



FTT WOLBROM®

Fabryka Taśm Transporterowych Wolbrom S. A.



AB 169
Laboratorium
FTT WOLBROM S.A.



EN ISO 9001 | EN ISO 14001 | PN-N 18001 | PN-ISO/IEC 27001
PN-EN ISO/IEC 17025 Laboratorium



Vulcanized and non-vulcanized rubber sheets

Types of rubber sheets

Vulcanized:

- without fabric plies (W),
- with fabric plies (Wp).

The following fabrics may be used as fabric plies:

Cotton (B), polyester - polyamide (EP), polyamide - polamide (PP).

Non-vulcanized

Use

The following sheet types are available depending on the characteristics of the rubber mixture used for production of sheets:

1. General purpose ordinary, rubber characteristics per **Table 3:**
2. Special characteristics, rubber characteristics per **Table 4:**
 - General purpose, abrasion-resistant, frost-resistant,
 - General purpose, with improved physical and mechanical parameters,
 - Resistant to oils and petrol,
 - Resistant to diluted acids and alkali,
 - Fire-retardant,
 - Dielectric,
 - Temperature resistant: T1 up to 120 [°C], T2 up to 150 [°C], T3 up to 200 [°C],
 - Ozone and heat resistant based on EPDM rubber.

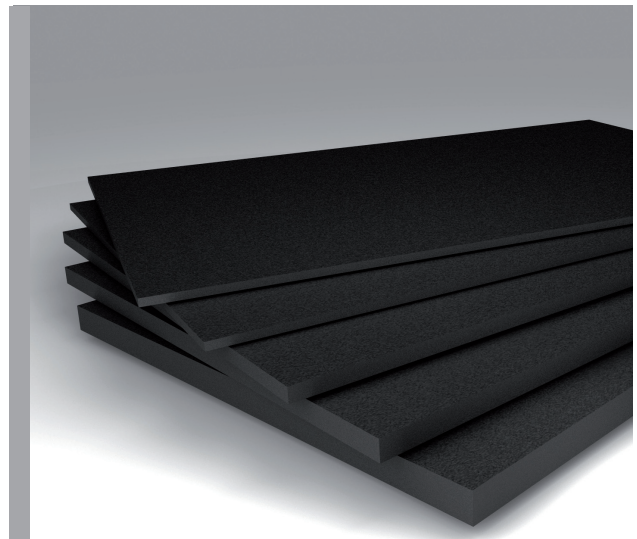
Plate design per: **WT 31/12**

Characteristics of vulcanized plates

Plate colour: black, w/o dielectric plates (gray). All plates, with the exception of dielectric plates have anti-electrostatic characteristics.

Vulcanized rubber plates are designed for operation under static conditions, in temperature ranges stated in **Tables 3, 4** and **5**.

EPDM rubber vulcanized rubber plates (ethylene - propylene - dienes) feature perfect resistance to ozone and weather conditions. The plates feature very good resistance to cooling liquids (ethylene glycol based) and brake liquids,



water vapour, alcohols, detergents, acids and alkali solutions. The characteristics of EPDM vulcanized plates are shown in **Table 5**.

Characteristics of non-vulcanized plates

The non-vulcanized plates are designed for making rubber products by means of vulcanization under the conditions specified by the plate manufacturer, characteristic to the mixture used for making the plate.

Rubber characteristics after vulcanization under conditions specified by the manufacturer are given in **Tables 3, 4** and **5**.

Data sheets conforming to the applicable regulations for each compound used for making non-vulcanized rubber plate are available on the manufacturer's website.

FTT Wolbrom S.A. does not use oils containing poly-aromatic hydrocarbons (PAHs) in the production of rubber compounds, i.e. the substances listed in annex XIV of the regulation no. 1907/2006 (REACH) and included on the Candidate List of very high concern substances (SVHC).

We can supply vulcanized and non-vulcanized plates to different dimensions and using different rubber compounds with the parameters agreed upon with the Manufacturer.

Table 1. Standard dimensions of vulcanized plates

Plate thickness [mm]	Length	Width
0,5 ±0,2	10 ±0,1 [m]	1200 [mm] ±2,5 [%]
1 ±0,2		
2 ±0,3		
3 ±0,4		
4 ±0,5		
5 ±0,5		
6 ±0,6		
7 ±0,7		
8 ±0,8		
9 ±0,9		
10 ±1,0		
12 +1,5/-1,0	1000 ±15 [mm] 4,5 ±0,1 [m] 4,5 ±0,1 [m] or 9,5 ±0,1 [m] 9,5 ±0,1 [m] with fabric image at the one side of the plate	1000 [mm] ±15 [mm] 200, 250, 400, 650, 800 [mm] ±2,0 [%] 1000 lub 1200 [mm] ±2,0 [%] 1400, 1600, 1800, 2000 [mm] ±2,0 [%]
15 +1,5/-1,0		
20 +2,0/-1,0		
25 +2,5/-1,0		
30 +3,0/-1,5		
40 +4,0/-2,0	1000 ±15 [mm]	1000 ±15 [mm]
50 +4,0/-2,0	1000 ±15 [mm]	1000 ±15 [mm]

Table 2. Dimensions of manufactured non-vulcanized plates

Plate thickness [mm]	Plate width	Plate length	<p>Tables 1 and 2 include thicknesses and tolerances proposed by the manufacturer.</p> <p>Different dimensions may be used after agreement between manufacturer and customer.</p>
0,5 ±0,2	1200 [mm] ±2,5 [%]	15 ±0,2 [m]	
1 ±0,3			
2 ±0,4			
3 ±0,5			
4 ±0,6			
5 ±0,7			
6 ±0,8			
8 ±1,0			
10 ±1,5			

