

Product For Sale

PRODUCT BOOK

TIN MILL PRODUCTS

**Single Reduced – Double Reduced
Electrolytic Tin Plate
Electrolytic Chromium Coated Steel
Black Plate – As Rolled, Full Finish
Black Plate – Full Hard**

ArcelorMittal USA

Product For Sale

Suggestion to Buyers

We call your attention to the following items which, when shown on your orders, will expedite entry, production and shipment. Specifications beyond stated limitations are subject to inquiry.

UNIT OF QUANTITY	Specify whether ordered quantity is base boxes or weight
ORDERED SIZE	Order accepted in even 1/16 in. increments. All tin mill products are produced to actual ordered width
ROLLING INSTRUCTIONS	Rolling width, if critical. (Grain direction is perpendicular to rolling width.)
STEEL TYPE AND TEMPER	Specify if known. Note: Only aluminum killed continuous cast steels are available
CUSTOMER APPLICATION	Specify end use and any special property requirements. Mill can then determine steel type and temper, if not known. (Samples of parts are desirable.)
COILS	Inside diameter: (16-1/2 in. - std, 20 in.) Maximum coil weight. Maximum outside diameter Welds (number acceptable) or No Welds (no welds subject to price extra.) On no weld orders, minimum coil weight can not be greater than 50% of maximum coil weight If differentially coated, whether the marking is coiled inside or outside.
METHOD OF PACKING	Eye vertical on skids – standard; other – inquire. Tail end direction -- clockwise or counterclockwise.
METHOD OF TRANSPORTATION	Rail or truck If rail – name of delivering carrier and any restrictions such as maximum car length, etc. If truck – any specific equipment necessary, method of unloading (fork-lift tractor, overhead crane with “C” hook), whether side or rear unloading, etc.; also receiving days, unloading hours

Product For Sale

Any question you may have concerning this product should be directed to

ArcelorMittal Weirton
100 Pennsylvania Ave
Weirton, WV 26062
T +1 304 797 2000

Index	Page
1CRETP – Single Reduced Electrolytic Tin Plate	4
1CRECCS – Single Reduced Electrolytic Chromium Coated Steel	5
1CRBP – Single Reduced Black Plate	6
FHBP - Black Plate Full Hard	7
2CRETP – Double Reduced Electrolytic Tin Plate	8
2CRECCS – Double Reduced Electrolytic Chromium Coated Steel	9
2CRBP – Double Reduced Black Plate	10
GLOSSARY	11 -14

Product For Sale

1CRETP – Single Reduced Electrolytic Tin Plate

Options

TIN COATING

- a. Regular or differential
- b. Marking system. If differential – lines or geometric
- c. Melted (Bright), Unmelted (Matte) or Fully Alloyed (#05 coating only)

BASE METAL FINISH

- a. 7C (Stone)
- b. 5C (Shot Blast)
- c. Other – Inquire

SURFACE TREATMENT

- a. CDC (Cathodic Dichromate – normally furnished when treatment not specified)
- b. SDCD (Sodium Dichromate Dip)

OILING

- a. ATBC (Acetyl Tributyl Citrate)

Limitations

Tin Coating Weights

Standard Coating Weights are: No.05, No.10, No.15, No. 20, No. 25, No. 50, No. 75, No. 100, No. 05/20, No. 05/25, No. 10/20, No. 20/25, No. 20/30, No. 20/50, No. 20/75, No. 20/100, No. 25/50, No. 25/75, No. 25/100, No. 50/75

Minimum Actual Widths		
Base Weight	Nominal Thickness (Inches)	Minimum Actual Width (Inches)
70 to 135 Incl.	.0077 to .0149 Incl.	29

Maximum Actual Widths						
Base Weight	Nominal Thickness (Inches)	Maximum Actual Width (Inches) Steel Types D, L & MR Temper				
		T1-BA	T2-BA	T3-BA	T4-CA	T5-CA
70 to 74 Incl.	.0077 to .0081 Incl.	37-1/4	37-1/4	37-1/4	39	39
75 to 89 Incl.	.0083 to .0098 Incl.	37-1/4	37-1/4	37-1/4	39	39
90 to 135 Incl.	.0099 to .0149 Incl.	38	38	38	39	39

Product For Sale

1CRECCS – Single Reduced Electrolytic Chromium Coated Steel

Options

BASE METAL FINISH

- a. 7C (Stone) – normally furnished when finish not specified
- b. 5C (Shot Blast)
- c. Other – Inquire

OILING

- a. BSO (Butyl Stearate)
- b. ATBC – Inquire

INSIDE DIAMETER

- a. 16 -1/2" Standard
- b. Inquire for other ID's

Limitations

Minimum Actual Widths		
Base Weight	Nominal Thickness (Inches)	Minimum Actual Width (Inches)
70 to 135 Incl.	.0077 to .0149 Incl.	29

