

**STEELFORCE**  
PACKAGING

**TECHNICAL DATASHEET**  
**Tin Mill Black Plate**



# Tin Mill Black Plate (TMBP)

## Comprehensive Technical Overview

is a low-carbon steel plate used as raw material for TFS (Tin-Free Steel) or ETP (Electrolytic Tin Plate) and some non-food applications. The material's chemical composition imparts special corrosion resistance properties. It is coated with a special oil film applied using an electrostatic oiler on both sides, protecting it from environmental humidity and facilitating handling.

### 1. Uses

TMBP can be utilized for:

- Stamped parts
- Lids and ends
- Oval and cylindrical two-piece cans
- Rectangular cans
- (All for non-food applications)

### 2. Technical specifications

Type	Features
<b>D</b>	Aluminum killed steel (deoxidized). This is used for deep drawn cans (two-piece cans, aerosol, etc.) or in those processes where wrinkles –de Luders– are likely to appear during machining.
<b>L</b>	Contains small quantities of metalloids and residual elements such as: Cu, Ni, Cr, Mo. Used to improve the internal corrosion resistance of cans for certain food products.
<b>MR</b>	Contains low percentages of residual elements and has a good corrosion resistance. It is the most common in the market and is used for general purposes, including cans.



### 3. Chemical compositions

<b>CHEMICAL COMPOSITION FOR STEEL USED FOR ETP</b>			
<b>Elemental</b>	<b>Type D % max</b>	<b>Type L (1) % max</b>	<b>Type MR (1) % max</b>
<b>Carbon</b>	0,12	0,13	0,13
<b>Manganese</b>	0,60	0,60	0,60
<b>Phosphorus</b>	0,02	0,015	0,02
<b>Sulfur</b>	0,05	0,05	0,05
<b>Silicon (2)</b>	0,02	0,02	0,02
<b>Copper</b>	0,20	0,06	0,20
<b>Nickel</b>	0,15	0,04	0,15
<b>Chromium</b>	0,10	0,06	0,10
<b>Molybdenum</b>	0,05	0,05	0,05
<b>Others, each</b>	0,02	0,02	0,02

According to ASTM A623-2009. (1) Double reduction products are obtained in type L and MR. (2) When it is used steel obtained by continuous casting killed by silicon it is accepted until 0.08%

#### 4. Finishes

FINISHES		
Type	Main uses	Features
<b>Bright</b>	General purpose cans	Finishing with melted tin, with a bright shine
<b>Mate</b>	Crown caps	Matte finishes, without shine, with electrolytically deposited tin without melting on the matte finishes steel plate
<b>Silver</b>	Cans for different applications, crown caps	Finish with melted tin produced using a special treatment on the base metal
<b>Stone</b>	General use cans	Finish with melted tin, produced on the base metal, with a slightly matte appearance. Resist scratching during lithography or cans production.

#### 5. Hardness, temper and reduction type

TEMPER	Hardness, HR 30T	Thickness: e, mm	Uses
<b>T1-BA</b>	Max 53	$e \leq 0,21$	Necks, nozzles, taps, toys bottoms for 5 gal. cans for oil and other uses that require deep drawing.
	Max 52	$0,21 < e \leq 0,28$	
	Max 51	$e > 0,28$	
<b>T2-BA</b>	$53 \pm 4$	$e \leq 0,21$	Small, square cans, cans for fish (0) salted meat, rings and other uses, with moderate draw.
	$52 \pm 4$	$0,21 < e \leq 0,28$	
	$51 \pm 4$	$e > 0,28$	
<b>T2,5 - BA, CA</b>	$56 \pm 4$	$e \leq 0,21$	Crowns, for cans and other applications that require moderate draw and harness.
	$55 \pm 4$	$0,21 < e \leq 0,28$	
	$54 \pm 4$	$e > 0,28$	
<b>T3 - BA, CA</b>	$58 \pm 4$	$e \leq 0,21$	Bodies for 5 gal oil cans, large cans and other applications that require an appropriate level of hardness.
	$57 \pm 4$	$0,21 < e \leq 0,28$	
	$56 \pm 4$	$e > 0,28$	
<b>T4 - C4 (1)</b>	$62 \pm 4$	<b><math>e \leq 0,21</math></b>	Bodies and bottoms for cans that require relatively high strenght, and crown caps.
	$61 \pm 4$	<b><math>0,21 &lt; e \leq 0,28</math></b>	
	$60 \pm 4$	<b><math>e &gt; 0,28</math></b>	
<b>T5 - CA (1)</b>	$65 \pm 4$	$e \leq 0,21$	Bodies and bottoms for cans that require a combination of high hardness, strength, and good formability.
	$65 \pm 4$	$0,21 < e \leq 0,28$	
	$64 \pm 4$	$e > 0,28$	



DR 7,5	70 ± 4	$e \leq 0,21$	Bodies and bottoms of small diameter cans requiring high strength.
	70 ± 4	$0,21 < e \leq 0,28$	
	70 ± 4	$e \geq 0,28$	
DR 8(2) BA - CA	73 ± 4	$e \leq 0,21$	
	73 ± 4	$0,21 < e \leq 0,28$	
	73 ± 4	$e \geq 0,28$	
DR 9(2) CA	76 ± 4	$e \leq 0,21$	
	76 ± 4	$0,21 < e \leq 0,28$	
	76 ± 4	$e \geq 0,28$	
DR 9 M (2)	77 ± 4	$e \leq 0,21$	
	77 ± 4	$0,21 < e \leq 0,28$	
	77 ± 4	$e \geq 0,28$	
DR 10	80 ± 4	$e \leq 0,21$	
	80 ± 4	$0,21 < e \leq 0,28$	
	80 ± 4	$e \geq 0,28$	