Table 3. Characteristics of general purpose vulcanized and non-vulcanized* plates

Characteristics	PZMM	PZM	PZS	PZ	PZT	PZTT
Type A Shore's hardness [°Sh]	50 ±5	60 ±5	65 ±5	70 ±5	80 ±5	85 ±5
Tensile strength [MPa], min.	5	5	4	5	5	5
Elongation at rupture [%], min.	300	200	150	200	150	150
Temperature of operation [°C]	from -30 to +50	from -25 to +50	from -25 to +50	from -25 to +50	from -25 to +50	from -20 to +50
Heat resistance (70 [°C]/168 h) ΔTS max. [%] ΔE _b max. [%]	-30 -30	-30 -30	-30 -30	-30 -30	-30 -30	-30 -30
Rubber base	SBR/NR	SBR/NR	SBR/NR	SBR/NR	SBR/NR	SBR/NR

* characteristics after vulcanization of rubber

Table 4. Characteristics of vulcanized and non-vulcanized* plates with special characteristics

Characteristics / Symbol	Abrasion-resistant, frost-resistant STM	Abrasion-resistant, frost-resistant PMAR	Dielectric PDC	General purpose, improved physical and mechanical parameters			Resistant to oil, petrol, diluted acids and alkali OP	Oil and petrol resistant		Fire-retardant ZNKK	Temperature resistant:
				PŁM	PLS	STS		OPM	TOA		
Type A Shore's hardness [°Sh]	65 ±5	60 ±5	65 ±5	45 ±5	65 ±5	60 ±5	65 ±5	50 ±5	80 ±5	60 ±5	60 ±5
Tensile strength (TS), min. [MPa]	18	20	5	15	25	15	5	3	11	15	T1: 15 T2: 15 T3: 12
Elongation at rupture (E _r), min. [%]	400	450	250	400	450	350	200	200	-	350	T1: 350 T2: 350 T3: 400
Working temperature [°C]	-60 to +50	-30 to +50	-30 to +50	-30 to +50	-30 to +50	-25 to +50	-20 to +50	-20 to +50	-20 to +50	-25 to +50	from -30 to T1, T2, T3
Heat resistance (70 [°C], 168 h), max [%] ΔTS ΔE _b	-25 -25	-25 -25	-20 -25	-30 -30	-25 -25	-25 -25	-30 -30	- -	- -	-25 -25	T1** T2** T3**
Liquid resistance shown by mass change (Δm) - solvent B (isooctan mix: toluene in proportion 70:30) (20 [°C]/24h), max. [%]	-	-	-	-	-	-	30	30	-	-	-
Liquid resistance shown by mass change (Δm) - oil IRM 902 (20 [°C]/ 24h), [%]	-	-	-	-	-	-	±10	-	-	-	-
Liquid resistance shown by mass change (Δm) - 20[%] dulfuric acid or 20[%] soda lye (20 [°C], 72 h), [%]	-	-	-	-	-	-	±2	-	-	-	-
Liquid resistance shown by hardness change: - oil IRM 901 (125 [°C]/ 70h), [°Sh] - oil IRM 903 (125 [°C]/ 70h), [°Sh]	-	-	-	-	-	-	-	-	±5 ±12	-	-
Electric characteristics class — alternating current voltage, test, withstand for strength class, rms value [kV]	-	-	0: 5/10 1: 10/20 2: 20/30 3: 30/40	-	-	-	-	-	-	-	-
Abrasion resistance [mm ³], max.	90	60	-	-	100	200	-	-	-	200	150
Flame resistant - average burning time 3 specimens 150x20x12 [mm] - max [s]. Lighting time 30 [s].	-	-	-	-	-	-	-	-	-	5	-
Rubber base	IR/BR	IR/BR	SBR/NR	IR	IR/BR	SBR/BR	NBR/NR	NBR/NR	NBR/NR	BR/SBR/NR	-

* characteristics after vulcanization of rubber

** temperature resistance: T1 (100 [°C], after 72 hours) ΔTS max ±40 [%], ΔE_b max ±60 [%]; T2 (125 [°C], after 72 hours) ΔTS max ±45 [%], ΔE_b max ±65 [%]; T3 (125 [°C], after 168 hours) TS min 10 [MPa], E_r min 300 [%]

Table 5. Characteristics of EPDM rubber vulcanized and non-vulcanized* plates

Characteristics / Symbol	Unit	EPDM 50	EPDM 60	EPDM 70
Tensile strength, TS	[MPa]	≥ 7	≥ 7	≥ 7
Elongation at rupture, E _b	[%]	≥ 350	≥ 300	≥ 200
Type A Shore's hardness	[°Sh]	50 ±5	60 ±5	70 ±5
Compression set/70 [°C] x 22h	[%]	≤ 50	≤ 50	≤ 50
Heat resistance /70 [°C] x 72h/:				
Δ TS	[%]	≥ -30	≥ -30	≥ -30
Δ E _b	[%]	≥ -50	≥ -50	≥ -50
Δ H max.	[°Sh]	+10	+10	+10
Tear resistance	[kN/m]	≥ 20	≥ 20	≥ 20
Ozone resistance: 50 pphm X 40 [°C] x 72h x 20 [%] elongation	-	No cracks	No cracks	No cracks
Working temperature	[°C]	From -40 to +100 Periodically up to +125		

* characteristics after vulcanization of rubber

HANDLING USED PRODUCTS

Used products should be liquidated by means of recovery or storage on a landfill other than hazardous or inactive waste

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