded mechanisms. Inhibiting oil in stored aircraft system.	
Standardized Alternatives	See Annex O	
Remarks	• This product replaces OM-13. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities • The specification includes tests for copper corrosion, ash, acidity, saponifiable matter, oxidation stability & aromatic content. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-666-4262	400 ml	OL1	0475	- -	34B
9150-12-125-9197	1 ltr	OL2	0475	- -	34B
9150-99-910-5055	25 ltr	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	O-142	
JSD Code	OM-12	
Description	LUBRICATING OIL, GENERAL PURPOSE: Low temperature	
Specification	Def Stan 91-47	
Composition	Light mineral oil containing corrosion & oxidation inhibitors	
Characteristics	Viscosity @ 40°C, min	9 mm ² /s (cSt)
	Viscosity @ -40°C, max	4000 mm ² /s (cSt)
	Pour point, max	-57°C
	Flash point, closed cup, min	118°C
Examples of Uses	Lubrication of certain lightly loaded aircraft mechanisms & instruments operated over the temperature range of -55°C to +70°C.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for acidity, precipitation number, copper corrosion, oxidation stability, corrosion protection of steels & various other metals & alloys, low temperature stability & evaporation loss.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-943-8712	1 ltr	OL2	0475	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	H-515	
JSD Code	OM-15	
Description	HYDRAULIC FLUID, PETROLEUM: Superclean	
Specification	Def Stan 91-48	
Composition	Light mineral oil blended with an oxidation inhibitor including not more than 20%wt of viscosity index improver & 0.5%wt of a technically acceptable non-toxic triaryl phosphate as an antiwear agent	
Characteristics	Colour, Lovibond Red	20–40
	Viscosity @ 100°C, min	4 mm ² /s (cSt)
	Viscosity @ 40°C, min	13 mm ² /s (cSt)
	Viscosity @ -40°C, max	500 mm ² /s (cSt)
	Viscosity @ -54°C, max	3000 mm ² /s (cSt)
	Pour point, max	-60°C
	Flash point, closed cup, min	81°C
Examples of Uses	Hydraulic mechanisms in certain aircraft & other specified equipment operated over the temperature range of -54°C to +90°C in unpressurized systems & -54°C to +135°C in pressurized systems.	
Standardized Alternatives	Refer to the Air Force Service Authority, see Clause 1.2 Service Authorities	
Remarks	• This product implements STANAG 3748 & ASIC 15/7. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for particulate contamination, acidity, oxidation stability, low temperature stability, evaporation loss, shear stability, foaming characteristics, phosphorus content, corrosion of metals & the effect on rubber. • PSN: Environmentally Hazardous Substance, Liquid, NOS; UN No: 3082; UN Class: 9; UN Packaging Group: III	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-4971	1 ltr	OL2	- -	- -	34B
9150-99-910-0572	5 ltr	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-756	
JSD Code	OM-16	
Description	INSULATING OIL, ELECTRICAL	
Specification	BS EN 60296	
Composition	Highly refined mineral oil, specially prepared for use as insulating oil	
Characteristics	Viscosity @ -15°C, min	800 mm ² /s (cSt)
	Pour point, max	-30°C
	Flash point, closed cup, min	140°C
Examples of Uses	Transformers, switchgear & for other electrical purposes	
Standardized Alternatives	See Annex O	
Remarks	- The specification includes tests for density, sludge formation tendency, acidity after oxidation, electric strength, corrosive sulfur & water content. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9160-99-942-7822	5 ltr	OL3	0475	+ +	34D
9160-99-942-7823	25 ltr	OL3	0475	+ +	34D
9160-99-942-7825	200 ltr	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-17	
Description	LUBRICATING OIL: White	
Specification	Proprietary	
Composition	Water white, tasteless & odourless mineral oil complying with the requirements of the UK Mineral Hydrocarbons in Food Regulations 1966 (SI 1966/1073). The oil may contain no more than 10 ppm(w) of a technically acceptable stabilizer. Suppliers shall state the nature & concentration of stabilizer used.	
Characteristics	Viscosity @ 40°C	12–15 mm ² /s (cSt)
	Flash point, closed cup, min	150°C
Examples of Uses	For the lubrication of certain machinery, & in many other applications where non-additive, highly refined, white mineral oils are required.	
Standardized Alternatives	None	
Remarks		
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-910-0545	25 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-22	
Description	INSULATING OIL, ELECTRICAL: Low pour point	
Specification	BS 148, Class II	
Composition	Highly refined mineral oil, specially prepared for use as an insulating oil	
Characteristics	Viscosity @ 40°C, max	11 mm ² /s (cSt)
	Viscosity @ -30°C, min	1800 mm ² /s (cSt)
	Pour point, max	-45°C
	Flash point, closed cup, min	130°C
Examples of Uses	In transformers & switchgear, & for other electrical purposes where especially low temperatures may be encountered	
Standardized Alternatives	None	
Remarks		
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9160-99-956-3461	25 ltr	- -	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-24	
Description	FLUSHING OIL	
Specification	BS 4475 Grade CS-22	
Composition	Mineral oil with pour point depressant	
Characteristics	Viscosity @ 40°C	19.8–24.2 mm ² /s (cSt)
	Viscosity index, min	90
	Pour point, max	-9°C
	Flash point, closed cup, min	160°C
Examples of Uses	For flushing oil systems of Naval equipment where the working lubricant is OM-33, OM-65, OM-100, OMD-113 or OEP-80. Also for flushing oil systems of land service engines, piston aero engines & gearboxes.	
Standardized Alternatives	None	
Remarks	The specification includes a test for acidity.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-224-0360	25 ltr	OL3	0475	+ +	34D
9150-99-224-1653	200 ltr	OL1	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	H-576	
JSD Code	OM-33	
Description	HYDRAULIC FLUID, PETROLEUM: Antiwear	
Specification	Def Stan 91-39	
Composition	Mineral oil with additives. The use of additives containing metals is prohibited.	
Characteristics	Viscosity @ 0°C, max	500 mm ² /s (cSt)
	Viscosity @ 40°C	28.8–35.2 mm ² /s (cSt)
	Pour point, max	-30°C
	Flash point, closed cup, min	160°C
Examples of Uses	Hydraulic fluid in machine tools, forklift trucks & handling gear systems of HM ships & certain fighting vehicles. Lubrication of certain gunnery equipment, radar equipment where the ambient temperature is not lower than -30°C.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 4601. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for acidity, water content, copper corrosion, load carrying ability, antiwear properties, compatibility, demulsification, air release, rust preventing characteristics, oxidation stability, foaming characteristics, filterability characteristics & a swelling test on a standard rubber • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	Some nations' products may contain zinc. These shall not be used in place of OM-33.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-942-3224	5 ltr	OL3	0475	+ +	34D
9150-99-943-1325	25 ltr	OL3	0475	+ +	34D
9150-99-944-0596	200 ltr	OL3	0475	+ +	34D
9150-99-641-8036	Bulk	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-58	
Description	LUBRICATING OIL, PETROLEUM: Compressor, light	
Specification	Def Stan 91-42, includes OM-160	
Composition	Mineral oil which may contain a technically acceptable pour point depressant	
Characteristics	Viscosity @ 40°C	61.2–74.8 mm ² /s (cSt)
	Viscosity index, min	75
	Pour point, max	-18°C
	Flash point, closed cup, min	177°C
Examples of Uses	Certain air compressors, Naval breech blocks & miscellaneous lubricant for equipment where the ambient temperature is not lower than -18°C.	
Standardized Alternatives	None	
Remarks	The specification includes tests for acidity, ash, saponification value, copper corrosion, oxidation stability & asphaltenes	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-910-6165	25 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	H-572	
JSD Code	OM-65	
Description	HYDRAULIC FLUID, PETROLEUM: Uninhibited	
Specification	BS 4475, Grade CS-68, specification includes other grades	
Composition	Plain mineral oil	
Characteristics	Viscosity @ 40°C	61.2–74.8 mm ² /s (cSt)
	Viscosity index, min	90
	Pour point, max	-9°C
	Flash point, closed cup, min	192°C
Examples of Uses	Certain Naval gunnery systems & submarine telemotor equipment under temperate conditions.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for acidity. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-220-1942	250 ml	- -	0475	- -	- -
9150-99-220-3468	5 ltr	OL1	0475	- -	- -
9150-99-224-2541	25 ltr	- -	0475	- -	- -
9150-99-910-0576	200 ltr	OL1	0475	- -	- -
9150-99-797-3609	500 ml	- -	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	O-285	
JSD Code	OM-70	
Description	LUBRICATING OIL, REFRIGERANT COMPRESSOR: Uninhibited	
Specification	BS 2626, Type A, Grade 68	
Composition	Plain mineral oil	
Characteristics	Viscosity @ 40°C	61.2–74.8 mm ² /s (cSt)
	Pour point, max	-24°C
	Flash point, closed cup, min	171°C
Examples of Uses	Refrigerator Compressors	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for moisture, acidity, copper corrosion, & material insoluble refrigerant. • In addition to meeting specification requirements a proportion of filled containers are subjected to an immersion test. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-942-4990	1 ltr	OL3	0475	+ +	34D
9150-99-942-4989	5 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	O-138	
JSD Code	OM-71	
Description	LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Petroleum	
Specification	Belgian Specification BA-PO-103B, includes OEP-71	
Composition	Pure refined mineral oil which may contain a technically acceptable pour point depressant	
Characteristics	Viscosity @ 100°C	8.7–9.3 mm ² /s (cSt)
	Viscosity index, min	100
	Pour point, max	-29°C
	Flash point, open cup, min	210°C
Examples of Uses	Miscellaneous aircraft applications	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for copper corrosion, ash, acidity & saponification value.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-910-0577	500 ml	OL2	- -	- -	34B
9150-99-943-3224	25 ltr	- -	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	O-240	
JSD Code	OM-100	
Description	LUBRICATING OIL, GEAR: Light service	
Specification	Def Stan 91-25	
Composition	Mineral oil with additives	
Characteristics	Viscosity @ 100°C, min	8.0 mm ² /s (cSt)
	Viscosity @ 40°C	72–81 mm ² /s (cSt)
	Pour point, max	-6°C
	Flash point, closed cup, min	165°C
Examples of Uses	Principal lubricant for Naval main propulsion gearboxes with forced lubrication systems. Ball & roller bearings in certain electric motors, torpedo tube mechanisms, preservation of Naval aircraft guns & belt feed mechanisms. Also for certain hydraulic systems in HM ships & general purposes.	
Standardized Alternatives	See Annex O	
Remarks	- This product implements STANAG 1425. - The specification includes tests for acidity, copper corrosion, oxidation stability, foaming characteristics, water separation properties, demulsification properties, rust preventing characteristics & rust inhibiting properties.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-944-0425	25 ltr	OL1	0475	--	--
9150-99-910-0578	200 ltr	OL3	0475	--	34D
9150-99-224-2538	Bulk	OL1	0725	--	--

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-150	
Description	LUBRICATING OIL, AIRCRAFT CONTROLS: Antifreezing	
Specification	Def Stan 91-114	
Composition	Mineral oil containing a technically acceptable thickening agent	
Characteristics	Viscosity @ 60°C, min	50 mm ² /s (cSt)
	Viscosity @ 20°C	350–2000 mm ² /s (cSt)
	Viscosity @ -55°C, max	500,000 mPa s (cP)
	Flash point, closed cup, min	149°C
Examples of Uses	Low temperature lubrication of hinges & open bearings in flying control systems down to -55°C where grease cannot be applied, & for W/T aerial gear.	
Standardized Alternatives	None	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for acidity, copper corrosion & lubricating properties at -55°C.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-910-0550	25 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-160	
Description	LUBRICATING OIL, PETROLEUM: Compressor, medium	
Specification	Def Stan 91-42, includes OM-58	
Composition	Mineral oil which may contain technically acceptable pour point depressant.	
Characteristics	Viscosity @ 40°C	135–165 mm ² /s (cSt)
	Viscosity index, min	75
	Pour point, max	-12°C
	Flash point, closed cup, min	186°C
Examples of Uses	General purpose lubricant for machinery & running in Service spark & compression ignition engines.	
Standardized Alternatives	None	
Remarks	- The specification includes tests for acidity, ash, saponification value, copper corrosion, oxidation stability & asphaltenes. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-910-0551	25 ltr	OL3	0475	+ +	34D
9150-99-282-3291	200 ltr	- -	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-170	
Description	LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Grade SAE 40	
Specification	SAE J 1966, Grade 40, includes OM-270	
Composition	Mineral oil which may contain approved pour point depressants, anti-foam agents & antioxidants	
Characteristics	Viscosity @ 100°C	12.5–16.5 mm ² /s (cSt)
	Viscosity index, min	85
	Pour point, max	-15°C
	Flash point, open cup, min	225°C
Examples of Uses	For certain aircraft piston engines, magneto & generator bearings of certain aircraft.	
Standardized Alternatives	None	
Remarks	• This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes engine tests, & tests for copper corrosion, sedimentation, foaming characteristics, ash & acidity.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-910-0553	1 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-180	
Description	LUBRICATING OIL, PETROLEUM: Multistage Air Compressor	
Specification	Proprietary	
Composition	Mineral oil containing additives	
Characteristics	Viscosity @ 100°C, typical	11.5 mm ² /s (cSt)
	Viscosity @ 40°C	90–110 mm ² /s (cSt)
	Viscosity index, min	95
	Flash point, open cup, min	200°C
Examples of Uses	Three-stage high pressure air compressors mainly on Naval vessels	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The lubricant should exceed the requirements of the DIN 51506 VD-L specification & be suitable for use in high pressure, multistage, air cooled, reciprocating air compressors. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-874-0784	20 ltr	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OM-270	
Description	LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Grade SAE 50	
Specification	SAE J 1966, Grade 50, includes OM-170	
Composition	Mineral oil which may contain technically acceptable pour point depressants, anti-foam agents & antioxidants	
Characteristics	Viscosity @ 100°C	16.3–21.9 mm ² /s (cSt)
	Viscosity index, min	85
	Pour point, max	-12°C
	Flash point, open cup, min	240°C
Examples of Uses	For certain aircraft piston engines	
Standardized Alternatives	None	
Remarks	- This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. - The specification includes engine tests, & tests for copper corrosion, sedimentation, foaming characteristics, ash & acidity.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-433-5063	1 ltr	- -	- -	- -	34B
9150-99-910-0554	200 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	O-252	
JSD Code	OM-750	
Description	LUBRICATING OIL, STEAM CYLINDER: Saturated	
Specification	BS 4475, Grade CS-680, specification includes other grades	
Composition	Mineral oil which may contain pour point depressants	
Characteristics	Viscosity @ 40°C	612–748 mm ² /s (cSt)
	Viscosity index, min	80
	Pour point, max	-3°C
	Flash point, closed cup, min	249°C
Examples of Uses	Lubricant for saturated steam cylinders & the firing gear of torpedo tubes.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for acidity & oxidation characteristics. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-943-3220	25 ltr	OL1	0475	+ +	34D
9150-99-910-0556	200 ltr	OL1	0475	+ +	- -

DEF STAN 01-005 Issue 19

NATO Code	O-258	
JSD Code	OM-1300	
Description	LUBRICATING OIL, STEAM CYLINDER: Superheated	
Specification	BS 4475, Grade CS-1000, specification includes other grades	
Composition	Mineral oil which may contain pour point depressants	
Characteristics	Viscosity @ 40°C	900–1100 mm ² /s (cSt)
	Viscosity index, min	70
	Pour point, max	-6°C
	Flash point, closed cup, min	261°C
Examples of Uses	Lubricant for superheated steam cylinders & as a heat transfer medium.	
Standardized Alternatives	See Annex O	
Remarks	The specification includes tests for acidity.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-943-1329	25 ltr	- -	0475	- -	34D

ANNEX D: LUBRICATING OILS, HEAVY DUTY ENGINE – OMD

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OMD-23	
Description	LUBRICATING OIL, ENGINE: 2-stroke	
Specification	NMMA TC-W3	
Composition	Mineral oil &/or synthetic oils with a technically acceptable Hydrocarbon diluent to facilitate mixing with fuel	
Characteristics	Viscosity @ 100°C, min	5 mm ² /s (cSt)
	Flash point, open cup, min	61°C
Examples of Uses	In 2-stroke engines which require fuel/oil mixture. The fuel/oil ratio to be used in an engine is that recommended in the relevant Service instruction or by the engine manufacturer. This oil is not suitable for motorcycle or chainsaw applications.	
Standardized Alternatives	None	
Remarks	- This oil corresponds to the American Boating Industries Association Certification for Service. Two-Cycle Water Cooled Engines (TC-W3). This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This oil is for outboard motor use only.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-547-5556	1 ltr	OL3	0475	+ +	34D
9150-99-374-6895	5 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	O-1178	
JSD Code	OMD-55	
Description	LUBRICATING OIL, ENGINE: Severe duty, diesel, low temperature, SAE 5W-30	
Specification	ACEA E3	
Composition	Synthetic &/or mineral hydrocarbons with additives	
Characteristics	SAE viscosity classification	5W-30
	ACEA / API performance, min	E3 / CG-4
	Viscosity @ 100°C	9.3–12.5 mm ² /s (cSt)
	LT Pumping viscosity at -35°C, max	60,000 mPa.s (cP)
	LT Cranking viscosity at -30°C, max	6,600 mPa.s (cP)
	Pour point, max	-42°C
	Flash point, closed cup, min	180°C
Examples of Uses	The primary use of this heavy-duty crankcase oil is to replace OMD-90 in compression ignition & spark ignition engines when operated persistently below -20°C.	
Standardized Alternatives	See Annex O	
Remarks	• This implements STANAG 7091. • The specification includes tests for corrosion inhibition, volatility, low temperature pumpability, foaming characteristics, shear stability, elastomer compatibility. • When reverting to normal temperature conditions OMD-55 need not be replaced until next oil change is due.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-477-3153	25 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	O-1176	
JSD Code	OMD-90	
Description	LUBRICATING OIL, ENGINE: Severe duty, diesel, extended service, SAE 10W-30	
Specification	Def Stan 91-113	
Composition	Mineral oil &/or synthetic hydrocarbons with additives	
Characteristics	SAE viscosity classification	10W-30
	API performance, min	CH-4/SJ or ACEA equivalent
	Allison, min	C3
	Viscosity @ 100°C	9.3–12.5 mm ² /s (cSt)
	Pour point, max	-30°C
	Flash point, closed cup, min	190°C
Examples of Uses	Multigrade heavy duty crankcase oil for use in compression ignition & spark ignition engines of ground equipment operated at all ambient temperatures above -20°C. Also in some gearboxes, automatic gearboxes, torque converters, hydraulic systems & power steering systems.	
Standardized Alternatives	See Annex O	
Remarks	- The specification includes tests for corrosion inhibition, volatility, low temperature pumpability, foaming characteristics, shear stability, elastomer compatibility & reserve alkalinity. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This oil should not be used on equipment with active EURO IV (& onwards) emission control systems. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-190-7166	1 ltr	OL3	- -	+ +	34D
9150-99-968-3822	5 ltr	OL3	- -	+ +	34D
9150-99-991-1124	25 ltr	OL3	0475	+ +	34D
9150-99-244-8028	200 ltr	OL3	0475	+ +	34D
9150-99-670-3317	Bulk	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	O-278	
JSD Code	OMD-113	
Description	LUBRICATING OIL, NAVAL DIESEL: Severe service	
Specification	Def Stan 91-22	
Composition	Mineral oil with additives	
Characteristics	SAE viscosity classification	40
	ACEA performance, min	E2
	API performance, min	CF
	Viscosity @ 100°C	12.5–16.3 mm ² /s (cSt)
	Viscosity @ 0°C, max	3,300 mm ² /s (cSt)
	Pour point, max	-15°C
	Flash point, closed cup, min	180°C
	Total base number, typical	10 mg KOH/g
Examples of Uses	Lubrication of main & auxiliary IC engines in Naval ships & craft operating in all climates. Also in other machinery in HM ships where authorized. Used in engines of certain railway locomotives, stationary generating plant, certain RAF marine craft & the sleeve spindle oil tank of RN Sea King helicopters.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 4596. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes engine tests & tests for sulfated ash, load carrying ability, rust prevention, foaming characteristics & additive content. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	Not to be used in gasoline engines.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-224-2540	25 ltr	OL3	0475	- -	34D
9150-99-220-3088	200 ltr	OL3	0475	+ +	34D
9150-99-224-7025	Bulk	OL1	0725	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OMD-140	
Description	LUBRICATING OIL, ENGINE: Diesel 2-stroke, heavy duty, monograde, Grade SAE 40	
Specification	Detroit Diesel Corporation Publication 7SE 270	
Composition	Highly Refined Petroleum Mineral Base Oil & Additives	
Characteristics	SAE viscosity classification	SAE 40
	API performance, min	CF-2
	Viscosity @ 100°C	12.5–16.3 mm²/s (cSt)
	Sulfated ash, max	1%wt
Examples of Uses	In both naturally aspirated & turbo-charged Detroit Diesel two-stroke engines. Could be used in other related applications but not for outboard motors or chainsaws.	
Standardized Alternatives	None	
Remarks		
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-869-7211	5 ltr	OL3	- -	+ +	34D
9150-99-869-7212	25 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OMD-160	
Description	LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Dispersant base mineral oil, (Ashless Dispersant), Grade SAE 40	
Specification	SAE J 1899, Grade 40. SAE J 1899 also includes OMD-162, OMD-250 & OMD-370	
Composition	Mineral oil which shall contain approved ashless dispersant additives & may contain approved pour point depressants, VI improvers, anti-foam agents & antioxidants	
Characteristics	Viscosity @ 100°C	12.5–16.3 mm²/s (cSt)
	Pour point, max	-15°C
	Flash point, open cup, min	225°C
	Ash, max	0.011%wt
Examples of Uses	Certain aircraft piston engines & in the sleeve spindle oil tank of RAF Sea King helicopters.	
Standardized Alternatives	None	
Remarks	• This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes engine tests & tests for acidity, copper corrosion, carbon residue, total sulfur, sedimentation & foaming characteristics. • The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-8087	25 ltr	OL2	- -	+ +	34B
9150-99-220-1093	200 ltr	- -	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OMD-162	
Description	LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Dispersant base mixed synthetic hydrocarbon & mineral oil (Ashless Dispersant), Grade SAE 15W-50	
Specification	SAE J 1899, Multi-grade, SAE J 1899 also includes OMD-160, OMD-250 & OMD-370	
Composition	Mixed synthetic hydrocarbon & mineral oil which shall contain an approved antiwear additive, together with approved ashless dispersant additives. The lubricant may also contain approved pour point depressants, VI improvers, anti-foam agents & antioxidants.	
Characteristics	Viscosity @ 100°C	16.3–21.9 mm ² /s (cSt)
	Viscosity @ -15°C, max	3,500 mPa.s (cP)
	Viscosity index, min	100
	Flash point, open cup, min	220°C
Examples of Uses	Certain aircraft piston engines	
Standardized Alternatives	None	
Remarks	- This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. - Lubricants procured to OMD-162 listed on the TAPL for UK MOD use, already contain the antiwear additive which meets the requirements of Avco Lycoming (Allied Signal) IO-360 engines. No further addition of the Textron Lycoming oil additive Part No. LW-16702 should be made. - The specification includes engine tests & tests for acidity, copper corrosion, total sulfur, sedimentation & foaming characteristics.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-360-4081	1 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code			
JSD Code	OMD-250		
Description	LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Dispersant base mineral oil (Ashless Dispersant), Grade SAE 50		
Specification	SAE J 1899, Grade 50, SAE J 1899 also includes OMD-160, OMD-162 & OMD-370		
Composition	Mineral oil which shall contain approved ashless dispersant additives & may contain approved pour point depressants, VI improvers, anti-foam agents & antioxidants.		
Characteristics	Viscosity @ 100°C	16.3–21.9 mm²/s (cSt)	
	Pour point, max	-18°C	
	Flash point, open cup, min	243°C	
	Ash, max	0.011%wt	
Examples of Uses	Certain aircraft piston engines		
Standardized Alternatives	None		
Remarks	- This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. - The specification includes engine tests & tests for acidity, copper corrosion, total sulfur, sedimentation & foaming characteristics.		
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-1095	200 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OMD-370	
Description	LUBRICATING OIL, AIRCRAFT PISTON ENGINE: Dispersant base mineral oil (Ashless Dispersant), Grade SAE 60	
Specification	SAE J 1899, Grade 60, also includes OMD-160, OMD-162 & OMD-250	
Composition	Mineral oil which shall contain approved ashless dispersant additives & may contain approved pour point depressants, VI improvers, anti-foam agents & anti-oxidants.	
Characteristics	Viscosity @ 100°C	21.9–26.1 mm ² /s (cSt)
	Pour point, max	-18°C
	Flash point, open cup, min	243°C
	Ash, max	0.011%wt
Examples of Uses	Certain aircraft piston engines	
Standardized Alternatives	None	
Remarks	- This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authority. - The specification includes engine tests & tests for acidity, copper corrosion, total sulfur, sedimentation & foaming characteristics.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-0875	25 ltr	OL2	--	--	34B
9150-99-220-1097	200 ltr	OL2	--	--	34B

ANNEX E: LUBRICATING OILS, FLUIDS – OX

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-7	
Description	LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE: Synthetic 3 cSt	
Specification	Def Stan 91-94	
Composition	Synthetic oil with additives	
Characteristics	Viscosity @ 200°C, min	1.0 mm ² /s (cSt)
	Viscosity @ 100°C, max	4.0 mm ² /s (cSt)
	Viscosity @ 40°C, max	16.0 mm ² /s (cSt)
	Viscosity @ -54°C, max	13,000 mm ² /s (cSt)
	Pour point, max	-60°C
	Flash point, open cup, min	225°C
Examples of Uses	Certain aircraft turbine engines & auxiliary equipment	
Standardized Alternatives	None	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for performance in aircraft engines, load carrying ability, acidity, foaming characteristics, high temperature oxidative stability, sediment, trace element content, confined heat stability, corrosivity, elastomer compatibility, miscibility & compatibility with other oils to the same & other specifications, hydrolytic stability, coking propensity, catalytic oxidation & low-temperature viscosity stability.	
Warning	This oil is unsuitable for use with natural, silicone & polychloroprene, eg Neoprene, elastomers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-1938	5 ltr	OL2	- -	+ +	34B
9150-99-224-0745	200 ltr	- -	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	H-542	
JSD Code	OX-8	
Description	BRAKE FLUID, AUTOMOTIVE	
Specification	SAE J 1704, Rev Sept 2008	
Composition	Borate ester based brake fluid	
Characteristics	Viscosity @ 100°C, min	1.5 mm ² /s (cSt)
	Viscosity @ -40°C, max	1,800 mm ² /s (cSt)
	Flash point, closed cup, min	80°C
	Equilibrium reflux boiling point, min	230°C
	Equilibrium reflux boiling point, with 3% added water, min	155°C
Examples of Uses	Certain hydraulic clutches, most automotive braking systems fitted with cups & seals made from natural rubber & styrene-butadiene rubber, operated over the ambient temperature range of -40°C to +55°C. Also meets the requirements of DOT 4.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 7093. • The specification includes tests for high & low temperature stability, pH value, effects on rubbers, corrosive properties in contact with various metals & alloys & simulated service performance tests. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product is not compatible with mineral or silicone based products.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-224-8089	500 ml	OL3	- -	+ +	34D
9150-99-220-2348	1 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	O-148	
JSD Code	OX-9	
Description	LUBRICATING OIL, AIRCRAFT TURBINE ENGINE: Synthetic 3 cSt	
Specification	MIL-PRF-7808L Grade 3	
Composition	Synthetic based oil with additives	
Characteristics	Viscosity @ 100°C, min	3.0 mm ² /s (cSt)
	Viscosity @ -51°C, max	17,000 mm ² /s (cSt)
	Flash point, closed cup, min	210°C
Examples of Uses	Certain aircraft turbine engines & auxiliary equipment	
Standardized Alternatives	See Annex O	
Remarks	• This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes engine, gear & bearing tests & tests for trace metals, particulate contamination, acidity, viscosity change, evaporation loss, foaming characteristics, deposition, corrosivity, corrosion & oxidation stability, elastomer compatibility, compatibility with oils to same & other specifications & storage stability. • The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	This oil is unsuitable for use with natural, silicone or polychloroprene, eg Neoprene, elastomers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-782-2627	1 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	O-147	
JSD Code	OX-14	
Description	LUBRICATING OIL, INSTRUMENT: Synthetic	
Specification	Def Stan 91-49	
Composition	Synthetic oil with corrosion & oxidation inhibitors	
Characteristics	Viscosity @ 40°C, min	12 mm ² /s (cSt)
	Viscosity @ -54°C, max	12,000 mm ² /s (cSt)
	Pour point, max	-57°C
	Flash point, closed cup, min	165°C
Examples of Uses	Lubricant for aircraft instruments, electronic equipment, certain aircraft controls, & mechanical fuzes	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for acidity, precipitation number, oxidation stability, corrosion protection of steel & various other metals & alloys, low temperature stability, evaporation loss & storage stability.	
Warning	This oil is unsuitable for use with natural or polychloroprene, eg Neoprene, rubbers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-6128	1 ltr	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-16	
Description	DAMPING FLUID: Silicone base	
Specification	DTD 900/4386A, (AFS 1475) Arlcone fluid	
Composition	Silicone based fluid	
Characteristics	Viscosity @ 99°C, min	5 mm ² /s (cSt)
	Viscosity @ 38°C, max	10 mm ² /s (cSt)
	Pour point, max	-59°C
Examples of Uses	Damping fluid in oleo legs of certain aircraft	
Standardized Alternatives	None	
Remarks		
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-083-1010	5 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	O-190	
JSD Code	OX-18	
Description	LUBRICATING OIL, GENERAL PURPOSE: Preservative, light	
Specification	MIL-PRF-32033 Amd 2	
Composition	Mineral oils with additives	
Characteristics	Viscosity @ 38°C, min	12 mm ² /s (cSt)
	Viscosity @ -40°C, max	6,000 mm ² /s (cSt)
	Pour point, max	-57°C
	Flash point, open cup, min	135°C
Examples of Uses	Lubrication, preservation of certain missile & ejector seat guides & undercarriages of certain aircraft	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for precipitation number, copper corrosion, rust inhibiting properties, oxidation stability, film forming properties, removability of film, water displacing ability in the presence of water.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-0364	500 ml	OL2	0475	- -	34B
9150-99-220-1174	5 ltr	- -	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	H-537	
JSD Code	OX-19	
Description	HYDRAULIC FLUID, SYNTHETIC, FIRE RESISTANT	
Specification	MIL-PRF-83282D	
Composition	Synthetic hydrocarbons containing up to 33%wt of diesters, with additives	
Characteristics	Colour	Red
	Viscosity @ 205°C, min	1.0 mm ² /s (cSt)
	Viscosity @ 100°C, min	3.45 mm ² /s (cSt)
	Viscosity @ 40°C, min	14.0 mm ² /s (cSt)
	Viscosity @ -40°C, max	2,200 mm ² /s (cSt)
	Pour point, max	-55°C
	Flash point, open cup, min	205°C
Examples of Uses	For hydraulic systems in certain aircraft. The fluid has an operating temperature range of -40°C to +205°C.	
Standardized Alternatives	Refer to the Air Force Service Authority, see Clause 1.2 Service Authorities	
Remarks	• This product implements STANAG 3748 & ASIC 15/7. • This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes tests for specific gravity, colour, acidity or alkalinity, firepoint, auto ignition temperature, bulk modulus, corrosion & oxidation stability, resistance to oxidation, swelling of synthetic rubber, solid particle contamination, foaming characteristics, water content, flammability, lubricity, compatibility, low & high temperature stability & storage stability.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-00-149-7432	1 US Gal	OL2	- -	- -	34B
9150-00-281-6191	5 US Gal	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-20	
Description	HYDRAULIC FLUID, PHOSPHATE ESTER BASE	
Specification	DTD 900/4881D, (AFS-1559B) Skydrol 500B-4	
Composition	Phosphate ester fluid	
Characteristics	Colour	Purple
	Density @ 24°C	~1.045 kg/m ³
	Viscosity @ 100°C	~3.8 mm ² /s (cSt)
	Viscosity @ 40°C	~11 mm ² /s (cSt)
	Pour point, max	-62°C
	Flash point, open cup, min	160°C
	Water content	~0.5%vol
Examples of Uses	Hydraulic fluid in certain aircraft	
Standardized Alternatives	None	
Remarks		
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-7916	1 US Gal	OL2	- -	- -	34B
9150-99-877-1089	5 US Gal	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	O-157	
JSD Code	OX-24	
Description	LUBRICATING OIL, WEAPONS, SMALL ARMS & LIGHT CALIBRE WEAPONS	
Specification	Def Stan 91-102	
Composition	Mineral oil &/or synthetic hydrocarbon oil polyalphaolefin (PAO) with corrosion & oxidation inhibitors	
Characteristics	Viscosity @ 40°C, min	5.5 mm ² /s (cSt)
	Viscosity @ -54°C, max	4,000 mm ² /s (cSt)
	Pour point, max	-60°C
	Flash point, closed cup, min	120°C
Examples of Uses	Lubrication & preservation of small arms & light calibre weapons up to 20mm. OX-24 is compatible with current weapon cleaning / lubrication kits & is to be applied in accordance with the appropriate weapon cleaning / lubricating instructions.	
Standardized Alternatives	See Annex O	
Remarks	• This product replaces OX-18 for small arms applications. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for total acid number, copper corrosion, corrosion prevention, wear prevention, corrosiveness & oxidation stability & elastomer compatibility. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-414-6509	1 ltr	OL3	0475	++	34D
9150-99-126-6420	25 ltr	OL3	--	++	34D

