

Isocyanates Methodology

The main use for methyl di-p-phenylene isocyanate (MDI) is in the production of rigid and semi-rigid polyurethane foams, which accounts for some 80% of global consumption. The majority is used in the construction industry. MDI is supplied as a mixture of polymeric isocyanates, the dimer and trimer (PMDI), and in its pure form. This is not the blended form known as systems. Pure MDI (as reported by ICIS pricing) is distilled from the mixture and is used in reaction injection moulding (RIM), thermoplastic elastomers and adhesives.

Applications for MDI also include construction, refrigeration, packaging, tank and pipe insulation, and other foam uses, including transportation, marine flotation and furniture where its good insulating properties are utilised. In marine uses, rigid foam has superior buoyancy in addition to providing insulation. PMDI is also used as a foundry core binder resin. RIM products are used in automobile parts to produce fascias, bumpers and other body parts.

Pure MDI occurs as white to pale yellow crystals or flakes with a slightly musty odour.

The major outlet for toluene di-isocyanate (TDI) is in the manufacture of flexible polyurethane foam for use in furniture, buildings and transportation. Other outlets include rigid foams and adhesives, as a cross-linking agent for nylon 6; as a chemical intermediate in the manufacture of polyurethane coatings in floor and wood finishes and sealers, paints, concrete sealers, for aircraft and tank trucks as well as in the manufacture of polyurethane elastomers in coated fabrics and clay pipe seals. Polyurethane elastomers, produced by the reaction of TDI with short-chain polyols, can be used in the manufacture of polyurethane fibres.

TDI occurs as colourless to pale yellow liquid or crystals with a pungent odour. It turns pale yellow on exposure to air and is soluble in aromatic and chlorinated aromatic hydrocarbons, ether, acetone, and esters. It reacts with water, ammonia and alcohols with the evolution of carbon dioxide and oxidising agents.

All isocyanates are toxic and harmful through inhalation, ingestion or skin contact.

ICIS pricing quotes Isocyanates in **Europe, Asia-Pacific, China, USA** and the **Middle East**.

Frequency:

Published weekly on Wednesdays in Europe, Asia, US and on Thursdays in the Middle East.

Isocyanates (EUROPE)

Weekly Price Assessments:

ISOCYANATES Monthly Contract Prices

- MDI (CRUDE) CP FD W.EUROPE (EUR/MT & US CTS/LB)
- MDI (PURE) CP FD W.EUROPE (EUR/MT & US CTS/LB)
- TDI CP FD W.EUROPE (EUR/MT & US CTS/LB)

Isocyanates (ASIA-PACIFIC)

Weekly Price Assessments:

Polymeric MDI Spot Prices

- CFR CHINA (USD/MT & conversion to US CTS/LB)
- CFR S.E.ASIA (USD/MT & conversion to US CTS/LB)
- CIF INDIA (USD/MT & conversion to US CTS/LB)

Pure MDI Spot Prices

- CFR N.E. ASIA (USD/MT & conversion to US CTS/LB)

TDI Spot Prices

- CFR CHINA MAIN PORT & HONG KONG (USD/MT & conversion to US CTS/LB)
- CFR S.E.ASIA (USD/MT & conversion to US CTS/LB)
- CIF INDIA (USD/MT & conversion to US CTS/LB)

TDI Monthly Contract Prices

- CFR CHINA MAIN PORT & HONG KONG (USD/MT & conversion to US CTS/LB)

TDI (CHINA)

Weekly Price Assessments:

- DEL NORTH CHINA (DRUMS) (CNY/MT)
- DEL EAST CHINA (DRUMS) (CNY/MT)
- DEL SOUTH CHINA (DRUMS) VAT excluded (CNY/MT)

Isocyanates (USA)

Weekly Price Assessments:

Domestic Prices Delivered for 80:20 TDI

- SPOT/BULK (US CTS/LB & conversion to USD/MT)
- SPOT/DRUMS (US CTS/LB & conversion to USD/MT)

Domestic US Prices Delivered for Polymeric/Crude MDI

- SPOT/BULK (US CTS/LB & conversion to USD/MT)
- SPOT/DRUMS (US CTS/LB & conversion to USD/MT)

Domestic US Prices Delivered for Pure MDI

- SPOT/DRUMS (US CTS/LB & conversion to USD/MT)

Export Prices for 80:20 TDI

- EXPORT/DRUMS FOB USG (US CTS/LB & conversion to USD/MT)

Export Prices for Polymeric/Crude MDI:

- EXPORT/DRUMS (US CTS/LB & conversion to USD/MT)

Isocyanates (MIDDLE EAST)

Weekly Price Assessments:

Polymeric MDI Spot Prices

- CFR GCC (USD/MT & conversion to US CTS/LB)
- CFR EAST MED (USD/MT & conversion to US CTS/LB)
- CFR IRAN (USD/MT & conversion to US CTS/LB)

TDI Spot Prices

- CFR GCC (USD/MT & conversion to US CTS/LB)
- CFR EAST MED (USD/MT & conversion to US CTS/LB)
- CFR IRAN (USD/MT & conversion to US CTS/LB)

General Information:

Assessment window: Price assessments are based on information supplied by market participants through the week up to close of business on Wednesdays at 1800 hours in London, Singapore, Houston, and 1700 hours in Shanghai. For price assessments in the Middle East, Africa and Turkey, information is supplied by market players through the week up to close of business on Thursday at 1800 hours in Singapore.