Maximum Actual Widths						
Base Weight	Nominal Thickness (Inches)	Maximum Actual Width (Inches) Steel Types D, L & MR Temper				
		T1-BA	T2-BA	T3-BA	T4-CA	T5-CA
70 to 74 Incl.	.0077 to .0081 Incl.	37-1/4	37-1/4	37-1/4	39	39
75 to 89 Incl.	.0083 to .0098 Incl.	37-1/4	37-1/4	37-1/4	39	39
90 to 135 Incl.	.0099 to .0149 Incl.	38	38	38	39	39

Product For Sale

1CRBP – Single Reduced Black Plate

Options

BASE METAL FINISH

- a. 5C (Shot Blast)
- b. 7C (Stone)
- c. Other – Inquire

SURFACE TREATMENT AND OILING

- a. As Rolled – Product is considered dry and is provided exclusive of a claimable rust/oxidation
- b. Full Finish – Heavier chemical treatment for rust protection plus BSO oil
- c. ATBC oil - inquire

Limitations

Minimum Actual Widths		
Base Weight	Nominal Thickness (Inches)	Minimum Actual Width (Inches)
70 to 128 Incl.	.0077 to .0149 Incl.	29

Maximum Actual Widths						
As Rolled or Full Finish Black Plate						
Base Weight	Nominal Thickness (Inches)	Maximum Actual Width (Inches)				
		Steel Types D, L & MR Temper				
		T1-BA	T2-BA	T3-BA	T4-CA	T5-CA
70 to 74 Incl.	.0077 to .0081 Incl.	37-1/4	37-1/4	37-1/4	39	39
75 to 89 Incl.	.0083 to .0098 Incl.	37-1/4	37-1/4	37-1/4	39	39
90 to 128 Incl.	.0099 to .0141 Incl.	38	38	38	39	39

Product For Sale

Full Hard Black Plate

STEEL GRADE	ORDERED THICKNESS (Inches)	ORDERED WIDTH (Inches)
.07% Carbon or Less	.0073 - .0090	29 – 40
	.0091 - .0141	29 – 44
.08% Carbon or Greater	.0078 - .0090	29 – 40
	.0091 - .0141	29 – 44

FHBP is ordered & produced to actual thickness

Items exceeding above limitations subject to inquiry

Product For Sale

2CRETP – Double Reduced Electrolytic Tin Plate

Options

TIN COATING

- a. Regular or differential
- b. Marking system. If differential – lines or geometric
- c. Melted (Bright), Unmelted (Matte) or Fully Alloyed (#05 coating only)

BASIC METAL FINISH

- a. 7C (Stone)
- b. Other – Inquire

SURFACE TREATMENT

- a. CDC (Cathodic Dichromate – normally furnished when treatment not specified)
- b. SDCD (Sodium Dichromate Dip)

OILING

- a. ATBC (Acetyl Tributyl Citrate)

Limitations

Tin Coating Weights

Standard Coating Weights are: No. 05, No. 10, No. 15, No. 20, No. 25, No. 50, No. 75, No. 100, No. 05/20, No. 05/25, No. 10/20, No. 20/25, No. 20/30, No. 20/50 No. 20/75, No. 20/100, No. 25/50, No. 25/75, No. 25/100, No. 50/75

Widths			
Continuous Annealed			
Base Weight	Nominal Thickness (Inches)	Minimum Width (Inches)	Maximum Width (Inches)
52 to 55 Incl.	.0057 to .0062 Incl.	29-1/2	36-1/4
56 to 135 Incl.	.0063 to .0149 Incl.	29-1/2	37-1/4
Batch Annealed			
52 to 107 Incl.	.0057 to .0118 Incl.	29-1/2	37-1/4
108 to 135 Incl.	.0119 to .0149 Incl.	29-1/2	34

Product For Sale

2CRECCS – Double Reduced Electrolytic Chromium Coated Steel

Options

BASIC METAL FINISH

- a. 7C (Stone)
- b. Other – Inquire

OILING

- a. BSO (Butyl Stearate)
- b. ATBC – Inquire

Limitations

Widths			
Base Weight	Nominal Thickness (Inches)	Minimum Width (Inches)	Maximum Width (Inches)
52 To 107 Incl.	.0057 To .0118 Incl.	29-1/2	37-1/4
108 To 135 Incl.	.0119 To .0149 Incl.	29-1/2	34

Product For Sale

2CRBP – Double Reduced Black Plate

Options

BASIC METAL FINISH

- a. 7C (Stone)
- b. Other – Inquire

SURFACE TREATMENT AND OILING

- a. As Rolled – Uncontrolled residual rolling oil level not suitable for coating/lithography without prior cleaning by customer
- b. Full Finish – Heavier chemical treatment for rust protection plus BSO oil
- c. ATBC oil - inquire

Limitations

Widths			
As Rolled or Full Finish Black Plate			
Base Weight	Nominal Thickness (Inches)	Minimum Width (Inches)	Maximum Width (Inches)
55 To 107 Incl.	.0060 To .0118 Incl.	29-1/2	37

Product For Sale

Glossary of Tinplate Terms

Base box — a unit of area equivalent to 112 sheets 14 by 20 in. or 31,360 in.² (217.78 ft²)

Base weight — a term used to describe the thickness of tin mill products. The designated base weight multiplied by a factor of 0.00011 is the nominal decimal thickness, in inches, of the material.