DEF STAN 01-005 Issue 19

NATO Code	O-160	
JSD Code	OX-26	
Description	LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE: Synthetic 5 cSt	
Specification	Def Stan 91-100	
Composition	Synthetic oil with additives	
Characteristics	Viscosity @ 200°C, min	1.25 mm ² /s (cSt)
	Viscosity @ 100°C	4.9–5.4 mm ² /s (cSt)
	Viscosity @ 40°C, max	30 mm ² /s (cSt)
	Viscosity @ -40°C, max	13,000 mm ² /s (cSt)
	Pour point, max	-54°C
	Flash point, open cup, min	210°C
Examples of Uses	Certain aircraft turbine engines, helicopter gearboxes & auxiliary equipment	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for performance in aircraft engines, load carrying ability, acidity, foaming characteristics, high temperature oxidative stability, sediment, trace element content, confined heat stability, corrosivity, elastomer compatibility, miscibility & compatibility with other oils to the same & other specifications, hydrolytic stability, coking propensity, catalytic oxidation & low-temperature viscosity stability. - The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	This oil is unsuitable for use with natural, silicone & polychloroprene, eg Neoprene, elastomers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-551-0171	1 ltr	- -	- -	+ +	34B
9150-99-225-0985	5 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	O-156	
JSD Code	OX-27	
Description	LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE: Synthetic 5 cSt	
Specification	Def Stan 91-101	
Composition	Synthetic oil with additives	
Characteristics	Viscosity @ 200°C, min	1.25 mm ² /s (cSt)
	Viscosity @ 100°C	4.9–5.4 mm ² /s (cSt)
	Viscosity @ 40°C, max	30 mm ² /s (cSt)
	Viscosity @ -40°C, max	13,000 mm ² /s (cSt)
	Pour point, max	-54°C
	Flash point, open cup, min	246°C
Examples of Uses	Certain aircraft turbine engines, auxiliary equipment & in certain powered flying controls, operated over the ambient temperature range of -40°C to +200°C.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - This specification includes tests for performance in ship gas turbine engines & elastomer compatibility. There are also tests for load carrying ability, acidity, foaming characteristics, volatility, corrosiveness & oxidative stability, sediment, trace element content, confined heat stability, miscibility & compatibility with other oils to the same & other specifications, coking propensity, hydrolytic stability & low-temperature viscosity stability. - The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	This oil is unsuitable for use with natural, silicone & polychloroprene, eg Neoprene, elastomers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-225-1747	1 ltr	OL2	0475	- -	34B
9150-99-220-1940	5 ltr	OL2	0475	+ +	34B
9150-99-220-1939	200 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	H-584	
JSD Code	OX-30	
Description	HYDRAULIC FLUID, PETROLEUM: Emulsifying	
Specification	Def Stan 91-35	
Composition	Mineral oil with additives	
Characteristics	Colour, Lovibond Red	20–40
	Viscosity @ 40°C	28.8–35.2 mm ² /s (cSt)
	Viscosity @ 0°C, max	630 mm ² /s (cSt)
	Pour point, max	-30°C
	Flash point, closed cup, min	165°C
Examples of Uses	Emulsifiable hydraulic fluid for use in the hydraulic systems of certain submarines & ground radar installations & alternator test rigs.	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for acidity, water content, copper corrosion, oxidation stability, rust inhibiting properties, foaming characteristics, air release, emulsion stability, filterability, load carrying, wear & fatigue tests & elastomer compatibility. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-224-0325	200 ltr	OL1	0475	- -	34D
9150-99-831-2599	Bulk	OL1	0725	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	O-149	
JSD Code	OX-38	
Description	LUBRICATING OIL, AIRCRAFT GAS TURBINE ENGINE: Synthetic 7.5 cSt	
Specification	Def Stan 91-98	
Composition	Synthetic oil with additives	
Characteristics	Viscosity @ 100°C, min	7.35 mm ² /s (cSt)
	Viscosity @ 40°C, max	36 mm ² /s (cSt)
	Viscosity @ -40°C, max	13,000 mm ² /s (cSt)
	Pour point, max	-54°C
	Flash point, closed cup, min	216°C
Examples of Uses	Certain aircraft turbine engines, helicopter gearboxes & auxiliary equipment.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for performance in aircraft engines, load carrying ability, acidity, foaming characteristics, high temperature oxidative stability, sediment, trace element content, confined heat stability, corrosivity, elastomer compatibility, miscibility & compatibility with other oils to the same & other specifications, hydrolytic stability & catalytic oxidation. - The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	This oil is unsuitable for use with natural & polychloroprene, eg Neoprene elastomers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-910-0591	5 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-40	
Description	HYDRAULIC FLUID, AQUEOUS POLYGLYCOL BASED: Fire Resistant	
Specification	Def Stan 91-110	
Composition	Water, polyglycol polymers with additives	
Characteristics	Colour	Green, fluorescent
	Density @ 15°C	Report
	Viscosity @ 40°C	41.4–50.6 mm ² /s (cSt)
	Viscosity @ 0°C, max	350 mm ² /s (cSt)
	Pour point, max	-39°C
	pH	7.5–10.0
	Water content	35–45%vol
Examples of Uses	General use as a fire-resistant hydraulic fluid in systems specifically designed for this fluid. Not to be used in existing systems without the approval of the design authority.	
Standardized Alternatives	None	
Remarks	- The specification includes tests for fire resistance, copper corrosion, wear resistance, shear stability, rust inhibition in presence of sea water & compatibility with sea water, water content, foaming characteristics, air release, additive elements & elastomer compatibility. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This fluid is not compatible with conventional mineral oil, conventional oil resistant paints & light metals, eg cadmium, zinc & aluminium alloys.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-731-2026	25 ltr	OL1	0475	- -	- -
9150-99-721-7413	200 ltr	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-64	
Description	SEMI-FLUID GREASE, HELICOPTER TRANSMISSION	
Specification	Hughes/McDonnell Douglas HMS20-1155	
Composition	Synthetic blend with a gelling agent, & extreme pressure & anti-wear additives	
Characteristics	Penetration, worked	442–458 mm/10
	NLGI grade	000
	Base fluid type	Synthetic blend
	Thickener type	Lithium complex
	Dropping point, min	148.9°C
Examples of Uses	Apache helicopter Intermediate & Tail Rotor gearboxes operated over the temperature range -54°C to +135°C.	
Standardized Alternatives	None	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for evaporation loss, deleterious particles, corrosive preventive properties, load wear index, weld point, & 4-Ball wear.	
Warning	The use of this grease is restricted to authorised applications on the Apache helicopter & may not be suitable for other aviation use.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-151-2806	5 lb	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-1735	
JSD Code	OX-70	
Description	MOLYBDENUM DISULFIDE LUBRICATING OIL, Silicone base	
Specification	MIL-DTL-25681	
Composition	Silicone fluid, based on methylphenyl polysiloxane & molybdenum disulfide powder 50/50% mixture.	
Characteristics	Viscosity @ 100°C	16–22 mm ² /s (cSt)
	Viscosity @ 40°C	65–85 mm ² /s (cSt)
	Flash point, open cup, min	274°C
Examples of Uses	Lubricant for certain aircraft slow speed sliding surfaces, operated up to temperatures of +400°C	
Standardized Alternatives	See Annex O	
Remarks	- The oil & molybdenum disulfide are blended to give a homogenous mixture at the time of packing but the molybdenum disulfide powder settles at the bottom of containers during storage. - Stir well before use.	
Warning	This fluid shall not be used on antifriction bearings under any circumstances. This fluid tends to cause certain rubbers & plastics to shrink & harden.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-7914	500 g	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	H-548	
JSD Code	OX-75	
Description	HYDRAULIC FLUID, AUTOMATIC TRANSMISSION	
Specification	This product complies with the performance requirements of General Motors Dexron III H specification (GMN 10055)	
Composition	Synthetic hydrocarbon oils with additives	
Characteristics	Viscosity @ 100°C	6.5–9.0 mm ² /s (cSt)
	Viscosity index, min	160
	Apparent viscosity @ -20°C, max	1,500 mPas (cP)
	Apparent viscosity @ -40°C, max	20,000 mPas (cP)
	Flash point, open cup, min	170°C
Examples of Uses	Power steering & automatic transmissions not fitted with wet brakes, normally using DEXRON III fluids.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 7093. • The specification includes GM transmission test, tests for foaming characteristics, copper corrosion, de-aeration, oxidation stability, elastomeric compatibility, load carrying capacity & corrosion.	
Warning	This fluid is not compatible with ethylene/propylene rubbers. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-869-4113	1 ltr	OL3	0475	+ +	34D
9150-99-869-4114	5 ltr	OL3	0475	+ +	34D
9150-99-771-1899	20 ltr	OL3	0475	+ +	34D
9150-99-729-1751	205 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-79	
Description	TRANSMISSION FLUID TO-4 (SAE 10W)	
Specification	This product complies with the performance requirements of Caterpillar Inc. publication TO-4	
Composition	Highly refined petroleum mineral base oil & additives	
Characteristics	SAE viscosity classification	SAE 10W
	Viscosity @ 100°C, min	4.1 mm ² /s (cSt)
	Flash point, closed cup, min	160°C
Examples of Uses	In powershift transmissions & hydraulic systems requiring a lubricant meeting the requirements of Caterpillar Inc. publication TO-4 where the temperature is persistently below -20°C.	
Standardized Alternatives	None	
Remarks	The specification includes tests for corrosion control, elastomer compatibility, oxidation resistance, wear & friction.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-598-6128	20 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-80	
Description	TRANSMISSION FLUID TO-4 (SAE 30)	
Specification	This product complies with the performance requirements of Caterpillar Inc. publication TO-4	
Composition	Highly refined petroleum mineral base oil & additives	
Characteristics	SAE viscosity classification	SAE 30
	Viscosity @ 100°C	9.3–12.5 mm ² /s (cSt)
	Flash point, closed cup, min	160°C
Examples of Uses	In powershift transmissions & hydraulic systems requiring a lubricant meeting the requirements of Caterpillar Inc. publication TO-4 at ambient temperatures above -20°C.	
Standardized Alternatives	None	
Remarks	The specification includes tests for corrosion control, elastomer compatibility, oxidation resistance, wear & friction.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-406-8020	20 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-85	
Description	TRANSMISSION FLUID	
Specification	This product complies with the performance requirements of both Ford ESEN-M2C 86B & Massey Ferguson CMS M1135:1980	
Composition	Mineral oil with additives	
Characteristics	Viscosity @ 100°C	10–11 mm ² /s (cSt)
	Viscosity index, min	105
	Pour point, max	-27°C
	Flash point, open cup, min	210°C
Examples of Uses	Where specified for automatic transmissions fitted with metal sintered wet brakes operating at ambient temperatures above -20°C.	
Standardized Alternatives	None	
Remarks		
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-282-3293	25 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	O-1180	
JSD Code	OX-90	
Description	LUBRICATING OIL, ENGINE: Severe duty, diesel, extended service, SAE 10W-40	
Specification	ACEA E6 & E7	
Composition	Synthetic hydrocarbons with additives, low SAPS	
Characteristics	SAE viscosity classification	10W-40
	ACEA performance, min	E6 & E7
	Viscosity @ 100°C	12.5–16.3 mm²/s (cSt)
	Apparent viscosity @ -25°C, max	7,000 mPa.s (cP)
	Flash point, closed cup, min	160°C
Examples of Uses	Multigrade heavy duty crankcase oil for use in EURO IV compliant compression ignition engines of ground equipment operated at all ambient temperatures above -20°C.	
Standardized Alternatives	None	
Remarks	This product implements STANAG 7091.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-361-7232	5 ltr	OL3	0475	+ +	34D
9150-99-302-5053	25 ltr	OL3	0475	+ +	34D
9150-99-275-5212	200 ltr	OL3	0475	+ +	34D
9150-99-579-8296	Bulk	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-95	
Description	LUBRICATING OIL, COMPRESSOR: Synthetic	
Specification	Proprietary	
Composition	Synthetic oil with additives	
Characteristics	Viscosity @ 40°C	~95 mm ² /s (cSt)
	Viscosity @ -18°C	~20,000 mm ² /s (cSt)
	Pour point, max	-30°C
	Flash point, closed cup, min	266°C
Examples of Uses	Cylinder & crankcase lubricant for air-cooled high-pressure compressors including those used for diving air.	
Standardized Alternatives	None	
Remarks		
Warning	This oil is unsuitable for use with certain rubbers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-225-3824	1 ltr	OL3	0475	+ +	34D
9150-99-225-3825	5 ltr	OL3	0475	- -	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-125	
Description	HELICOPTER TRANSMISSION LUBRICANT	
Specification	Air Standard ACS-4035	
Composition	Synthetic oil with additives	
Characteristics	Viscosity @ 100°C	8.75–9.25 mm ² /s (cSt)
	Viscosity @ -32°C	~13,000 mPa.s (cP)
	Pour point, max	-40°C
	Flash point, closed cup, min	232°C
Examples of Uses	In certain helicopter transmission systems, temperature range -40 to +150°C	
Standardized Alternatives	None	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for acidity, oxidation stability, corrosion inhibiting properties, elastomer compatibility, evaporation loss, foaming characteristics, specific heat & load carrying capacity.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-517-1644	5 ltr	- -	- -	- -	34B
9150-99-219-8894	25 ltr	- -	- -	- -	34B
9150-99-464-3014	200 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-135	
Description	LUBRICATING OIL, REFRIGERANT COMPRESSOR: Synthetic ester based	
Specification	Proprietary	
Composition	Synthetic ester based fluid with additives	
Characteristics	Viscosity @ 100°C	~9.0 mm ² /s (cSt)
	Viscosity @ 40°C	61.2–74.8 mm ² /s (cSt)
	Pour point, max	-39°C
	Flash point, closed cup, min	200°C
Examples of Uses	Refrigeration Compressors used for refrigerated stores, chillers etc using the HFC R134a type refrigerant gases	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The refrigeration compressor lubricant should be fully miscible with HFC, HCFC & CFC refrigerant gases to ensure satisfactory operation in systems converted from CFC refrigerant gas to HFC or HCFC refrigerant gases. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This fluid is unsuitable for use with most automotive air conditioning units.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-490-4481	1 ltr	OL1	0475	--	--
9150-99-577-8313	5 ltr	OL1	0475	--	--
9150-99-551-4487	20 ltr	OL1	0475	--	--

DEF STAN 01-005 Issue 19

NATO Code	O-152	
JSD Code	OX-152	
Description	LUBRICATING OIL, GAS TURBINE ENGINE, CORROSION INHIBITING: Synthetic 5 cSt	
Specification	MIL-PRF-23699 (Class C/I)	
Composition	Synthetic oil with additives	
Characteristics	Viscosity @ 100°C	4.9–5.4 mm ² /s (cSt)
	Viscosity @ 40°C, min	23 mm ² /s (cSt)
	Viscosity @ -40°C, max	13,000 mm ² /s (cSt)
	Pour point, max	-54°C
	Flash point, open cup, min	246°C
Examples of Uses	Certain RN marine gas turbine engines operated over the ambient temperature range of -40°C to +200°C.	
Standardized Alternatives	See Annex O	
Remarks	• This product involves US qualification procedures. See Clause 1.2 Service Authorities. • This specification includes tests for performance in gas turbine engines, elastomer compatibility, load carrying ability, acidity, foaming characteristics, volatility, corrosiveness & oxidative stability, sediment, trace element content, compatibility with other oils to the same & other specifications, bearing deposits, bearing corrosion & low-temperature viscosity stability. • The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	This oil is unsuitable for use with natural, silicone & polychloroprene, eg Neoprene, elastomers. It also affects certain paints & plastics.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-216-6951	5 ltr	OL1	0475	- -	- -
9150-99-264-1404	25 ltr	OL1	0475	- -	- -
9150-99-842-0867	200 ltr	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-165	
Description	LUBRICATING FLUID, GEAR: Synthetic	
Specification	Def Stan 91-71	
Composition	Polyalkylene glycol with additives	
Characteristics	Viscosity @ 100°C	20.0–25.0 mm ² /s (cSt)
	Viscosity index, min	160
	Flash point, open cup, min	255°C
Examples of Uses	Spiral bevel gears & in transmissions incorporating a hydraulic steering system & in aircraft arrester barriers, operated over the temperature range of -40°C to +150°C. Also in fuel & lubricant Oil (LO) centrifuges.	
Standardized Alternatives	None	
Remarks	- The specification includes tests for acidity, oxidation stability, corrosion protection of steel & various other metals, low temperature stability, evaporation loss, foaming characteristics & load carrying capacity & miscibility. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This material is not intended for use with conventional hypoid gears. This oil is incompatible with mineral oils. It must not be used as a top up fluid for addition to equipment containing mineral oils. This material may also have deleterious effects on certain elastomers, paint systems & leather. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-147-6169	5 ltr	OL3	- -	- -	34D
9150-99-225-2356	25 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	OX-300	
Description	LUBRICATING OIL, STERN TUBE: Emulsifying	
Specification	Proprietary	
Composition	Mineral & fatty oil with additives	
Characteristics	Colour	Green
	Viscosity @ 60°C	98–110 mm ² /s (cSt)
	Pour point, max	3°C
	Flash point, closed cup, min	165°C
Examples of Uses	Stern tube lubricant in certain marine craft	
Standardized Alternatives	None	
Remarks	The specification includes tests for free fatty acids, emulsification & emulsion stability.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-224-7379	22 kg	- -	0475	- -	- -
9150-99-224-7378	185 kg	- -	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	H-538	
JSD Code	OX-538	
Description	HYDRAULIC FLUID, FIRE RESISTANT: Low temperature, synthetic hydrocarbon base, aircraft & missile	
Specification	MIL-PRF-87257B	
Composition	Synthetic hydrocarbons containing up to 35%wt of diesters, with additives	
Characteristics	Colour	Red
	Viscosity @ 100°C, min	2.0 mm ² /s (cSt)
	Viscosity @ 40°C, min	6.7 mm ² /s (cSt)
	Viscosity @ -40°C, max	550 mm ² /s (cSt)
	Viscosity @ -54°C, max	2,500 mm ² /s (cSt)
	Pour point, max	-60°C
	Flash point, open cup, min	160°C
	Fire point, open cup, min	170°C
Examples of Uses	For hydraulic systems in certain aircraft. The fluid has an operating temperature range of -54°C to +200°C.	
Standardized Alternatives	Refer to the Air Force Service Authority, see Clause 1.2 Service Authorities	
Remarks	• This product implements STANAG 3748 & ASIC 15/7. • This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • This specification includes tests for specific gravity, acidity or alkalinity bulk modules, corrosion & oxidation stability, swelling of synthetic rubber, solid particle contamination, foaming characteristics, lubricity water content compatibility, low & high temperature stability & storage stability.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-239-2250	1 ltr	OL2	- -	- -	34B
9150-99-285-3752	5 ltr	OL2	- -	- -	34B

ANNEX F: GREASES – XG

DEF STAN 01-005 Issue 19

NATO Code	G-363	
JSD Code	XG-235	
Description	GREASE, PLUG VALVE, HYDROCARBON RESISTANT	
Specification	Def Stan 91-6	
Composition	Animal, vegetable or synthetic oil with a gelling agent	
Characteristics	Penetration, unworked	180–260 mm/10
	Dropping point, min	125°C
Examples of Uses	Lubricant for glands & cocks in fuel & oil supply systems	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for copper corrosion, resistance to fuel & water, grease film stability, corrosion of steel.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-944-0585	500 g	OL2	0475	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-736	
JSD Code	XG-250	
Description	SILICONE COMPOUND: Electrical insulating	
Specification	Def Stan 68-69	
Composition	Silicone fluid & a gelling agent	
Characteristics	Penetration, unworked	190–250 mm/10
	Penetration, worked, max	310 mm/10
	Base fluid type	Silicone fluid
	Volume resistivity @ 23°C, min	$1.0 \times 10^{14} \text{ ohm.cm}^{-1}$
Examples of Uses	Protective insulating compound as a filling & coating material in electrical equipment & installations, suitable over the temperature range of -50°C to +200°C. Protection of all aluminium alloy fittings in HM ships, bushes, engine mountings, components of hydraulic equipment.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for oil separation, evaporation loss, low temperature stability, freedom from abrasive particles, freedom from corrosive action on metals, effect on rubber, waterproof sealing properties, electrical proof strength, power factor, permittivity & storage stability. • For NSN 5970-99-224-4975 – PSN: Aerosols; UN No: 1950; UN Class: 2.1; UN Packaging Group: N/A. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
5970-99-220-2421	50 g	- -	0475	+ +	34B
5970-99-224-8408	1 kg	OL2	0475	+ +	34B
5970-99-224-4975	400 ml aerosol	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	XG-261	
Description	GREASE, SILICONE	
Specification	AFS 990C Molykote 44 Grease-Medium	
Composition	Silicone fluid & a gelling agent	
Characteristics	Penetration, worked	240–280 mm/10
	Dropping point, min	200°C
Examples of Uses	Roller bearings of radar pedestals in HM ships	
Standardized Alternatives	None	
Remarks	The specification includes tests for foreign particles, oil separation, evaporation loss & copper corrosion.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-225-3133	100 g	OL2	0475	- -	34D
9150-01-418-8231	1 kg	OL2	- -	- -	34D
9150-99-314-5745	25 kg	OL2	- -	- -	34D

DEF STAN 01-005 Issue 19

NATO Code	G-412	
JSD Code	XG-264	
Description	GREASE, GRAPHITE: Medium	
Specification	Def Stan 91-18	
Composition	95%wt XG-279 / 5%wt graphite powder	
Characteristics	Penetration, worked	240–300 mm/10
	Base fluid type	Mineral oil
	Thickener type	Metallic soap
Examples of Uses	General purpose lubricant where a graphited grease is required, for leaf springs & lift guides, protective for wire ropes, certain antiseize applications, operated over the temperature range of -54°C to +105°C.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes a test for graphite content. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-220-1049	3 kg	OL2	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	G-392	
JSD Code	XG-269	
Description	GREASE, AIRCRAFT: Synthetic, pneumatic system	
Specification	SAE-AMS-G-4343	
Composition	Liquid lubricant & a gelling agent	
Characteristics	Penetration, worked	260–300 mm/10
	NLGI grade	2
	Dropping point, min	163°C
Examples of Uses	Lubricant for certain specified components in Hercules aircraft, operated over the temperature range of -55°C to +95°C & pressures up to 14 mPa.	
Standardized Alternatives	See Annex O	
Remarks	• This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes tests for apparent viscosity, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, rust preventive properties, effects on rubber & storage stability. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-00-269-8255	1 lb	OL2	--	--	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	XG-273	
Description	GREASE: AIRCRAFT, Synthetic, graphite	
Specification	Def Stan 91-85	
Composition	90%wt XG-287 / 10%wt graphite powder	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Diester
	Thickener type	Lithium complex soap
Examples of Uses	Lubricant for leaf springs & lift guides, steel wire ropes & Bowden cables, machine guns & small arms in hot dusty conditions.	
Standardized Alternatives	None	
Remarks	The specification includes tests for graphite content, oil separation & copper corrosion.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-942-3151	125 g	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	G-353	
JSD Code	XG-276	
Description	GREASE: AIRCRAFT, Synthetic, molybdenum disulfide	
Specification	Def Stan 91-57	
Composition	95%wt XG-287 / 5%wt ZX-35	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Diester
	Thickener type	Lithium complex soap
Examples of Uses	Certain heavily loaded sliding applications & anti-friction bearings carrying high loads over the temperature range -73°C to +120°C.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for molybdenum disulphide content & oil separation. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-942-5139	125 g	OL2	0475	+ +	34B
9150-99-224-7683	3 kg	OL2	0475	+ +	34B
9150-99-593-2251	12.5 kg	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	G-403	
JSD Code	XG-279	
Description	GREASE, AUTOMOTIVE & ARTILLERY	
Specification	Def Stan 91-27	
Composition	Mineral oil & a gelling agent	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Mineral oil
	Thickener type	Metallic soap
	Dropping point, min	130°C
Examples of Uses	General purpose lubricant for automotive & artillery applications, operated over the temperature range of -54°C to +105°C.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 7101. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for foreign particles, oil separation, evaporation loss, water absorption, copper corrosion, oxidation stability, working stability in the presence of water, roll stability, roller bearing performance, extreme pressure properties, wear preventive characteristics, rust preventive properties, apparent viscosity at -54°C & storage stability. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-220-2418	3 kg	OL3	0475	++	34D
9150-99-220-1149	12.5 kg	OL3	0475	++	34D
9150-99-220-2731	25 kg	OL3	--	++	34D
9150-99-220-1150	50 kg	OL3	--	++	34D

DEF STAN 01-005 Issue 19

NATO Code	G-366	
JSD Code	XG-284	
Description	GREASE, AIRCRAFT: Helicopter oscillating bearing	
Specification	Def Stan 91-51	
Composition	Low temperature liquid lubricant & a gelling agent	
Characteristics	Penetration, worked	265–305 mm/10
	Base fluid type	Mineral oil
	Thickener type	Calcium soap
	Dropping point, min	138°C
Examples of Uses	General purpose lubricant for helicopter & aircraft antifretting applications, operated over the temperature range of -55°C to +75°C.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for foreign particles, unworked penetration, working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance, rust preventive properties & storage stability.	
Warning	This grease should not be used in ball & roller bearings, operated at high temperatures or speeds.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-943-9321	500 g	OL2	0475	+ +	34B
9150-99-224-7907	3 kg	OL2	- -	+ +	34B
9150-99-220-2310	12.5 kg	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	G-355	
JSD Code	XG-285	
Description	GREASE, AIRCRAFT: Graphite	
Specification	Def Stan 91-54	
Composition	95%wt XG-291 / 5%wt graphite powder	
Characteristics	Penetration, worked	265–340 mm/10
	Base fluid type	Synthetic / semi-synthetic hydrocarbon oil
	Thickener type	Lithium complex soap
	Dropping point, min	150°C
Examples of Uses	For use over the operating temperature range -40°C to +120°C in heavily loaded intermittent applications such as aircraft combustion starter gears & slow moving plain bearings & sliding surfaces.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for graphite content, working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance & storage stability. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This grease should not be used in ball & roller bearings, operated at high temperatures or speeds. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-910-0517	125 g	OL2	0475	++	34B
9150-99-923-0474	3 kg	OL2	0475	++	34B

DEF STAN 01-005 Issue 19

NATO Code	G-460	
JSD Code	XG-286	
Description	GREASE, SEA WATER RESISTING	
Specification	Def Stan 91-34	
Composition	Lubricating oil & water-resistant soaps	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Mineral oil
	Thickener type	Calcium soap
	Dropping point, min	130°C
Examples of Uses	Lubrication & protection against corrosion of mechanisms submerged in sea water or subject to wave action & the washing effect of heavy seas over the temperature range of -20°C to +60°C.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 7101. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for oil separation, copper corrosion, water resistance & rust preventive properties. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-224-8885	3 kg	OL2	0475	++	34B
9150-99-163-5750	12.5 kg	OL2	0475	--	--

DEF STAN 01-005 Issue 19

NATO Code	G-354	
JSD Code	XG-287	
Description	GREASE: Multi-purpose, low temperature range	
Specification	Def Stan 91-53	
Composition	Synthetic lubricant with gelling agent & extreme pressure additives	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Diester
	Thickener type	Lithium complex soap
	Dropping point, min	180°C
Examples of Uses	General purpose lubricant for aircraft accessories, instruments gears, actuators & other mechanisms where high load carrying capacity is required, operated over the temperature range of -73°C to +120°C where satisfactory performance in the presence of water is required.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for oil separation, evaporation loss, oxidation stability, copper corrosion, water absorption, elastomer compatibility, working stability, low temperature torque, extreme pressure properties, wheel bearing leakage, roll stability, water washout, rust prevention, apparent viscosity, rolling bearing & elevated temperature performance & storage stability. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-1793	125 g	OL2	0475	++	34B
9150-99-350-6234	4.5 kg	OL2	--	--	34B
9150-99-224-1861	12.5 kg	OL2	0475	++	34B

DEF STAN 01-005 Issue 19

NATO Code	G-382 / G-421	
JSD Code	XG-291	
Description	GREASE: Multipurpose, heavy duty	
Specification	Def Stan 91-105	
Composition	Mineral oil &/or synthetic hydrocarbon oil polyalphaolefin (PAO) with gelling agent & additives	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Synthetic / semi-synthetic hydrocarbon oil
	Thickener type	Lithium complex soap
	Dropping point, min	230°C
Examples of Uses	Lubrication of gears, anti-friction bearings, high speed ball & roller bearings, plain bearings, internal combustion engine accessories, certain fire control instruments & other mechanisms over the temperature range of -40°C to +140°C, where satisfactory performance in the presence of water is required.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for viscosity of base oil, oil separation, evaporation loss, oxidation stability, copper corrosion, water absorption, elastomer compatibility, working stability, low temperature torque, extreme pressure properties, wheel bearing leakage, roll stability, water washout, rust prevention, apparent viscosity, rolling bearing & elevated temperature performance, churning & storage stability. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-925-0415	125 g	OL2	0475	++	34B
9150-99-812-6659	280 g	OL2	--	--	34B
9150-99-918-3786	500 g	OL2	0475	++	34B
9150-99-838-1808	3 kg	OL2	0475	++	34B
9150-99-333-0167	50 kg	OL2	0475	++	34B

DEF STAN 01-005 Issue 19

NATO Code	G-395	
JSD Code	XG-293	
Description	GREASE, AIRCRAFT: Multipurpose	
Specification	Def Stan 91-52	
Composition	Wide temperature range liquid lubricant & a high melting gelling agent.	
Characteristics	Penetration, worked	265–320 mm/10
	Dropping point, min	232°C
Examples of Uses	Wheel bearings, antifriction bearings, plain bearings, gearboxes & aircraft accessories, operated over the temperature range of -55°C to +175°C. Reactor compartments of nuclear submarines.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for foreign particles, working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance, load carrying capacity, steel/steel wear, elevated temperature performance, rust preventive properties, gear wear, friction & wear under oscillating conditions, effect on rubber & storage stability. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-224-1797	500 g	- -	0475	+ +	34B
9150-99-513-5131	12.5 kg	OL2	0475	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	XG-294	
Description	GREASE: Multi-purpose, elevated temperature range	
Specification	Def Stan 91-106	
Composition	Synthetic hydrocarbon lubricant with gelling agent & extreme pressure additives	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Polyalphaolefin
	Thickener type	Lithium soap
	Dropping point, min	230°C
Examples of Uses	Lubrication of gearboxes, anti-friction bearings, plain bearings & other mechanisms over the temperature range of -54°C to +175°C, & where satisfactory performance in the presence of water is required.	
Standardized Alternatives	None	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for oil separation, evaporation loss, oxidation stability, copper corrosion, water absorption, elastomer compatibility, working stability, low temperature torque, extreme pressure properties, anti-wear properties, wheel bearing leakage, roll stability, water washout, rust prevention, apparent viscosity, rolling bearing performance, elevated temperature performance & storage stability.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-855-1324	500 g	OL2	- -	- -	34B
9150-99-376-9100	12.5 kg	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	G-372	
JSD Code	XG-300	
Description	GREASE, AIRCRAFT: Synthetic, high temperature	
Specification	MIL-G-25013E	
Composition	Liquid lubricant with a gelling agent & additives	
Characteristics	Penetration, worked	260–320 mm/10
	NLGI grade	2
	Dropping point, min	230°C
Examples of Uses	Lubricant for lightly loaded high speed anti-friction bearings & certain aircraft actuators & similar equipment, certain equipment in submarines & where conventional soap thickened greases would be unsuitable, operated over the temperature range of -75°C to +230°C.	
Standardized Alternatives	See Annex O	
Remarks	• This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes tests for working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, elevated temperature performance, water resistance, rust preventive properties & storage stability.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-01-234-5866	1 lb	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	XG-305	
Description	GREASE, MOLYBDENUM DISULFIDE	
Specification	Def Stan 91-64	
Composition	Liquid lubricant with a gelling agent & 3%wt min of molybdenum disulfide.	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Mineral oil
	Thickener type	Metallic soap
	Dropping point, min	180°C
Examples of Uses	Lubricant for heavily loaded applications & for certain antiseize uses, operated over the temperature range of -20°C to +120°C.	
Standardized Alternatives	None	
Remarks	The specification includes tests for working stability, oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, water resistance, extreme pressure properties, rust preventive properties & storage stability.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-814-8952	500 g	OL3	- -	+ +	34D
9150-99-760-7160	3 kg	OL2	0475	- -	34D

DEF STAN 01-005 Issue 19

NATO Code	G-394	
JSD Code	XG-315	
Description	GREASE: Silicone, metal to rubber	
Specification	Def Stan 91-56	
Composition	Silicone fluid, gelling agent & additives	
Characteristics	Penetration, worked	265–295 mm/10
	NLGI grade	2
	Base fluid type	Silicone fluid
	Thickener type	Metallic soap
	Dropping point, min	200°C
Examples of Uses	Metal to rubber lubrication, except silicone rubbers, especially in aircraft pneumatic systems & guided weapons.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for oil separation, evaporation loss, copper corrosion, oxidation stability, low temperature torque, effect on rubber & storage stability. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-220-1438	100 g	OL2	0475	+ +	34B
9150-99-220-4466	200 g	- -	- -	- -	34B
9150-99-944-0603	1 kg	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	XG-380	
Description	GREASE, PUMPABLE CALCIUM BASE	
Specification	Def Stan 91-111	
Composition	Low viscosity mineral oil & water insoluble calcium soap	
Characteristics	Base fluid type	Mineral oil
	Thickener type	Calcium soap
	Dropping point, min	130°C
Examples of Uses	Lubricant for exposed parts of Naval gun mountings at low temperatures, torpedoes & for Naval missile handling gear. Preservation of metal parts including artillery & small arms sub-assemblies, & on unwrapped heavy engineering & tool stores.	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for, copper corrosion, oil separation & apparent viscosity at -40°C. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-910-0504	3 kg	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	XG-460
Description	GREASE, NAVAL: Graphite
Specification	Proprietary
Composition	Semi-fluid grease containing gelling agent, graphite & extreme pressure additives
Characteristics	
Examples of Uses	Breech-blocks of guns
Standardized Alternatives	None
Remarks	This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-910-0524	3 kg	OL1	0475	- -	34D

ANNEX G: SPECIALITIES – ZX

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	ZX-9
Description	CUTTING FLUID, SOLUBLE, BIOSTABLE
Specification	Def Stan 91-70
Composition	Mineral oil with emulsifiers & additives
Characteristics	Flash point, closed cup, min 70°C
Examples of Uses	General purpose coolant & lubricant for metal machining operations. The concentration is varied according to the machining operation, the work piece material & the hardness of the water. For advice, refer to the Service Authority, see Clause 1.2 Service Authorities.
Standardized Alternatives	None
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for copper corrosion, pH value, cast iron corrosion, fluid stability, frothing tendency, thermal stability, resistance to bacterial & fungal attack. ZX-9 forms a stable translucent emulsion in hard or soft water. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).
Warning	Add ZX-9 to water, not water to ZX-9 when mixing. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-108-3103	25 ltr	OL3	0475	++	34D

DEF STAN 01-005 Issue 19

NATO Code	S-720	
JSD Code	ZX-13	
Description	ANTISEIZE COMPOUND: Graphite	
Specification	Def Stan 80-80	
Composition	50%wt grease / 50%wt graphite powder	
Characteristics	Penetration, worked	170–260 mm/10
	Dropping point, min	100°C
Examples of Uses	Sparking plug thread antiseize compound & certain other threaded fittings operated up to +500°C.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes a test for graphite content. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This compound shall not be used for oxygen equipment or systems. See ZX-24 for low-pressure aircraft oxygen systems. ZX-13 is an electrical conductor. When used on sparking plugs it shall not be allowed to come into contact with the terminal or electrode. This product is not intended as a general purpose lubricant & ZX-13 shall not be used in ball & roller bearings.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
8030-99-910-0528	500 g	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-718
JSD Code	ZX-24
Description	ANTISEIZE COMPOUND: Aircraft, oxygen system
Specification	DTD 900/4042A, (AFS 355A) Acheson Aquadag
Composition	Stabilized dispersion of colloidal graphite in water
Characteristics	Black fluid
Examples of Uses	Antiseize compound for low pressure aircraft oxygen systems
Standardized Alternatives	See Annex O
Remarks	Stir well before use.
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-942-7802	75 g	- -	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	ZX-30
Description	LUBRICANT, SOLID FILM: Unbonded, graphite dispersion
Specification	DTD 900/4639, Acheson Dag 580
Composition	Stabilized dispersion of colloidal graphite in ethanol
Characteristics	Black fluid
Examples of Uses	Unbonded dry film lubricant coating for bomb release mechanisms & certain antiseize applications
Standardized Alternatives	None
Remarks	- Stir well before use. - PSN: Paint; UN No: 1263; UN Class: 3; Packaging Group: III This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-944-0586	1 kg	OL2	0475	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-1738
JSD Code	ZX-34
Description	LUBRICANT, SOLID FILM: Heat cured
Specification	SAE AS 5272 Type I
Composition	Molybdenum disulfide powder & a resin binder dispersed in a solvent
Characteristics	
Examples of Uses	Bonded dry film lubricant for metal surfaces
Standardized Alternatives	See Annex O
Remarks	• This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes tests for appearance, adhesion, thermal shock stability, resistance to various fluids, endurance life, load carrying capacity & corrosion resistance of the cured coating & storage stability of the dispersion. • Stir well before use. • PSN: Flammable Liquid, Toxic, NOS; UN No: 1992; UN Class: 3; UN Packaging Group: II
Warning	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-225-0980	500 g	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-740
JSD Code	ZX-35
Description	MOLYBDENUM DISULFIDE POWDER, LUBRICATING
Specification	Def Stan 68-62
Composition	Molybdenum disulfide powder
Characteristics	A fine powder of which 100, 99 & 95%wt shall pass through a 150, 75 & 63 micrometre mesh sieve, respectively
Examples of Uses	Boundary lubricant, an ingredient in certain greases & bonded coating compositions.
Standardized Alternatives	See Annex O
Remarks	The specification includes tests for molybdenum & sulfur content, insoluble matter, acetone & water soluble matter & abrasiveness.
Warning	This product shall not be added to any lubricant without the prior written agreement from the appropriate Service Authority. See Clause 1.2 Service Authorities.