Specifications: The price range includes pure MDI sold as feedstock. In CASE (Coatings, Adhesives, Sealants & Elastomers) account instances, the price trend reflected in the range is used as a benchmark only. ICIS reports on the most common form of TDI offered commercially, which is known as 80/20 mixture of the 2,4- and 2,6-isomers.

Timing: Cargoes delivered up to six weeks from the date of publication. In the Chinese domestic market, cargoes are for delivery within two weeks from the date of publication.

Terms: Generally 30-60 days after bill of lading date. CFR China prices assume that the buyer holds a letter of credit with credit terms between 30-90 days. CIF India prices include a 90 days credit term for TDI and a 30-90 days credit term for PMDI. Payment terms in Asia are 90-180 days credit for transactions outside China and India. In the Chinese domestic market, terms are cash payment. South China prices do not include value added tax (VAT). CFR Middle East and Africa assessments assume that the buyer holds a letter of credit with credit terms between 60-120 days for Asian origins. For European and some Korean origins, DA (documents against acceptance) 90 days is accepted or 60-90 days after bill of lading date or open terms with 90-120 days credits.

Standard cargo size: In Europe, a typical full bulk truck load size is 20-25 tonnes. In Europe, ICIS isocyanate assessments are based on truck loads in western Europe, with average players buying 5,000-10,000 tonnes/year for crude MDI in the rigid foam sector (for construction applications), 500-2,000 tonnes/year for pure MDI into the footwear, elastomer and thermoplastic sectors and 1,000-8,000 tonnes/year for TDI for small to average volume players in the foam sector.

In the US, the bulk assessments for both 80:20 TDI and Polymeric MDI are based on typical railcar and tank truck volumes of roughly 190,000 lb for railcars and 46,000 lb for tank trucks. Drum assessments for 80:20 TDI, Polymeric and Pure MDI are based on 560 lb drums.

In Asia, typical cargo sizes for TDI and polymeric MDI covered in the report are 20 tonnes and above, and for monomeric MDI are 15.75 tonnes and above. In the China domestic market TDI drum assessments are based on 250 kg drums, with usual cargo sizes ranging between 5-50 tonnes.

In the Middle East, the typical cargo size for TDI and polymeric MDI from Asia is in drums of 20 tonnes and a maximum of 15 drums will be considered in the assessment. TDI and polymeric MDI from Europe are traded in bulk of 20-25 tonnes.

Assessment basis: ICIS pricing isocyanates price ranges include transactions reported as physical deals for the month indicated in the price quote. Certain prices may be excluded from the range if they have been negotiated in unusual circumstances or if special conditions are thought to apply. In the absence of business, the price spread

can also move based on the majority of market sentiment. The contract prices in the ICIS pricing range are a fixed price for that month. Price changes are calculated against the previous monthly contract prices quoted. All prices in the range are pre-discounts.

In Europe, the contract price ranges for MDI and TDI are valid for the current month. For crude MDI, any quarterly pricing information will be included in the body of the text. Any MDI or TDI spot pricing will also be mentioned in the text.

In Asia, domestic prices in China, Taiwan and in Southeast Asian countries will be discussed in the text. Prices are for drummed material for both TDI and polymeric MDI. Bulk transactions for TDI may also be included in the text. Pure MDI values are bulk transactions from producer to end-users due to the strict storage requirements.

In the US, information is gathered throughout the week from suppliers, consumers, distributors and other market players. The published prices do not include discounts for volume or customer/contract status. Business concluded in Latin America is included in the body of the report.

In the Middle East, prices of TDI and polymeric MDI are discussed for both drummed and bulk material. Countries in the Gulf Cooperation Council (GCC) region include Saudi Arabia, UAE (United Arab Emirates), Kuwait, Qatar and Bahrain. Countries in the East Mediterranean include Jordan, Syria, Lebanon and Israel. Domestic TDI prices in Iran will be discussed in the commentary. African price assessments of TDI and polymeric MDI will be commented on. Western Africa covers main ports in Mauritania, Senegal, The Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Togo, Benin and Nigeria. Eastern Africa covers main ports in Eritrea, Djibouti, Somalia, Kenya and Tanzania. Northern Africa covers main ports in Morocco, Algeria, Tunisia, Libya, Egypt and Sudan. Southern Africa covers main ports in Namibia, Mozambique and South Africa. TDI import prices in Turkey will be discussed in the commentary as and when available.

Assessments are based on deals done and confirmed. In the absence of business, bids and offers and notional discussions will be considered. Factors affecting price movements, including supply/demand information, plant operating rates, feedstock and derivative markets and general sentiment, will also be taken into account.

All regional reports offer market commentary that includes details of traced transactions, news on the supply/demand balance, export/import information, contract price negotiations and general sentiment for price direction. Where applicable there is product information, comments on up and downstream market developments and general market intelligence.

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