

# MERCURY METALS

## MATERIAL USAGE and SAFETY STANDARDS

FOR METRIC AND IMPERIAL - L.S.D.

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### MATERIAL DESIGN AND SAFETY STANDARDS:

The products in this catalogue are designed for structural end use. The properties and load capacities of the steel profiles have been computed in accordance with CSA - S136-94 for limit states design. Mercury Metals Ltd. is a member of the Canadian Sheet Steel Building Institute ( CSSBI ) and adheres to the material, safety and policy standards formulated and promoted by the CSSBI. The following CSSBI technical standards apply to the various Mercury Metal's products.

<u>PRODUCT</u>	<u>STANDARD NO.</u>	<u>STANDARD TITLE</u>
Roof Decks	CSSBI 10M-96 CSSBI B13-91	Standard for Roof Deck Design of Steel Deck Diaphragms
Floor Decks	CSSBI 12M-96 CSSBI S3 - 88 CSSBI S2 - 88	Standard for Composite Steel Deck Criteria for the Design of Composite Slabs Criteria for the Testing of Composite Slabs
Metal Roofs & Walls	CSSBI 20M-91  CSSBI B11-89  CSSBI B12-90	Sheet Steel Cladding for Architectural and Industrial Applications Criteria for the Design and Installation of Double Skin Insulated Steel Roofs Thermal Resistance of Double Skin Insulated Sheet Steel Walls & Roofs
Structural Components	CSSBI 30M-82 CSSBI B15-93	Standard for Steel Building Systems Snow, Wind, and Earthquake Load Design Criteria for Steel Building Systems

For steel products Mercury utilizes ASTM A653 / A653M Structural Quality Steel with guaranteed minimum yield strengths and other chemical and mechanical properties. Other steel grades such as Commercial Grade Steel without guaranteed properties are unacceptable for structural components.

### BASE STEEL NOMINAL THICKNESS:

Mercury products are designed on the basis of the base steel thickness, not the total sheet thickness including zinc or paint coatings. The external zinc is to protect the base steel; the thickness of this coating does not contribute to the structural strength of the profile.

The minimum base steel thickness of sheet used for structural products shall not be less than the design thickness minus the permissible under-tolerance. The permissible under-tolerance may be specified by either the material standard or the design standard. The more restrictive will apply.

Although the rolling mill tolerance is subtracted from the design thickness, any reduction in strength is compensated for by the safety factor in the design, and by the fact that the yield strength specified in the design is a minimum yield strength.

The official CSSBI terminology for the thickness of the base steel is "Base Steel Nominal Thickness" and it is expressed in millimeters ( mm ) to 2 decimal places. Former gauge designations are no longer applicable within the steel industry. However, due to their continuing use within certain sectors Mercury has included gauge references as an aid only. All material tolerances are to code unit and standards.

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CONVERSION CHART - SI (Metric) VS. IMPERIAL FOR "BASE STEEL NOMINAL THICKNESS"		
Former Gauge Designation	SI  mm	Imperial Equivalent Inches
29	0.34	0.0135
26	0.46	0.018
24	0.61	0.024
22	0.76	0.030
20	0.91	0.036
18	1.22	0.048
16	1.52	0.060
14	1.91	0.075
12	2.67	0.105

### CSSBI STANDARDS FOR BASE STEEL MINIMUM THICKNESS

PRODUCT	Base Steel Nominal Thickness ( mm ) (1)	Base Steel Minimum Thickness ( mm )
Steel Roof Deck	0.76	0.71
Composite Steel Floor Deck, structural only	0.76 (2)	0.71
Cellular Composite Steel Floor Deck with wired raceways	0.91 (2)	0.86
Cladding & Panels ( interior & exterior exposed elements ) intended for commercial, industrial, institutional & architectural applications	0.46	0.42
Cladding & Panels intended for agricultural applications	0.33	0.29
Structural Steel studs ( axial load bearing )	*	0.90 (4)
Structural Steel studs ( wind load bearing )	*	0.85 (4)
Non Structural steel studs	*	0.46 (4)