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6810-99-220-5785	500 g	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	ZX-36
Description	LUBRICANT, ELECTRICAL SLEEVING
Specification	DTD 900/4877A, (AFS 611A) Hellerine Grade M
Composition	Transparent viscous oil
Characteristics	
Examples of Uses	Lubricant for the sleeves of electrical cables
Standardized Alternatives	None
Remarks	This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-3658	250 ml	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-722	
JSD Code	ZX-38	
Description	ANTI-SEIZE COMPOUND: Molybdenum disulfide	
Specification	Def Stan 80-81	
Composition	Mineral oil & a gelling agent containing not less than 50%wt ZX-35.	
Characteristics	Penetration, worked	200–300 mm/10
	Dropping point, min	100°C
Examples of Uses	Anti-seize & anti-scuffing compound for metal parts, operated over the temperature range of up to +250°C.	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for copper corrosion & molybdenum disulfide content. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This compound is not intended as a general purpose lubricant. This product shall not be used on ball & roller bearings. ZX-38 is not for use with gaseous or liquid oxygen. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
8030-99-224-9248	100 g	OL2	0475	+ +	34B
8030-99-224-9249	500 g	OL2	0475	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	ZX-40	
Description	GREASE, STERN TUBE: Emulsifying	
Specification	Proprietary	
Composition	Petrolatum & emulsifying additives	
Characteristics	Colour	Green
	Penetration, unworked	140–170 mm/10
	Flash point, closed cup, min	200°C
Examples of Uses	Stern tube lubricant & for other applications in certain marine craft.	
Standardized Alternatives	None	
Remarks		
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-220-1628	3 kg	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	S-1716	
JSD Code	ZX-43	
Description	DAMPING FLUIDS: Dimethyl silicone	
Specification	Proprietary	
Composition	Silicone fluids based on dimethyl polysiloxanes	
Characteristics	Colour	Colourless
	Viscosity @ 25°C	20 mm ² /s (cSt)
	Flash point, min	186°C
Examples of Uses	Damping, transducer & dielectric fluids in radar, radio & missile equipment. Also used as heat transfer fluids.	
Standardized Alternatives	See Annex O	
Remarks	- The specification typically includes tests for colour, haze, acidity, volatility, refractive index & permittivity. - The product is colourless, odourless, water repellent, chemically inert, & have good dielectric properties. It is highly compressible & have low rates of change of viscosity with temperature.	
Warning	This product shall not be mixed with any lubricant or hydraulic fluid. It shall not be used as water displacing fluid. It is not effective as lubricants for steel/steel at high loads.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-2534	500 g	OL2	0475	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-1718	
JSD Code	ZX-44	
Description	DAMPING FLUIDS: Dimethyl silicone	
Specification	Proprietary	
Composition	Silicone fluids based on dimethyl polysiloxanes	
Characteristics	Colour	Colourless
	Viscosity @ 25°C	50 mm ² /s (cSt)
	Flash point, min	234°C
Examples of Uses	Damping, transducer & dielectric fluids in radar, radio & missile equipment. Also used as heat transfer fluids.	
Standardized Alternatives	See Annex O	
Remarks	- The specification typically includes tests for colour, haze, acidity, volatility, refractive index & permittivity. - The product is colourless, odourless, water repellent, chemically inert, & have good dielectric properties. It is highly compressible & have low rates of change of viscosity with temperature. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product shall not be mixed with any lubricant or hydraulic fluid. It shall not be used as water displacing fluid. It is not effective as lubricants for steel/steel at high loads.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-2924	500 g	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-1720	
JSD Code	ZX-45	
Description	DAMPING FLUIDS: Dimethyl silicone	
Specification	Proprietary	
Composition	Silicone fluids based on dimethyl polysiloxanes	
Characteristics	Colour	Colourless
	Viscosity @ 25°C	100 mm ² /s (cSt)
	Flash point, min	249°C
Examples of Uses	Damping, transducer & dielectric fluids in radar, radio & missile equipment. Also used as heat transfer fluids.	
Standardized Alternatives	See Annex O	
Remarks	- The specification typically includes tests for colour, haze, acidity, volatility, refractive index & permittivity. - The product is colourless, odourless, water repellent, chemically inert, & have good dielectric properties. It is highly compressible & have low rates of change of viscosity with temperature. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product shall not be mixed with any lubricant or hydraulic fluid. It shall not be used as water displacing fluid. It is not effective as lubricants for steel/steel at high loads.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-3409	500 g	OL2	0475	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	ZX-46	
Description	DAMPING FLUIDS: Dimethyl silicone	
Specification	Proprietary	
Composition	Silicone fluids based on dimethyl polysiloxanes	
Characteristics	Colour	Colourless
	Viscosity @ 25°C	500 mm ² /s (cSt)
	Flash point, min	270°C
Examples of Uses	Damping, transducer & dielectric fluids in radar, radio & missile equipment. Also used as heat transfer fluids.	
Standardized Alternatives	See Annex O	
Remarks	- The specification typically includes tests for colour, haze, acidity, volatility, refractive index & permittivity. - The product is colourless, odourless, water repellent, chemically inert, & have good dielectric properties. It is highly compressible & have low rates of change of viscosity with temperature. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product shall not be mixed with any lubricant or hydraulic fluid. It shall not be used as water displacing fluid. It is not effective as lubricants for steel/steel at high loads.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-1235	500 g	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	ZX-47	
Description	DAMPING FLUIDS: Dimethyl silicone	
Specification	Proprietary	
Composition	Silicone fluids based on dimethyl polysiloxanes	
Characteristics	Colour	Colourless
	Viscosity @ 25°C	1,000 mm ² /s (cSt)
	Flash point, min	270°C
Examples of Uses	Damping, transducer & dielectric fluids in radar, radio & missile equipment. Also used as heat transfer fluids.	
Standardized Alternatives	See Annex O	
Remarks	- The specification typically includes tests for colour, haze, acidity, volatility, refractive index & permittivity. - The product is colourless, odourless, water repellent, chemically inert, & have good dielectric properties. It is highly compressible & have low rates of change of viscosity with temperature.	
Warning	This product shall not be mixed with any lubricant or hydraulic fluid. It shall not be used as water displacing fluid. It is not effective as lubricants for steel/steel at high loads.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-5616	100 ml	OL1	0475	- -	- -
9150-99-220-3410	1 kg	- -	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	ZX-51	
Description	DAMPING FLUIDS: Dimethyl silicone	
Specification	Proprietary	
Composition	Silicone fluids based on dimethyl polysiloxanes	
Characteristics	Colour	Colourless
	Viscosity @ 25°C	60,000 mm ² /s (cSt)
	Flash point, min	276°C
Examples of Uses	Damping, transducer & dielectric fluids in radar, radio & missile equipment. Also used as heat transfer fluids.	
Standardized Alternatives	See Annex O	
Remarks	- The specification typically includes tests for colour, haze, acidity, volatility, refractive index & permittivity. - The product is colourless, odourless, water repellent, chemically inert, & have good dielectric properties. It is highly compressible & have low rates of change of viscosity with temperature.	
Warning	This product shall not be mixed with any lubricant or hydraulic fluid. It shall not be used as water displacing fluid. It is not effective as lubricants for steel/steel at high loads.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-220-3543	500 g	- -	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	ZX-54	
Description	COMPOUND: Rust penetrating oil	
Specification	Def Stan 91-72	
Composition	Unpigmented petroleum materials, corrosion inhibitors & low aromatic hydrocarbon solvent.	
Characteristics	Flash point, closed cup, min	32°C
Examples of Uses	As release agent for rusted & corroded components & fasteners etc.	
Standardized Alternatives		
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for corrosion prevention & rust penetration. • For NSN 8030-99-923-1633 – PSN: Aerosols, flammable; UN No: 1950; UN Class: 2.1; UN Packaging Group: N/A. • For NSN 9150-99-453-7068 & NSN 9150-99-684-3867 – PSN: Petroleum Distillates NOS (contains Naphtha); UN No: 1268; UN Class: 3; UN Packaging Group: II. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-99-453-7068	250 ml	OL1	0475	++	--
8030-99-923-1633	400 ml Aerosol	OL3	--	--	--
9150-99-684-3867	5 ltr	OL1	0475	++	--

DEF STAN 01-005 Issue 19

NATO Code	S-749
JSD Code	ZX-55
Description	LUBRICANT: Solid film air drying corrosion inhibiting
Specification	MIL-L-23398D Amd 2 Type 2 (Aerosol pack)
Composition	Molybdenum disulfide with resin binder system
Characteristics	
Examples of Uses	Air curing bonded dry film lubricant for metal surfaces
Standardized Alternatives	
Remarks	• This specification involves US qualification procedures. For products currently approved, see Clause 1.2 Service Authorities. • The specification includes tests for film thickness & adhesion, resistance to water, load carrying characteristics & aluminium corrosion resistance. • PSN: Aerosols, flammable; UN No: 1950; UN Class: 2.1; UN Packaging Group: N/A. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).
Warning	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9150-33-002-1389	500 ml Aerosol	OL2	- -	- -	34B

ANNEX H: CORROSION PREVENTIVES – PX

DEF STAN 01-005 Issue 19

NATO Code	C-614	
JSD Code	PX-1	
Description	CORROSION PREVENTIVE COMPOUND: Soft film, cold application	
Specification	Def Stan 80-217	
Composition	The undyed grade consists of lanolin & white spirit only. The dyed grade also contained a small quantity of xylene & a green dye.	
Characteristics	Total solid	28–32%wt
	A thin soft film, which hardens slightly on ageing, is left when the solvent evaporates. The film does not withstand rubbing, hence treated articles should be wrapped, with the minimum of handling, in grease resistant wrapping. Owing to the low melting point of lanolin, +34°C to +40°C, PX-1 is unsuitable for high storage temperatures.	
Examples of Uses	Short-term preservation in temperate climates. Protection of certain engine cylinders, valve gear, complete engines & gun barrels. Preservation of ferrous & light alloy sheets in storage.	
Standardized Alternatives	See Annex O	
Remarks	• This specification covers two grades, DYED & UNDYED but only the undyed grade is available currently. • The specification includes tests for water content & film forming properties. • Dyed Grade: Not provisioned by the RN, Army & RAF. • PSN: Flammable Liquid, NOS. (contains turpentine substitute); UN No: 1993; UN Class: 3; UN Packaging Group: III. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
8030-99-910-0478	5 ltr	OL2	0475	+ +	34B
8030-99-910-0479	25 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	C-642	
JSD Code	PX-4	
Description	CORROSION PREVENTIVE OIL: Thin film	
Specification	Def Stan 80-34	
Composition	Mineral oil with corrosion & oxidation inhibitors	
Characteristics	Viscosity @ 100°C	12.5–16.3 mm ² /s (cSt)
	Pour point, max	-20°C
	Flash point, closed cup, min	150°C
Examples of Uses	Preservation of internal metal surfaces, steel components prior to wrapping, packaging or storage, land & marine IC engines, automotive components, small mechanisms, certain fuze parts, aluminium & phosphated steel sheets.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for copper corrosion, corrosiveness & oxidation stability, corrosion protection of steel & film forming properties. • Not always essential to remove this prior to use of certain equipment. If in doubt consult the appropriate Service Authority. See Clause 1.2 Service Authorities. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
8030-99-943-1320	5 ltr	OL3	0475	++	34D
8030-99-910-0484	25 ltr	OL3	0475	--	34D
8030-99-522-0381	200 ltr	--	--	--	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	PX-6	
Description	PETROLATUM, TECHNICAL: Hard	
Specification	Def Stan 91-38, includes PX-7	
Composition	A stiff, tacky petrolatum	
Characteristics	Penetration, unworked	90–140 mm/10
	Viscosity @ 100°C	17–25 mm ² /s (cSt)
	Melting point, min	64°C
	Flash point, closed cup, min	235°C
Examples of Uses	Preservation of torpedoes & various ordnance stores.	
Standardized Alternatives	None	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for acidity, ash, saponification value & volatile matter. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-943-1548	3 kg	OL1	0475	- -	- -
9150-99-910-0485	12.5 kg	OL3	0475	- -	34D

DEF STAN 01-005 Issue 19

NATO Code	S-743	
JSD Code	PX-7	
Description	PETROLATUM, TECHNICAL	
Specification	Def Stan 91-38, includes PX-6	
Composition	Soft petrolatum	
Characteristics	Penetration, worked	230–275 mm/10
	Melting point, min	40°C
	Flash point, closed cup, min	205°C
Examples of Uses	Preservation of battery terminals, certain torpedo mechanisms & components	
Standardized Alternatives	See Annex O	
Remarks	- This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. - The specification includes tests for acidity, ash, saponification value & volatile matter. This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9150-99-910-0488	100 g	OL2	0475	+ +	34B
9150-99-943-2033	3 kg	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	PX-11
Description	CORROSION PREVENTIVE: Soft film, hot application
Specification	Proprietary
Composition	Petrolatum based, waxy film forming
Characteristics	Dropping point 55°C
Examples of Uses	Preservation of anti-friction bearings, machined surfaces, automotive, artillery & small arms sub-assemblies.
Standardized Alternatives	See Annex O
Remarks	- The Manufacturer's specification includes tests for dropping point & penetration. - This product provides a soft waxy film. Treated items require to be over-wrapped in a grease resistant paper after the film has been allowed to solidify.
Warning	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
8030-99-910-0494	12.5 kg	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	PX-15
Description	CORROSION PREVENTIVE: Hard film, hot application
Specification	Proprietary
Composition	Plastic material, oil free
Characteristics	A tough transparent plastic material of high melting point. It does not adhere to metal. Metal objects properly cleaned & completely enveloped in PX-15 will remain fully protected for several years.
Examples of Uses	Protection of components, tools, cutting edges from corrosion & mechanical damage
Standardized Alternatives	None
Remarks	The manufacturer's specification includes tests for appearance at +150°C, film forming properties & effect of impact.
Warning	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
8030-99-910-7062	25 kg	- -	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	C-634	
JSD Code	PX-24	
Description	CORROSION PREVENTIVE: Water displacing	
Specification	Def Stan 68-10	
Composition	Petroleum materials with corrosion inhibitors & surface active agents.	
Characteristics	Flash point, closed cup, min	61°C
	This product displaces water from surfaces & leaves a soft protective film	
Examples of Uses	Preservation & corrosive inhibition after operation of certain gas turbine engines & as a dewatering & protective fluid. This product is suitable for use on low voltage electrical equipment (up to 440V).	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for protection against corrosion, water displacing properties, freedom from corrosive effects, demulsification, film forming, lacquer forming tendency, copper corrosion under electric stress, electric strength, recovery of surface resistance & effect on non-metallic materials. • This product replaces PX-10 & PX-29. • PSN: Petroleum Distillate NOS (contains White Spirit); UN No: 1268; UN Class: 3; UN Packaging Group: III. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
8030-99-224-4966	5 ltr	OL2	0475	++	34B
8030-99-224-5311	1 ltr	--	--	++	--
8030-99-062-9759	500 ml Handspray	OL2	0475	--	--

DEF STAN 01-005 Issue 19

NATO Code	C-635	
JSD Code	PX-26	
Description	CORROSION PREVENTIVE: Hydraulic system	
Specification	Def Stan 80-142	
Composition	Hydraulic fluid OM-15 with technically acceptable corrosion inhibitors.	
Characteristics	Colour, Lovibond red	20–40 units
	Viscosity @ 40°C, min	13 mm ² /s (cSt)
	Viscosity @ -40°C, max	500 mm ² /s (cSt)
	Viscosity @ -54°C, max	3,000 mm ² /s (cSt)
	Pour point, max	-60°C
	Flash point, closed cup, min	81°C
	This product is similar to OM-15 & can be used as an emergency substitute, subject to technical advice.	
Examples of Uses	Corrosion preventive oil for aircraft hydraulic systems in storage, radar equipment & rig testing of hydraulic components.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 7093. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for solid particle contamination, strong acid number, total acid number, copper corrosion, low temperature stability, sheer stability, wear scar diameter, evaporation loss, foaming characteristics, phosphorus content, corrosiveness & oxidation stability, corrosion prevention of steel & elastomer compatibility.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-700-8672	5 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	C-615	
JSD Code	PX-27	
Description	CORROSION PREVENTIVE OIL, AIRCRAFT ENGINE: Piston, metallic	
Specification	French Air 1503	
Composition	Mineral oil with a technically acceptable additive concentrate containing corrosion inhibitors & formulated to neutralize the corrosion effect of the products of combustion of leaded gasoline.	
Characteristics	Viscosity @ 100°C, min	17.5–21.9 mm²/s (cSt)
	Viscosity index, min	90
	Pour point, max	-6°C
	Flash point, closed cup, min	170°C
Examples of Uses	Corrosion preventive oil for aircraft piston engines which is circulated during final running on the test bed & for installed engines when an aircraft is being prepared for storage. Also preservation of certain helicopter gearboxes for storage.	
Standardized Alternatives	See Annex O	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for corrosion protection of steel, other metals & alloys, carbon residue, sulfated ash & storage stability.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9150-99-225-0849	25 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	PX-28	
Description	CORROSION PREVENTIVE: Undersealing	
Specification	Def Stan 80-143	
Composition	Petroleum based materials dispersed in hydrocarbon solvents.	
Characteristics	Total solid, min	50%wt
	Flash point, closed cup, min	38°C
Examples of Uses	Preservation & corrosion inhibition of the interior surfaces of hollow sections of automotive & vehicle underbodies, certain artillery components bare metal & over certain paint systems.	
Standardized Alternatives	None	
Remarks	• Halogenated solvents are excluded. • The specification includes tests for freedom from corrosive effects, water displacing properties & resistance to solvent vapour washing. • PSN: Flammable Liquid, NOS (contains turpentine substitute); UN No: 1993; UN Class: 3; UN Packaging Group: III. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
8030-99-657-7708	25 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	PX-31	
Description	CORROSION PREVENTIVE COMPOUND: Hard film, cold application	
Specification	Proprietary	
Composition	Bitumen with additives in a hydrocarbon solvent	
Characteristics	Surface drying time, max	45 min
	Flash point, closed cup, min	38°C
Examples of Uses	Preservation of tools & automotive parts	
Standardized Alternatives	None	
Remarks	• Halogenated solvents are excluded. • The Manufacturer's specification includes tests for film properties, total solids, viscosity, film resistance to humidity, film flexibility, adhesion & stickiness. • This product is unsuitable for internal use in engines, sub-assemblies with moving parts & components with inaccessible recesses. • PSN: Flammable Liquid, NOS (contains Naphtha); UN No: 1993; UN Class: 3; UN Packaging Group: III.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
8030-99-225-0860	5 ltr	OL2	0475	+ +	34B
8030-99-225-0861	25 ltr	- -	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	PX-32	
Description	CORROSION PREVENTIVE: Aircraft structures, hard film, transparent, cold application	
Specification	Def Stan 80-83	
Composition	Unpigmented petroleum based materials dispersed in hydrocarbon solvents	
Characteristics	Viscosity @ 25°C, min	1,500 mPa.s (cP)
	Flash point, closed cup, min	32°C
	This product provides a light brown transparent film when the solvent evaporates.	
Examples of Uses	Preservation & corrosion inhibition of structural members of airframes, interior surfaces of aircraft skins, components, bare metal & over certain paint systems.	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • Bitumen products & halogenated solvents are excluded. • The specification includes tests for freedom from corrosive effects, film forming, sag, effect on polymethacrylate, transparency, flammability, adhesion, effect of impact, resistance to removal by aircraft exterior cleaner, resistance to anti-icing & de-icing fluids & resistance to weathering. • PSN: Flammable Liquid, NOS (contains turpentine substitute); UN No: 1993; UN Class: 3; UN Packaging Group: III.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
8030-99-225-3835	5 ltr	OL2	0475	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	PX-36	
Description	CORROSION PREVENTIVE: Weapon cleaner, lubricant	
Specification	Def Stan 91-103	
Composition	Mineral oil &/or synthetic hydrocarbon oil poly-alphaolefin (PAO), non-halogenated hydrocarbon solvent, corrosion & oxidation inhibitors.	
Characteristics	Viscosity @ 40°C, min	3.5 mm ² /s (cSt)
	Viscosity @ -40°C, max	400 mm ² /s (cSt)
	Pour point, max	-50°C
	Flash point, closed cup, min	61°C
	This product has moderate lubrication properties.	
Examples of Uses	The cleaning & preservation of the internal surfaces of barrels & breeches of ordnance of calibre over 20 mm.	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for water displacing properties, protection against corrosion, salt spray resistance, corrosion prevention, firing residue removal & elastomer compatibility. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
8030-99-051-9497	500 ml	OL3	0475	+ +	34D
8030-99-488-7047	5 ltr	OL1	0475	+ +	34D

ANNEX I: FLUIDS, WTA & WHITE SPIRIT – AL

DEF STAN 01-005 Issue 19

NATO Code	S-745	
JSD Code	AL-5	
Description	DE-ICING, DEFROSTING FLUID: Aircraft surfaces, in flight	
Specification	DTD 406B	
Composition	85%vol AL-20 / 5%vol AL-11 / 10%vol Water	
Characteristics	Viscosity @ 20°C	11–13 mm ² /s (cSt)
	Specific gravity @ 15.6°/15.6°C	1.092–1.097
	pH value	6.0–7.5
	This product is a clear colourless liquid	
Examples of Uses	De-icing or defrosting propellers, wing & tail systems equipped with porous distributors.	
Standardized Alternatives	See Annex O	
Remarks	The specification includes tests for miscibility with water, conductivity & a cold test at -40°C.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-910-0472	25 ltr	OL2	- -	- -	34B
6850-99-220-5387	200 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-737	
JSD Code	AL-11	
Description	ISOPROPANOL, TECHNICAL	
Specification	BS 1595-1	
Composition	Propan-2-ol (Isopropyl alcohol) for industrial use	
Characteristics	Density @ 20°C	0.785–0.787 g/cm ³
	Residue on evaporation, max	0.002%wt
	Flash point, closed cup, max	11°C
	This product is a clear colourless liquid	
Examples of Uses	De-icing windscreens, corrosion inhibition procedure for certain gas turbines, diluted with water it is used as a compressor washing fluid during cold weather & prior to inhibition of the engine with PX-24.	
Standardized Alternatives	See Annex O	
Remarks	- The specification includes tests for colour, distillation range, miscibility with water, water content, alkalinity, acidity, aldehydes & ketones content. - PSN: Isopropanol; UN No: 1219; UN Class: 3; UN Packaging Group: II.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6810-99-224-5628	25 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-747	
JSD Code	AL-14	
Description	METHANOL, TECHNICAL	
Specification	BS 506-1	
Composition	Propan-2-ol (Isopropyl alcohol) for industrial use	
Characteristics	Density @ 20°C	0.791–0.794 g/cm ³
	Residue on evaporation, max	0.001%wt
	This product is a clear colourless liquid	
Examples of Uses	This product is also blended with high purity water to make AL-28 & AL-40.	
Standardized Alternatives	See Annex O	
Remarks	- The specification includes tests for colour, distillation range, miscibility with water, alkalinity, acidity, aldehydes & ketones, sulfur & its compounds. - PSN: Methanol; UN No: 1230; UN Class: 3, Subsidiary Risk 6.1; UN Packaging Group: II.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6810-99-220-0988	25 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	AL-20	
Description	ETHANEDIOL, TECHNICAL	
Specification	Def Stan 68-108	
Composition	Ethanediol	
Characteristics	Density @ 20°C	1.112–1.115 g/cm ³
	Distillation: 95%vol, recovery	194–199°C
	This product is a clear colourless liquid	
Examples of Uses	Cooling systems of certain types of radar, when diluted with distilled or demineralized water & in certain transmitting equipment & marine gas turbines. The antifreeze is approved for use with AFFF fire extinguishers.	
Standardized Alternatives	None	
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for a cold test, ash content, acidity, chlorine & sulfate content. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
6810-99-224-6027	25 ltr	OL3	0475	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	S-1744	
JSD Code	AL-28	
Description	METHANOL/WATER: 44/56	
Specification	Def Stan 68-253, includes WTA	
Composition	43.8%vol AL-14 / 56.2%vol WTA	
Characteristics	Density @ 20°C	0.941–0.945 g/cm ³
	This product is a clear colourless liquid	
Examples of Uses	Thrust augmentation fluid in certain aircraft turbine engines	
Standardized Alternatives	See Annex O	
Remarks	- The specification includes tests for acidity & total solids. - PSN: Methanol; UN No: 1230; UN Class: 3, Subsidiary risk 6.1; UN Packaging Group: II.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-220-2292	200 ltr	- -	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-1746
JSD Code	AL-34
Description	DE-ICING, DEFROSTING FLUID: Aircraft surfaces, ground use
Specification	DTD 900/4907, Kilfrost Anti-Icing Barrier Compound (AFS 663)
Composition	
Characteristics	Thixotropic fluid
Examples of Uses	Anti-icing barrier compound providing protection for aircraft & certain missiles on the ground & for defrosting of turn around aircraft.
Standardized Alternatives	See Annex O
Remarks	
Warning	This product shall not be used in aircraft de-icing systems under any circumstances. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-766-3796	25 ltr	OL2	- -	+ +	- -
6850-99-220-3463	200 ltr	OL2	- -	- -	34B
6850-99-220-3464	Bulk	OL2	- -	- -	34B
6850-99-426-2932	200 ltr, pre-dilute	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	AL-36
Description	WINDSCREEN WASHING FLUID: Aircraft
Specification	DTD 900/4939B, (AFS 959B) Kilfrost WWF/Mod 3
Composition	
Characteristics	Clear colourless liquid of low freezing point
Examples of Uses	Windscreen washing fluid in certain aircraft
Standardized Alternatives	None
Remarks	
Warning	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-224-9463	1 ltr	OL1	0475	- -	- -
6850-99-224-5397	25 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-757	
JSD Code	AL-39	
Description	ANTIFREEZE, INHIBITED ETHANEDIOL	
Specification	Def Stan 68-127	
Composition	Ethanediol & water, inhibited with sodium sebacate & benzotriazole	
Characteristics	Colour	Blue
	Flash point, open cup, min	110°C
	Freezing point, 25%vol aqueous solution, max	-10°C
	Water content, max	5.0%wt
	Di-sodium sebacate content	4.0–4.5%wt
	Benzotriazole content	0.25–0.30%wt
Examples of Uses	Antifreeze in the cooling systems of marine & land service IC engines containing both ferrous & non-ferrous components.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 7093. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The specification includes tests for density, boiling point & pH value. • The product shall be diluted with an equal volume of water, before use. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
6850-99-641-8053	5 ltr	OL3	- -	+ +	34D
6850-99-225-0424	25 ltr	OL3	0475	+ +	34D
6850-99-225-0425	200 ltr	OL3	- -	+ +	34D
6850-99-818-0087	Bulk	- -	- -	+ +	- -

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	AL-40	
Description	METHANOL/WATER: Hydrogen Generators	
Specification	Def Stan 68-129	
Composition	9 parts (vol) of AL-14 / 4 parts (vol) of water.	
Characteristics	Appearance	clear colourless liquid
	Density @ 15°C	0.886–0.890 g/cm ³
Examples of Uses	For use in catalytic generators providing hydrogen for balloon filling	
Standardized Alternatives	None	
Remarks	PSN: Methanol; UN No: 1230; UN Class: 3, Subsidiary Risk 6.1; UN Packaging Group: II.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6810-99-513-3295	25 ltr	OL3	- -	+ +	34D

DEF STAN 01-005 Issue 19

NATO Code	S-1745	
JSD Code	AL-41	
Description	FUEL SYSTEM ICING INHIBITOR: High flash type	
Specification	Def Stan 68-252	
Composition	Diethylene glycol monomethyl ether	
Characteristics	Density @ 15°C	1.024–1.028 g/cm ³
	Flash point, closed cup, min	65°C
Examples of Uses	Aviation fuel system icing inhibitor (FSII) added to aviation turbine fuels.	
Standardized Alternatives	See Annex O	
Remarks	- The specification includes tests for acidity, colour, distillation range, ethylene glycol & water content. - When aviation fuel containing this product becomes contaminated with free water the AL-41 migrates from the fuel to the water where it acts as a freezing point depressant. - The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-225-1930	5 ltr	OL3	0721	--	--
6850-99-225-1929	25 ltr	--	0721	--	--
6850-99-300-6950	205 ltr	OL2	--	--	34B
6850-99-669-2914	1000 ltr	OL2	--	--	34B
6850-99-836-8940	Bulk	OL2	--	--	34B

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	AL-48	
Description	MIXTURE OF FUEL SYSTEM ICING INHIBITOR AL-41 & LUBRICITY IMPROVING ADDITIVE AL-61	
Specification	Def Stan 68-150	
Composition	A homogeneous mixture of AL-41 & AL-61. The concentrations to be used are listed in Def Stan 68-150.	
Characteristics	Density @ 15°C	1.024–1.028 g/cm ³
	This product is a clear colourless liquid	
Examples of Uses	This mixture allows two additives to be injected into aviation fuels in a single operation. It should not be used where there are facilities for separate injection, which is the recommended method of injection of FSII & lubricity improving additives for the preparation of AVTUR/FSII (F-34), AVTAG/FSII (F-40) & AVCAT/FSII (F-44).	
Standardized Alternatives	None	
Remarks	- Joint Service Designation AL-48 is followed by a type number to indicate the corrosion inhibitor used. - The specification includes a test for Total Acid Number.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-549-2707	25 ltr	OL2	- -	- -	34B
6850-99-000-6760	200 ltr	OL2	- -	- -	34B
6850-99-304-1578	Bulk	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-1747
JSD Code	AL-61
Description	LUBRICITY IMPROVING ADDITIVE FOR AVIATION TURBINE FUELS
Specification	Def Stan 68-251
Composition	A mixture of fatty acids
Characteristics	
Examples of Uses	As a lubricity improver for aviation gas turbine engine fuels
Standardized Alternatives	None
Remarks	• This product implements STANAG 3390. • This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • Each additive must meet the requirements for Minimum Effective Concentration & Lubricity Improving Potential. In addition, quality control characteristics for each product approved to this specification are listed in the Def Stan 68-251 TAPL. This includes tests for ash, density, flash point, kinematic viscosity, pour point, microseparometer rating & total acid number. • Concentration limits, applicable when the product is used as an Aviation Fuel Lubricity Improving Additive as a fuel specification requirement, are also given.
Warning	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-663-3466	500 ml	OL2	- -	- -	34B
6850-99-224-5252	200 ltr	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	
JSD Code	AL-71
Description	COOLING SYSTEM CORROSION INHIBITOR: Diesel Engines
Specification	Proprietary
Composition	A mixture of corrosion inhibitors
Characteristics	
Examples of Uses	As a corrosion inhibitor for use mainly in marine diesel engine cooling systems on Naval vessels.
Standardized Alternatives	None
Remarks	• This product requires Product Conformity Certification. See Clause 1.2 Service Authorities. • The inhibitor system additives shall be based on organic acid technology & be free from nitrite, silicate, amine & phosphate based corrosion inhibitors. • The corrosion inhibitor shall be compatible with engines manufactured from cast iron, steel, aluminium & aluminium alloys & coolant systems manufactured from carbon & stainless steel, copper & copper alloys & meet the requirements of all environmental & H&S legislation. • The corrosion inhibitor shall be fully compatible with AL-39 to Def Stan 68-127 in all proportions. • This material is subject to assessment as required by BR 1326 – Materials Toxicity Regulations (Submarines). Refer to Clause 1.3 Technical Acceptable Products List (TAPL).
Warning	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
6850-99-968-4899	20 ltr	OL1	0475	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	S-1719	
JSD Code	AL-342	
Description	DE-ICING/ANTI-ICING NON-NEWTONIAN FLUID: Aircraft surfaces, ground use	
Specification	SAE AMS 1428 Type II	
Composition	Mixture of water & monopropylene glycol (50% min) plus additives	
Characteristics	Appearance	clear water white/pale straw coloured
	Density @ 20°C	1.040±0.015 g/cm ³
	pH @ 20°C	7.0±0.5
	Freezing point, 100%, max	-32°C
	Freezing point, 50%wt, max	-10°C
	The product is a thixotropic liquid.	
Examples of Uses	Anti-icing barrier compound providing protection for aircraft & certain missiles on the ground & for defrosting of turn around aircraft. Please refer to manufacturer's publications regarding application & holdover times.	
Standardized Alternatives	See Annex O	
Remarks		
Warning	This product shall not be used in aircraft de-icing systems under any circumstances. Also check that the ground equipment used for application is suitable for this product (no centrifugal or high-speed piston pumps shall be used that may cause mechanical shearing).	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6850-99-253-5434	25 ltr	OL2	- -	+ +	34B
6850-99-495-9521	200 ltr	OL2	- -	- -	34B
6850-99-878-8535	Bulk	OL2	- -	- -	34B
6850-99-154-8585	200 ltr, pre-dilute	OL2	- -	- -	34B

DEF STAN 01-005 Issue 19

NATO Code	S-1764	
JSD Code	NO_x REDUCTION AGENT	
Description	AQUEOUS UREA SOLUTION	
Specification	BS ISO 22241-1	
Composition	Mixture of pure water & urea (32.5%wt)	
Characteristics	Urea content	31.8–33.2%wt
	Density @ 20°C	1087.0–1093.0 kg/m ³
	Refractive index @ 20°C	1.3814–1.3843
	Alkalinity as NH ₃ , max	0.2 %wt
Examples of Uses	Treatment of exhaust gases to reduce NO _x emissions in line with EURO V onwards emissions legislation.	
Standardized Alternatives	See Annex O	
Remarks		
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
6850-17-118-9436	10 ltr	8RE30	0475	++	--
6850-17-123-0687	18 ltr	8RE30	0475	++	--
6810-99-245-4836	200 ltr	8RE30	0475	++	--
6810-99-842-8187	1,000 ltr	8RE18	0475	++	--

DEF STAN 01-005 Issue 19

NATO Code	S-1739	
JSD Code	WTA	
Description	WATER, THRUST AUGMENTATION: Demineralized	
Specification	Def Stan 68-253, includes AL-28	
Characteristics	Dissolved solids, max	10 mg/ltr
	pH value or electrical conductivity @ 20±5°C, max	5.0–7.5 or 1100 µs/m
	Silica content, max	3 mg SiO ₂ /ltr
	This product is a clear colourless liquid free from solid matter	
Examples of Uses	Thrust augmentation fluid in the Pegasus engine of the Harrier aircraft & an ingredient of AL-28.	
Standardized Alternatives	See Annex O	
Remarks	The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
6810-99-220-3461	200 ltr	OL2	- -	+ +	34B

DEF STAN 01-005 Issue 19

NATO Code	S-752	
JSD Code	WHITE SPIRIT	
Description		
Specification	BS 245, Type A	
Composition	Hydrocarbons	
Characteristics	Recovery @ 145°C, max	10%vol
	Recovery @ 200°C, min	90%vol
	Final boiling point, max	220°C
	Aromatic content, max	25%vol
	Flash point, closed cup, min	32°C
Examples of Uses	General purpose cleaner, thinners for certain paints & removal of certain temporary protectives.	
Standardized Alternatives	See Annex O	
Remarks	- The specification includes tests for suspended matter, free water, colour residue on evaporation, neutrality & corrosive sulfur. - PSN: Turpentine Substitute; UN No: 1300; UN Class: 3; UN Packaging Group: III.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
8010-99-942-7564	25 ltr	OL3	0442	+ +	34D
8010-99-942-9258	200 ltr	- -	- -	- -	34D
8010-99-220-1815	Bulk	- -	0442	- -	- -

ANNEX J: FUELS – AVIATION GASOLINES

DEF STAN 01-005 Issue 19

NATO Code	F-18	
JSD Code	AVGAS/100LL	
Description	GASOLINE, AVIATION: Grade 100/130 low lead	
Specification	Def Stan 91-90, includes other grades	
Composition	Hydrocarbons with technically acceptable additives	
Characteristics	Appearance	Blue colour
	Distillation temperature, 10%vol recovered, max	75°C
	40%vol recovered, min	75°C
	50%vol recovered, max	105°C
	90%vol recovered, max	135°C
	End point, max	170°C
	Freezing point, max	-60°C
	Lean mixture, motor method, octane number, min	99.5
	Rich mixture, octane number, min	130
	Reid vapour pressure @ 37.8°C	38.0–49.0 kPa
	Sulfur total, max	0.05%wt
Examples of Uses	In aircraft piston engines	
	See Annex O	
Remarks	- The specification includes tests for specific energy, copper corrosion, existent gum, oxidation stability & water reaction. - PSN: Petrol; UN No: 1203; UN Class: 3; UN Packaging Group: II.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9130-99-549-5532	205 ltr	- -	- -	+ +	- -
9130-99-910-0444	Bulk	- -	0722	- -	34A

ANNEX K: FUELS – AVIATION TURBINE FUELS

DEF STAN 01-005 Issue 19

NATO Code	F-40	
JSD Code	AVTAG/FSII	
Description	TURBINE FUEL, AVIATION: Wide cut type with FSII	
Specification	Def Stan 91-88	
Composition	Hydrocarbons with AL-41 & AL-61 as mandatory additives these additives may be added to the fuel as an admixture AL-48	
Characteristics	Appearance	
	Distillation temperature, 20%vol recovered, min	100°C
	50%vol recovered, min	125°C
	End point, max	270°C
	Aromatics, max	25.0%vol
	Density @ 15°C	751–802 kg/m ³
	Freezing point, max	-58°C
	Reid vapour pressure @ 37.8°C	14–21 kPa
	Sulfur total, max	0.30%wt
	Specific energy, min	42.8 MJ/kg
Examples of Uses	Aircraft turbine engines	
Standardized Alternatives	See Annex O	
Remarks	- This standard implements STANAG 3747 & ASIC 15/6. - No transport information available. Highly flammable. - The specification includes tests for acidity, mercaptan sulfur, hydrogen content, specific energy, smoke point, copper corrosion, thermal stability, existent gum, water reaction, water separation (MSEP) & electrical conductivity. - Small amounts of free water in the fuel are prevented from freezing by the presence of 0.10–0.15%vol of AL-41. The AL-61 improves the lubricity of the fuel. - This fuel is not normally available in UK or NATO Europe. In UK the specification is being retained because it is required for aero engine certification. The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING.	
Warning	Not acceptable for use or embarkation in HM ships. The vapour pressure of this fuel is such that it forms explosive mixtures with air over a very wide range of temperatures & concentrations. This product should not be used in new applications or designs. Refer to the appropriate service authority, see Clause 1.2 Service Authorities.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9130-99-220-1037	Bulk	--	--	++	34A

DEF STAN 01-005 Issue 19

NATO Code	F-44	
JSD Code	AVCAT/FSII	
Description	TURBINE FUEL, AVIATION: High flash type with FSII	
Specification	Def Stan 91-86	
Composition	Hydrocarbons with AL-41 & AL-61 as mandatory additives: these additives may be added to the fuel as an admixture AL-48	
Characteristics	Appearance	
	Distillation temperature, 10%vol recovered, max	205°C
	End point, max	300°C
	Aromatics, max	22.0%vol
	Density @ 15°C	788–845 kg/m ³
	Freezing point, max	-46°C
	Flash point, closed cup, min	61°C
	Sulfur total, max	0.20%wt
	Viscosity @ -20°C, max	8.8 mm ² /s (cSt)
	Specific energy, min	42.6 MJ/kg
Examples of Uses	Turbine engines of shipborne aircraft, emergency use in ships' main & auxiliary engines in lieu of DIESO F-76	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 3747 & ASIC 15/6. • The Aviation Fuels Committee is responsible for the amendment of Def Stan 91-86. • The specification includes tests for acidity, olefins, mercaptan sulfur, hydrogen content, specified energy, smoke point, copper corrosion, silver corrosion, thermal stability, copper content, existent gum, water reaction & water separation index, modified. • Small amounts of free water in the fuel are prevented from freezing by the presence of 0.12–0.15%vol of AL-41. The AL-61 improves the lubricity of the fuel. • The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING. • PSN: Fuel, Aviation, Turbine Engine; UN No: 1863; UN Class: 3; UN Packaging Group: III.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9130-99-224-9717	200 ltr	- -	0722	- -	- -
9130-99-220-2148	Bulk	- -	0722	- -	- -

DEF STAN 01-005 Issue 19

NATO Code	F-35	
JSD Code	AVTUR	
Description	TURBINE FUEL, AVIATION: Kerosene type	
Specification	Def Stan 91-91	
Composition	Hydrocarbons with technically acceptable additives	
Characteristics	Appearance	
	Distillation temperature, 10%vol recovered, max	205°C
	End point, max	300°C
	Aromatics, max	25.0%vol
	Density @ 15°C	775–840 kg/m ³
	Freezing point, max	-47°C
	Flash point, closed cup, min	38°C
	Sulfur total, max	0.30%wt
	Viscosity @ -20°C, max	8.0 mm ² /s (cSt)
	Specific energy, min	42.8 MJ/kg
Examples of Uses	Aircraft turbine engines, & the basis of AVTUR/FSII to Def Stan 91-87	
Standardized Alternatives	See Annex O	
Remarks	- This product implements STANAG 3747 & ASIC 15/6. - The specification includes tests for acidity, lubricity, mercaptan sulfur, specific energy, smoke point, naphthalenes, thermal stability, existent gum, water reaction, water separation index, modified, & electrical conductivity. - The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING. - PSN: Fuel, Aviation, Turbine Engine; UN No: 1863; UN Class: 3; UN Packaging Group: III.	
Warning	Not acceptable for use or embarkation in HM Ships.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9130-99-943-1771	Bulk	- -	0722	- -	34A