(1) CA means continuous annealing and BA means box annealing. (2) DR: Base metal produced using the double cold reduction process; provides greater stiffness and strength than conventional base material and, therefore, provides the same strength using smaller cross sections. These advantages make it possible to produce more cans per unit weight. Service characteristic, thickness distribution and chemical characteristics are similar to those of conventional steel.

**6. Tin mill black plate availability**

<b>Rectangular re-squared cutting sheets</b>			
Thickness	mm	0,13(1)	0,40
Width	mm	600	1000
Cutting length	mm	500	1000
Package weight	Kg	N/A	2500
Package height	mm	N/A	450
<b>Lithographed sheets (Press)</b>			
Width	mm	710	1130
Lenght	mm	510	960
Maximum printing area	mm	1130 (Width)	945 (Length)
Package weight	Kg	N/A	2500
Package height	mm	N/A	450
<b>Varnished sheets</b>			
Width	mm	710	1130
Lenght	mm	510	960
Maximum printing area	mm	1130 (Width)	970 (Length)
Package weight	Kg	N/A	2500
Package weight	mm	N/A	450
<b>3.4.3 COILS PRESENTATION</b>			
<b>3.1 Coils</b>			
Coil weight	Kg	1000	9000
Internal diameter	mm	419	505
External diameter	mm	610	1626



**DIMENSIONS AVAILABILITY**

Variable	Units	Minimum	Maximum
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**3.4.1. MECHANICAL PROPERTIES AND COATINGS**

Thickness	mm	0,15	0,6
Temper	N/A	T1	DR10
Oil	mg/m <sup>2</sup>	0	25

**3.4.2. PACKAGES PRESENTATION**
**Rectangular cutting sheets**

Cutting length	mm	457,2	1250
Width	mm	600	965,2
Package weight	Kg	N/A	2500
Package height	mm	N/A	450

**Pre-scroll cutting sheets**

Thickness	mm	0,13(1)	0,50
Cutting length	mm	610	1016
Width	mm	610	1118
Package weight	Kg	N/A	2500
Package height	mm	N/A	457,2

<b>Rectangular re-squared cutting sheets</b>			
Thickness	mm	0,13(1)	0,40
Width	mm	600	1000
Cutting length	mm	500	1000
Package weight	Kg	N/A	2500
Package height	mm	N/A	450
<b>Lithographed sheets (Press)</b>			
Width	mm	710	1130
Lenght	mm	510	960
Maximum printing area	mm	1130 (Width)	945 (Length)
Package weight	Kg	N/A	2500
Package height	mm	N/A	450
<b>Varnished sheets</b>			
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<b>3.4.3 COILS PRESENTATION</b>			
<b>3.1 Coils</b>			
Coil weight	Kg	1000	9000
Internal diameter	mm	419	505
External diameter	mm	610	1626

Strips			
Thickness	mm	0,17	0,6
Coil width	mm	600	984
Strip width	mm	20	614
Strips by step	Units	2	15
Coil weight	Kg	1000	9000
Internal diameter	mm	505	-----
External diameter	mm	610	1624

1 Sheets with thickness less than 0.15 mm are provided by the customer

## **8. Recomendations and product handling**

- For maximum usage of the raw material, the following recommendations should be followed:
- The Tin Mill Black Plate (TMBP) should be stored in a humidity- free environment to prevent risk of oxidation.
- Oxidation is the result of the interaction among the iron, exposed through imperfections in the coating, water (humidity) and oxygen in the air.
- To prevent oxidation it is necessary to take care when transporting, storing and handling the TMBP by following these precautions:
- Demand appropriate transportation, with vehicles that have floors and roofs in good condition
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- Inspect one hundred percent of each production order to check the general status of the packaging
- Never leave the TMBP outdoors
- Store the TMBP in closed warehouses with low relative humidity. In coastal areas or lots of rainfall, it is advisable to use equipment to reduce relative humidity to acceptable levels.
- Do not store TMBP without appropriate packaging



- Do not make piles higher than 2.50 m.
- Never handle TMBP without gloves. The humidity and salts in perspiration attack TMBP very quickly
- If the TMBP bales must be inspected, they should be covered again for storage. If humidity is seen during inspection, it is advisable to use that TMBP immediately to prevent the oxidation process.
- Use TMBP immediately after opening it.
- In production processes that use TMBP and require cuts, the resulting parts should not be stored for a long time because the edges do not contain tin and become quickly oxidized
- Special care should be taken in handling and fabrication of cans and caps to avoid scratching the TMBP. Do not store the TMBP for very long because the oil applied to protect it evaporates and breaks down until it disappears

### Contact Us for Technical Inquiries

For more detailed technical information or to discuss your specific requirements, reach out to our expert team. Let us help you select the optimal specifications for your project.





# STEEELFORCE

P A C K A G I N G

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