Black plate — light-gage, low-carbon, cold-reduced steel intended for use in the untinned state or for the production of other tin mill products.

Box annealing — a process involving slow heating of coils to a subcritical temperature, holding, and cooling therefrom, to soften the strip and relieve stresses produced during cold reduction. It is accomplished in a sealed container. By introducing and maintaining an inert or slightly reducing atmosphere during the cycle, a relatively bright surface is obtained.

Bright finish — a surface that has a melted tin coating.

Burr — metal displaced beyond the plane of the surface by slitting or shearing

Camber — the greatest deviation of a coil edge from a straight line. The measurement is taken on the concave side and is the perpendicular distance from a straight line to the point of maximum deviation

Chemical treatment, electrolytic tin plate — a passivating chemical treatment applied to the surface of electrolytic tin plate to stabilize the plate surface characteristics compatible with a specified end use

Chemically treated steel - light-gage, low-carbon, cold-reduced steel that has a passivating or chemical treatment applied to the surface to provide rust resistance or retard underfilm corrosion, or both.

Cold reduction — the process of reducing the thickness of the strip cold, generally accomplished by one rolling through a series of four-high mills arranged in tandem.

Product For Sale

Continuous annealing — a process consisting of passing the cold-reduced strip continuously and in a single thickness through a series of vertical passes within a furnace consisting of heating, soaking, and cooling zones to soften the strip and relieve stresses produced during cold reduction. An inert or slightly reducing atmosphere is maintained in the furnace to obtain a relatively bright strip.

Differentially coated tin plate—electrolytic tin plate with a different weight of tin coating on each surface.

Double-reduced plate — plate given a second major cold reduction following annealing.

Electrolytic chromium-coated steel — light-gage, low-carbon, cold-reduced steel on which chromium and chromium oxides have been electrodeposited.

Electrolytic tin plate — light-gage, low-carbon, cold-reduced steel on which tin has been electrodeposited by an acid or alkaline process.

J Plate — electrolytic tin plate, No. 50 or heavier tin coating, with improved corrosion performance for some galvanic detinning food products as measured by the Special Property Tests for Pickle Lag (PL), Iron Solution Values (ISV), Tin Crystal Size (TCS). The alloy layer is normally light in color, characteristic of the acid tinning process.

K Plate — electrolytic tin plate, No. 50 or heavier tin coating, with improved corrosion performance for some galvanic detinning food products as measured by the Special Property Tests for Pickle Lag (PL)(3), Iron Solution Value (ISV) , Tin Crystal Size (TCS) , and Alloy Tin Couple (ATC) or Aerated Media Polarization (AMP).

The production of J Plate and K Plate require special processing and testing. In order to receive J Plate or K Plate, this requirement must be specified on the order.

Matte finish — a surface that has an unmelted tin coating, generally on a shot-blast finish (SBF) base steel.

Mechanical designation — an arbitrary number to designate Rockwell hardness and ultimate tensile strength characteristics for double-reduced plate

Oiling — a lubricant film applied to both surfaces of the plate.

Product For Sale

Passivating treatment — a surface chemical treatment

Ratio — the number of base boxes in a package of a given size

Rockwell hardness test — a test for determining hardness

Rolling width — the dimension of the sheet perpendicular to the rolling direction.

Single-reduced plate — plate produced with one major cold reduction.

Steel Type D — base-metal steel aluminum killed, sometimes required to minimize severe fluting and stretcher-strain hazards or for severe drawing applications

Steel Type L — base-metal steel, low in metalloids and residual elements, sometimes used for improved internal corrosion resistance for certain food-product containers

Steel Type MR — base-metal steel, similar in metalloid content to Type L but less restrictive in residual elements, commonly used for most tin mill products.

Surface appearance — visual characteristics determined primarily by the steel surface finish. For electrolytic tin plate, the appearance is also influenced by the weight of coating and by melting or not melting the tin coating.

Surface finishes — steel surface finishes for tin mill products imparted by the finishing-mill work rolls. These may be either ground or blasted-roll finishes.

Temper designation — an arbitrary number to designate a Rockwell hardness range for single-reduced products which indicates the forming properties of the plate

Temper mill — a mill for rolling base metal steel after annealing to obtain proper temper, flatness, and surface finish. It may consist of one stand or two stands arranged in tandem.

Tin coating weight — the weight of tin applied to the steel surface, usually stated as pounds per base box, distributed evenly over both surfaces of a base box, the total coated area being 62 720 in.² Thus 0.25 lb/bb has a nominal weight of 0.125 lb on each of the two surfaces. Frequently, the coating is referred to as a designation number, and the decimal point is omitted. Thus, 0.25 lb/bb is 25.

Product For Sale

For differentially coated tin plate, twice the nominal coating weight on each side is designated, usually by the number method; hence, 10/25 designates the nominal weight of 0.05 lb/bb on one side and 0.125 lb/bb on the other side.

Note - The terms in this document have been extracted from the current version of ASTM A 623-03 for accuracy of terminology.