DEF STAN 01-005 Issue 19

NATO Code	F-34	
JSD Code	AVTUR/FSII	
Description	TURBINE FUEL, AVIATION: Kerosene type with FSII	
Specification	Def Stan 91-87	
Composition	Hydrocarbons with AL-41 & AL-61 as mandatory additives: these additives may be added to the fuel as an admixture AL-48	
Characteristics	Appearance	
	Distillation temperature, 10%vol recovered, max	205°C
	End point, max	300°C
	Aromatics, max	25.0%vol
	Density @ 15°C	775–840 kg/m ³
	Freezing point, max	-47°C
	Flash point, closed cup, min	38°C
	Sulfur total, max	0.30%wt
	Viscosity @ -20°C, max	8.0 mm ² /s (cSt)
	Specific energy, min	42.8 MJ/kg
Examples of Uses	Aircraft turbine engines & compression ignition engines (single fuel policy)	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 3747 & ASIC 15/6. • Small amounts of free water in the fuel are prevented from freezing by the presence of 0.10–0.15%vol of AL-41. The AL-61 improves the lubricity of the fuel. • The listing of alternatives in Annex O is a guide only & reference must be made to the Aircraft's Documents. See page 2-O-3 WARNING. • PSN: Fuel, Aviation, Turbine Engine; UN No: 1863; UN Class: 3; UN Packaging Group: III.	
Warning	Not acceptable for use or embarkation in HM Ships.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army	RAF*
9130-99-330-1276	200 ltr	--	--	++	34A
9130-99-220-1036	Bulk	--	0722	++	34A

ANNEX L: FUELS – AUTOMOTIVE GASOLINES

DEF STAN 01-005 Issue 19

NATO Code	F-67	
JSD Code	ULGAS	
Description	GASOLINE, AUTOMOTIVE: Unleaded	
Specification	BS EN 228	
Composition	Volatile hydrocarbons together with additives as required	
Characteristics	Appearance	
	Lead content, max	5 mg/ltr
	Motor Octane Number (MON), min	85
	Research Octane Number (RON), min	95
	Reid vapour pressure @ 37.8°C, including seasonal variation	45–100 kPa
	Specific energy, typical	42.5 MJ/kg
Examples of Uses	Spark ignition engines for ground use	
Standardized Alternatives	None	
Remarks	• This product implements STANAG 7090. • In Europe the local National guide specification, which interprets EN 228 will be used. • PSN: Petrol; UN No: 1203; UN Class: 3; UN Packaging Group: II.	
Warning	Not to be used in engines requiring leaded gasoline.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9130-99-300-6864	20 ltr	- -	0723	+ +	34C
9130-99-956-6833	Bulk	- -	0723	+ +	34C

ANNEX M: FUELS – DIESELS

DEF STAN 01-005 Issue 19

NATO Code	F-54	
JSD Code	DIESO MT	
Description	DIESEL FUEL, GENERAL PURPOSE MT	
Specification	BS EN 590	
Composition	Hydrocarbons & corrosion inhibitors, technically acceptable cetane number improvers may be included	
Characteristics	Appearance	
	Distillation, fuel recovered	
	Recovery @ 350°C, max	85%vol
	Flash point, closed cup, min	55°C
	Viscosity @ 40°C	2.0–4.5 mm ² /s (cSt)
	Sulfur content, max	10 ppm(m)
	Cetane number, min	51
	Ash content, max	0.01%wt
	Cold filter plugging point	
	Summer, max	-5°C
	Winter, max	-15°C
Examples of Uses	Compression ignition engines, for motor transport on public roads	
Standardized Alternatives	See Annex O	
Remarks	- This product implements STANAG 7090. - The specification includes tests for copper corrosion, carbon residue, oxidation stability, lubricity, contamination, polycyclic aromatic hydrocarbons & water content. - Bulk supplies will be either winter or summer grade fuel dependant on the time of year as supplied ex refinery. Packed stock (20 litre Jerricans) issued by the Petroleum Depot West Moors will always be filled with the winter grade. - PSN: Diesel Fuel; UN No: 1202; UN Class: 3; UN Packaging Group: III.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9140-99-910-5052	20 ltr	- -	- -	++	- -
9140-99-910-0459	Bulk	- -	0723	++	34C

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	DIESO UK	
Description	DIESEL FUEL, GENERAL PURPOSE	
Specification	BS 2869, Class A2, includes other grades & products	
Composition	Hydrocarbons & corrosion inhibitors, technically acceptable cetane number improvers may be included	
Characteristics	Appearance	Red colour
	Distillation, fuel recovered	
	Recovery @ 250°C, max	65%vol
	Recovery @ 350°C, min	85%vol
	Flash point, closed cup, min	56°C
	Viscosity @ 40°C	
	Summer (Mar–Sep incl)	2.0–5.5 mm ² /s (cSt)
	Winter (Oct–Feb incl)	1.5–4.5 mm ² /s (cSt)
	Sulfur content, max	10 ppm(m)
Examples of Uses	Cetane number, min	45
	Ash content, max	0.01%wt
	Cold filter plugging point	
	Summer (Mar–Sep incl), max	-4°C
	Winter (Oct–Feb incl), max	-12°C
	Compression ignition engines, other than motor transport on public roads.	
	None	
	- The specification includes tests for copper corrosion, carbon residue, sediment, strong acid number & water content. - PSN: Diesel Fuel; UN No: 1202; UN Class: 3; UN Packaging Group: III.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9140-99-005-0243	20 ltr	- -	- -	+ +	- -
9140-99-224-9638	Bulk	- -	- -	+ +	34C

DEF STAN 01-005 Issue 19

NATO Code	F-76	
JSD Code	DIESO F-76	
Description	FUEL NAVAL DISTILLATE	
Specification	Def Stan 91-4	
Composition	Petroleum distillates, technically acceptable cetane number improvers may be included.	
Characteristics	Appearance	
	Density @ 15°C	820–880 kg/m ³
	Distillation, fuel recovered Recovery @ 350°C, min	85%vol
	Flash point, closed cup, min	61°C
	Viscosity @ 40°C	1.7–4.3 mm ² /s (cSt)
	Sulfur content, max	1,000 ppm(m)
	Cetane number, min	45
	Cloud point, max	-1°C
	Pour point, max	-6°C
Examples of Uses	Compression ignition engines of the high & medium speed types, Naval gas turbines, steam raising plant in certain HM ships.	
Standardized Alternatives	See Annex O	
Remarks	• This product implements STANAG 1385. • The specification includes tests for colour, lubricity, ash content, copper corrosion, acidity, carbon residue, filter blocking, storage stability & water reaction. • Instructions for fuel receipt & on-board management are contained in BR3009A, the Fuel System Management Handbook. • PSN: Diesel Fuel; UN No: 1202; UN Class: 3; UN Packaging Group: III.	
Warning	Not suitable for use in compression ignition engines of vehicles with active emission control systems meeting EURO IV (& onwards) emission requirements.	

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9140-99-942-3220	Bulk	- -	0721	- -	- -

ANNEX N: FUELS – HEATING & LIGHTING

DEF STAN 01-005 Issue 19

NATO Code	F-58	
JSD Code	KERO/A	
Description	KEROSENE: Flueless burner, Class C1	
Specification	BS 2869 Class C1, includes other grades	
Composition	Hydrocarbons	
Characteristics	Appearance	
	Distillation, fuel recovered Recovery @ 200°C	15–60%vol
	Final boiling point, max	280°C
	Flash point, closed cup, min	43°C
	Sulfur content, max	400 ppm(m)
	Smoke point, min	34 mm
Examples of Uses	For heating & lighting, particularly for flueless wick fed burners operating indoors. Not for IC engines.	
Standardized Alternatives	None	
Remarks	- The specification includes tests for colour, char value & copper corrosion. - PSN: Kerosene; UN No: 1223; UN Class: 3; UN Packaging Group: III.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy*	Army	RAF
9140-99-943-9602	20 ltr	- -	- -	+ +	- -
9140-99-910-5053	Bulk	- -	0475	+ +	34C

DEF STAN 01-005 Issue 19

NATO Code		
JSD Code	STOVE NAPHTHA	
Description	NAPHTHA FOR COOKING STOVES & LANTERNS	
Specification	DFG Procurement Specification Ver 3.2 dated 11/10/2014	
Composition	Hydrocarbons & an anti-oxidant may be included	
Characteristics	Appearance	
	Distillation temperature, Initial boiling point	30–40°C
	20%vol recovered	60–80°C
	50%vol recovered	90–100°C
	Final boiling point, max	200°C
	Sulfur content, max	500 ppm(m)
	Vapour pressure, max	60 kPa
Examples of Uses	Fuel for cooking stoves & lanterns	
Standardized Alternatives	None	
Remarks	- The specification includes tests for Reid vapour pressure, aromatics content, benzene content, hexane content, lead content, existent gum, oxidation stability & copper corrosion. - PSN: Petroleum Distillates, NOS (contains Hexane); UN No: 1268; UN Class: 3; UN Packaging Group: II.	
Warning		

Stores Numbers					
NSN	Nominal Size	DMC	Navy	Army*	RAF
9140-99-131-8110	1 ltr	- -	- -	+ +	- -
9140-99-241-6306	5 ltr	OL3	- -	+ +	- -

**ANNEX O: NATO STANDARDIZED PRODUCTS (FUELS, LUBRICANTS &
ASSOCIATED PRODUCTS)**

DEF STAN 01-005 Issue 19

The section lists national specifications which have been agreed by the appropriate Working Parties as being similar & interchangeable after study & comparison with the guide specification where applicable. It implements NATO STANAG 1135, Annex C & ASIC Air Std 15/9. These documents are reviewed periodically & identify the degree of interchangeability between the agreed products of NATO countries, Australia & New Zealand. Only products that are fully standardized may be interchanged under the NATO code. It has been agreed by the authorities concerned that propellant fuels shall not be detailed in the list.

NATO Codes are allocated to NATO Standardized Products by the Military Agency for Standardization, NATO. They consist of an index letter followed by a number, eg O-134. The NATO Code is enclosed in a rectangle when applied as an identification for marking on containers, dispensing equipment & installation.

Keys to the list:

- The number in brackets placed beside the NATO Code Number indicates the STANAG's number agreed as the guide specification
- The symbol (+) is placed beside a national specification when this is the agreed guide specification
- Services using a product are identified as follows with a capital letter indicates the Service responsible for the specifications:
 - Navy – n / N
 - Army – a / A
 - Air Force – af / AF
- If the Service responsible for the specification does not use the product the identifying capital letter will be shown in brackets, eg (A)
- Standardized Product is defined as a product that conforms to specifications resulting from the same or equivalent technical requirements. The standardized fuels, lubricants & associated products are identified by a NATO Code.
- Acceptable Product is defined as one which may be used in place of another product for extended periods without technical advice.
- Emergency Substitute is defined as a product which may only be used in an emergency on the advice of technically qualified personnel of the sponsor Service, who will specify the limitations.
- Abbreviations used in the list:

Abbreviation	Definition
AFIC	Air Force Interoperability Council
AP	Acceptable Products
C	Corrosion Preventives
ES	Emergency Substitutes
F	Fuels
G	Greases
H	Hydraulic Fluids
JSD	Joint Service Designations
NATO	North Atlantic Treaty Organisation
O	Oils
Q	Product is subject to qualification testing
R	Remarks
S	Speciality Products
WG	Working group responsible for Standardized Product

- Three letter country codes (STANAG 1059):

Country Code	Country Name
BEL	Belgium
BGR	Bulgaria
CAN	Canada
CZE	Czech Republic

DEF STAN 01-005 Issue 19

DNK	Denmark
EST	Estonia
FRA	France
DEU	Germany
GRC	Greece
HUN	Hungary
ISL	Iceland
ITA	Italy
LVA	Latvia
LTU	Lithuania
LUX	Luxembourg
NLD	Netherlands
NOR	Norway
POL	Poland
PRT	Portugal
ROU	Romania
SVK	Slovakia
SVN	Slovenia
ESP	Spain
TUR	Turkey
GBR	United Kingdom
USA	United States

- Non-NATO country codes:

Country Code	Country Name
AS	Australia
NZ	New Zealand

Warning – A listing under Acceptable Product & Emergency Substitute may not necessarily apply to aircraft usage. The use of fuels & lubricants in aircraft engine types is authorized by Controller of Aircraft Release to Service documents. Information as to the types of fuels & lubricants that may be used, including emergency use, is also shown in the aircraft's Servicing Manual & Pilot's Notes, together with relevant engineering safeguards. The Joint Air publication (JAP) 200A refers.

DEF STAN 01-005 Issue 19

1 NATO Code	F-18	F-24	F-27	F-34 (3747)
2 Product Description	Gasoline aviation Grade 100/130	Aviation turbine fuel, JET A + S-1745 + S-1747 + SDA	Aviation turbine fuel, F-24 + S-1749	Turbine fuel aviation kerosene type + S-1745
3 NATO Nations	ALB			
	BEL	DCSEA 118/B	Note L	DStan 91-87 Iss 6 AVTUR/FSII
	BGR			
	CAN	ASTM D910-11 Grade 100 LL	AF Note L	CGSB 3.24-2012 Amnd 2 Grade F-34 VJS PHM 1-3-L Iss 9
	CZE	VJS PHM 1-2-L Iss 4	AF	
	DEU	DStan 91-90 Iss 4 Grade 100 LL	A Note L	TL 9130-0012 Iss 9
	DNK	DStan 91-90 Iss 2 Grade 100 LL	AF Note L	DStan 91-87 Iss 5
	ESP	ASTM D910-15	AF a Note L	NME-3004/2014
	EST			
	FRA	DCSEA 118/C (+)	n AF a	DCSEA 134/D
	GBR	DStan 91-90 Iss 3 AVGAS 100 LL	AF	DStan 91-87 Iss 6 AVTUR/FSII
	GRC	ASTM D910-07	n AF a	MIL-DTL-83133 G
	HUN	DERD 2485	AF Note L	MSZ-10870 Iss 95
	HVR			
	ITA			AER M C 141e F-34
	LTU			STANAG 3747
	LUX			
	LVA	DStan 91-90 Iss 2 AVGAS 100 LL	AF Note L	
	NLD	DStan 91-90 Iss 2 AVGAS 100LL	AF Note L	DStan 91-87 Iss 6 AVTUR/FSII
	NOR			MIL-DTL-83133 H Amnd 2
3a ABCANZ	POL			
	PRT	ASTM D910-11 Grade 100 LL	AF Note L	DStan 91-87 Iss 6 AVTUR/FSII
	ROU	ASTM D910 Grade 100LL	AF	
	SVK			MSU-11 L/F
	SVN			
	TUR			MIL-DTL-83133 D Amnd 1
	USA	ASTM D910-16 Grade 100 LL	AF Note L	ASTM D1655-15d n AF a Note 1
	AS			DEF(AUS) 5240D
	NZ	D STAN 91-90 Iss1	AF	D STAN 91-87 Iss 5
	Sea			
4 Acceptable Substitutes	Air			
	Land			F-44*
5 Emergency Substitutes	Sea			
	Air			
	Land			
6 Observations & Remarks	STANAG	(1) Additives (F-SII, LLA, SDA) per MIL-DTL-83133	(1) S-1749 per MIL-DTL-83133	(1) Synthetic or semi-synthetic fuels are not allowed (*) Freezing point F-40: -58°C; F-34/F-35: -47°C; F-44: -46°C
6a Availability	(L) Limited stocks	No / Air	No / Air	No / Air
7 Qual / 8 WG	No / Air			

DEF STAN 01-005 Issue 19

1 NATO Code	F-35 (3747)	F-37	F-40 (3747)	F-44 (3747)
2 Product Description	Turbine fuel, aviation, kerosene type	Aviation turbine fuel, F-34 + S-1749	Turbine fuel, wide cut type + (S-1745)	Turbine fuel, aviation, high flash type + S-1745
3 NATO Nations	ALB			
	BEL	DStan 91-91 Iss 7 Amd 3 AVTUR FTS 1.05	AF a Note 1, L	DStan 91-86 Iss 6 AVCAT/FSII
	BGR		n AF a Note L	
	CAN	CAN/CSB 3, 23-2012 Amd 2 Grade Jet A-1	AF Note 2	CCSB 3, 24-2012 Amd 2 Grade F-44
	CZE			
	DEU	DStan 91-91 Iss 7 Amd 3	AF Note 2	DStan 91-86 Iss 6
	DNK	DStan 91-91 Iss 7	AF Note 2	MIL-DTL-5624 U Grade JP-5
	ESP	MIL-DTL-83133 J	AF	MIL-PRF-5624 V
	EST			
	FRA	DCSEA134/D	n AF a Note 2	DCSEA 144/D
	GBR	DStan 91-91 Iss 7 Amd 3 AVTUR	(AF) Note 2	DStan 91-86 Iss 6 AVCAT/FSII
	GRC	MIL-DTL-83133 G	n AF a	MIL-DTL-5624 T Grade JP-5
	HUN	MSZ-10870 Iss 95	AF Note L	
	HVR			
	ITA	AER M C 14L/ef-35	AF a Note L	MIL-DTL-5624 U Grade JP-5
	LTU	ASTM D1655 JET A-1	AF a Note L	
	LUX			
	LVA	ASTM D1655 JET A-1	AF Note 2	
	NLD	DStan 91-91 Iss 7 Amd 3 AVTUR	n (AF)	DStan 91-86 Iss 6 AVCAT/FSII
	NOR	MIL-DTL-83133 H Amd 2	AF Note L	MIL-DTL-5624 V Grade JP-5
3a ABCANZ	POL			
	PRT	DStan 91-91 Iss 7 Amd 3 AVTUR	AF	MIL-DTL-5624 V Grade JP-5
	ROU			
	SVK	MSU-11, L/F	af A Note L	
	SVN			
	TUR			MIL-DTL-5624 U Grade JP-5
	USA	MIL-DTL-83133 J	n AF a	MIL-DTL-5624 W Grade JP-4
	AS	DStan 91-91	AF a	DEFAUS 5240D Inc. CI/CL for Aus man. Fuel
	NZ	DStan 91-91 Iss 5	AF	DEFAUS 5207A
	Sea			
4 Acceptable Substitutes	Air	F-34, F-44	F-34	F-34*
	Land			
5 Emergency Substitutes	Sea			
	Air	F-40	F-35	F-35*, F-40*
	Land			
6 Observations & Remarks	(1) Synthetic or semi-synthetic fuels are not allowed (2) Available only at civil airports		(*) Freezing point F-40: -58°C, F-34/35: -47°C, F-43/44: -46°C	Does not contain corrosion inhibitor & lubricity additive (*) Not acceptable for storage aboard warships
7 Qual / 8 WG	(L) Limited stocks No / Air	(L) Limited stocks No / Air	(L) Limited stocks No / Air	(L) Limited stocks No / Air

DEF STAN 01-005 Issue 19

1 NATO Code	F-54 (7090)	F-58 (7090)	F-63 (7090)	F-67 (7090)				
2 Product Description	Diesel fuel, military	Kerosene	Diesel engine fuel kerosene type	Gasoline automotive, unleaded 95 RON				
ALB								
BEL	NBN EN 590 Class E	n af A Note 0	NBN T52-707 Type C	A	DCSEA 108/A	A	NBN EN 228 RON 98	n af A Note L
BGR	TS V 02:1995 EN 590 Class F	n af A Note L					BDS EN 228 Class A, Class C	n af A Note L
CAN	CAN/CSB-3.517-2013 Amnd 1 Type A or B	n af A Note 0	CAN/CSB-3.3-2014 Type 1K	n af A			CAN/CSB-3.5-2011 Amnd 2	n af A
CZE	VJS PHM 1-1-P Iss 8	af A Note 0	VJS - 1-5-P Iss 7	af A			VJS PHM 1-4-P Iss 7	A
DEU	DIN EN 590:2014-04 Class F	A Note 2	TL 9140-0005 Iss 7	n af A	DCSEA 108/A	A	DIN EN 228:2013 E5/E10	AF
DNK	CP max -10°C CFPP max -24°C	n af A	BS 2869:2006 Class C2	n af A			EN 228:2013	n af A
ESP	RD 61/2006 RD 1027/2006 RD 1088/2010 Grd B, D	n af A Note 2						
EST								
FRA	CSR 4-0-05 Class B&E	n af A Note 3			DCSEA 108/A	n af A	CSR 1-2-08	n af A
GBR	BS EN 590 Current ed DIE50 MT	af A	BS 2869 Current Edition Class C1 KERO A	n af A			BS EN 228 Current edition - UL GAS	n af A
GRC	EN 590:2013 No FAME Grade E	n af A Note 0					EN 228:2013 Class A Class C/C1 E5	n af A
HUN	MSZ EN 590 Iss 04 Arctic 2, CFPP -32°C	A Note L					MSZ EN 228 Iss 08	A Note L
HVR								
ITA							EN 228:2004	n af A
LTU	EN 590:2014 Blue dye Class C, E Arctic 1, 2	n af A Note 0	AELP 7090	n af A	DCSEA 75L/B	(A)	EN 228:2013	n af A
LUX	BT-PF-54 Iss C Amnd 2	A	BT-PF-57 Iss C	n af (A)				
LVA	LVS EN 590:2004	N					LVS EN 228:2011	n af A Note L
NLD	NEN EN 590:2013 No FAME / Class F	n af A Note 0			DCSEA 108/A	A	NEN EN 228:2013	n af A
NOR								
POL	NO-91-A219_2007 / A1- 2009	A Note 0						
PRT	NP EN 590:2014 A1:2010 Class B, C & F	n af (A) Note 2					NP EN 228:2014	n af A
ROU	SR EN 590:2004	n af A					SR EN 228:2004 COR min 95	n af A
SVK	MSÜ-12.1/F	A Note 0					MSÜ-14.4/F	A Note L
SVN								
TUR	ASTM D975-11B No FAME / Grade 2-D	n af A Note 0						
USA	ASTM D975-16a Grade 2-D S-15	n af A Note 1	ASTM D3699-13p4.1 Grade 1K	n af A			ASTM D4814-16e1	n AF a
AS	Aust Diesel Determination Act / AS 3570	n af A	ASTM D3699 Grade 1K	n af A				
3a ABCANZ								
NZ								
Sea								
Air								
Land	F-34; F-35; F-63		F-34; F-35		F-34; F-35; F-54			
Sea								
Air								
Land	F-76; F-75		F-44		F-75			
6 Observations & Remarks	(0) FAME ≤ 0.5%; Cloud point ≤ -5°C (1) FAME ≤ 5% (2) FAME ≤ 7% (3) FAME ≤ 8%							
6a Availability	(L) Limited stocks	No / Army	No / Army	No / Army	(L) Limited stocks	No / Army	(L) Limited stocks	No / Army
7 Qual / 8 WG	No / Army	No / Army	No / Army	No / Army	No / Army	No / Army	No / Army	No / Army

1 NATO Code	F-75 (1385)	F-76 (1385)	O-133	O-134
2 Product Description	Fuel, naval distillate, low pour point	Fuel, naval distillate	Lubricating oil, aircraft turbine engine, petroleum	Lubricating oil, general purpose, petroleum light
ALB				
BEL		BN-PF-711	AIR 3516/A Iss 2	AF
BGR		TS V02:1995		
CAN	CCSB-3.11-2010 Type 15	N	CGSB-3.11-2010 Type 11	Note L
CZE				
DEU	TL 9140-0003 Iss 10	N	DSian 91-4 Iss 9	N
DNK	STANAG 1385	N		
ESP			MIL-DTL-16884 N	N
EST				
FRA			DCSEA 176/A	N a
GBR			DSian 91-4 Iss 9	N
GRC			MIL-F-16884 J	N at a
HUN				
HVR				
ITA		NAV-80-9140-0001-1-4-00B00		N
LTU				
LUX				
LVA				
NLD		KN 10323 Iss 9		N
NOR				
POL	NO-91-A268:2005	N		
PRT		PTDINAV 002		N
ROU				Note L
SVK				
SVN				
TUR				
USA				
AS				
NZ				
Sea				
Air				
Land				
5 Emergency Substitutes				
4 Acceptable Substitutes				
3a ABCANZ				
SEA				
AIR				
Land				
Sea				
Air				
Land				
6 Observations & Remarks				
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	O-135	O-136	O-138	O-142
2 Product Description	Lubricating oil, aircraft turbine engine, petroleum	Lub oil, aircraft turbine engine, petro. extreme pressure	Lubricating oil, aircraft turbine engine, petroleum	Lubricating oil, general purpose low temperature
ALB				
BEL	AIR 3515/B Iss 3	n AF a Note 1		MIL-PRF-7870 D AF Note L
BGR				
CAN				MIL-PRF-7870 D n AF a
CZE	VJS PHM 2-2-L Iss 3	AF		
DEU	DSian 91-99 Iss 2 And 1	n AF a Note 1	AIR 3512/A Iss 2	AF a Note L
DNK	DSian 91-99 Iss 2	n (AF) Note 1		
ESP	DSian 91-99 Iss 2 And 1	n AF		MIL-PRF-7870 D n AF
EST				
FRA	AIR 3515/B Iss 3	n AF a	AIR 3512/A Iss 2 (+)	n AF a
GBR	DSian 91-99 Iss 2 And 1 (+) OM-11	n AF a Note 1	BA-PO-103 Iss B OEP-71	n AF a
GRC	DSian 91-99 Iss 2 And 1 OM 11	(AF) a		DSian 91-47 Iss 1 (+) OM-12
HUN				MIL-PRF-7870 D n AF a
HVR				MIL-PRF-7870 C OM-12 AF
ITA	AIR 3515/B Iss 3	AF		MIL-PRF-7870 C n AF a
LTU				
LUX				
LVA				
NLD	AIR 3515/B	AF		MIL-PRF-7870 D n AF
NOR				
POL	DSian 91-99 Iss 2	AF		
PRT	DSian 91-99 Iss 2 And 1	AF Note 1	AIR 3512/A Iss 2	n (AF)
ROU				MIL-PRF-7870 C AF
SVK	MSÜ-26.1/L	af (A)		
SVN				
TUR	DSian 91-99 Iss 1 (DERD 2490)	n AF a Note 1	DSian 91-97 Iss 1	AF
USA				MIL-PRF-7870 E n AF a
AS	DSian 91-99		DSian 91-97	MIL-PRE-7870
NZ	DSian 91-99 Iss 1	AF	DSian 91-97 Iss 1	AF
3a ABCANZ				
Sea				
Air			O-136	
Land				
5 Emergency Substitutes				
Sea				
Air				
Land				
6	(1) Qualification not required			(*) Except for extreme low temperatures
Observations & Remarks				
6a Availability	Yes / Air	Yes / Air	(1) Limited stocks Yes / Air	(1) Limited stocks Yes / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	O-147	O-148	O-149	O-150
2 Product Description	Lubricating oil, instrument, synthetic	Lubricating oil, aircraft turbine engine, synthetic 3cSt	Lubricating oil, aircraft turbine engine, synthetic 7.5cSt	Lubricating oil, aircraft turbine engine, synthetic 3cSt
ALB				
BEL		MIL-PRF-7808 L Grade 3	AF a	
BGR				
CAN	MIL-PRF-6085 E	n AF		
CZE				
DEU	MIL-PRF-6085 E	n AF a		
DNK		MIL-PRF-7808 L Grade 3	AF	
ESP	MIL-PRF-6085 E	n A	MIL-PRF-7808 L Grade 3	n AF a
EST				
FRA	AIR 3511/A Iss 2	n AF		AIR 3514/A Iss 2 (+)
GBR	DSian 91-49 Iss 1 OX-14	n AF	MIL-PRF-7808 L Grade 3 OX-9	AF a
GRC	MIL-PRF-6085 E	n AF a	MIL-PRF-7808 L Grade 3	AF a
HUN	MIL-PRF-6085 D OX-14	AF		
HVR				
ITA	MIL-PRF-6085 D	n AF	MIL-PRF-7808 L Grade 3	n AF a
LTU	MIL-PRF-6085 D	AF		
LUX				
LVA				
NLD	MIL-PRF-6085 E	n AF	MIL-PRF-7808 L Grade 3	AF
NOR				
POL				
PRT	MIL-PRF-6085 E	n AF	MIL-PRF-7808 L Grade 3	AF
ROU	MIL-PRF-6085 D	AF	MIL-PRF-7808 L Grade 3	Note L
SVK				
SVN				
TUR	MIL-PRF-6085 D	n AF	MIL-PRF-7808 L Grade 3	n AF a
USA	MIL-PRF-6085 E (+)	n AF a	MIL-PRF-7808 L (+) Grade 3	AF a
AS	MIL-PRF-6085		MIL-PRF-7808 L Grade 3	DSian 91-98
NZ	MIL-PRF-6085 D	AF		DSian 91-98 (DERD 2487)
Sea				
Air			O-163	
Land				
Sea				
Air		O-149*, O-150, O-156	O-148*, O-154, O-156*, O-159	O-156, O-148
Land				
6 Observations & Remarks	(*) Up to 50% in O-148			
6a Availability	(L) Limited stocks			
7 Qual / 8 WG	Yes / Air	Yes / Air	Yes / Air	Yes / Air

DEF STAN 01-005 Issue 19

1 NATO Code	O-152	O-153	O-154	O-155
2 Product Description	Synthetic corrosion inhibited turbine engine oil, 5cSt	Lubricating oil, gear aircraft light grade	Lubricating oil, aircraft turbine engine, synth, 5cSt, HTS	Lubricating oil, gear aircraft, medium grade
ALB				
BEL			MIL-PRF-23699 G Class HTS	DCSEA 255/A n AF a
BGR				
CAN	MIL-PRF-23699 F Class C/I AF Note L			MIL-PRF-6086 F And 1 Grade M n AF
CZE				
DEU		DStan 91-112 Iss 2 Grade OEP-30 n AF a		DStan 91-112 Iss 2 OEP 70 n AF
DNK		MIL-PRF-6086 F Grade L n AF a	MIL-PRF-23699 F Class HTS AF a	MIL-PRF-6086 E Grade M n AF
ESP	MIL-PRF-23699 G Class C/I AF	MIL-PRF-6086 F And 1 Grade L AF a	MIL-PRF-23699 G Class HTS AF	MIL-PRF-6086 F And 1 Grade M n AF a
EST				
FRA		MIL-PRF-6086 F RO-153 n (AF)		DCSEA 255/A n AF a
GBR	MIL-PRF-23699 G Class C/I OX-152 N	DStan 91-112 Iss 2 OEP-30 n AF Note L		DStan 91-112 Iss 2 OEP 70 n AF a
GRC	MIL-PRF-23699 G CLASS C/I n AF a	MIL-PRF-6086 F And 1 Grade L n AF a		MIL-PRF-6086 F And 1 Grade M n AF a
HUN				
HVR				
ITA		MIL-PRF-6086 E Grade L AF		MIL-PRF-6086 E Grade M n AF
LTU				MIL-PRF-6086 E Grade M AF
LUX				
LVA				
NLD		MIL-PRF-6086 F Grade L n AF	MIL-PRF-23699 F Class HTS AF	MIL-PRF-6086 F Grade M n AF a
NOR				
POL				
PRT	MIL-PRF-23699 G Class C/I n AF	MIL-PRF-6086 F And 1 Grade L AF a	MIL-PRF-23699 G Class HTS AF Note L	MIL-PRF-6086 F And 1 Grade M n AF
ROU				MIL-PRF-6086 E Grade M n AF
SVK				
SVN				
TUR	MIL-PRF-23699 F Class C/I n AF	MIL-PRF-6086 E Grade L n AF		MIL-PRF-6086 E Grade M AF a
USA	MIL-PRF-23699 G (+) Class C/I N af	MIL-PRF-6086 F And 1 (+) Grade L n AF a	MIL-PRF-23699 G (+) Class HTS N af	MIL-PRF-6086 F And 1 (+) Grade M n AF a
AS	MIL-PRF-23699 Class C/I n AF	MIL-PRF-6086 Grade L AF a	MIL-PRF-23699 Class HTS	MIL-PRF-6086 Grade M
NZ		MIL-PRF-6086 F Grade L AF a		
Sea				
Air	O-148; O-154; O-156; O-160; O-163		O-156; O-160; O-163	O-154; O-160; O-163
Land				
Sea				
Air	O-149; O-150	O-155	O-148; O-150	O-148; O-149; O-150; O-153
Land				
6 Observations & Remarks				
6a Availability	(L) Limited stocks Yes / Air	(L) Limited stocks Yes / Air	(L) Limited stocks Yes / Air	Yes / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	O-156	O-157	O-158	O-159
2 Product Description	Lubricating oil, aircraft turbine engine, synthetic 5cSt	Lubricating oil, low temperature, weapons	Lubricating oil, semi-fluid	Lubricating oil, aircraft turbine engine, synthetic, 7.5cSt
ALB				
BEL	MIL-PRF-23699 G Class STD	AF		
BGR				
CAN	MIL-PRF-23699 F Class STD	n AF	MIL-L-46000 C Amd 1	n af A
CZE	VJS PHM 2-4L Iss 5	AF		
DEU	MIL-PRF-23699 G Class STD	n AF a	MIL-L-46000 C Amd 1	n af A
DNK	MIL-PRF-23699 F Class STD	n AF a	MIL-L-46000 C Amd 1	af (A)
ESP	MIL-PRF-23699 G Class STD	n AF a	MIL-L-46000 C Amd 1	AF a
EST				
FRA	DCSEA 299/A	n AF a		AIR 3517/A Iss 2 (+) n AF a
GBR	DStan 91-101 Iss 3 Amd 1 OX-27	n AF a	DStan 91-102 Iss 2 Amd 2 (+) OX-24	n af A
GRC	MIL-PRF-23699 G Amd 1 Class STD	n AF a	MIL-PRF-14107 D	AF a
HUN				
HVR				
ITA	MIL-PRF-23699 F Class STD	n AF a	MIL-PRF-14107 D	AF
LTU	MIL-PRF-23699 F	AF		
LUX				
LVA				
NLD	MIL-PRF-23699 F Class STD	n AF	MIL-L-46000 C	N
NOR				
POL	MIL-PRF-23699 F Class STD	AF		
PRT	MIL-PRF-23699 G Class STD	n AF	MIL-L-46000 C Amd 1	n A
ROU	MIL-PRF-23699 F Class STD	n AF		
SVK	MSÜ-26.2L	af (A)		
SVN				
TUR	MIL-PRF-23699 F Class STD	n AF a	MIL-L-14107 C Amd 2	AF a
USA	MIL-PRF-23699 G (+) Class STD	N af a	MIL-PRF-14107 D	AF
AS	MIL-PRF-23699 Class STD		MIL-L-46000 C Amd 1 (+)	n af A
NZ	MIL-PRF-23699 F Class STD	n AF		
Sea				
Air	O-148; O-152; O-154; O-160; O-163			
Land			S-758*	
Sea				
Air	O-149; O-150			O-149
Land				
6 Observations & Remarks			(*) US only	
7 Qual / 8 WG	Yes / Air	Yes / Air	Yes / Army	Yes / Air

DEF STAN 01-005 Issue 19

1 NATO Code	O-160	O-163	O-164	O-165
2 Product Description	Lubricating oil, aircraft turbine engine, synthetic, 5cSt	4cSt, aviation turbine, fugue oil	Helicopter transmission lubricant, 5cSt ester	Helicopter transmission lubricant, 9cSt synthetic base
ALB				
BEL	DStan 91-100 Iss 3 And 1	AF		
BGR				
CAN		MIL-PRF-7808 L Grade 4	AF	
CZE	VJS PHM 2-3-L Iss 3	AF		
DEU	DStan 91-100 Iss 3 And 1	n AF		
DNK	DStan 91-100 Iss 3 And 1	n AF		
ESP	DStan 91-100 Iss 3 And 1	A		
EST				
FRA				
GBR	DStan 91-100 Iss 3 And 1 (+) OX-26	AF a		
GRC				
HUN				
HVR				
ITA	DStan 91-100 Iss 3 And 1	AF		
LTU				
LUX				
LVA				
NLD	DStan 91-100 Iss 3 And 1	n AF	DOD-PRF-85734	AF
NOR				
POL				
PRT	DStan 91-100 Iss 3 And 1	N		
ROU				
SVK	MSÜ-26-2/L	af (A)		
SVN				
TUR	DStan 91-100 Iss 1	AF	MIL-PRF-7808 L Grade 4	n AF a
USA			MIL-PRF-7808 L (+) Grade 4	n AF a
AS	DOD-PRF-85734			
NZ	DOD-PRF-85734	n AF		
Sea				
Air	O-156		O-148; O-150	
Land				
Sea				
Air	O-148; O-149; O-150; O-163		O-149; O-154; O-156; O-160	
Land				
6 Observations & Remarks				
6a Availability	Yes / Air	Yes / Air	No / Air	No / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	O-167	O-185 (7091)	O-186 (7091)	O-190
2 Product Description	Enhanced ester 50St turbine oil	Lubricating oil, gear extreme pressure, grade 75W, API GL4	Lubricating oil, gear extreme pressure, grade 75W, API GL5	Lubricating oil, general purpose preservative light
ALB				
BEL		API GL-4 MB 235.11	API GL-5 MB 235.8	MIL-PRF-32033 A
BGR				
CAN			SAE J 2360 Iss 2012 Grade 75W	MIL-PRF-32033 Amd 2
CZE			VJS PHM 3.3-P Iss 6	VJS PHM 4-16-P Iss 2
DEU			SAE J 2360 Grade 75W	
DNK				
ESP				MIL-PRF-32033 Amd 1
EST				
FRA		DCSEA 220/G Grade 75W-80	n af A	
GBR			SAE 75W API GL5 OEP-38	DSian 91-79 Iss 1 OX-18
GRC			SAE J 2360 Grade 75W	MIL-PRF-32033 Amd 2
HUN				
HVR				
ITA				MIL-PRF-32033 Amd 2
LTU				
LUX				
LVA				
NLD		AP GL-4 A Grade 75W-90	SAE J 2360 Grade 75W-90	MIL-PRF-32033 Amd 2
NOR				
POL				
PRT			SAE J 2360 (1998) Grade 75W	MIL-PRF-32033 A
ROU				VVL-800 C Amd 1
SVK			MSU-28 J/L	
SVN				
TUR				MIL-PRF-32033 Amd 2
USA			SAE J 2360 (2012) Grade 75W	MIL-PRF-32033 A (*)
AS				MIL-PRF-32033
NZ			MIL-PRF-2105 E+ Grade 75W	
3a ABCANZ				
Sea				
Air				
Land				O-142; S-758*; S-761; O-157
4 Acceptable Substitutes				
Sea				
Air				
Land				
5 Emergency Substitutes			O-226	O-134; S-758
Land				
6 Observations & Remarks				(*) US only
6a Availability			(1) Limited stocks	(1) Limited stocks
7 Qual / 8 WG	No / Alt	No / Army	Yes / Army	Yes / Army