- (1) Minimum thickness are calculated by applying the tolerances specified in CSA - S136-94 to the nominal thickness, except where more restrictive tolerances are required by governing codes or standards.
- (2) Flat steel used as the lower element of a two-element section shall have a base steel minimum nominal thickness 1.12 mm where sprayed fire protection is applied to the underside unless otherwise listed by Underwriters' Laboratories of Canada for a specific assembly.
- (3) Thickness is measured at any point not less than 10 mm from an edge or bend.
- (4) Only minimum thickness are specified in the governing standard CGSB-7.1-M86.

### ZINC OR ALUMINUM - ZINC COATING DESIGNATIONS

Zinc coated sheet steel intended for structural building products shall conform to ASTM Standard *A653/A653M Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, Structural (Physical) Quality*.

Aluminum - zinc alloy coated steel for structural building products shall conform to ASTM Standard *A792M Sheet Steel, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process, General Requirements (Metric)*.

All metallic coated steel must comply with the provisions of ASTM Standard *General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process*.

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### METRIC COATING DESIGNATIONS, MINIMUM UNIT MASS & COATING THICKNESS

Metric Coating Designation	Imperial ( 1 ) Coating Designation	Minimum Unit Mass by Triple Spot Test g / m <sup>2</sup> of coating, total both sides	Coating Thickness Allowance, Nominal both Sides of Sheet (mm )
<b>Galvanized Coatings</b>			
ZF075	Galvanneal or Wiped Coat	75	.010 ( 2 )
Z180	G 60	180	0.025
Z275	G 90	275	0.040
Z350 ( 3 )	G 115	350	0.050
Z450 ( 3 )	G 140	450	0.065
Z600 ( 3 )	G 165	600	0.085
<b>Aluminum - Zinc Coatings</b>			
AZ150	N/A	150	0.040
AZ180	N/A	180	0.050

- ( 1 ) Imperial Zinc Coating Designation is no longer available. Specify Metric Zinc Coating Classification only.  
 ( 2 ) The coating thickness allowance for Galvanneal or Wiped Coat is normally disregarded.  
 ( 3 ) Non - stock material, inquire as to delivery date, if time is critical.

### CSSBI STANDARDS FOR MINIMUM METALLIC COATINGS

Product or Element	Minimum Metallic Coating on Product or Element
Exterior exposed cladding and exterior exposed elements of wall & roof panels	Z275 or AZ150
Steel coat which will have a factory applied paint finish system ( 2 )	Z275 or AZ150
Interior exposed roof or floor deck ( 1 ) and interior elements of wall or roof panels	Z075 or AZ150
Roof or floor deck with ceilings under, in buildings conditioned for human comfort	Z075 or AZ150
All products or elements exposed to heavy industrial or otherwise corrosive environment. Consult CSSBI or Mercury Metals for recommendations concerning a particular condition.	>Z275 >AZ180
Structural steel studs, purlins or girts ( axial and/or wind bearing )	Z180 or AZ150
Non - structural steel studs	Z180 or AZ150

- ( 1 ) Roof or floor deck which acts as an enclosure of an air - handling system should be considered as "interior exposure".  
 ( 2 ) Mercury Metals stock colour coils are Z275 coated material with one of the following paint systems; Silicone Modified Polyester, 50 % Kynar & Barrier Coat. AZ150 painted coils are available by special order.

### WHITE RUST POLICY FOR GALVANIZED OR ALUMINUM - ZINC PRODUCTS

Moisture can cause wet storage staining of roll formed material and usually occurs in one of three ways:

- 1) condensation from high humidity and/or temperature cycling
- 2) wet shipping conditions
- 3) wind - driven rain penetration ( outdoor storage )

The usual progression is from visible water staining to unsightly whiterust ( dark grey to dull black on aluminum - zinc alloy coated sheet ) to red rust. On material where wet storage stain has occurred, it should be noted that minor amount of white or grey staining is not detrimental to the functioning of the product and is considered acceptable.