DEF STAN 01-005 Issue 19

1 NATO Code	O-192	O-204	O-214	O-226 (7091)
2 Product Description	Lubricating oil, general purpose preservative	Lubricating oil semi liquid for machine guns	Cutting fluid soluble	Lubricating oil gear extreme pressure, grade 80W-90
3 NATO Nations	ALB			
	BEL			SAE J 12360 Grade 80W-90
	BGR			BDS 9797-82 n af A Note L
	CAN			SAE J 2360 Iss 2012 Grade 80W-90 A
	CZE	VJS PHM 4-11-P Iss 4 A		VJS PHM 3-5-P Iss 8 af A
	DEU	TL 9150-0069 Iss 7 (+) n af A		TL 9150-0082 Iss 6 Grade 80W-90 n af A
	DNK			SAE J 12360 Grade 80W-90 n af A Note L
	ESP	MIL-PRF-3150 E AF a TL 9150-0069 Iss 7 A NME-3011/2015 n (A)		SAE J 12360 Grade 80W-90 n af A
	EST			Grade 80W-90
	FRA	DCSEA 231/A n A		DCSEA 220/G Grade 80W-90 n af A
	GBR			SAE J 12360 Grade 80W-90 DEP-220 n af A
	GRC	MIL-PRF-3150 E n af A Note L	VV-C-846 D Type 1 n A	SAE J 12360 Grade 80W-90 n af A
	HUN			
	HVR			
	ITA			MIL-PRF-2105 E Grade 80W-90 n af A
	LTU			
	LUX	BT-PO-164 Grade M A		BT-PO-152 B Grade 80W-90 A
	LVA			SAE J 12360 Grade 80W-90 n af A Note L
	NLD	TL 9150-0069 Iss 6 A Note L		TL 9150-0082 Iss 6 Grade 80W-90 n af A
	NOR			
	POL			
	PRT	MIL-PRF-3150 D And 2 n A		SAE J 2360 (1998) Grade 80W-90 n af A
	ROU			
	SVK			MSÜ-28, J/L A
	SVN			
	TUR	MIL-PRF-3150 E N af a		SAE J 12360 Grade 80W-90 n af A
	USA	MIL-PRF-3150 E (+) n af A	VV-C-846 D (+) Type I n af A	SAE J 2360 (2012) Grade 80W-90 n af A
	AS		VV-C-846 C Type 1	SAE J 12360 Grade 80W-90
3a ABCANZ	NZ			MIL-PRF-2105 E Grade 80W-90 N AF
4 Acceptable Substitutes	Sea			
	Air			
	Land	C-642		
5 Emergency Substitutes	Sea			
	Air			
	Land	O-134		O-228
6 Observations & Remarks				
6a Availability	(L) Limited stocks Yes / Army	(L) Limited stocks Yes / Army	Yes / Army	(L) Limited stocks Yes / Army
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	O-228 (7091)	O-236 (7091)	O-237 (7091)	O-238 (7091)
2 Product Description	Lubricating oil gear extreme pressure, grade 85W-140	Lub oil engine severe duty, diesel & gasoline service 15W-40	Lubricating oil engine severe duty, diesel service, grade 10W	Lubricating oil engine severe duty diesel service, grade 30
ALB				
BEL	SAE J 2360 Grade 85W-140	n af A	TL 9150-0063 Iss 6	n af A
BGR		TS V 40:2008	n af A Note L	MIL-PRF-2104 G Grade 30
CAN	SAE J 2360 Iss 2012 Grade 85W-140	A	MIL-PRF-2104 J Grade 10W	n af A Note L
CZE	VJS PHM 3-6-P Iss 5	af A		MIL-PRF-2104 J Grade 30
DEU		TL 9150-0063 Iss 6	n af A	
DNK	SAE J 2360 Grade 85W-140	af A Note L	TL 9150-0063 Iss 6	n af A Note L
ESP	SAE J 2360 Grade 85W-140	n af A	MIL-PRF-2104 J Grade 10W	n af A
EST				
FRA	DCSEA 220/G Grade 85W-140	n af A		
GBR				
GRC	SAE J 2360 Grade 85W-140	n af A	MIL-PRF-2104 J Grade 10W	n af A
HUN				
HVR				
ITA				
LTU				
LUX	BT-PO-152 B Grade 85W-140	n af A		
LVA		ACEA E3	n af A Note L	
NLD	SAE J 2360 Grade 85W-140	n af A	TL 9150-0063 Iss 6	n af A
NOR				
POL				
PRT	SAE J 2360 (2012) Grade 85W-140	n af A	MIL-PRF-2104 J Grade 10W	A
ROU		DCSEA 214/A	AF	
SVK	MSÜ-28.1/L	A		MSÜ-27.1/L
SVN				
TUR	SAE J 2360 Grade 85W-140	n af A	MIL-PRF-2104 G Grade 10W	n af A
USA	SAE J 2360 (2012) Grade 85W-140	n af A		
AS	SAE J 2360 Grade 85W-140		MIL-PRF-2104 Grade 10W	
NZ	SAE J 2360 E Grade 85W-140	MIL-L-2104 G	MIL-PRF-2104 G Grade 10W	(AF)
Sea				
Air				
Land		O-1236; O-1179		O-236; O-1236
5 Emergency Substitutes				
Land	O-226	O-1176; O-1178		
Air				
Sea				
6 Observations & Remarks				
6				
7 Qual / 8 WG	(L) Limited stocks Yes / Army	(L) Limited stocks Yes / Army	(L) Limited stocks Yes / Army	(L) Limited stocks Yes / Army

2-O-16
OFFICIAL

1 NATO Code	O-239	O-240 (1425)	O-249	O-250
2 Product Description	Lubricating oil engine severed, diesel service, grade 50	Lubricating oil, steam turbine & gear, light service	Lubricating oil, steam turbine & gear, extreme pressure, ISO VG 68	Lubricating oil, steam turbine & gear, moderate service
3 NATO Nations	ALB			
	BEL			
	BGR	TS K81.0131.05	N Note L	
	CAN		C-82-001-000/SF-001 N af	
	CZE	VJS PHM 2-2-P iss 7 A		
	DEU			
	DNK			
	ESP	NME-2992/2016 (+) af A		MIL-PRF-17331 K N af A
	EST			
	FRA		DCEA 241/A N	
	GBR		DStan 91-25 iss 4 OM-100 N a	
	GRC			MIL-PRF-17331 H Amd 3 N
	HUN			
	HVR			
	ITA		DStan 91-25 iss 4 N	
	LTU			
	LUX			
	LVA			
	NLD			
	NOR			
	POL			MIL-PRF-17331 J N
	PRT			
	ROU		DStan 91-25 iss 4 OM 100 N	
	SVK	MSU-27.1/L A		
SVN				
TUR			MIL-PRF-17331 J Amd 1 N af a	
USA			MIL-PRF-17331 K (+) N af a	
3a ABCANZ	AS			MIL-PRF-17331
	NZ	DStan 91-25 iss 3		
4 Acceptable Substitutes	Sea		O-250	
	Air			
	Land			
5 Emergency Substitutes	Sea		O-250	O-240, O-249
	Air			
	Land	O-236, O-1236		
6 Observations & Remarks				
7 Qual / 8 WG	(L) Limited stocks Yes / Army	(L) Limited stocks Yes / Navy	Yes / Navy	Yes / Navy

DEF STAN 01-005 Issue 19

1 NATO Code	O-252	O-253 (1425)	O-262	O-274
2 Product Description	Lubricating oil, steam cylinder, saturated	Lubricating oil, steam turbine & gear, light service, ISO VG 68	Lubricating oil, naval gear, extreme pressure, ISO VG 100	Lubricating oil, naval diesel, moderate service
ALB				
BEL		KN 10401 Ed 3	N	
BGR				
CAN				
CZE				
DEU			TL 9150-0105 Iss 3 (+) ISO VG 100	N at a
DNK				
ESP				
EST				
FRA				
GBR	BS 4475:2000 (+) Grade CS-680 OM-750	N at a		
GRC	STM 7261 Amd 3	N		
HUN				
HVR				
ITA				MMO 2009 Iss 2 Grade 30
LTU				N Note L
LUX				
LVA				
NLD		KN 10401 Ed 3	N	
NOR				
POL				
PRT	STM 7261 Iss 1 Amd 3	N	KN 10401 Iss 2	N
ROU			STAS 12163-84	N
SVK				
SVN				
TUR				
USA				
AS	BS 4475:2000 (Grade CS-680)			
NZ				
3a ABCANZ				
Sea				O-278
Air				
Land				
4 Acceptable Substitutes				
Sea				O-238
Air				
Land				
5 Emergency Substitutes				
Sea				
Air				
Land				
6 Observations & Remarks				
6a Availability	No / Navy	Yes / Navy	Yes / Navy	(L) Limited stocks Yes / Navy
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	O-278 (4596)	O-283	O-285	O-290
2 Product Description	Lubricating oil, naval diesel, severe service, grade 40	Lubricating oil refrigerant compressor inhibited ISO VG 68	Lubricating oil refrigerant compressor uninhibited ISO VG 68	Lubricating oil refrigerant compressor inhibited ISO VG 32
3 NATO Nations	ALB			
	BEL	BN-PO-178 D	N	
	BGR	MIL-PRF-9000 H	N	
	CAN	DSian 91-22 Iss 5 OMD-113	N	
	CZE			
	DEU	TL 9150-0031 Iss 4	N at a	
	DNK		VV-L-825 C Type II	N
	ESP	MIL-PRF-9000 L	N at	
	EST			
	FRA	DCSEA 278/A	N	
	GBR	DSian 91-22 Iss 6 OMD-113	N	
	GRC	MIL-PRF-9000 H	N	
	HUN			
	HVR			
	ITA	MIL-PRF-9000 K	N	
	LTU			
	LUX			
	LVA			
	NLD	BN-PO-178 D	N	
3a ABCANZ	NOR			
	POL	MIL-PRF-9000 H	N	
	PRT	MTL 5044 Type II- Oil Cat 2	N	
	ROU			
	SVK			
	SVN			
	TUR	MIL-PRF-9000 H	N	
	USA	MIL-PRF-9000 L	N	
	AS	DSian 91-22 Grade 40	N	
	NZ	MIL-PRF-9000 H	N	
	Sea			
	Air			
	Land			
	Sea	O-238; O-274	O-285	O-283
	Air			
	Land			
	Sea			
	Air			
	Land			
6 Observations & Remarks	Used with R11 & R12			
6a Availability	Used with R11, R12 & R22			
7 Qual / 8 WG	Yes / Navy	Yes / Navy	No / Navy	(1) Limited stocks Yes / Navy

DEF STAN 01-005 Issue 19

1 NATO Code	O-1176	O-1177	O-1178 (7091)	O-1179 (7091)
2 Product Description	Lubricating oil engine severe duty multigrade 10W-30	2 strokes spark lubricating oil biodegradable	Lubricating oil heavy duty engine multigrade 5W-30	Lubricating oil engine duty multigrade 5W-40
ALB				
BEL	DSian 91-113 Iss 2 Amd 1	n A	DCSEA 242/C	n af A
BGR			TL 9150-0080 Iss 3	A
CAN			Note 1	DCSEA 215/C
CZE	VJS PHM 2-3-P Iss 6	A		af A
DEU			TL 9150-0080 Iss 3	
DNK		DCSEA 242/C	n af A	STAMAG 7091
ESP		DCSEA 242/C	n af A	DCSEA 215/C
EST				af A
FRA		DCSEA 242/C (+)	n af A	DCSEA 215/C
GBR	DSian 91-113 Iss 2 Amd 1 (+) OMD-90	n af A	SAE 5W-30 ACEA E3 OMD-55	n af A
GRC				
HUN				
HVR				
ITA				
LTU				
LUX				
LVA			SAE 5W-30 ACEA E3	n af A
NLD		DCSEA 242/C	af A	DCSEA 215/C
NOR				n af A
POL				
PRT		DCSEA 242/C	n af A	
ROU			Note N	
SVK	MSÜ-27.1/L	A		
SVN				
TUR			TL 9150-0080 Iss 3	A
USA				DCSEA 215/B
AS			DSian 91-68 Grade 5W-30	A
NZ		NMMA TC-W3		
Sea				
Air				
Land	O-237, O-238, O-1178, O-1179		O-236, O-1176*	
6 Observations & Remarks			(*) Dependent of ambient temperature (1) FZG not specified	
7 Qual / 8 WG	Yes / Army	(N) No stock Yes / Army	Yes / Army	(1) Limited stocks Yes / Army

DEF STAN 01-005 Issue 19

1 NATO Code	C-1180 (7091)	O-1236	G-353	G-354		
2 Product Description	Lubricating oil engine multigrade 10W-40	Lubricating oil severe duty diesel engine 15W-40	Grease, aircraft synthetic molybdenum disulphide	Grease, aircraft synthetic extreme pressure, type I, Li based		
3 NATO Nations	ALB					
	BEL	TL 9150-0107 Iss 2	A			
	BGR		TS V 40:2008	n af A Note L		
	CAN		MIL-PRF-2104 J Grade 15W-40	n A		
	CZE					
	DEU	TL 9150-0107 Iss 2 SAE 10W-40	n af A Note 2 3			
	DNK					
	ESP	ACEA E6 SAE 10W-40	AF			
	EST					
	FRA					
	GBR	ACEA E6 & E7 SAE 10W-40; OX-90	n A			
	GRC					
	HUN					
	HVR					
	ITA					
	LTU					
	LUX					
	LVA	ACEA E6 SAE 10W-40	n af A Note 1			
	NLD	TL 9150-0107 Iss 2 SAE 10W-40	n af A			
	NOR					
	POL					
	PRT					
	ROU					
	SVK					
	SVN					
	TUR	ACEA E6 SAE 10W-40	A			
	USA					
3a ABCANZ	AS					
	NZ					
4 Acceptable Substitutes	Sea					
	Air					
	Land					
5 Emergency Substitutes	Sea					
	Air					
	Land					
6 Observations & Remarks	(1) FZG not specified (2) ACEA E6 & API C1-4 (3) Stable pourpoint max -36°C					
6a Availability	No / Army	(1) Limited stocks Yes / Army	Yes / Air	Yes / Air		
7 Qual / 8 WG						

DEF STAN 01-005 Issue 19

1 NATO Code	G-355	G-359	G-361	G-363
2 Product Description	Grease, aircraft graphite	Grease, aircraft, high temperature	Grease, aircraft, synthetic wide temperature	Grease, plug valve, hydrocarbon resistant
ALB				
BEL	DCSEA 355/A			SAE AMS-G-6032 Type I n AF a
BGR				
CAN				SAE AMS-G-6032 Type I n AF
CZE				
DEU	DCSEA 355/A n AF a			SAE AMS-G-6032 n AF a
DNK	DStan 91-54 Iss 2 And 2 AF		DCSEA 361/B AF	
ESP	DStan 91-54 Iss 2 And 2 AF a	DCSEA 359/A n AF a		DStan 91-6 Iss 4 And 1 AF
EST				
FRA	DCSEA 355/A n AF a	DCSEA 359/A (+) n AF a	DCSEA 361/B (+) n AF a	DCSEA 363/B n AF a
GBR	DStan 91-54 Iss 2 And 2 (+) XG-285 n AF a			DStan 91-6 Iss 4 And 1 (+) XG-235 n AF a
GRC	MIL-G-7187 And 1 n AF	MIL-G-3545 C And 1 (MR) n (AF)		SAE AMS-G-6032 And 1 Type I n AF
HUN				
HVR				
ITA		DCSEA 359/A AF		
LTU				MIL-G-6032 D AF
LUX				
LVA				
NLD	DCSEA 355/A AF	DCSEA 359/A n AF Note L		SAE AMS-G-6032 Type I n AF
NOR				
POL				
PRT	DStan 91-54 Iss 2 And 2 n AF	MIL-G-3545 C And 1 n AF		SAE AMS-G-6032 (2012) Type I AF
ROU	DStan 91-54 Iss 2 And 1 XG-285 n AF	AIR 4205/B Iss 3 AF	AIR 4207/A Iss 2 AF	
SVK				
SVN				
TUR	DStan 91-54 Iss 2 And 2 A	DCSEA 359/A A	DCSEA 361/B A	SAE AMS-G-6032 Type I n af A
USA				SAE AMS-G-6032A (2012) Type I N af a
AS	DStan 91-54			SAE AMS-G-6032 Type I
NZ	DStan 91-54	MIL-G-3545 C And 1 (MR) AF		SAE AMS-G-6032 Type I SAE AMS-G-6032 (1999) Type I AF
Sea				
Air			G-395	
Land				
Sea				
Air				
Land				
Sea				
Air				
Land				
6 Observations & Remarks	Operating temperature range: -40°C to +121°C	Operating temperature range: -18°C to +149°C	Operating temperature range: -40°C to +177°C	
6a Availability	Yes / Air	(L) Limited stocks Yes / Air	Yes / Air	Yes / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	G-366	G-372	G-382	G-392
2 Product Description	Grease aircraft, helicopter oscillating bearing	Grease aircraft, synthetic, high temperature	Grease aircraft, general purpose	Grease, aircraft, synthetic, pneumatic system
ALB				
BEL	MIL-G-25537 C And 1	AF a	MIL-G-25013 E	AF
BGR			DCSEA 382/A	AF a
BGR				SAE AMS-G-4343
CAN	MIL-G-25537 C And 1	n AF	MIL-G-25013 E	n AF
CZE			VJS PHM 5-3-L Iss 5	AF a
DEU			MIL-G-25013 E	Note N
DNK	MIL-G-25537 C And 1	AF	MIL-G-25013 E	n AF a
ESP	MIL-G-25537 C And 1	n AF a	MIL-G-25013 E	n AF a
EST				
FRA	DSian 91-51 Iss 2 RG-366	n AF a		DCSEA 382/A
GBR	DSian 91-51 Iss 2 XG-284	n AF a	MIL-G-25013 E XG-300	n AF
GRC	MIL-G-25537 C And 1	n AF a	MIL-G-25013 E	n AF a
HUN				
HVR				
ITA	MIL-G-25537 C And 1	n AF a	MIL-G-25013 E	n AF a
LTU			MIL-G-25013 E	AF
LUX				
LVA				
NLD	MIL-G-25537 C And 1	n AF	MIL-G-25013 E	N af Note L
NOR				
POL				
PRT	MIL-G-25537 C And 1	n AF	MIL-G-25013 E	n AF
ROU	MIL-G-25537 C And 1	AF	MIL-G-25013 E	AF
SVK				
SVN				
TUR	MIL-G-25537 C And 1	n af A	MIL-G-25013 E	n AF a
USA	MIL-G-25537 C And 1 (+)	N af a	MIL-G-25013 E (+)	N af a
AS	MIL-G-25537		MIL-G-25013	
NZ	MIL-G-25537 C And 1	AF	MIL-G-25537 C And 1	AF
Sea				
Air				
Land				
5 Emergency Substitutes				
Sea				
Air				
Land				
Sea				
Air				
Land				
6 Observations & Remarks	Operating temperature range: -54°C to +71°C	Operating temperature range: -73°C to +232°C	Operating temperature range: -40°C to +121°C	Operating temperature range: -54°C to +93°C
6a Availability	Yes / Air	(L) Limited stocks: (N) No stock	(L) Limited stocks	Yes / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	G-394	G-395	G-396	G-397
2 Product Description	Grease, aircraft, silicone, pneumatic system	Grease, aircraft, multi-purpose	Grease, aircraft, PTFE	Grease, perfluorinated liquid oxygen compatible
ALB				
BEL	DStan 91-56 Iss 3 And 1	AF	MIL-PRF-81322 G	n AF
BGR				
CAN		MIL-PRF-81322 G	n AF	
CZE		VJS PHM 5-2-L Iss 5	AF a Note N	MIL-PRF-27617 F Type I
DEU	DStan 91-56 Iss 3 And 1	AF	MIL-PRF-81322 G	n AF a
DNK	DStan 91-56 Iss 3 And 1	AF	MIL-PRF-81322 G	AF a
ESP	DStan 91-56 Iss 3 And 1	AF	MIL-PRF-81322 G	n AF a
EST				
FRA		DCSEA 395/C	n AF a	
GBR	DStan 91-56 Iss 3 And 1 (+) XG-315	n AF a	DStan 91-52 Iss 1 And 2 XG-293	n AF a
GRC		MIL-PRF-81322 G	n AF a	
HUN			MIL-PRF-81322 G XG-293	AF
HVR				
ITA		MIL-PRF-81322 G	AF Note L	MIL-PRF-27617 F Type I
LTU				
LUX				
LVA				
NLD	DStan 91-56 Iss 3 And 1	n AF a	MIL-PRF-81322 G	n AF a
NOR				
POL				
PRT	DStan 91-56 Iss 3 And 1	n AF	MIL-PRF-81322 G	n AF
ROU	DStan 91-56 Iss 3	n AF	MIL-PRF-81322 F	n AF
SVK				
SVN				
TUR		MIL-PRF-81322 G Grade A	n AF a	
USA		MIL-PRF-81322 G (+)	N at a	MIL-PRF-27617 G And 1 (+) Type I
AS	DStan 91-56 Iss 3 And 1		MIL-PRF-81322 NLGI Grade 2	n AF
NZ	DStan 91-56 Iss 2	AF	MIL-PRF-81322 F	n AF
Sea				
Air				
Land				
5 Emergency Substitutes				
Sea				
Air				
Land				
4 Acceptable Substitutes				
Sea				
Air				
Land				
5 Emergency Substitutes				
Sea				
Air				
Land				
6 Observations & Remarks		Operating temperature range: -54 °C to +177°C		See G-1350 for Type IV
6a Availability				
7 Qual / 8 WG	Yes / Air	(L) Limited stocks: (N) No stock Yes / Air	(L) Limited stocks Yes / Air	Yes / Air

1 NATO Code	G-398	G-399	G-403 (7101)	G-408
2 Product Description	Grease, perfluorinated liquid oxygen compatible	Grease, perfluorinated, liquid oxygen compatible	Grease, automotive & artillery	Grease graphite soft
3 NATO Nations	ALB			
	BEL	MIL-PRF-27617 G And 1 Type II	AF	AF
	BGR			TS 0317:94 n af A Note L
	CAN		MIL-PRF-27617 F Type III	n AF a MIL-PRF-10924 H n af A
	CZE			
	DEU		MIL-PRF-27617 G And 1 Type III	n AF
	DNK			MIL-PRF-10924 H n af A Note L
	ESP		MIL-PRF-27617 G And 1 Type III	AF a DSian 91-27 Iss 3 And 2 n af A
	EST			
	FRA			
	GBR			DSian 91-27 Iss 3 And 2 XG-279 n af A
	GRC		MIL-PRF-27617 F Type III	n AF MIL-PRF-10924 H And 2 n af A
	HUN			
	HVR			
	ITA	MIL-PRF-27617 F Type II	AF	MIL-PRF-27617 F Type III
	LTU			
	LUX			BT-PG-453 B And 1 A
	LVA			
	NLD	MIL-PRF-27617 F Type II	n AF	MIL-PRF-27617 G And 1 Type III n AF
	NOR			
	POL			
	PRT	MIL-PRF-27617 G And 1 Type II	AF	MIL-PRF-27617 F Type III AF
	ROU			
	SVK			
	SVN			
	TUR			MIL-G-27617 E And 1 Type III n AF a MIL-PRF-10924 H n af A
	USA	MIL-PRF-27617 G And 1 (+) Type II	AF	MIL-PRF-27617 F Type III AF
	AS	MIL-PRF-27617 F Type II		DSian 91-27 DSian 91-27 (AF)
3a ABCANZ	NZ	MIL-PRF-27617 F (+) Type II	AF	MIL-PRF-27617 F Type III AF
4 Acceptable Substitutes	Sea			
	Air			
5 Emergency Substitutes	Land			G-382, G-450
	Air			
6 Observations & Remarks	Sea			
	Land			
6a Availability	See G-1350 for Type IV	See G-1350 for Type IV		
7 Qual / 8 WG	Yes / Air	Yes / Air	(U) Limited stocks Yes / Army	Yes / Army

DEF STAN 01-005 Issue 19

1 NATO Code	G-412	G-414 (7101)	G-421 (7101)	G-450					
2 Product Description	Grease graphite medium	Grease, general use (-30°C to +130°C)	Grease, general use (-30°C to +150°C)	Grease, naval general-purpose, ball & roller bearing					
3 NATO Nations	ALB								
	BEL	VV-G-671 G	A	DCSEA 301/A	af A	DSian 91-105 Iss 2 Amd 1			
	BGR								
	CAN								
	CZE		VJS PHM 5-1-P Iss 6	A		TL 9150-007/5 Iss 4	n af A		
	DEU								
	DNK							MIL-PRF-24139 A	N af a
	ESP	VV-G-671 G	n af A	DCSEA 301/A Ed 2	n af A	DSian 91-105 Iss 2 Amd 1	AF a	MIL-PRF-24139 A Amd 3	N af
	EST								
	FRA			DCSEA 301/A Iss 2 Amd 1	n af A				
	GBR	DSian 91-18 Iss 2 Amd 2 (+) XG-264	n af A		DSian 91-105 Iss 2 Amd 1 XG-291	n AF a		DSian 91-28 Iss 1 XG-160	N
	GRC	VV-G-671 F	N	Note L	STANAG 7101	A	Note L		
	HUN								
	HVR								
	ITA							MIL-PRF-24139 A	N
	LTU								
	LUX								
	LVA								
	NLD	VV-G-671 F	n af A		TL 9150-007/5 Iss 4	n af A			
	NOR								
	POL							MIL-G-24139 A	N
	PRT							MIL-PRF-24139 A	N
ROU	DSian 91-18 Iss 2 Amd 1 XG-264	N		DSian 91-105 Iss 2 XG-291	N		DSian 91-28 Iss 1	N	
SVK			MSÜ-39.19/G	A					
SVN									
TUR	VV-G-671 F Grade 2	AF							
USA	VV-G-671 G (+)	n af A Note 1							
AS	DSian 91-18	Note 1		DSian 91-105					
NZ									
3a ABCANZ									
4 Acceptable Substitutes	Sea							G-403	
	Air								
	Land			G-403					
	Sea							G-382	
	Air								
5 Emergency Substitutes	Land								
		G-355		G-382		G-450			
6 Observations & Remarks	(1) Qualification not required								
	(1) Limited stocks								
	Yes / Army								
	(1) Limited stocks								
6a Availability	(1) Limited stocks								
7 Qua / 8 WG	Yes / Army								

DEF STAN 01-005 Issue 19

1 NATO Code	G-460 (7101)	G-1350	H-515 (3748)	H-522					
2 Product Description	Grease, sea water resistant	Grease, perfluorinated, liquid oxygen compatible	Hydraulic fluid petroleum super clean	Phosphate ester hydraulic fluid, low density, type IV					
3 NATO Nations	ALB								
	BEL	STM 310 B	N	MIL-PRF-5606 H Amd 3 Super clean	n AF a				
	BGR								
	CAN	DStan 91.34 Iss 2 Amd 2 XG-286	N Note L	MIL-PRF-27617 F Type IV	n AF	MIL-PRF-5606 H Amd 3	n AF a	n AF a	
	CZE			VJIS PHM 4.1-L Iss 6	AF a				
	DEU	TL 9150-0066 Iss 7	N at a		MIL-PRF-5606 H Amd 3	n AF a	n AF a		
	DNK	DStan 91.34 Iss 2 Amd 2	N at		MIL-PRF-5606 H Amd 3	n AF a	n AF a		
	ESP	DStan 91.34 Iss 2 Amd 2	N at a		MIL-PRF-5606 H Amd 3	AF a			
	EST								
	FRA	DCSEA 360/A	N		DCSEA 415/A	n AF a			
	GBR	DStan 91.34 Iss 2 Amd 2 XG-286	N at a		DStan 91.48 Iss 2 OM-15	n AF a			
	GRC	DStan 91.34 Iss 1 XG-286	N		MIL-PRF-5606 H Amd 3	n AF a			
	HUN				MIL-PRF-5606 H Amd 1 OM-15	AF Note L			
	HVR								
	ITA			MIL-PRF-27617 F Type IV	AF	MIL-PRF-5606 H Amd 3	n AF a		
	LTU								
	LUX								
	LVA								
	NLD	TL 9150-0066 Iss 7	N at a		MIL-PRF-5606 H Amd 3	n AF a		SAE AS 1241C Type IV Class 1	AF Note L
	NOR								
	POL	DStan 91.34 Iss 2 Amd 2	N						
	PRT	STM 310 A	N Note L	MIL-PRF-27617 G Amd 1 Type IV	AF	MIL-PRF-5606 H Amd 3	n AF a		
	ROU	DStan 91.34 Iss 1 XG-286	N		MIL-PRF-5606 H Amd 1	n AF a			
	SVK				MSU-212.1/H	at (A)			
	SVN								
	TUR	STM 310 A	N Note L		MIL-PRF-5606 H Amd 3	n AF a			
	USA			MIL-PRF-27617 G Amd 1 (+) Type IV	AF	MIL-PRF-5606 H Amd 3	n AF a	SAE AS 1241C Type IV Class 1	n AF a Note L
	3a ABCANZ	AS	DStan 91.34			MIL-PRF-5606			
NZ		DStan 91.34 Iss 1	N		MIL-PRF-5606 H	AF			
4 Acceptable Substitutes	Sea								
	Air								
5 Emergency Substitutes	Land								
	Sea	G-421							
6 Observations & Remarks	Air								
	Land								
7 Qual / 8 WG	(1) Limited stocks Yes / Navy	Yes / Air		(7) Preferred emerg subs for GE Army (1) H-537 is the only emerg subs for UK aircraft (2) H-537, H-538 are preferred emerg subs for US aircraft, GE AF (3) C-635 used as a last resort for US	(1) Limited stocks Yes / Air	(1) Limited stocks No / Air			

DEF STAN 01-005 Issue 19

1 NATO Code	H-523	H-524	H-537 (3748)	H-538 (3748)
2 Product Description	Phosphate ester hydraulic fluid, standard density, type IV	Phosphate ester hydraulic fluid, type V	Hydraulic fluid synthetic, hydrocarbon	Hydraulic fluid low temperature synthetic
ALB				
BEL			MIL-PRF-83282 D Amd 1	
BGR				
CAN	SAE AS 1241C Type IV Class 2	AF	MIL-PRF-83282 D Amd 1	MIL-PRF-87257 B n AF a
CZE				
DEU			MIL-PRF-83282 D Amd 1	MIL-PRF-87257 B n AF Note 2
DNK			MIL-PRF-83282 D Amd 1	MIL-PRF-87257 B AF
ESP			MIL-PRF-83282 D Amd 1	AF a
EST				
FRA			DCSEA 437/B	n AF a
GBR			MIL-PRF-83282 D Amd 1 OX-19	AF MIL-PRF-87257 B OX-538 n AF Note L
GRC			MIL-PRF-83282 D Amd 1	n AF a
HUN				
HVR				
ITA			MIL-PRF-83282 D Amd 1 Amd Int 1	n (AF) Note L
LTU				
LUX				
LVA				
NLD			MIL-PRF-83282 D Amd 1	n AF
NOR				
POL				
PRT			MIL-PRF-83282 D Amd 1	AF
ROU				
SVK				
SVN				
TUR			MIL-PRF-83282 D Amd Int 1	n AF a
USA	SAE AS 1241C Type IV Class 2	n AF a Note L	MIL-PRF-83282 D Amd 1	MIL-PRF-87257 B AF a
AS			MIL-PRF-83282	
NZ			MIL-PRF-83282 D Amd 1	Note L
Sea				
Air				H-515, (1)
Land				
Sea				
Air			C-535, H-544, H-515*, (1, 2)	H-537*
Land				
6 Observations & Remarks	(*) Only for US aircraft (1) H-515, only emerg subs for GE (2) H-515, H-520, H-538; only emerg subs for US aircraft			
6a Availability	(1) Limited stocks	No / Air	(1) Limited stocks	(1) Limited stocks
7 Qual / 8 WG	No / Air		Yes / Air	Yes / Air

DEF STAN 01-005 Issue 19

1 NATO Code	H-540	H-542 (7093)	H-544 (7093)	H-547
2 Product Description	Hydraulic fluid petroleum	Brake fluid, automotive borate ester base	Hydraulic fluid synthetic, flammable	Brake fluid, synthetic, silicone
ALB				
BEL	TL 9150-0035 Iss 7	AFEP 7093		MIL-PRF-46176 B A Note L
BGR				
CAN		STANAG 7093	Note L MIL-PRF-46170 E Type I	MIL-PRF-46176 B A
CZE	VJS PHM 6-5-P Iss 3	A Note N VJS PHM 6-1-P Iss 7	A TL 9150-0097 Iss 4, or MIL-PRF-46170 E Type I	
DEU	TL 9150-0035 Iss 7 (+)	n af A TL 9150-0101 Iss 1 DOT 4 wet boiling pt >180°C	n af A TL 9150-0097 Iss 4, or MIL-PRF-46170 E Type I	A Note L
DNK	TL 9150-0035 Iss 7	n af A	MIL-H-46170 E Type I	A
ESP	TL 9150-0035 Iss 7	AF a NME-3009/2015	n af A MIL-PRF-46170 E Type I	
EST				
FRA		DCSEA 402/B DOT 4 / 5.1 SAE J 1704	n af A	
GBR				
GRC	TL 9150-0035 Iss 5	n af A		
HUN				
HVR				
ITA				
LTU				
LUX				
LVA				
NLD	TL 9150-0035 Iss 7	af A	TL 9150-0097 Iss 4, or	A
NOR				
POL				
PRT	TL 9150-0035 Iss 7	A	MIL-PRF-46170 E Type I	A MIL-PRF-46176 B A
ROU				
SVK	MSU-212 2/H	A		
SVN				
TUR			MIL-PRF-46170 D Type I	n af A MIL-B-46176 A And 1 DOT 5 AF
USA			MIL-PRF-46170 E Type I	A MIL-PRF-46176 B (+) n A
AS		SAE J 1704 DOT 4	Note L	
NZ				
3a ABCANZ				
Sea				
Air				
Land				
5 Emergency Substitutes				
Land	H-515, C-635, H-544, H-574		H-537	
Air				
Sea				
6 Observations & Remarks				
6a Availability	(N) No stock Yes / Army	(L) Limited stocks Yes / Army	(L) Limited stocks Yes / Army	(L) Limited stocks Yes / Army
7 Qual / 8 WG				

1 NATO Code	H-548 (7093)	H-549	H-572	H-573 (4601)				
2 Product Description	Hydraulic fluid, automatic transmission	Brake fluid automotive polyglycol base DOT 3 - SAE J 1703	Hydraulic fluid petroleum uninhibited ISO VG 68	Hydraulic fluid petroleum inhibited, ISO VG 46				
3 NATO Nations	ALB							
	BEL	STANAG 7093	A	SAE J 1703 DOT 3	A	MIL-PRF-17672 E	N	
	BGR	DEXTRON II D	n af A Note L			BDS ISO 11158-05	n af A Note L	
	CAN	STANAG 7093	A	SAE J 1703 Iss 2014 DOT 3	n af A			
	CZE					VJS PHM 4-3-P BS 7	A	
	DEU							
	DNK					MIL-PRF-17672 D And 3 MS 2110 TH	N	
	ESP	AFLP-7093 Ed A Ver 1	n af A		BS 4475:2000	n af A	MIL-PRF-17672 E MS 2110 TH	N af a
	EST							
	FRA	DCSEA 403/D NIVEAU/LEVEL FZG 12	n af A			STM 422 A	N	
	GBR	STANAG 7093 GMN 10095; OX-75	n af A		BS 4475:2000 (+) Grade CS-68 OM-65	N Note 1		
	GRC	STANAG 7093	A Note L		BS 4475:1991 Grade CSB-68	N	MIL-PRF-17672 D And 3 MS 2110 TH	n af A
	HUN							
	HVR							
	ITA						MIL-PRF-17672 E	N
	LTU							
	LUX							
	LVA							
	NLD	STANAG 7093	n af A		BS 4475:2000 Grade CS-68	n AF Note 1		
	NOR							
POL						MIL-PRF-17672 D And 3 MS 2110 TH	N	
PRT				BS 4475:2000 Grade CS-68	N	MIL-PRF-17672 E And 3 MS 2110 TH	N	
ROU								
SVK						MSU-212 2/H	A	
SVN								
TUR						MIL-PRF-17672 D And 3 MS 2110 TH	N af a	
USA						MIL-PRF-17672 E MS 2110	N af a	
3a ABCANZ	AS							
	NZ				BS 4475:1991 Grade CS-68	N Note 1		
	Sea							
4 Acceptable Substitutes	Air							
	Land							
5 Emergency Substitutes	Sea					H-573		
	Air							
	Land							
6 Observations & Remarks	(1) Specify VI 95 min							
7 Qual / 8 WG	(1) Limited stocks Yes / Army	Yes / Army	Yes / Navy	(1) Limited stocks Yes / Navy				

DEF STAN 01-005 Issue 19

1 NATO Code	H-574 (4601)	H-575	H-576 (4601)	H-579
2 Product Description	Hydraulic fluid petroleum anti-wear zinc-containing ISO VG 46	Hydraulic fluid petroleum ordnance	Hydraulic fluid petroleum anti-wear, ashless ISO VG 32	Hydraulic fluid water glycol fire resistant
ALB				
BEL		MIL-DTL-17111 E Amd1	DSian 91-39 Iss 3 Amd 1	N
BGR				
CAN		MIL-DTL-17111 D	N	
CZE				
DEU	TL 9150-0081 Iss 3	N at a	MIL-DTL-17111 E Amd 1 OS	N
DNK		MIL-DTL-17111 D OS	N a	
ESP		MIL-DTL-17111 E Amd 1	N at a	DSian 91-39 Iss 3 Amd 1
EST				
FRA		MIL-DTL-17111 E OS	N	DCSEA 479/A
GBR			DSian 91-39 Iss 3 Amd 1 OM-33	N at a
GRC		MIL-DTL-17111 D	N	
HUN				
HVR				
ITA		MIL-DTL-17111 D OS	N	
LTU				
LUX				
LVA				
NLD		MIL-DTL-17111 E Amd 1 OS	N	DSian 91-39 Iss 3 Amd 1
NOR				
POL		MIL-DTL-17111 D OS	N	MIL-H-22072 C
PRT		MIL-DTL-17111 D	N	STM 7310 A Iss 2
ROU			Note L	
SVK			DSian 91-39 Iss 3 OM-33	N
SVN			MSU-212-2/H	A
TUR		MIL-DTL-17111 D OS	N	MIL-H-22072 C
USA		MIL-DTL-17111 E Amd 1 (+)	N a	MIL-H-22072 C (+)
AS			MIL-DTL-17111 D OS	
NZ		MIL-DTL-17111 C	DSian 91-39 Iss 3	N
3a ABCANZ				DSian 91-110
Sea				
Air				
Land				
5 Emergency Substitutes				
Sea				
Air				
Land				
6 Observations & Remarks		High viscosity index (1) Qualification not required		(1) Surface ships only
6a Availability				
7 Qual / 8 WG	Yes / Navy	(1) Limited stocks	Yes / Navy	Yes / Navy

DEF STAN 01-005 Issue 19

1 NATO Code	H-580	H-584	C-608	C-609
2 Product Description	Hydraulic fluid, phosphate ester fire resistant	Hydraulic fluid, emulsifying, ISO VG 32 HM	Corrosion preventive oil, aircraft engine concentrate	Corrosion preventive oil, aircraft engine- piston
ALB				
BEL				MIL-C-6529 C And 2 Type II AF
BGR				
CAN		DStan 91.35 Iss 3 And 1 OX-30	MIL-C-6529 C And 2 Type I AF	MIL-C-6529 C And 2 Type II n (AF)
CZE				
DEU				
DNK				
ESP	MIL-H-19457 D (N) at		MIL-C-6529 C And 2 Type I n (AF)	MIL-C-6529 C And 2 Type II n AF a
EST				
FRA	DCSEA 446/A FHORI N			
GBR		DStan 91.35 Iss 3 And 1 (+) OX-30 N		
GRC			MIL-C-6529 C And 2 Type I AF	MIL-C-6529 C And 2 Type II n (AF)
HUN				
HVR				
ITA			MIL-C-6529 C And 2 Type I AF a	MIL-C-6529 C And 2 Type II n AF a
LTU				
LUX				
LVA				MIL-C-6529 C And 2 Type II AF Note L
NLD				
NOR				
POL				
PRT			MIL-C-6529 C And 2 Type I AF	MIL-C-6529 C And 2 Type II AF
ROU				
SVK				
SVN				
TUR	MIL-H-19457 D Note L		MIL-C-6529 C And 2 Type I AF a	MIL-C-6529 C And 2 Type II AF a
USA	MIL-H-19457 D (+) N a Note 1		MIL-C-6529 C And 2 (+) Type I n AF a	MIL-C-6529 C And 2 (+) Type II n AF a
AS			MIL-C-6529 Type I	MIL-C-6529 Type II
NZ				MIL-C-6529 C And 2 Type II
Sea				
Air				
Land				
6	(1) Qualification not required			
Observations & Remarks				
6a Availability	(1) Limited stocks Yes / Navy	Yes / Navy	Yes / Air	(1) Limited stocks Yes / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	C-610	C-614	C-615	C-620
2 Product Description	Corrosion preventive oil, aircraft engine: turbine	Corrosion preventive compound soft film, cold application	Corrosion preventive oil, aircraft engine: piston metallic	Corrosion preventive compound soft film, cold application
ALB				
BEL				MIL-PRF-16173 E And 1 Grade 2
BGR				
CAN	MIL-C-6529 C And 2 Type III	n AF		MIL-PRF-16173 E And 1 Grade 2
CZE				
DEU				TL 8030-0015 Iss 5 Type II
DNK				
ESP	MIL-C-6529 C And 2 Type III	n (AF)		MIL-PRF-16173 E And 1 Grade 2
EST				
FRA	DCSEA 510/B	n AF	AIR 1503/B Iss 3	DCSEA 520/A
GBR		DSian 80-217 Iss 1 (+) PX-1	AIR 1503 PX-27	n AF a Note 1
GRC	MIL-C-6529 C And 2 Type III	n AF	AIR 1503/B Iss 3 Type A	MIL-PRF-16173 E And 1 Grade 2
HUN				
HVR				
ITA	MIL-C-6529 C And 2 Type III	n AF a	DSian 91-40 Iss 3	AF
LTU				
LUX				BA-PC-508/A Grade 2
LVA				
NLD	MIL-C-6529 C And 2 Type III	AF Note L	DSian 80-217 Iss 1	af A Note L
NOR				
POL				
PRT	MIL-C-6529 C And 2 Type III	AF	DSian 91-40 Iss 3	n AF
ROU				
SVK				
SVN				
TUR	MIL-C-6529 C And 2 Type III	AF a		MIL-PRF-16173 E Grade 2
USA	MIL-C-6529 C And 2 (+) Type III	n AF a		MIL-PRF-16173 E (+) Grade 2
AS	MIL-C-6529 Type III			MIL-PRF-16173 Grade 2
NZ		DEF-2331 A AMD 3	AF	MIL-PRF-16173 E And 1 Grade 2
Sea				
Air				
Land				
6 Observations & Remarks				(1) Qualification required
7 Qual / 8 WG	(1) Limited stocks Yes / Air	(1) Limited stocks Yes / Army	Yes / Air	Yes / Army

1 NATO Code	C-630	C-632	C-633	C-634
2 Product Description	Corrosion preventive soluble oil thrust augmentation fluid	Corrosion preventive compound hard film, cold application	Corrosion preventive compound hard film hot application	Corrosion preventive compound water displacing
3 NATO Nations	ALB			
	BEL	MIL-PRF-16173 E And 1 Grade 1	af A	DSian 68-10 Iss 5
	BGR			
	CAN	MIL-PRF-16173 E And 1 Grade 1	n af A	
	CZE			
	DEU	TL 6890-0014 Iss 4	n AF a	DSian 68-10 Iss 5
	DNK			
	ESP	MIL-PRF-16173 E And 1 Grade 1	af A	DSian 68-10 Iss 5
	EST			
	FRA	DCSEA 530/A	n AF	DCSEA 534/B
	GBR			DSian 68-10 Iss 4 PX-24
	GRC	MIL-DTL-4339 E	n AF	
	HUN			DSian 68-10 Iss 5 PX-24
	HVR			
	ITA			DSian 68-10 Iss 5
	LTU			
3a ABCANZ	LUX	BA-PC-508/A Grade 1	A	
	LVA			
	NLD	MIL-PRF-16173 E Grade 1	n af A	AFR 3634 Iss 1
	NOR			
	POL			
	PRT	MIL-DTL-4339 E	N	
	ROU			DSian 68-10 Iss 5 PX-24
	SVK			MSÜ-211.23/O
	SVN			
	TUR			
	USA	MIL-DTL-4339 E (+)	n AF Note 1	
	AS			DSian 68-10
	NZ			DSian 68-10 Iss 4
	Sea			
	Air			
	Land			
5 Emergency Substitutes				
4 Acceptable Substitutes				
6 Observations & Remarks	(1) Qualification not required			
6a Availability	(1) Limited stocks			(1) Limited stocks
7 Qual / 8 WG	Yes / Air	Yes / Army	Yes / Army	Yes / Air

1 NATO Code		C-635 (7093)		C-638		C-640		C-642	
2 Product Description		Corrosion preventive oil hydraulic system		Corrosion preventive oil, aircraft engine turbine synthetic		Lubricating oil engine: preservative, grade 10		Lubricating oil engine: preservative, grade 30	
	ALB								
	BEL	MIL-PRF-6083 G	AF a	MIL-PRF-8188 D	AF				
	BGR								
	CAN	MIL-PRF-6083 G	AF a	MIL-PRF-8188 D	n AF			MIL-PRF-21260 E Grade 30	n A
	CZE								
	DEU	MIL-PRF-6083 G or DCSFA 535/A	n af A	MIL-PRF-8188 D	n AF a				
	DNK	MIL-PRF-6083 G	af A						
	ESP	MIL-PRF-6083 G	n A	MIL-PRF-8188 D	n (AF)			MIL-PRF-21260 E Grade 30	af A
	EST								
	FRA								
	GBR	DStan 80-142 Iss 2 And 1 PX-26	AF a					DStan 80-34 Iss 3 And 1	n af A
	GRC	MIL-PRF-6083 G	n A			MIL-PRF-21260 E Grade 10	n A Note L	MIL-PRF-21260 E Grade 30	n A Note L
	HUN								
	HVR								
	ITA	MIL-PRF-6083 F	AF a	MIL-PRF-8188 D	n AF			MIL-PRF-21260 E Grade 30	n af (A)
	LTU								
	LUX								
	LVA								
	NLD	MIL-PRF-6083 G	n af A	MIL-PRF-8188 D	n AF	MIL-PRF-21260 E Grade SAE 10W	n A	MIL-PRF-21260 E And 2 Grade SAE 30	n af A
	NOR								
	POL								
	PRT	MIL-PRF-6083 F	(AF) a	MIL-PRF-8188 D	AF	MIL-PRF-21260 E Grade SAE 10W	A	MIL-PRF-21260 E Grade SAE 30	A
	ROU								
	SVK								
	SVN								
	TUR	MIL-PRF-6083 F	AF a	MIL-C-8188 C And 1	AF a	MIL-PRF-21260 E Grade SAE 10W	af (A)	MIL-L-21260 D And 2 Grade 30	AF
	USA	MIL-PRF-6083 G	n af A	MIL-PRF-8188 D (+)	AF a	MIL-PRF-21260 E (+) Grade SAE 10W	n af A	MIL-PRF-21260 E (+) Grade SAE 30	n af A
3a ABCANZ	AS	MIL-PRF-6083		MIL-PRF-8188					
	NZ	MIL-PRF-6083 F	AF						
4 Acceptable Substitutes	Sea								
	Air								
	Land								
5 Emergency Substitutes	Sea								
	Air								
	Land								
6 Observations & Remarks									
7 Qual / 8 WG		Yes / Army		Yes / Air		(L) Limited stocks Yes / Army		(L) Limited stocks Yes / Army	

DEF STAN 01-005 Issue 19

1 NATO Code	S-712	S-716	S-717	S-718
2 Product Description	Compass fluid: aircraft, petroleum	Anti-seize compound: lead free	Anti-seize compound: aircraft oxygen system	Anti-seize compound: aircraft oxygen system
ALB				
BEL				
BGR				
CAN	MIL-DTL-5020 F		MIL-T-5542 E Amd 1 MI	n AF
CZE				
DEU	MIL-DTL-5020 F	n AF		
DNK	MIL-L-5020 E	AF		
ESP	MIL-DTL-5020 E	AF		
EST				
FRA				
GBR				DTD 900/4042A (+) ZX-24
GRC	MIL-DTL-5020 E	AF	AF	n AF
HUN		TT S 1732		
HVR				
ITA				
LTU				
LUX				
LVA				
NLD		TT S 1732	n (AF)	
NOR				
POL				
PRT	MIL-DTL-5020 E	AF	MIL-T-5542 E MI	AF
ROU				
SVK				
SVN				
TUR	MIL-L-5020 C	AF	MIL-T-5542 E MI	AF
USA	MIL-DTL-5020 F (+)	n AF		
AS				DTD 900/4042
NZ			MIL-T-5542 E MI	(AF) DTD 900/4042A
AF				AF
3a ABCANZ				
5 Emergency Substitutes				
Land				
Air				S-717*
Sea				
4 Acceptable Substitutes				
Land				
Air				
Sea				
6 Observations & Remarks			MIL-T-5542 E (SH) is incompatible with MIL-T-5542 E (M)	(*) Not to be used over 140 bars (2000 psi)
6a Availability	No / Air	No / Air	Yes / Air	Yes / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	S-720	S-722	S-732	S-736
2 Product Description	Anti-seize compound: aircraft graphite petrolatum	Anti-seize compound: molybdenum disulphide	Graphite powder lubricating	Silicone compound electrical insulating
3 NATO Nations	ALB			
	BEL	DSian 80-80 Iss 2	AF a	SAE AS-8660
	BGR			
	CAN	SAE AMS-2518 D	AF	
	CZE			
	DEU	DSian 80-80 Iss 2	n AF a	SAE AS-8660
	DNK	DSian 80-80 Iss 2	n AF	
	ESP	DSian 80-80 Iss 2	n AF a	
	EST			
	FRA	AIR 4247/A Iss 2	n AF a	
	GBR	DSian 80-80 Iss 2 ZX-13	n AF a	DSian 68-69 Iss 1 And 1 (+) XG-250
	GRC	SAE AMS-2518 A	AF	MLL-S-8660 C And 1
	HUN			
	HVR			
	ITA	DSian 80-80 Iss 2	AF a	
	LTU			
	LUX			
	LVA			
	NLD	AIR 4247/A Iss 2	n AF a	SAE AS-8660 And 1
	NOR			
	POL			
	PRT	SAE AMS-2518 D	n AF	SAE AS-8660
	ROU			DSian 68-69 Iss 1 XG-250
	SVK			
	SVN			
	TUR	SAE AMS-2518 D	AF a	MLL-S-8660 C And 1
	USA	SAE AMS-2518 D (+)	n AF	SAE AS-8660 (1999)
	AS			SAE AS-8660
3a ABCANZ	NZ	DSian 80-80 Iss 1 And 1	AF	DSian 80-81 Iss 2
4 Acceptable Substitutes	Sea			
	Air			
5 Emergency Substitutes	Land			
	Air			
6 Observations & Remarks	Sea			
	Land			
6a Availability	No / Air	Yes / Air	(1) Limited stocks	(1) Limited availability for the Navy
7 Qual / 8 WG			No / Air	Yes / Air

DEF STAN 01-005 Issue 19

1 NATO Code	S-737	S-738	S-740	S-742
2 Product Description	Isopropanol technical	Ethanol denatured	Molybdenum disulphide powder lubricating	De-icing, de-frosting fluid: aircraft surfaces ground use
ALB				
BEL	TT-I-735A And 3 Grade B	AF	O E 00760/D And 2 Type III	AF
BGR				
CAN			SAE-AMS-M-7866	n AF
CZE		VJS PHM 7-2-P Iss 4	af A Note L	
DEU	TL 6810-0002 Iss 6	n AF a	TL 6810-0001 Iss 6	n (AF) a
DNK	TT-I-735A And 3 Grade B	AF	SAE-AMS-M-7866	AF a
ESP	DCSEA 637/A	AF a	DCSEA 638/A	n AF a
EST				
FRA	DCSEA 637/A	n AF	DCSEA 638/A (+)	n AF a
GBR	BS 1595 Pt 1 1986 AL-11	n AF a	DSian 68-62 Iss 2 (+) ZX-35	n AF
GRC	TT-I-735 A And 3 Grade B	AF a Note 1	O E 00760/D And 2 Type III	AF a Note 1
HUN				
HVR				
ITA			SAE-AMS-M-7866	n AF a
LTU				
LUX				
LVA				
NLD	TT-I-735 A And 3 Grade B	n AF	O E 00760/D And 2 Type III	n AF
NOR				
POL				
PRT	TT-I-735 A And 3 Grade B	n AF	A-A-53880 denatured IAW 27 CFR 21.35	AF
ROU			MSU-414 B/S	A
SVK				
SVN				
TUR	TT-I-735 A And 3 Grade B	AF	O E 00760/D And 1 Type III	AF
USA	TT-I-735 A And 3 (+) Grade B	N af a	A-A-53880 denatured IAW 27 CFR 21.35	n AF
AS	BS 1595 And 1		DEF(AUS) 5438	DSian 68-62
NZ	BS 1595 And 1	af		DSian 68-62 Iss 2
Sea				
Air		S-738		
Land				
Sea				
Air			S-737*	
Land				
6 Observations & Remarks	(1) Commercial quality (2) Insolubility not required	(*) UK not to be used in compasses using ethanol as fluid (1) Commercial quality		
6a Availability	No / Air	No / Air	No / Air	No / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	S-743	S-745	S-747	S-749				
2 Product Description	Petroleum technical	De-icing, de-frosting fluid: aircraft surfaces in flight	Pure methanol technical	Lubricant solid film air drying				
ALB								
BEL	DStan 91-38 Iss 1 And 1 Grade PX-7	n AF a	DTD 406B	MIL-L-23398 D And 2	n AF			
BGR								
CAN	VV-P-236 A And 2	n AF Note L	CGS83-GP-531M	n AF a	MIL-L-23398 D And 2	n AF a		
CZE								
DEU	TL 9150-0042 Iss 6	n AF a	TL 6890-0011 Iss 5	n AF a		MIL-L-23398 D And 2	AF	
DNK	DStan 91-38 Iss 1 And 1 Grade PX-7	n AF a				MIL-L-23398 D And 2	AF a	
ESP	DStan 91-38 Iss 2	n AF a			O-M-232 L Grade A	n AF a	MIL-L-23398 D And 2	n AF a
EST								
FRA	AIR 3565/A Iss 2	n AF a	DTD 406 B	n AF				
GBR	DStan 91-38 Iss 1 And 1 Grade PX-7	n AF a	DTD 406B (+) AL-5	n AF	BS 506 Pt 1 1987 AL-14	AF a	MIL-L-23398 D And 2 ZX-95	n AF a
GRC	VV-P-236 A And 2	n AF a			O-M-232 L Grade A	AF a	MIL-L-23398 D And 2	n AF a
HUN								
HVR								
ITA	VV-P-236 A And 2	n AF a					MIL-L-23398 D And 2	AF
LTU								
LUX								
LVA								
NLD	DStan 91-38 Iss 1 And 1 Grade PX-7	n AF a			O-M-232 L Grade A	n (AF)	MIL-L-23398 D And 2 Type II	n AF
NOR								
POL								
PRT	VV-P-236 A And 2	n AF	DTD 406B	AF			MIL-L-23398 D And 2	n AF
ROU	VV-P-236 A And 2	AF					MIL-L-23398 D And 2	AF
SVK								
SVN								
TUR	VV-P-236 A	n AF a			O-M-232 G Grade A	AF	MIL-L-23398 D And 2 Type II	n AF
USA	VV-P-236 A And 2 (+)	n AF a			O-M-232 N (+) Grade A	n af A	MIL-L-23398 D And 2 (+)	n AF a
AS	DStan 91-38 Iss 1 And 1 Or VV-P-236				BS 506 Pt 1		MIL-L-23398 Type II	
NZ	DStan 91-38 Iss 1	AF			BS 506 And 1	(AF)	MIL-L-23398 D And 2	n AF
3a ABCANZ								
Sea								
Air								
Land								
4 Acceptable Substitutes								
Land								
Sea								
Air								
Land								
5 Emergency Substitutes								
Sea								
Air								
Land								
6 Observations & Remarks					Consult appropriate T.O. for water purity for blends.			
6a Availability	(L) Limited stocks							
7 Qual / 8 WG	No / Air	No / Air	No / Air	No / Air	Yes / Air			

DEF STAN 01-005 Issue 19

1 NATO Code	S-750 (7093)	S-752	S-753	S-756
2 Product Description	Anti-freeze automotive engine	Dry cleaning solvent (white spirit); flash point 38°C	Dry cleaning solvent (white spirit); flash point 65°C	Insulating oil electrical
ALB				
BEL				DCSEA 668/C
BGR	BDS 1026.1982	n af A Note L		
CAN	CID A-A-52624A	n af A	MIL-PRF-680 C	af A
CZE				
DEU		TL 68.10-0012 Iss 8	n af (A)	
DNK				IEC 60296:2013 (I)
ESP	A-A-52624 A	AF a	MIL-PRF-680 C Type II	af A
EST				
FRA		DCSEA 602/D	n af A	DCSEA 668/C
GBR		BS 245:1976 Type A White Spirit	af A	BS 60296 OM-16
GRC	A-A-52624 A	af A	MIL-PRF-680 A And 1 Type I	BS 148.1984
HUN			Note L	A
HVR				
ITA				
LTU				
LUX				
LVA				
NLD		MIL-PRF-680 C Type I	n AF	MIL-PRF-680 C Type II
NOR				AF
NOR				NEN 10296 Iss 1 Class 1A
POL				
PRT	A-A-52624 A	A	MIL-PRF-680 C Type I	AF a
ROU				
SVK				
SVN				
TUR			MIL-PRF-680 C Type I	n af A
USA	A-A-52624 A Type I	n af A	MIL-PRF-680 C (+) Type I	n A
USA			MIL-PRF-680 C (+) Type II	n af A
AS		AS 3530		AS 17617.1 Class 1
NZ		P-D-680 And 2 Type I	AF	MIL-PRF-680 Type II
Sea				AF
Air				
Land		S-753		S-752
Sea				
Air				
Land	S-757			
6 Observations & Remarks				(1) Qualification required
6a Availability	(1) Limited stocks	(1) Limited stocks	(1) Limited stocks	
7 Qual / 8 WG	No / Army	Yes / Army	Yes / Army	No / Army

DEF STAN 01-005 Issue 19

1 NATO Code	S-757 (7093)	S-758	S-760	S-761
2 Product Description	Anti-freeze, inhibited ethanediol	Lubricant, cleaner & preservative for weapons	Dry cleaning solvent low aromatics	General purpose, weapons oil
ALB				
BEL		BT-PS-661 A Amnd1	n af A	
BGR				
CAN		MIL-PRF-63460 E Amnd 4	n af A	
CZE		VJS PHM 4-17-P Iss 2	A Note L	
DEU				TL 9150-0078 Iss 7 (+) n af A
DNK		BT-PS-661A Amnd 1	n af A	TL 9150-0078 Iss 6 n af A
ESP		MIL-PRF-63460 F	A	TL 9150-0078 Iss 7 AF A
EST				
FRA		DCSEA 5011A Iss 1	n af A	
GBR	DStan 68-127 Iss 2 Amnd 1 AL-39			
GRC		MIL-PRF-63460 E	n AF MIL-PRF-680 C Type III	af A
HUN		MIL-PRF-63460 E	A Note L	
HVR				
ITA		MIL-PRF-63460 E	A	
LTU				
LUX				
LVA				
NLD	PVE 104215	n af A	BT-PS-661 A Amnd 1 (3W) n af (A) Note L	MIL-PRF-680 C Type III n AF TL 9150-0078 Iss 7 n af A
NOR				
POL				
PRT		DCSEA 5011A Iss 1	n AF	MIL-PRF-680 C Type III AF a
ROU				
SVK				
SVN				
TUR				
USA		MIL-PRF-63460 E Amnd 4 (+)	n af A	MIL-PRF-680 C (+) Type III n af A
AS		MIL-PRF-63460 or STANAG 1135		
NZ		MIL-PRF-63460 D	af	
3a ABCANZ				
Sea				
Air				
Land		O-158*, O-190*		
5 Emergency Substitutes				
Sea				
Air				
Land		O-158*, O-190*		
6				
Observations & Remarks		(*) Except BE and NO		
6a Availability				
7 Qual / 8 WG	No / Army	(L) Limited stocks Yes / Army	Yes / Army	Yes / Army

DEF STAN 01-005 Issue 19

1 NATO Code	S-790		S-1712	S-1714	S-1716
2 Product Description	Lubricity improver additive, fuel naval distillates		Damping fluid: dimethyl silicone 3cSt	Damping fluid: dimethyl silicone 10cSt	Damping fluid: dimethyl silicone 20cSt
ALB					
BEL					
BGR					
CAN			VV-D-1078 B	n AF	VV-D-1078 B n AF
CZE					
DEU					VV-D-1078 B AF Note L
DNK			VV-D-1078 B	AF a Note L	VV-D-1078 B n AF
ESP			VV-D-1078 B	n AF a	
EST					
FRA					
GBR		Proprietary ZX-41	AF Note L	Proprietary ZX-42	AF Note L
GRC					
HUN					
HVR					
ITA			VV-D-1078 B	n (AF)	VV-D-1078 B n (AF)
LTU					
LUX					
LVA					
NLD			VV-D-1078 B	n (AF) Note L	VV-D-1078 B AF Note L
NOR					
POL					
PRT			VV-D-1078 B	AF	VV-D-1078 B AF
ROU					
SVK					
SVN					
TUR			VV-D-1078 B	n AF	VV-D-1078 B n AF
USA			VV-D-1078 B	N af	VV-D-1078 B N af
AS					Proprietary ZX-43
NZ			DStan 91-46 Iss 2	AF Note L	
Sea					
Air					
Land					
Sea					
Air					
Land					
6 Observations & Remarks					
6a Availability			(L) Limited stocks Yes / Air	(L) Limited stocks Yes / Air	(L) Limited stocks Yes / Air
7 Qual / 8 WG	No / Navy				

DEF STAN 01-005 Issue 19

1 NATO Code	S-1717	S-1718	S-1719	S-1720
2 Product Description	De-icing/anti-icing Newtonian fluid: aircraft surfaces ground use	Damping fluid: dimethyl silicone 50cSt	De-icing / anti-icing non-Newtonian fluid: aircraft surfaces ground use	Damping fluid: dimethyl silicone 100cSt
ALB				
BEL	SAE AMS 1424 K Type I		SAE AMS 1428 G Type II	
BGR				
CAN	SAE AMS 1424 H Type I	AF	SAE AMS 1428 E Type II	VF-D-1078 B n AF
CZE				
DEU	TL 6850-0057 Iss 1 & SAE AMS 1424 M		TL 6850-0043 Iss 4 & SAE AMS 1428 H	AF
DNK	SAE AMS 1424 H Type I	AF	VF-D-1078 B	VF-D-1078 B AF a
ESP		VF-D-1078 B	n AF	SAE AMS 1428 G
AF				
EST				
FRA	DCSEA 623/A	n AF		DCSEA 624/A
GBR		Proprietary ZX-44	n AF	SAE AMS 1428 G Type II AL-342
GRC				VF-D-1078 B
HUN				
HVR				
ITA		VF-D-1078 B	n (AF)	VF-D-1078 B n (AF)
LTU				
LUX				
LVA				
NLD	SAE AMS 1424 K Type I	AF Note L	VF-D-1078 B	n (AF)
NOR				
POL				
PRT		VF-D-1078 B	AF	VF-D-1078 B
ROU				
SVK				
SVN				
TUR		VF-D-1078 B	n AF	VF-D-1078 B n AF
USA	SAE AMS 1424 M (+)	n AF	VF-D-1078 B	N af
AS			SAE AMS 1428 H (+) Type II	AF
NZ		Proprietary ZX-44		Proprietary ZX-45
3a ABCANZ				DSian 91-46 Iss 2
Sea				AF Note L
Air				
Land				
5 Emergency Substitutes				
Sea				
Air				
Land				
6 Observations & Remarks			Type II	
6a Availability	(L) Limited stocks		Yes / Air	(L) Limited stocks
7 Qual / 8 WG	Yes / Air		Yes / Air	Yes / Air

DEF STAN 01-005 Issue 19

1 NATO Code	S-1723	S-1724	S-1726	S-1728
2 Product Description	De-icing/anti-icing non-Newtonian fluid: aircraft surfaces ground use	Damping fluid: dimethyl silicone 7.500cSt	Damping fluid: dimethyl silicone 20.000cSt	Damping fluid: dimethyl silicone 100.000cSt
ALB				
BEL				
BGR				
CAN	SAE AMS 1428 E Type IV	AF		
CZE				
DEU				
DNK				VV-D-1078 B
ESP				n AF a
EST				
FRA				
GBR				
GRC				
HUN				
HVR				
ITA		VV-D-1078 B	n (AF)	VV-D-1078 B
LTU				n (AF)
LUX				
LVA				
NLD				
NOR				
POL				
PRT		VV-D-1078 B	AF	
ROU				
SVK				
SVN				
TUR		VV-D-1078 B	n AF	VV-D-1078 B
USA	SAE AMS 1428 H Type IV	AF	VV-D-1078 B	VV-D-1078 B
AS		Proprietary ZX-48	N af	n AF a
NZ				Proprietary ZX-52
3a ABCANZ				
Sea				
Air				
Land				
Sea				
Air				
Land				
5 Emergency Substitutes				
6	Type IV			
Observations & Remarks				
6a Availability	Yes / Air	Yes / Air	Yes / Air	Yes / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	S-1732	S-1735	S-1736	S-1737				
2 Product Description	Damping fluid: dimethyl silicone 200,000cSt	Molybdenum disulphide lubricating oil: silicone base	Anti-seize tape: aircraft oxygen system	Lubricant solid film: extreme environment				
3 NATO Nations	ALB							
	BEL	MIL-DTL-25681 E	n AF a					
	BGR							
	CAN	MIL-DTL-25681 D	n AF	A-A-58092 ASG				
	CZE							
	DEU	MIL-DTL-25681 E	n AF a					
	DNK	DOD L 25681/D	AF					
	ESP	VV-D-1078 B	N	MIL-DTL-25681 E	n AF a			
	EST							
	FRA							
	GBR		DOD L 25681/D OX-70	AF				
	GRC		DOD L 25681/D	n AF	A-A-58092	AF a	MIL-PRF-81329 D And 1	(AF) a
	HUN							
	HVR							
	ITA	VV-D-1078 B	n (AF)	DOD-L-25681 D	n AF a		MIL-PRF-81329 D And 1	AF
	LTU							
	LUX							
	LVA							
	NLD		MIL-DTL-25681 E	n AF	A-A-58092	n AF		
	NOR							
	POL							
	PRT		MIL-DTL-25681 E	(AF) a			MIL-PRF-81329 E	AF
	ROU		DOD L 25681/D	AF				
	SVK							
	SVN							
	TUR		DOD L 25681/D	n AF a			MIL-L-81329 C And 1	AF
	USA	VV-D-1078 B	N af	MIL-DTL-25681 E (+)	n AF	A-A-58092 (+)	n AF	MIL-PRF-81329 E (+)
3a ABCANZ	AS		DOD-L-25681		A-A-58092			
	NZ		DOD-L-25681 D	AF	MIL-T-27730 A (ASG)	AF		
4 Acceptable Substitutes	Sea							
	Air							
5 Emergency Substitutes	Land							
	Sea							
6 Observations & Remarks	Air							
	Land							
7 Qual / 8 WG	Yes / Air	No / Air	No / Air	Yes / Air				

1 NATO Code	S-1738	S-1739	S-1744	S-1745
2 Product Description	Lubricant solid film: heat cured	Water (demineralised)	Methanol/water 44/56 for turbo machines	Fuel system icing inhibitor, high flash point type
ALB				
BEL				MIL-DTL-85470 B n AF a
BGR				
CAN	MIL-PREF-46010 H AF a			ASTM D 4171-11 Type III n (AF)
CZE				VJS PHM 6-1-L Iss 3 AF
DEU	MIL-PREF-46010 H n AF a		TL 6810-0030 Iss 7 n AF	MIL-DTL-85470 B Notice 1 n (AF) Note L
DNK			DSian 68-253 Iss 2 AF	MIL-DTL-85470 B n AF
ESP	MIL-PREF-46010 H Type III AF a	DSian 68-253 Iss 2 n AF a	DSian 68-253 Iss 2 AF	MIL-DTL-85470 B n AF a
EST				
FRA			AIR 3651/A Iss 2 (44/56) n AF	DCSEA 745/B n AF a
GBR	SAE AS 5272 Type I ZX-34 AF	DSian 68-253 Iss 2 (+) (DERD 2491) WTA AF	DSian 68-253 Iss 2 (+) (DERD 2491) AL-28 AF	DSian 68-252 Iss 3 And 1 (DERD 2451) AL-41 n AF
GRC	MIL-PREF-46010 G Type III n AF a			MIL-DTL-85470 B AF a
HUN				MIL-DTL-8547 B AL-41 AF
HVR				
ITA				
LTU				
LUX				
LVA				
NLD		PVE 104211 n AF a		MIL-DTL-85470 B AF
NOR				
POL				
PRT	MIL-PREF-46010 H Type III AF			MIL-DTL-85470 B n AF
ROU				MIL-DTL-85470 B AF
SVK				MSÜ-414, 11/S af (A)
SVN				
TUR	MIL-PREF-46010 G Type I n AF a			
USA	MIL-PREF-46010 H (+) n af A			MIL-DTL-85470 B (+) N af a
AS	MIL-PREF-46010 Type I		DSian 68-253 Iss 1 AL-28 (AF)	MIL-DTL-85470 or DSian 68-252 DSian 68-252 Iss 1 AF
NZ	MIL-PREF-46010 D Type I	Proprietary N	DSian 68-253 Iss 1 (AF)	
Sea				
Air				
Land				
Sea				
Air				
Land				
Sea				
Air				
Land				
6 Observations & Remarks				
6a Availability	Yes / Air	No / Air	No / Air	(1) Limited stocks No / Air
7 Qual / 8 WG				

DEF STAN 01-005 Issue 19

1 NATO Code	S-1746	S-1747 (3390)	S-1748	S-1749
2 Product Description	De-icing & de-frosting fluid: aircraft & surfaces ground use	Corrosion inhibitor & lubricating improver for aircraft use	Coolant fluid, hydrolytically stable, dielectric	Jet fuel thermal stability additive (+100)
3 NATO Nations	ALB			
	BEL	MIL-PRF-25017 H Amd 1	n AF a	
	BGR	STANAG 3390	n AF a Note L	
	CAN	MIL-PRF-25017 G	n AF a	MIL-DTL-83133 H Amd 2 AF
	CZE	VJS PHM 8-1-L Iss 1	AF	
	DEU		MIL-PRF-87252 D AF	
	DNK	MIL-PRF-25017 H Amd 1	AF	MIL-DTL-83133 F AF
	ESP		MIL-PRF-87252 C Amd 1 MIL-PRF-87252 D AF	
	EST			
	FRA	STANAG 3390 ED 12	n AF a	
	GBR	DTD 900/4907 (+) AL-34	AF a	
	GRC			
	HUN		MIL-PRF-25017 F AF Note L	
	HVR			
	ITA			
	LTU			
	LUX			
	LVA			
	NLD	MIL-PRF-25017 H Amd 1	n AF	MIL-PRF-87252 C Amd 1 AF
	NOR			
	POL			
	PRT	MIL-PRF-25017 H Amd 1	AF	
	ROU			
	SVK			
	SVN			
	TUR			
	USA	MIL-PRF-25017 H Amd 1	n AF a	MIL-PRF-87252 D (+) AF
	USA			MIL-DTL-83133 J (+) n AF a
3a ABCANZ	AS			
	NZ			
	Sea			
	Air			
4 Acceptable Substitutes	Land			
	Sea			
	Air			
	Land			
5 Emergency Substitutes	Sea			
	Air			
	Land			
6 Observations & Remarks				
6a Availability				
7 Qual / 8 WG	No / Air	(L) Limited stocks Yes / Air	Yes / Air	No / Air

DEF STAN 01-005 Issue 19

1 NATO Code	S-1750	S-1751	S-1752	S-1764	
2 Product Description	Multi purpose additive: diesel engine	Biocide additive for fuels	Micro organisms detection test set	Aquearous urea solution	
3 NATO Nations	ALB				
	BEL	DCSEA 75J/B Note N	DCSEA 75d Iss 1 n AF a		ISO 22241-1 AF
	BGR	DCSEA 75J/B n af A Note L			
	CAN				
	CZE	VJS PHM 8-5-P Iss 2 Note N	A		
	DEU	DCSEA 75J/B Note L	A		
	DNK	DCSEA 75J/B Note N	A		
	ESP				ISO 22241-1:2006 n af A
	EST				
	FRA	DCSEA 75J/B (+) n af A	DCSEA 75d Iss 1 (+) n AF a	NF M 07-070 (+) n AF a	ISO 22241-1 n af A
	GBR				
	GRC				
	HUN				
	HVR				
	ITA				
	LTU				
	LUX				
	LVA				
	NLD	DCSEA 75J/B n af A Note L	DCSEA 75d Iss 1 AF Note N	NF M 07-070 AF Note N	ISO 22241-1 n af A
	NOR				
	POL				
	PRT		DCSEA 75d Iss 1 n AF a	NF M 07-070 n AF a	
	ROU	DCSEA 75L Iss 1 Note N	A		
SVK	MSU-414 9/S Note N	A			
SVN					
TUR					
USA		DCSEA 75d Iss 1 AF			
3a ABCANZ	AS				
	NZ				
4 Acceptable Substitutes	Sea				
	Air				
5 Emergency Substitutes	Land				
	Sea				
6 Observations & Remarks	Air				
	Land				
6 Observations & Remarks					
7 Qual / 8 WG	(1) Limited stocks: (N) No stock Yes / Army	(N) No stock Yes / Air	(N) No stock Yes / Air	No / Army	

DEF STAN 01-005 Issue 19

1 NATO Code	P-912	P-922	P-923	P-925
2 Product Description	Propellant nitric acid	Propellant unsymmetrical dimethyl hydrazine	Propellant UDMH / turbine fuel aviation wide cut type	Propellant hydrazine-water
3 NATO Nations	ALB			
	BEL			MIL-PRF-87930 A AF
	BGR			
	CAN			MIL-PRF-87930 B AF
	CZE			
	DEU			
	DNK			MIL-PRF-87930 B AF
	ESP			
	EST			
	FRA			
	GBR			
	GRC			MIL-PRF-87930 A AF
	HUN			
	HVR			
	ITA			
	LTU			
	LUX			
	LVA			
	NLD			MIL-PRF-87930 AF
	NOR			
	POL			
	PRT			
	ROU			
	SVK			
	SVN			
	TUR	MIL-P-7254 F And 2 Type IIIA AF	MIL-P-25604 D And 1 AF	MIL-P-26694 B And 2 (USAF) AF
	USA	MIL-PRF-7254 H (+) Type IIIA AF	MIL-PRF-25604 F (+) AF a	MIL-PRF-87930 B (+) AF
3a ABCANZ	AS			
	NZ			
4 Acceptable Substitutes	Sea			
	Air			
5 Emergency Substitutes	Land			
	Sea			
6 Observations & Remarks	Air			
	Land			
7 Qual / 8 WG	Ready mix 17% UDMH & 83% F-40			
	No / Air	No / Air	Yes / Air	No / Air

ANNEX P: VISCOSITY / TEMPERATURE CHARACTERISTICS CHARTS

DEF STAN 01-005 Issue 19

Charts indicate the approximate viscosity of Service lubricating oils and fuels over a range of temperatures are provided here. They are:

- Figure 1 Fuels
- Figure 2 OEP Oils
- Figure 3 OM Oils
- Figure 4 OMD Oils
- Figure 5 OX Oils

In general, typical viscosity / temperature values have been plotted. Specification limits for viscosity on each product can be obtained by reference to the text of the Standard.

For the fuels chart, dotted lines indicate the variation in CFPP requirements for Summer and Winter.

For the lubricant charts, curves cover the normal use temperature range where possible and broken lines indicate the approach of the pour point.

It should be noted that these charts are approximations and the degree of approximation depends on how closely the viscosity limits are fixed by the specification and how far the temperature departs from that at which the specification limits are given.

FIG 1 VISCOSITY CHARACTERISTICS : FUELS

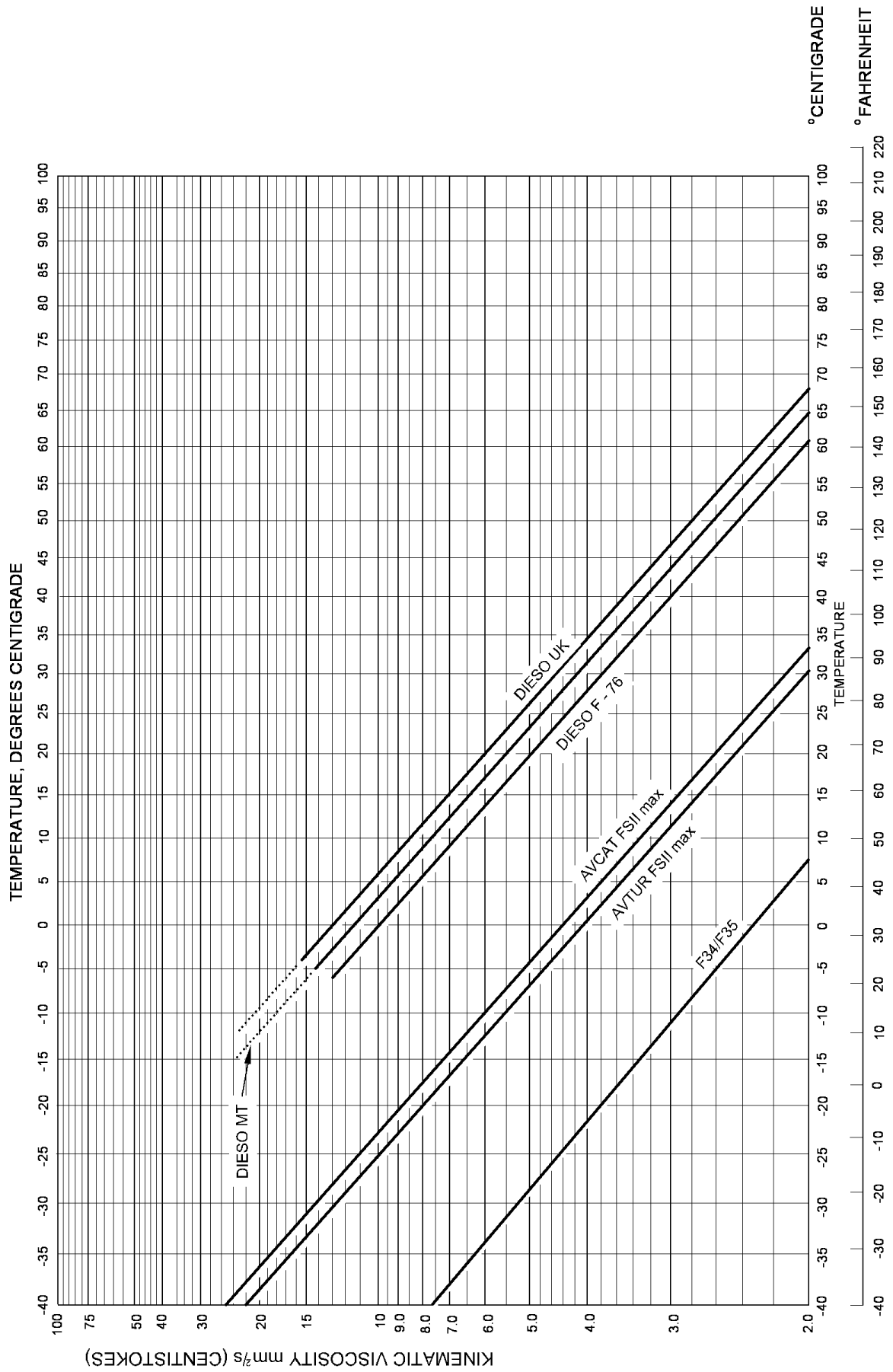


FIG 2 VISCOSITY CHARACTERISTICS : OEP OILS

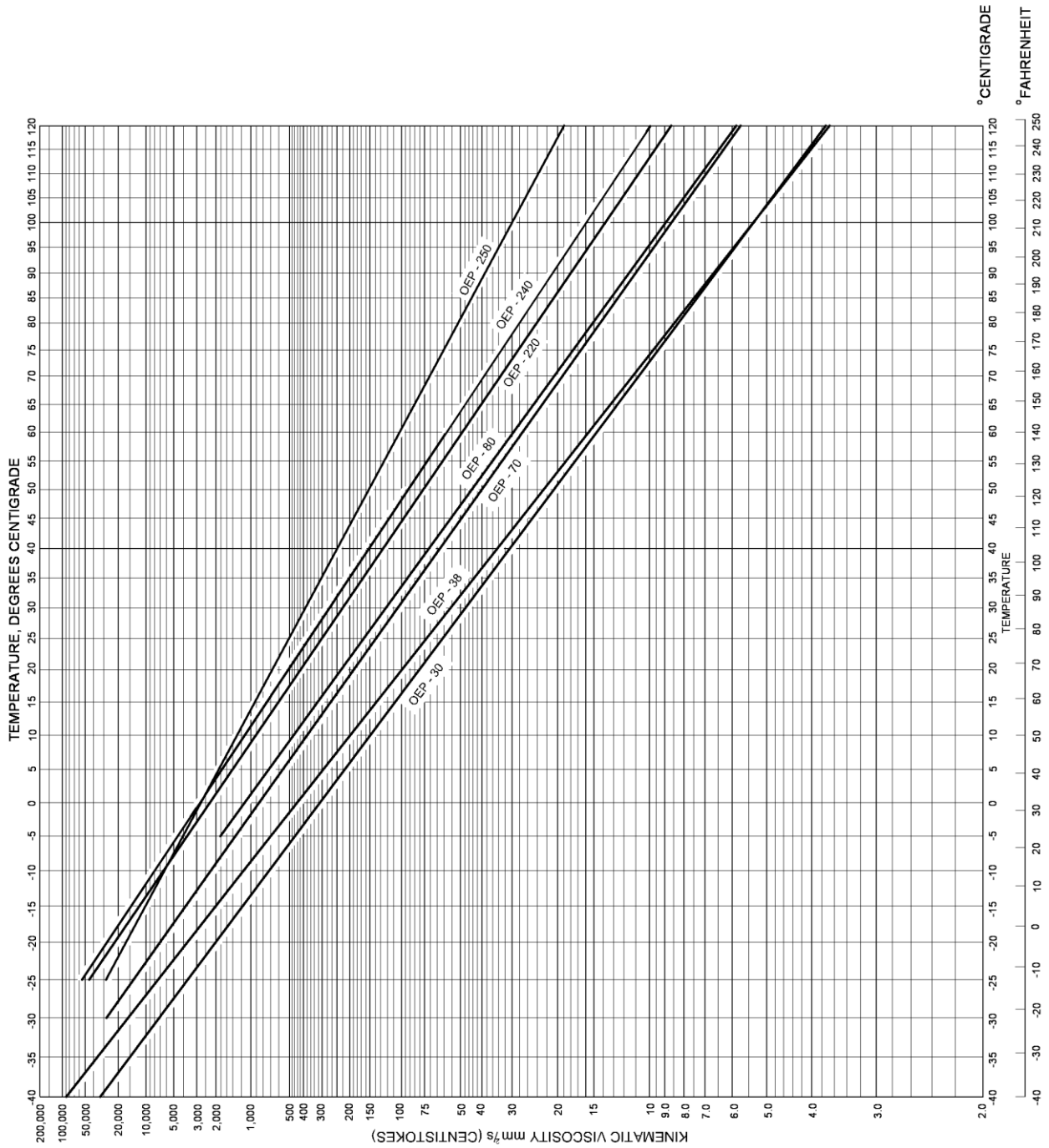


FIG 3 VISCOSITY CHARACTERISTICS : OM OILS

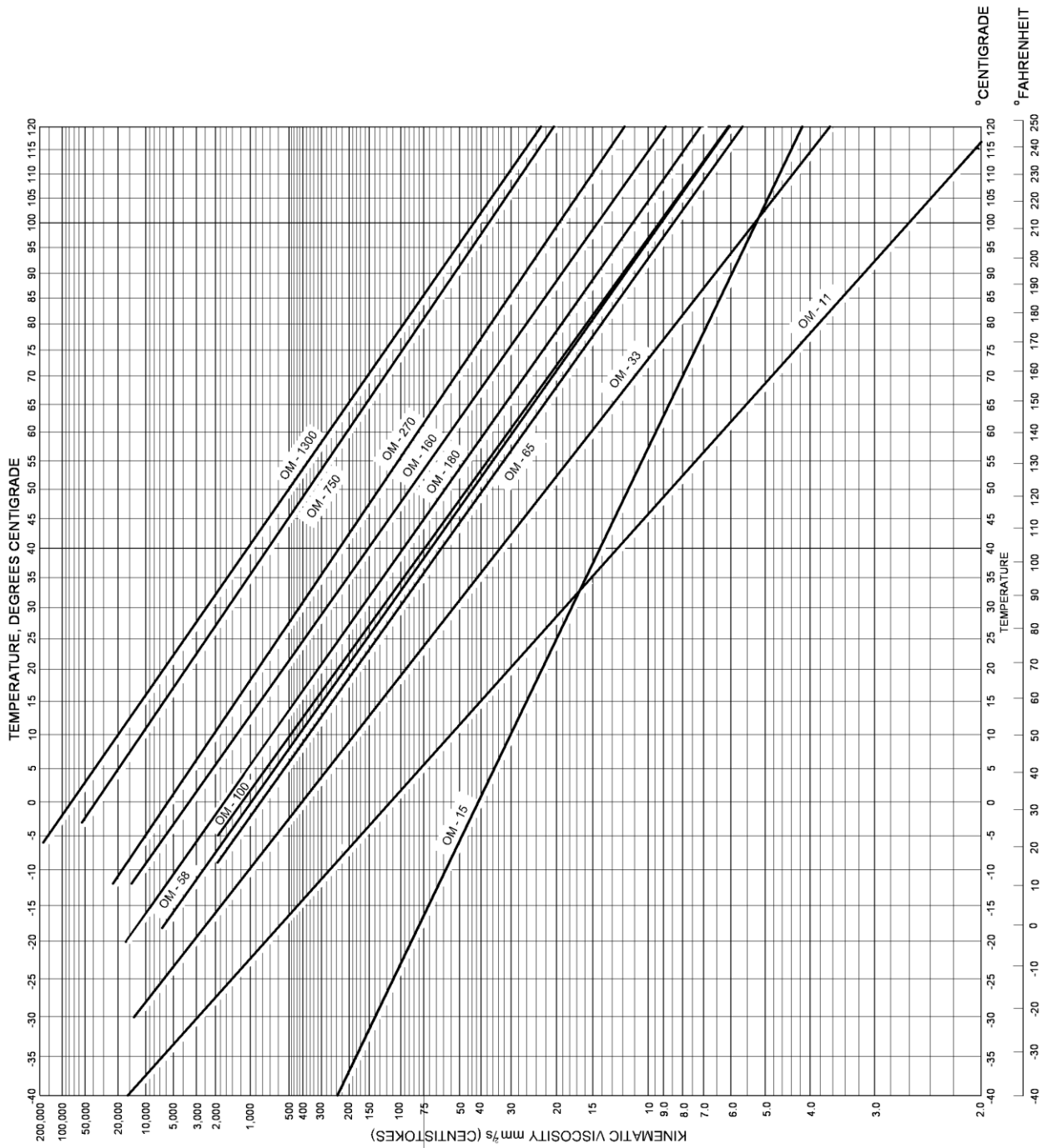


FIG 4 VISCOSITY CHARACTERISTICS : OMD OILS

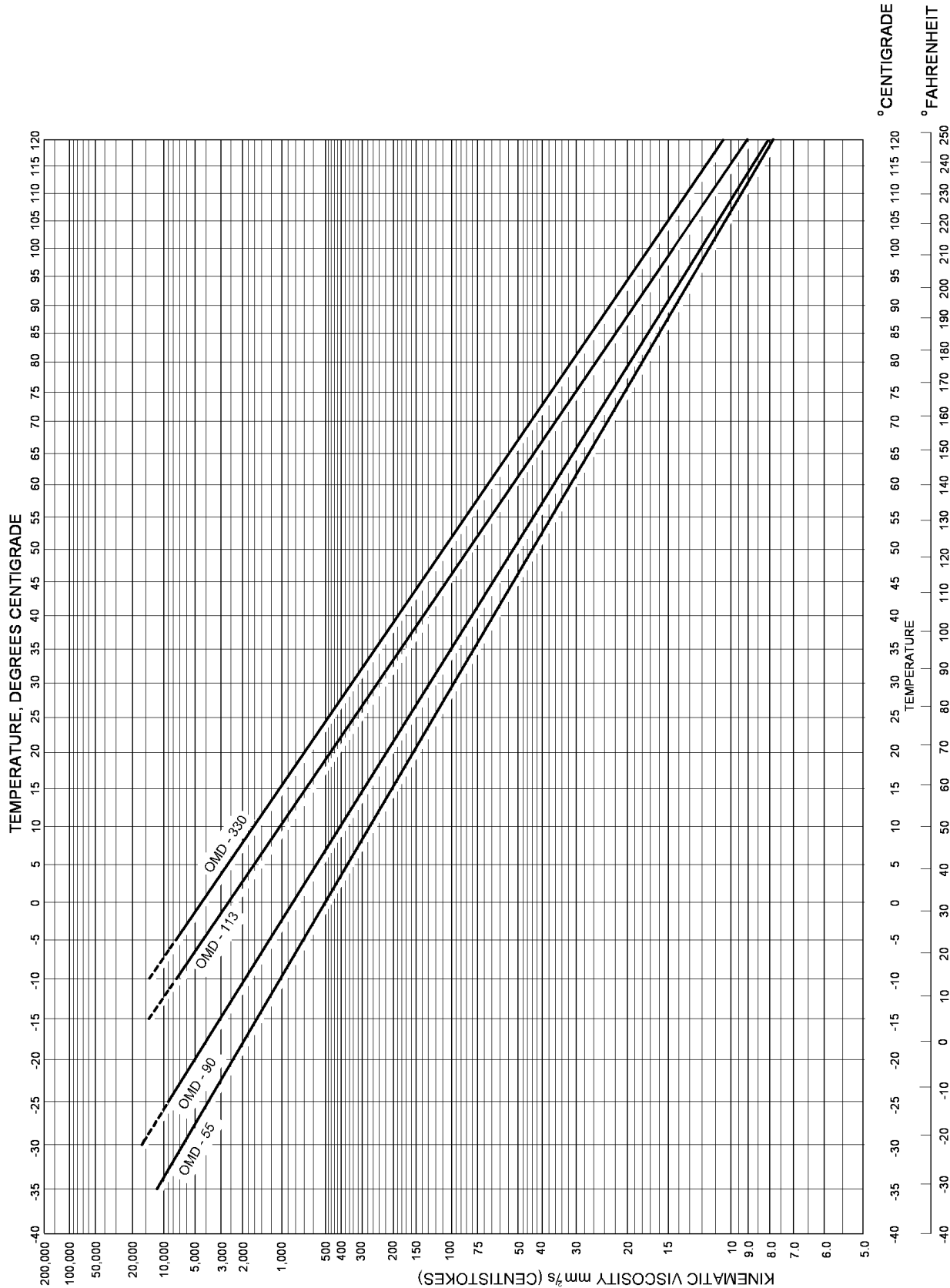
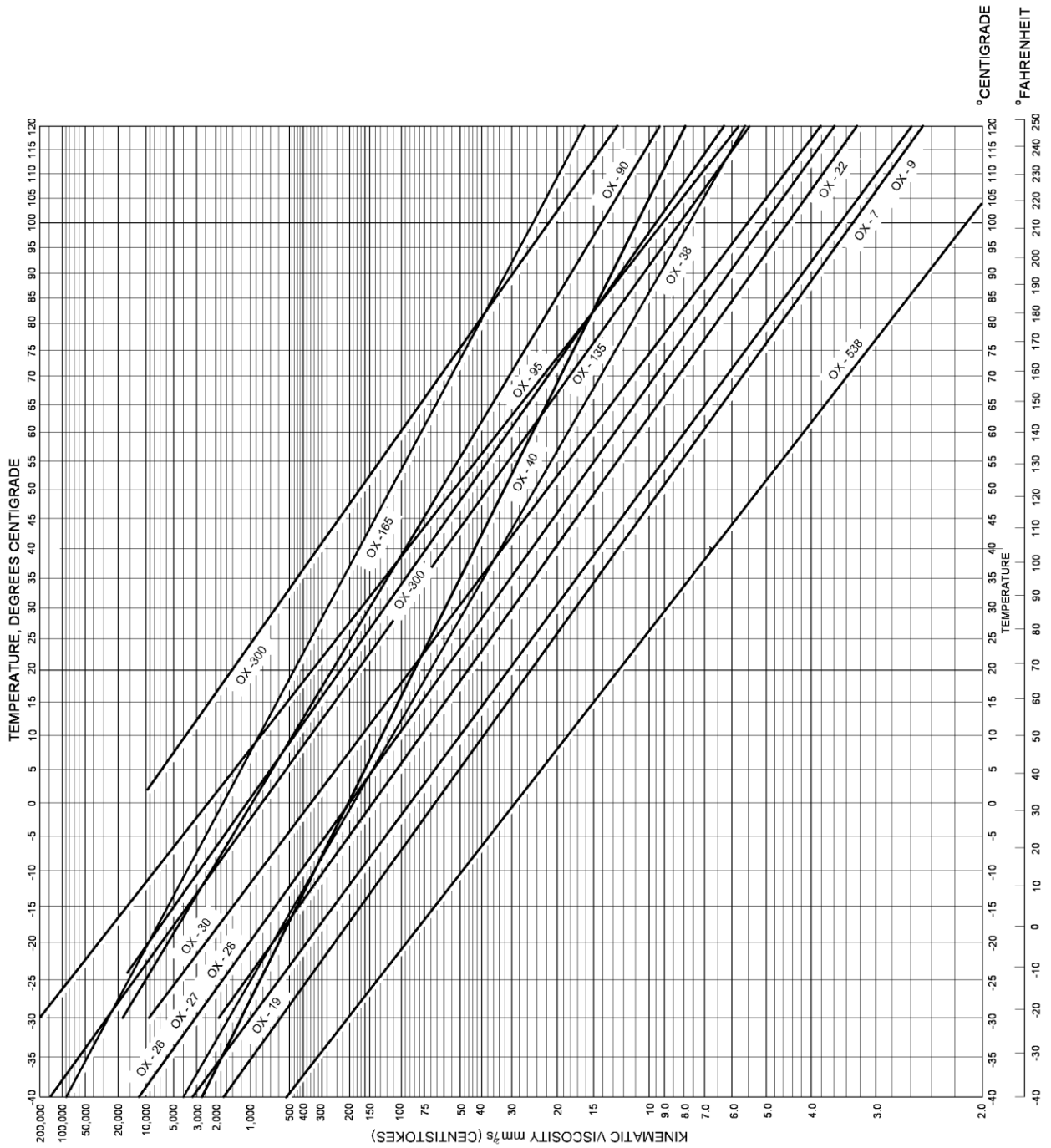


FIG 5 VISCOSITY CHARACTERISTICS : OX OILS



Section 3

Normative References

1 The publications shown below are referred to in the text of this standard. Publications are grouped and listed in alpha-numeric order.

Note: Def Stan's can be downloaded free of charge from the DStan web site by visiting <<http://dstan.uwh.diif.r.mil.uk/>> for those with RLI access or <<https://www.dstan.mod.uk>> for all other users. All referenced standards were correct at the time of publication of this standard (see 2, 3 & 4 below for further guidance), if you are having difficulty obtaining any referenced standard please contact the DStan Helpdesk in the first instance.

Def Stans

Number	Title
68-010, Iss 05	Corrosion Preventive, Water Displacing. NATO Code: C-634 Joint Service Designation: PX-24
68-062, Iss 02	Molybdenum Disulphide Powder, Lubricating NATO Code No:S-740 Joint Service Designation: ZX-35
68-069, Iss 01	Silicone Compound Electrical Insulating - NATO Code S-736 - Joint Service Designation XG-250
68-108, Iss 02	Ethenediol (Ethylene Glycol) Joint Service Designation AL-20
68-127, Iss 02	Antifreeze, Inhibited Ethenediol NATO Code S-757 Joint Service Designation AL-39
68-129, Iss 01	Methanol: Water Mixture for Hydrogen Generators - Joint Service Designation AL-40
68-150, Iss 02	Mixture of Fuel System Icing Inhibitor and Lubricity Improving Additive Joint Service Designation: AL-48
68-251, Iss 03	Fuel Soluble Lubricity Improving Additives for Aviation Turbine Fuels NATO Code: S-1747 Joint Service Designation: AL-61
68-252, Iss 03	Fuel System Icing Inhibitor NATO Code: S-1745 Joint service Designation: AL-41
68-253, Iss 02	Fluids, Aviation, Thrust Augmentation NATO Code : S-1744 and S-1739 Joint Service Designation: AL-28 and WTA
80-034, Iss 03	Corrosion Preventive, Compound Oil, Thin Film Joint Service Designation: PX-4
80-080, Iss 02	Anti-seize Compound, Graphite NATO Code: S-720 Joint Service Designation: ZX-13

DEF STAN 01-005 Issue 19

80-081, Iss 03	Anti-Seize Compound, Molybdenum Disulfide NATO Code: S-722 Joint Service Designation: ZX-38
80-083, Iss 03	Corrosion Preventive, Hard Film, Transparent: Cold Application Joint Service Designation: PX-32
80-142, Iss 02	Corrosion Preventive, Hydraulic System NATO Code: C-635 Joint Service Designation: PX-26
80-143, Iss 02	Corrosion Preventative, Automotive, Underbody and Hollow Section. Joint Service Designation: PX-28
80-217, Iss 01	Corrosion Preventive Compound: Soft Film, Cold Application NATO Code: C-614 JSD: PX-1
91-004, Iss 11	Fuel, Naval, Distillate NATO Code: F-76 Joint Service Designation DIESO F-76
91-006, Iss 04	Grease, Plug Valve, Hydrocarbon Resistant NATO Code G-363 Joint Service Designation XG-235
91-018, Iss 02	Grease, Graphite: Medium NATO Code: G-412 Joint Service Designation: XG-264
91-021, Iss 04	Lubricating Oil, Compounded NATO Code No: 0-254 Joint Service Designation: OC-160
91-022, Iss 07	Lubricating Oil, Diesel Engine: Severe Service, Grade 40, NATO Code No: O-278 Joint Service Designation: OMD-113
91-025, Iss 06	Lubricating Oil, Gear, Naval: Light Service NATO Code: O-240 Joint Service Designation: OM-100
91-027, Iss 03	Grease, Automotive and Artillery NATO Code No: G-403 Joint Service Designation: XG-279
91-034, Iss 03	Grease, Sea Water Resisting NATO Code: G-460 Joint Service Designation: XG-286
91-035, Iss 04	Hydraulic Fluid, Petroleum: Emulsifying, Anti-Wear Joint Service Designation: OX-30
91-038, Iss 03	Petrolatum, Technical Joint Service Designation: PX-6 Petrolatum, Technical NATO Code No: S-743 Joint Service Designation: PX-7
91-039, Iss 04	Hydraulic Fluid, Petroleum: Anti-Wear NATO Code No: H-576 Joint Service Designation: OM-33
91-042, Iss 03	Lubricating Oil, Petroleum: Compressor, Light Joint Service Designation: OM-58 Lubricating Oil, Petroleum: Compressor, Medium Joint Service Designation OM-160
91-047, Iss 01	Lubricating Oil, General Purpose: Low Temperature NATO Code No: 0-142 Joint Service Designation: OM-12

DEF STAN 01-005 Issue 19

91-048, Iss 02	Hydraulic Fluid, Petroleum: Superclean NATO Code No: H-515 Joint Service Designation: OM-15 Hydraulic Fluid Petroleum: Normal NATO Code No: H-520 Joint Service Designation: OM-18
91-049, Iss 01	Lubricating Oil, Instrument: Synthetic NATO Code No: 0-147 Joint Service Designation: OX-14
91-051, Iss 02	Grease, Aircraft: Helicopter Oscillating Bearing NATO Code No: G-366 Joint Service Designation: XG-284
91-052, Iss 01	Grease Aircraft: Multi-Purpose NATO Code No: G-395 Joint Service Designation: XG-293
91-053, Iss 03	Grease, Multipurpose: Low Temperature Range NATO Code: G-354 Joint Service Designation: XG-287
91-054, Iss 02	Grease, Aircraft: Graphite NATO Code No: G-355 Joint Service Designation: XG-285
91-056, Iss 03	Grease, Silicone, Metal to Rubber NATO Code G-394 Joint Service Designation XG - 315
91-057, Iss 02	Grease, Synthetic, Molybdenum Disulphide NATO Code No: G-353 Joint Service Designation: XG-276
91-064, Iss 02	Grease Molybdenum Disulphide Joint Service Designation: XG-305
91-065, Iss 02	Lubricating Oil, Gear, Compounded Joint Service Designation: OC-300 Lubricating Oil, Gear, Compounded NATO Code Number: 0-208 Joint Service Designation: OC-600
91-070, Iss 01	Cutting Fluid, Soluble, Biostable Joint Service Designation: ZX-9
91-071, Iss 02	Lubricating Oil, Gear Synthetic Joint Service Designation: OX-165
91-072, Iss 01	Rust Penetrating Oil Joint Service Designation: ZX-54
91-074, Iss 03	Lubricating Oil, Steam Turbine and Gear, Extreme Pressure Joint Service Designation: OEP-80
91-085, Iss 01	Grease, Synthetic, Graphite Joint Service Designation: XG-273
91-086, Iss 06	Turbine Fuel, Aviation Kerosine Type: High Flash Type Containing Fuel System Icing Inhibitor NATO code: F-44 Joint Service Designation: AVCAT/ FSII
91-087, Iss 06	Turbine Fuel, Aviation Kerosine Type: Containing Fuel System Icing Inhibitor NATO code: F-34 Joint Service Designation: AVTUR/ FSII
91-088, Iss 04	Turbine Fuel, Aviation: Wide Cut Type, Containing Fuel System Icing Inhibitor NATO Code: F-40 Joint Service Designation: AVTAG/FSII
91-090, Iss 05	Gasoline, Aviation: Grades UL91, 100/130 and 100/130 Low Lead. Joint service Designation: AVGAS 100 and AVGAS 100LL

DEF STAN 01-005 Issue 19

91-091, Iss 11	Turbine Fuel, Kerosene Type, Jet A-1; NATO Code: F-35; Joint Service Designation: AVTUR
91-094, Iss 02	Lubricating Oil, Gas Turbine Engine, Synthetic Grade 3 cSt Joint Service Designation: OX-7
91-098, Iss 02	Lubricating Oil, Gas Turbine Engine, Synthetic Grade 7.5 cSt NATO Code: 0-149 Joint Service Designation: OX-38
91-099, Iss 02	Lubricating Oil, Aircraft Turbine Engine, Petroleum NATO Code: 0-135 Joint Service Designation: OM-11
91-100, Iss 03	Lubricating Oil, Gas Turbine Engine, Synthetic Grade 5 cSt NATO Code: 0-160 Joint Service Designation: OX-26
91-101, Iss 03	Lubricating Oil, Gas Turbine Engine, Synthetic Grade 5 cSt NATO Code: 0-156 Joint Service Designation: OX-27 and OX-28
91-102, Iss 02	Lubricating Oil, Corrosion Preventive, Small Arms and Light Calibre Weapons NATO Code: 0-157 Joint Service Designation: OX-24
91-103, Iss 02	Corrosion Preventive, Weapon Cleaner Lubricant Joint Service Designation: PX-36
91-105, Iss 02	Grease, Multi-Purpose, Heavy Duty NATO Code: G-421 Joint Service Designation: XG-291
91-106, Iss 02	Grease, Multi-Purpose: Elevated Temperature Range NATO Code: G-1352 Joint Service Designation: XG-294
91-110, Iss 03	Hydraulic Fluid, Fire Resistant Aqueous Polyglycol Joint Service Designation: OX-40
91-111, Iss 03	Grease, Pumpable, Calcium Base Joint Service Designation: XG-380
91-112, Iss 02	Lubricating Oil Gear: Aircraft Light Grade NATO Code: O-153 Joint Service Designation: OEP-30 Lubricating Oil Gear: Aircraft Medium Grade NATO Code: O-155 Joint Service Designation: OEP-70
91-113, Iss 03	Lubricating Oil, Engine: Severe Duty Diesel, Extended Service - SAE 10W/30 NATO Code: O-1176 Joint Service Designation: OMD-90
91-114, Iss 01	Lubricating Oil, Aircraft Controls: Antifreezing. Joint service designation: OM-150

STANAGs

Number	Title
1059 Edition 8 Version 1	LETTER CODES FOR GEOGRAPHICAL ENTITIES
1110 Edition 11	ALLOWABLE DETERIORATION LIMITS FOR NATO ARMED FORCES FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS - AFLP-1110 EDITION A
1135 Edition 6	INTERCHANGEABILITY OF FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS USED BY THE ARMED FORCES OF THE NORTH ATLANTIC TREATY NATIONS - AFLP-1135 EDITION A
1385 Edition 7	GUIDE SPECIFICATION (MINIMUM QUALITY STANDARDS) FOR NAVAL DISTILLATE FUELS (F-75 AND F-76) – AFLP 1385 EDITION B
1414 Edition 3	GUIDELINES TO ENSURE THAT CONTRACTORS DESIGN AND SUPPLY NEW EQUIPMENT CAPABLE OF USING STANDARDIZED FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS
1425 Edition 3	NATO GUIDE SPECIFICATION FOR LUBRICATING OIL, STEAM TURBINE AND GEAR LIGHT SERVICE: NATO CODE NUMBER O-240 AND NATO CODE NUMBER O-253 (ISO VG 68) - AFLP-1425 EDITION A
2115 Edition 6	FUEL CONSUMPTION UNIT
3149 Edition 10	MINIMUM QUALITY SURVEILLANCE FOR FUELS
3390 Edition 12	GUIDE SPECIFICATION AND INSPECTION STANDARDS FOR FUEL SOLUBLE LUBRICITY IMPROVERS (S-1747) - AFLP-3390 EDITION A
3713 Edition 6	DETERMINATION OF PARTICULATE MATTER IN AEROSPACE HYDRAULIC FLUIDS USING A PARTICULATE ANALYSER - AFLP-3713 EDITION A
3748 Edition 5	HYDRAULIC FLUID, PETROLEUM (H-515), POLYALPHAOLEFIN (H-537, H-538) AND PHOSPHATE ESTER FLUIDS (H-522, H-523, H-524) - AFLP-3748 EDITION A
3747 Edition 12	GUIDE SPECIFICATIONS (MINIMUM QUALITY STANDARDS) FOR AVIATION TURBINE FUELS (F 24, F 27, F 34, F 35, F 37, F 40 AND F 44) - AFLP-3747 EDITION C
4362 Edition 3	FUELS FOR FUTURE GROUND EQUIPMENTS USING COMPRESSION IGNITION OR TURBINE ENGINES - AFLP-4362 EDITION A
4596 Edition 3	GUIDE SPECIFICATION FOR LUBRICATING OIL, NAVAL DIESEL ENGINE, SEVERE SERVICE, GRADE 40 (O 278) - AFLP-4596 EDITION A
4601 Edition 3	GUIDE SPECIFICATION FOR HYDRAULIC FLUIDS FOR NAVAL APPLICATIONS (H-573, H-574 AND H-576) - AFLP-4601 EDITION A

DEF STAN 01-005 Issue 19

4616 Edition 1	CAPABILITIES OF NATIONAL/MILITARY LABORATORIES OF NATO AND PARTNER NATIONS - AFIP-8
4714 Edition 2	MINIMUM QUALITY SURVEILLANCE FOR LUBRICANTS AND ASSOCIATED PRODUCTS - AFLP-4714 EDITION B
7036 Edition 6	FUELS TO BE INTRODUCED INTO AND DELIVERED BY THE NATO PIPELINE SYSTEM (NPS) - AFLP-7036 EDITION B
7063 Edition 3	METHODS OF DETECTION AND TREATMENT OF FUELS CONTAMINATED BY MICRO-ORGANISMS - AFLP-7063 EDITION A
7071 Edition 1	DESIGN AND PERFORMANCE REQUIREMENTS FOR ADDITIVE INJECTION EQUIPMENT FOR MILITARY FUELS
7091 Edition 4	GUIDE SPECIFICATIONS FOR NATO LAND SYSTEM OILS FOR ENGINES AND TRANSMISSIONS - AFLP-7091 EDITION B
7090 Edition 7	GUIDE SPECIFICATION (MINIMUM QUALITY STANDARDS) FOR NATO GROUND FUELS (F 54, F 58, F 67, F 63) - AFLP-7090 EDITION C
7093 Edition 4	GUIDE SPECIFICATION FOR NATO LAND SYSTEM AUTOMOTIVE FLUIDS - AFLP-7093 EDITION B
7101 Edition 2	GUIDE SPECIFICATION FOR GREASES - AFLP-7101 EDITION A

Allied Publications

Number	Title
AFLP-1110 Edition A Version 1	ALLOWABLE DETERIORATION LIMITS FOR NATO ARMED FORCES FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS
AFLP-1385 Edition B Version 1	GUIDE SPECIFICATION (MINIMUM QUALITY STANDARDS) FOR NAVAL DISTILLATE FUELS (F-75 AND F-76)
AFLP-3390 Edition A Version 1	GUIDE SPECIFICATION AND INSPECTION STANDARDS FOR FUEL SOLUBLE LUBRICITY IMPROVERS (S-1747)
AFLP-3390 Edition A Version 2	GUIDE SPECIFICATION AND INSPECTION STANDARDS FOR FUEL SOLUBLE LUBRICITY IMPROVERS (S-1747)
AFLP-3713 Edition A Version 2	DETERMINATION OF PARTICULATE MATTER IN AEROSPACE HYDRAULIC FLUIDS USING A PARTICLE ANALYSER

DEF STAN 01-005 Issue 19

AFLP-7071 Edition A Version 2	DESIGN AND PERFORMANCE REQUIREMENTS FOR ADDITIVE INJECTION EQUIPMENT FOR MILITARY FUELS
AFLP-1135 Edition A Version 1	INTERCHANGEABILITY OF FUELS, LUBRICANTS AND ASSOCIATED PRODUCTS USED BY THE ARMED FORCES OF THE NORTH ATLANTIC TREATY NATIONS
AFLP-1425 Edition A Version 1	NATO GUIDE SPECIFICATION FOR LUBRICATING OIL, STEAM TURBINE AND GEAR LIGHT SERVICE: NATO CODE NUMBER O-240 AND NATO CODE NUMBER O-253 (ISO VG 68)
AFLP-3747 Edition C Version 3	GUIDE SPECIFICATIONS (MINIMUM QUALITY STANDARDS) FOR AVIATION TURBINE FUELS (F 24, F 27, F 34, F 35, F 37, F 40 AND F 44)
AFLP-3748 Edition A Version 1	HYDRAULIC FLUID, PETROLEUM (H-515), POLYALPHAOLEFIN (H-537, H-538) AND PHOSPHATE ESTER FLUIDS (H-522, H-523, H-524)
AFLP-4362 Edition A Version 1	FUELS FOR FUTURE GROUND EQUIPMENT USING COMPRESSION IGNITION OR TURBINE ENGINES
AFLP-4596 Edition A Version 1	GUIDE SPECIFICATION FOR LUBRICATING OIL, NAVAL DIESEL ENGINE, SEVERE SERVICE, GRADE 40 (O 278)
AFLP-4601 Edition A Version 1	GUIDE SPECIFICATION FOR HYDRAULIC FLUIDS FOR NAVAL APPLICATIONS (H-573, H-574 AND H-576)
AFIP-08 Edition 2	CAPABILITIES OF NATIONAL/MILITARY LABORATORIES OF NATO AND PARTNER NATIONS
AFLP-4714 Edition B Version 1	MINIMUM QUALITY SURVEILLANCE FOR LUBRICANTS AND ASSOCIATED PRODUCTS
AFLP-7036 Edition B Version 1	FUELS TO BE INTRODUCED INTO AND DELIVERED BY THE NATO PIPELINE SYSTEM (NPS)
AFLP-7063 Edition A Version 1	METHODS OF DETECTION AND TREATMENT OF FUELS CONTAMINATED BY MICRO-ORGANISMS
AFLP-7090 Edition B Version 1	GUIDE SPECIFICATION (MINIMUM QUALITY STANDARDS) FOR NATO GROUND FUELS (F 54, F 58, F 67, F 63)
AFLP-7091 Edition B Version 1	GUIDE SPECIFICATIONS FOR NATO LAND SYSTEM OILS FOR ENGINES AND TRANSMISSIONS

DEF STAN 01-005 Issue 19

AFLP-7093 Edition B Version 1	GUIDE SPECIFICATION FOR NATO LAND SYSTEM AUTOMOTIVE FLUIDS
AFLP-7101 Edition A Version 1	GUIDE SPECIFICATION FOR GREASES

Other References

Standard Type	Standard Name
Other	Please refer to Section 2 Clause 9 for a full list of specifications used by the UK
CIVIL	ACEA European Oil Sequences, Service Fill Engine Oils for Gasoline & Light Duty Diesel Engines (A/B Catagories), Gasoline & Light Duty Diesel Engines with Exhaust Aftertreatment Devices (C Categories), and Heavy Duty Diesel Engines (E Categories)
CIVIL	ASTM D 445, Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
CIVIL	ASTM D 2983, Standard Test Method for Low-Temperature Viscosity of Automatic Transmission Fluids, Hydraulic Fluids, and Lubricants using a Rotational Viscometer
CIVIL	ASTM D7450-19, Standard Specification for Performance of Rear Axle Gear Lubricants Intended for API Category GL-5 Service
CIVIL	BS 148:2009, Reclaimed mineral insulating oil for transformers and switchgear. Specification
CIVIL	BS 1595-1:1986, Propan-2-ol (isopropyl alcohol) for industrial use. Specification for propan-2-ol (isopropyl alcohol)
CIVIL	BS 245:1976, Specification for mineral solvents (white spirit and related hydrocarbon solvents) for paints and other purposes
CIVIL	BS 2626:1992, Specification for lubricants for refrigerant compressors
CIVIL	BS 2869:2017, Fuel oils for agricultural, domestic and industrial engines and boilers. Specification
CIVIL	BS 4231 / ISO 3448, Classification for viscosity grades of industrial liquid lubricants
CIVIL	BS 4475:2000, Specification for straight mineral lubricating oils
CIVIL	BS 506-1:1987, Methanol for industrial use. Specification for methanol
CIVIL	BS EN 228:2012+A1:2017, Automotive fuels. Unleaded petrol. Requirements and test methods

DEF STAN 01-005 Issue 19

CIVIL	BS EN 590:2013+A1:2017, Automotive fuels. Diesel. Requirements and test methods
CIVIL	BS EN 14214, Liquid petroleum products. Fatty acid methyl esters (FAME) for use in diesel engines and heating applications. Requirements and test methods
CIVIL	BS EN 60296:2012, Fluids for electrotechnical applications. Unused mineral insulating oils for transformers and switchgear
CIVIL	BS ISO 22241-1:2019, Diesel engines. NOx reduction agent AUS 32. Quality requirements
Other	DTD 406B, DE-ICING FLUID AL-5
Other	MIL-DTL-25681E, DETAIL SPECIFICATION: LUBRICANT, MOLYBDENUM DISULFIDE, SILICONE (NATO S-1735)
Other	MIL-G-25013E, MILITARY SPECIFICATION: GREASE, AIRCRAFT, BALL AND ROLLER BEARING, NATO CODE NUMBER G-372
Other	MIL-L-5020C, MILITARY SPECIFICATION: LIQUID, COMPASS, AIRCRAFT
Other	MIL-L-23398D, MILITARY SPECIFICATION: LUBRICANT, SOLID FILM, AIR - CURED, CORROSION INHIBITING, NATO CODE NUMBER S-749
Other	MIL-PRF-23699G, PERFORMANCE SPECIFICATION: LUBRICATING OIL, AIRCRAFT TURBINE ENGINE, SYNTHETIC BASE, NATO CODE NUMBERS: O-152, O-154, O-156, and O-167
Other	MIL-PRF-32033A, PERFORMANCE SPECIFICATION: LUBRICATING OIL, GENERAL PURPOSE, PRESERVATIVE (WATER-DISPLACING, LOW TEMPERATURE)
Other	MIL-PRF-7808L, PERFORMANCE SPECIFICATION; LUBRICATING OIL, AIRCRAFT TURBINE ENGINE, SYNTHETIC BASE
Other	MIL-PRF-83282D, PERFORMANCE SPECIFICATION: HYDRAULIC FLUID, FIRE RESISTANT, SYNTHETIC HYDROCARBON BASE, NATO CODE NUMBER H-537
Other	MIL-PRF-87257C, PERFORMANCE SPECIFICATION: HYDRAULIC FLUID, FIRE RESISTANT, LOW TEMPERATURE, SYNTHETIC HYDROCARBON BASE, AIRCRAFT AND MISSILE
CIVIL	SAE AMS 1428 K, Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
CIVIL	SAE AMS G 4343 A, Grease, Pneumatic System
CIVIL	SAE AS 5272 E, Lubricant, Solid Film, Heat Cured, Corrosion Inhibiting, Procurement Specification
CIVIL	SAE J 1704, Motor Vehicle Brake Fluid Based Upon Glycols, Glycol Ethers and the Corresponding Borates

DEF STAN 01-005 Issue 19

CIVIL	SAE J 1899, Lubricating Oil, Aircraft Piston Engine (Ashless Dispersant)
CIVIL	SAE J 1966, Lubricating Oils, Aircraft Piston Engine (Non-Dispersant Mineral Oil)
CIVIL	SAE J 2360, Automotive Gear Lubricants for Commercial and Military Use

2 Reference in this Standard to any normative references means in any Invitation to Tender or contract the edition and all amendments current at the date of such tender or contract unless a specific edition is indicated. Care should be taken when referring out to specific portions of other standards to ensure that they remain easily identifiable where subsequent amendments and supersession's might be made. For some standards the most recent editions shall always apply due to safety and regulatory requirements.

3 In consideration of clause 2 above, users shall be fully aware of the issue, amendment status and application of all normative references, particularly when forming part of an Invitation to Tender or contract. Correct identification of standards is as defined in the ITT or contract.

4 DStan can advise regarding where to obtain normative referenced documents. Requests for such information can be made to the DStan Helpdesk. Details of how to contact the helpdesk are shown on the outside rear cover of Defence Standards.

Definitions

For the purpose of this standard, ISO/IEC Guide 2 'Standardization and Related Activities – General Vocabulary' and the definitions shown below apply.

Definition	Description
Acidity	The acidity of petroleum products is measured in terms of the amount of alkali required for neutralization under prescribed conditions.
Additive	A substance added to a product in a small proportion to achieve desired characteristics.
Alcohol	A compound of carbon, hydrogen and oxygen in which each atom of oxygen is linked to one of carbon and one of hydrogen, eg methanol and glycol.
Aniline Point	The lowest temperature at which a hydrocarbon fluid is completely miscible with an equal volume of aniline. A high reading points to a low aromatic content and less effect on rubbers.
Antifreeze Agent	A substance added to water to reduce its freezing point. ie Ethylene glycol is a common antifreeze agent in engine coolant.
Antiknock Agent	A substance which increases the resistance to detonation of a spark ignition engine fuel – see also Tetraethyl Lead & Tetramethyl Lead.
Anti-Oxidant	See Oxidation Inhibitor.
Antiseize Compound	A material designed to facilitate the assembly or disassembly of closely mating parts to either prevent scoring, gouging or galling of parts in close contact or seizure due to very hot exposure such as engine exhaust components.
Antiwear Additive	A substance which by surface activity increases the resistance of lubricating films to disruption.
Aromatics	Hydrocarbons of ring structure having the smallest hydrogen to carbon ratio.
Ash	The inorganic residue left after combustion under specified conditions – see also Sulfated Ash.
Asphaltenes	The proportion of a petroleum product which is soluble in aromatic solvent but insoluble in a petroleum spirit.
Autogenous Ignition Temperature	Auto ignition or spontaneous ignition temperature. The lowest temperature at which ignition of a flammable mixture of vapour and air occurs when tested under standard conditions.
B20 Biodiesel	A 20% blend of biodiesel in conventional diesel fuel – see Biodiesel.
B5 Biodiesel	A 5% blend of biodiesel in conventional diesel fuel – see Biodiesel.
Biodiesel	Biodiesel is a diesel fuel produced from plant oils or animal fats and can be used in a neat form or, more usually, as a blend in conventional diesel fuel. The feedstocks for biodiesel are commonly palm, sunflower and rapeseed oils.

DEF STAN 01-005 Issue 19

	These oils are subjected to esterification, a chemical process, to produce FAME (Fatty Acid Methyl Ester) – see FAME.
Bioethanol	Bioethanol fuel is mainly produced by the sugar fermentation process and typically used to supplement gasoline fuels. The main sources of sugar required to produce bioethanol come from sugar beet, sugar cane or crops such as corn, maize and wheat crops or even waste straw or willow.
Biofuels	Fuels derived from renewable animal or plant resources that may be used in place of diesel fuel or gasoline or, more commonly, to supplement fuels based on mineral hydrocarbons – see Biodiesel and Bioethanol.
Bitumen	A black solid or semi solid obtained as the end product from distillation of crude oils.
Bleeding	Separation of oil from grease during storage.
Blown Oil	An oil which has had air blown through it to increase its viscosity or to alter properties.
Bromine Number	Number of centigrams of bromine which are absorbed by 1g of oil. It provides a measure of the amount of unsaturated material in a fuel and to some extent its storage stability.
Bulk Modulus	The reciprocal of the compressibility of an oil.
Carbon Residue	The mass of carbon left when an oil or fuel is destructively distilled in the absence of air.
Carbonizable Substances	Impurities occurring in white oils identified by treatment with sulfuric acid.
Centipoise, cP	mPa.s (cP), unit of Dynamic Viscosity.
Centistokes, cSt	mm ² /s (cSt), unit of Kinematic Viscosity.
Cetane Index	A means of estimating the Cetane Number of distillate fuels.
Cetane Number	A measure of the ignition quality of a diesel fuel. The higher the number the better the ignition quality.
Channelling Test	Used for testing gear oils, in which a groove cut in the partly congealed oil at a specified temperature must collapse to a given extent within a stated number of seconds.
Char Value	The mass of carbonaceous matter formed on a wick after a specific amount of burning oil has been burnt in a special lamp under standard conditions.
Cloud Point	The temperature at which a cloud or haze begins to appear when an oil, which has been previously dried, is cooled under prescribed conditions. Such cloud is usually due to the separation of paraffin wax.

DEF STAN 01-005 Issue 19

Cold Plugging (CFPP)	Filter Point	A measure of the ability of diesel fuels to operate at reduced temperatures. The lower the temperature quoted the lower the temperature at which the fuel can be used.
Cold Test		Used herein to mean the lowest temperature at which the substance will flow when observed under specified conditions not identical with those of the pour point test.
Colloidal Suspension		A mixture of a solid in finely divided form and a liquid in which the solid is prevented from settling out of its extremely fine dispersion or by the presence of deflocculating agent.
Compounded Oil		A blend, usually of fatty oil with mineral lubricating oils.
Consistency		A measure of the degree of hardness of a grease – see Penetration.
Corrosion Inhibitor		An additive which reduces the corrosive properties of a product, or guards against the corrosive effects of contaminants which may be present in the product.
Crackle Test		Gives an indication of the presence of moisture by the crackling sound emitted when an oil is heated in a test tube.
Demulsification Number		A measure of the ability of an oil to separate from an oil/water emulsion. Time in seconds for separation of an emulsion of water and oil formed by injecting steam into the oil under prescribed conditions. Ranges from 30 to 1200 plus.
Density		The mass of product per unit volume at a specified temperature. For petroleum products this is usually reported in g/cm ³ at 15°C.
Detergent Additive		A substance which when dissolved in lubricating oil reduces the adhesion between solid particles, eg of gummy or carbonaceous matter and metals. Largely used to minimize persistent gumming of piston rings in heavy duty diesel engines. Most detergent additives produce a slight increase in load carrying capacity but tend to promote oxidation. To counteract this, anti-oxidant additives are usually incorporated.
DF-1		Obsolete diesel fuel described by the US military specification VV-F-800. The US military use diesel fuels described by civilian standards such as ASTM D975.
DF-2		Obsolete diesel fuel (F-54) described by the US military specification VV-F-800. The US military use diesel fuels described by civilian standards such as ASTM D975.
Diesel Fuel		A fuel, typically but not always, a petroleum-based product particularly suitable for use in compression ignition engines. Its viscosity and distillation range, approx 180 to 380°C, are generally intermediate between those of kerosene and light lubricating oil.
Diesel Index		A figure indicating the ignition quality of a compression ignition engine fuel. It is a calculated value obtained from the aniline point and specific gravity of the product as distinct from the Cetane Number which is determined by engine tests.

DEF STAN 01-005 Issue 19

Diesel Particulate Filter (DPF)	A filter included in a diesel engine exhaust system to trap Diesel Particulate Matter (DPM) from the fuel combustion.
Diesel Particulate Matter (DPM)	Particulate products found in the exhaust from diesel engines.
Dieso KT	See F-63.
Dispersant Additive	A substance which when dissolved in lubricating oil keeps low temperature sludges dispersed.
Dropping Point	Temperature at which the first drop falls from grease as melting begins under specified conditions.
Dynamic Viscosity	The dynamic viscosity of a fluid is defined as an indication of its ability to flow.
E10 Bioethanol	A 10% blend of bioethanol in conventional gasoline fuel – see Bioethanol.
E5 Bioethanol	A 5% blend of bioethanol in conventional gasoline fuel – see Bioethanol.
Electric Strength	The AC voltage required to initiate an arc between two electrodes immersed in insulating oil or the like at a stated distance apart.
Electrostatic Dissipator Additive	See Static Dissipator Additive (SDA).
Emission Control Areas (ECAs)	Sea areas in which stricter controls were established to minimize airborne emissions from ships.
Emulsion	A dispersion of very small globules of one liquid in another.
Endurance Life	As applied to solid film lubricants, that point at which the film is no longer providing acceptable friction and wear properties.
Esters	Compounds of alcohols and fatty acids which form the major constituents of many synthetic lubricating oils and to produce Biodiesel – see FAME.
Euro III, Euro IV, Euro V & Euro VI	European limits applying to all road vehicles which specify the maximum Carbon Monoxide, Hydrocarbon and Oxides of Nitrogen contents of the exhaust emissions. For diesel engineered vehicles, limits on particulates also apply. Euro III was effective for vehicles new in 2000, Euro IV for new vehicles in 2005, Euro V for new vehicles in 2008 and Euro VI for new vehicles in 2014.
Evaporation Loss	The loss in mass of an oil or grease, after heating under specified conditions.
Exhaust Gas Recirculation (EGR)	A method of recirculating a proportion of a diesel engine exhaust into the air intake system to control the harmful oxides of nitrogen (NOx).
Extreme Pressure Additive	An oil soluble compound of sulfur, chlorine or other active element which releases that element at the very high temperature reached at points on incipient scuffing between the hardened steel surfaces of, for example, hypoid gears. The active element combines with iron and prevents welding which otherwise would

DEF STAN 01-005 Issue 19

	lead to tearing of the surfaces. Oils containing these additives are not suitable for indiscriminate use.
Fatty Acid Methyl Ester (FAME)	The chemical term for biodiesel fuel which is produced by a chemical process of esterification to convert vegetable or animal oils to diesel fuel.
Fatty Oils	Esters of animal, fish or vegetable origin as distinct from mineral or synthetic oil.
Filter Blocking Tendency	The assessment of the cleanliness of distillate fuels by determining the volume of fuel that will pass through a fine membrane filter before blockage occurs.
Fire Point	The lowest temperature at which an oil vaporizes rapidly enough to burn for at least five seconds after ignition, under standard conditions.
Flash Point	Lowest temperature at which a substance gives off enough vapour under stated conditions, using a closed or open vessel, to ignite momentarily when a flame is applied. Flash point is in no way related to autogenous ignition temperature, which is, for example, higher for petrol than for lubricating oil.
Floc Point	Flocculation value is a measure of the tendency of a lubricant to precipitate wax or other solids from a solution under specified conditions.
Freezing Point	The temperature at which crystals formed on cooling, disappear when the temperature of a liquid is allowed to rise.
Fuel System Icing Inhibitor (FSII)	A fuel additive to prevent ice crystals forming when water is present.
Fuels, Lubricants and Associated Products (FLAP)	Petroleum fuels, lubricants, hydraulic and insulating oils, temporary protectives, liquid coolants, windscreen washing fluids, de-icing and antifreeze compounds together with components and additives for such products.
Gas Oil	A petroleum distillate having a viscosity and distillation range intermediate between those of kerosene and light lubricating oil. Distillation range normally falls within 200°C to 380°C. Used as a fuel for high speed diesel engines and as a burner fuel in heating installations.
Gas To Liquid (GTL)	The refinery process to convert natural gas or other gaseous hydrocarbons into longer-chain hydrocarbons such as gasoline or diesel fuel.
Gasoline (Petrol)	A refined petroleum distillate of high volatility used in spark ignition engines, normally boiling within the range 30°C to 220°C. Increasingly, a biofuel may be used to supplement the petroleum distillate – see Bioethanol.
Graphite	A form of carbon with a flaky structure and good lubricating properties.
Heat of Combustion	Thermal value of specific energy, a measure of the available energy in a fuel.
Heavy Duty Oil	Oil containing detergent, anti-oxidant and other additives to render it suitable for heavy duty diesel engines.

DEF STAN 01-005 Issue 19

Heavy Fuel Oil (HFO)	There are 2 types of HFO, firstly is a residual-type industrial heating oil and secondly a high-viscosity residual oil which may also be known as residual fuel oil (RFO).
Hertz Load	The Mean Hertz Load (load wear index) is derived from a series of wear measurements at graded loads, up to complete seizure, with an apparatus comprising four standard steel balls pressed together in pyramid form, the lower three being fixed whilst the upper one rotates against them.
High Frequency Reciprocating Rig (HFRR)	It is a microprocessor controlled reciprocating friction and wear test system which provides a fast, repeatable assessment of the performance of fuels and lubricants. It is particularly suitable for wear testing relatively poor lubricants such as diesel fuels and for boundary friction measurements of engine oils, greases and other compounds.
Hydrocarbons	Compounds of carbon and hydrogen only.
Hydrofluorocarbons (HFCs)	Hydrofluorocarbons are a group of man-made chemicals containing the elements carbon, hydrogen and fluorine. They are colourless, odourless and unreactive gases. mainly used in refrigeration and air conditioning equipment and as propellants in industrial aerosols (replacing the formerly used CFCs and HCFCs which have been shown to damage the ozone layer in the upper atmosphere). HFCs are also used for foam blowing, solvent cleaning and in fire extinguishers.
Iodine Value	The number of grams of iodine absorbed by 100 grams of the product. It gives an indication of the amount of unsaturated acids present in the product.
ISO (Viscosity) Grade	An international system that classifies lubricants based on their kinematic viscosity at 40°C.
Jet Fuel Thermal Oxidation Test (JFTOT)	The JFTOT (Jet Fuel Thermal Oxidation Test) is a widely used test method, IP 323/ASTM D3241, in which a controlled volume of fuel is passed over a heated tube. The thermal stability of the fuel is assessed by measuring the amount of deposit formed on the tube at the test temperature.
Kerosene	A refined petroleum distillate intermediate in volatility between gasoline and gas oil. Its distillation range is normally between 150 and 300°C.
Kinematic Viscosity	The dynamic viscosity divided by density and measured as mm ² /s (cSt).
Knock Rating	A measure of the detonation resistance of a spark ignition engine fuel – see Octane and Performance Numbers.
Lanolin	A substance extracted from sheep's wool. It has useful anti corrosion properties and is used in certain temporary protectives.
Lead Replacement Petrol (LRP)	Petrol in which anti-wear additives have replaced lead. Not for marine two-stroke use.
Lead Scavenger	A compound added to spark ignition engine fuels to remove the lead from the cylinders which would otherwise be left behind by the leaded antiknock agents.

DEF STAN 01-005 Issue 19

Light Absorption	The extent to which radiated light is absorbed in passing through a layer of an absorbing liquid. This is a measure of the purity of white oils.
Light Cycle Oil (LCO)	A light lubricating oil used mainly for lubricating bicycles and other similar devices.
Load Carrying Additive	An antiwear or extreme pressure additive.
Load Wear Index	See Hertz Load.
Marine Gas Oil (MGO)	Marine fuel that consists exclusively of distillate oil. It is the marine fuel with the lowest sulfur content and it is specified by BS ISO 8217. Royal Navy requirement is for MGO meeting category ISO-F-DMA.
Mercaptan Sulfur	A corrosive organic sulfur compound that occurs in crude oil. Normally removed by the refining process.
Microcrystalline Wax	Wax obtained from certain petroleum residues, the crystalline structure of which is not visible to the naked eye.
Mineral Jelly	Petrolatum.
Molybdenum Disulfide	A naturally occurring mineral with a flaky structure and good lubricating properties.
Motor Octane Number (MON)	A term used to indicate the octane number obtained under specified operating conditions in the assessment of gasolines.
Multigrade Oil	A lubricating oil having the combined viscosity characteristics of two single grades of oil. For example, an SAE 10W/30 engine oil has the low temperature advantages of an SAE 10W oil and the high temperature advantages of an SAE 30 oil.
Naphtha	See Petroleum Naphtha.
NLGI Number	A numerical number used to classify the consistency of greases.
Octane Number	A measure of the antiknock quality of a gasoline. The higher the number the greater the resistance of the fuel to knock – see Motor Octane Number and Research Octane Number.
Oil Mist Coking Propensity	The tendency of a hot air/oil mist mixture to form deposits when impinging on a hot static metal surface.
Oil Separation	See Bleeding.
Olefins	Hydrocarbons of ethene series which contain a double bond ethylene and are more reactive than paraffins.
Oxidation Inhibitor	An additive which reduces the rate of oxidation and subsequent deterioration of fuels and lubricants.

DEF STAN 01-005 Issue 19

Oxidation Stability	A measure of the resistance of a product to oxidation.
Paraffins	Hydrocarbons of the methane series which are indifferent to oxidizing agents and are less reactive than olefins.
Penetration	A measure of the consistency of a grease. The higher the number the softer the grease.
Performance Number (PN)	A figure used to indicate the knock rating characteristics of aviation gasolines in the region above 100 Octane.
Petrolatum, Mineral Jelly or Petroleum Jelly	A soft gel mixture of oil and wax obtained from petroleum.
Petroleum Naphtha	Petroleum distillate boiling in the gasoline range.
Petroleum Spirit	Narrow boiling range petroleum distillates of high volatility, eg petroleum spirit 60/80.
Petroleum, Oils & Lubricants (POL)	A term which has been used by the Armed Forces but now more commonly referred to as Fuels and Lubricants (F&L).
pH Value	A measure of acidity or alkalinity. pH 7 = neutral, pH 0 = extreme of acidity, pH 14 = extreme of alkalinity.
Poly-Alpha-Olefin (PAO)	A synthesized hydrocarbon used as a base fluid in some synthetic lubricant formulations.
Pour Point	The lowest temperature at which an oil moves under specified conditions. Oils can often be pumped at temperatures below pour point, but gravity flow into the pump may fail.
Pour Point Depressant	An additive which lowers the pour point by modifying the crystal formation of traces of dissolved wax.
Power Factor	A measure of the energy loss in insulating compounds or oils due to the presence of electrolytes.
Precipitation Number	A measure of the insoluble asphaltic materials which may be present in an oil.
Product Conformity Certification (PCC)	PCC is formal written certification that a product meets a specific specification. The certification can be undertaken by the supplier or a third party, depending on the needs of the project manager or equipment support manager and the assessment of the risks involved. PCC will be implemented by the relevant Standard. This will normally be invoked where airworthiness or confined atmospheres (eg submarines) are involved.
Proper Shipping Name (PSN)	The International Maritime Organisation's formalised identification scheme associated with the transport of dangerous or hazardous goods.

DEF STAN 01-005 Issue 19

Pumpability	The ability of any liquid, slurry or suspension to be moved through a flow conduit tube.
Reactive Sulfur	A form of sulfur added to certain metal working lubricants to provide extreme pressure lubrication by chemical action during machining under heavy duty conditions.
Redwood Viscosity	An obsolescent viscosity rating. The relationship between Redwood viscosity in Redwood Seconds No 1, RS1, and centistokes is shown in the charts at the end of this Standard.
Refractive Index	The ratio of velocity of light in air to its velocity in the material under test. It can be used as a measure of the concentration of some materials in water.
Reid Vapour Pressure (RVP)	The vapour pressure of a fuel at 37.8°C measured in a standard apparatus. It provides a measure of ease of starting and vapour locking tendency at high temperatures or high altitudes.
Relative Density	The ratio of the mass of a given volume of a substance to the mass of an equal volume of pure water
Research Octane Number (RON)	A term used to indicate the octane number obtained under specified operating conditions in the assessment of motor gasolines. The research numbers obtained are higher than the Motor Octane Numbers but there is no direct relationship between the two figures – see also Motor Octane Number.
Roll Stability	The ability of a grease to withstand shear breakdown when subjected to the milling action of a roller contained within a cylinder.
Saponification Value	Saponification number is a measure of the quantity of fatty materials compounded in an oil. Zero value indicates no fatty materials have been added.
Saybolt Viscosity	A measure of viscosity as used in the USA.
Selective Catalyst Reduction (SCR)	A means of controlling the NOx emissions in diesel engine exhaust systems.
Service Authority	The authoritative source advising on the use of products listed in this Standard.
Shear Breakdown	Breakdown of molecules into smaller molecules by shearing forces.
Shear Stability	Resistance of a lubricant to shear breakdown.
SI Units	The International System of Units, Systeme International, d'Unites, is a rationalized form of the metric system and employs seven base units from which most quantities can be derived in all technologies.
Silicone Fluids, Siloxanes	Synthetic lubricant containing silicon and oxygen in addition to carbon and hydrogen.
Silting Index	A measure of the filter blocking tendency of a fluid.
Single Fuel Policy (SFP)	It supersedes the Single Fuel Concept (SFC). The use of aviation fuel F-34/F-35 for all land -based equipment as referred to in NATO STANAG 4362.

DEF STAN 01-005 Issue 19

Smoke Point	The maximum height of a flame at which a fuel will burn without smoking when tested in a standard lamp.
SO _x Emission Control Area (SECA)	A designated area at sea where the emissions of oxides of sulfur (SO _x) in ships engine exhausts is controlled by requiring that the sulfur content of fuel oil used onboard ships must not exceed 1.5% m/m. Alternatively, ships must fit an exhaust gas cleaning system.
Specific Energy	See Heat of Combustion.
Specific Gravity	Obsolescent term. See Relative Density.
Specific Heat	The ratio of the thermal capacity of a material to that of water at a specified temperature.
Spontaneous Ignition Temperature	See Autogenous Ignition Temperature.
Standardized Product	A product is described as a standardized product when it conforms to specifications resulting from the same or equivalent technical requirements. NATO Standardized products are identified by a NATO code.
Static Dissipator Additive (SDA)	An electrostatic dissipator additive. An additive that increases the electrical conductivity of liquid fuels, permitting electrostatic charges to dissipate rapidly.
Sulfated Ash	The residue remaining after the ash from an ignited sample is treated with sulfuric acid. Generally taken to indicate the concentration of organo-metallic additives in the original sample.
Surface Active Materials, Surfactants	Additives or contaminants which impart surface energy properties. They lower surface tension, thereby increasing wetting and spreading power.
Surface Tension	The 'skin effect' which causes liquids to gather into droplets instead of spreading.
Synthetic Fuels	Synthetic fuels are currently mostly derived from coal or natural gas and have the potential to replace fuels derived from crude oil. Some synthetic fuel components (from the Fischer Tropsch Process) are already approved for use in UK F-34 and F-35 fuels at levels of up to 50% and this is likely to increase. However, the largest future use for synthetic fuel is likely to be as a component of automotive diesel fuel.
Synthetic Lubricants	Lubricants using base fluids prepared by chemical processes as distinct from conventional petroleum refinery processes.
Tetraethyl Lead (TEL)	A liquid organic lead compound that was once added in small proportions to gasoline to improve knock rating. It is now no longer permitted for such use.
Tetramethyl Lead (TML)	A liquid organic lead compound that was once added in small proportions to gasoline to improve knock rating. It is now no longer permitted for such use.
Thermal Value	See Heat of Combustion.

DEF STAN 01-005 Issue 19

Thixotropic	Property of certain gel like substances to behave as liquids when agitated or stirred, but which on resting, return to their normal state.
Thrust Augmentation Fluid	A fluid introduced into an engine to permit an increase in its power outputs for short periods.
Total Acid Number (TAN)	A measure of the total acidity of the product.
Total Base Number (TBN)	A measure of the ability of the oil to neutralize acidic products of combustion.
UN Number	A four-digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods to identify hazardous substances, material and articles considered dangerous for carriage.
UN Packaging Group	Class 3 – Flammable Fluids have, for packing and transport purposes, been allocated to one of three categories (Packaging Groups) by the United Nations Committee of Experts on the Transport of Dangerous Goods according to the degree of danger they present as determined by their closed flash point.
Unworked Penetration	Penetration reading taken on a grease which has received a minimum of handling and has not been 'worked' – see Worked Penetration.
Vapour Phase Inhibitor (VPI)	Corrosion Inhibitor, which when placed in closed systems minimizes corrosion of ferrous surfaces in the air space.
Viscosity	The property of a liquid resisting shear or flow. Viscosity decreases with increasing temperature as shown in the charts at the end of the Standard – see Dynamic viscosity and Kinematic viscosity.
Viscosity Index (VI)	A figure of merit, rating highest those products in which viscosity is least affected by change of temperature.
Viscosity Index Improver	An additive which reduces the effect of temperature on the viscosity of an oil.
Viscosity, Apparent	The viscosity expressed in poises calculated from measurements at a given rate of shear. The value varies with the shear rate.
Water Reaction Test	A test which detects the presence of water miscible components in fuels, and the effect of these components on the fuel water interface.
Water Separation Index Modified (WSIM)	A numerical rating indicating the ease with which a fuel will release entrained or emulsified water when passed through a coalescing medium.
Water Thrust Augmentation (WTA)	See Thrust Augmentation Fluid.
Water Washout Resistance	The ability of a lubricating grease to resist being removed from a bearing by a stream of water.

DEF STAN 01-005 Issue 19

Worked Penetration	A penetration reading taken on a grease immediately after it has been forced repeatedly through small holes in a plate – see Unworked Penetration.
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Abbreviations

Abbreviation	Description
AC	Alternating Current
ACEA	The European Automobile Manufacturers' Association (or Association des Constructeurs Européens d'Automobiles in French, hence the ACEA abbreviation)
AFIC	Air Force Interoperability Council
AFLP	NATO Allied Fuels and Lubricants Publication
API	American Petroleum Institute
ASCC	Air Standards Coordinating Committee. Superseded by ASIC.
ASIC	Air & Space Interoperability Council
ASTM	American Society for Testing and Materials
AVTUR	Aviation Turbine Fuel
BOCLE	Ball-on-Cylinder Lubricity Evaluator
BS	British Standard
BS EN	British Standard European Norm
BS EN ISO	British Standard European Norm International Standards Organisation
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CFCs	Chlorofluorocarbons
CFPP	Cold Filter Plugging Point
CHIP	The Chemical Hazard Information & Packaging for Supply Regulations.
COSHH	Control of Substances Hazardous to Health
cP	Centipoise, mPa.s, unit of Dynamic Viscosity.
cSt	Centistokes, mm ² /s, unit of Kinematic Viscosity.
Def Stan	Defence Standard
DESAT	Dangerous Engineering Substances Advisory Team
DF	Diesel Fuel

DEF STAN 01-005 Issue 19

DF-1	Diesel Fuel 1. Obsolete diesel fuel described by the US military specification VV-F-800. The US military use diesel fuels described by civilian standards such as ASTM D975.
DF-2	Diesel Fuel 2. Obsolete diesel fuel (F-54) described by the US military specification VV-F-800. The US military use diesel fuels described by civilian standards such as ASTM D975.
DFTA	Defence Fuel Technical Authority
DG	Dangerous Goods
DMC	Domestic Management Code
DoD	US Department of Defense
DPF	Diesel Particulate Filter
DPM	Diesel Particulate Matter
DSFA	Defence Strategic Fuels Authority
DStan	UK Defence Standardization
ECA	Emission Control Area
EGR	Exhaust Gas Recirculation
EI	Energy Institute
EP	Extreme Pressure
ETBE	Ethyl Tert-Butyl Ether – commonly used as an oxygenate gasoline additive to improve motor octane number.
F&L	Fuels and Lubricants
F&L	Fuels and Lubricants
FAME	Fatty Acid Methyl Esters
FLAP	Fuels, Lubricants and Associated Products
FSII	Fuel System Icing Inhibitor
g/cm ³	Grammes per cubic centimetre, unit of density.
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GTL	Gas to Liquid
HCFCs	Hydrochlorofluorocarbons
HD	Heavy Duty

DEF STAN 01-005 Issue 19

HFCs	Hydrofluorocarbons
HFO	Heavy Fuel Oil
HFRR	High Frequency Reciprocating Rig
HSIS	Hazardous Stores Information System
IFO	Intermediate Fuel Oil
IMO	International Maritime Organisation
IP	Institute of Petroleum. It is superseded by EI. It continues to publish test methods as IP Test Methods through EI.
ISO	International Organisation of Standardization
JFTOT	Jet Fuel Thermal Oxidation Test
JIG	Joint Inspection Group. It is a worldwide company representing all aspects of aviation fuel handling, from refineries to aircraft fuel delivery, including pipeline agencies and storage companies.
JSD	Joint Service Designation
JSP	Joint Service Publication
LCO	Light Cycle Oil
LPG	Liquid Petroleum Gas
LRP	Lead Replacement Petrol
MARPOL	International Convention for the Prevention of Pollution from Ships
MGO	Marine Gas Oil
MOD	Ministry of Defence
MON	Motor Octane Number
MSDS	Material Safety Data Sheet
MTBE	Methyl Tert-Butyl Ether – commonly used as an oxygenate gasoline additive to improve motor octane number.
NA	Not Applicable
NATO	North Atlantic Treaty Organisation
NLGI	American National Lubricating Grease Institute
NOS	Not Otherwise Specified

DEF STAN 01-005 Issue 19

NOx	Oxides of Nitrogen
NSN	NATO Stock Number
PAO	Poly-Alpha-Olefin
PCC	Product Conformity Certification
PN	Performance Number
POL	Petroleum, Oils & Lubricants. A term which has been used by the Armed Forces but now more commonly referred to as Fuels and Lubricants, F&L.
PSN	Proper Shipping Name
QPL	Qualified Products List
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RFO	Residual Fuel Oil
RO plc	Royal Ordnance plc
RON	Research Octane Number
RS1	Redwood Seconds No 1 – see Redwood Viscosity.
RVP	Reid Vapour Pressure
SAE	Formerly the Society of Automotive Engineers, but only the abbreviation is now used.
SAPS	Sulfated Ash, Phosphorus and Sulfur
SCR	Selective Catalyst Reduction
SDA	Static Dissipator Additive
SDS	Safety Data Sheet
SECA	SOx Emission Control Area
SFC	Single Fuel Concept. It is now superseded by SFP.
SFP	Single Fuel Policy
SOx	Oxides of Sulfur
SSU	Sabolt Seconds Universal
STANAG	NATO Standardization Agreement
SUS	Sabolt Universal Seconds

DEF STAN 01-005 Issue 19

TAN	Total Acid Number
TAPL	Technically Acceptable Products List
TBN	Total Base Number
TEL	Tetraethyl Lead
TML	Tetramethyl Lead
ULSD	Ultra-Low Sulfur Diesel
UN	United Nations
VG	Viscosity Grade
VI	Viscosity Index
VPI	Vapour Phase Inhibitor
WSIM	Water Separation Index Modified
WTA	Water Thrust Augmentation

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