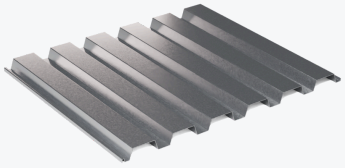
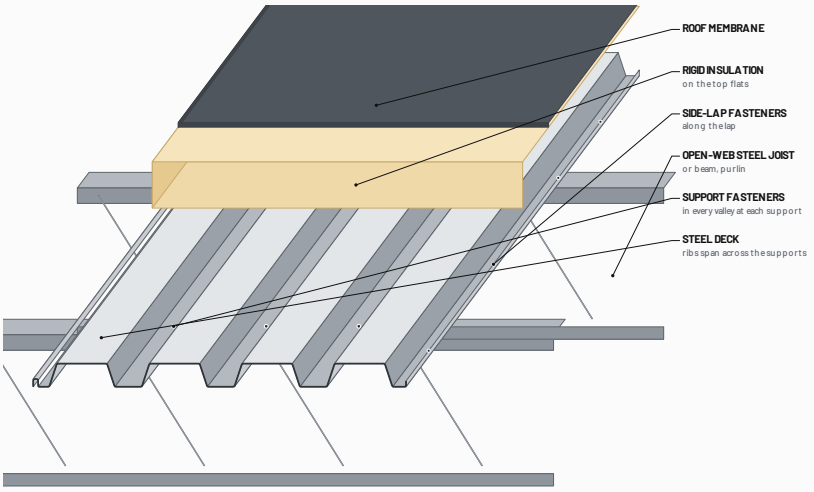
STEEL ROOF DECK

Galvanized steel roof deck · 1-1/2" × 6" and 3" × 6", 8", 12" · 22 to 16 gauge



ROOF DECK
R15 · 1-1/2" × 6" · 36" cover shown



PRODUCT 26 · STEEL ROOF DECK & FLOOR DECK

Saturn Metal roof deck is a **galvanized steel deck** that spans between open-web joists, purlins or beams and carries the **insulation, membrane, snow and wind** of a flat or low-slope roof. Fastened down and lapped sheet to sheet, it also ties the roof into one stiff **diaphragm**. Four profiles: the everyday **1-1/2" deck** on a 6" rib pitch with 36" cover, and **3" deep-rib deck** on 6", 8" or 12" pitches for longer spans and heavier roofs.

- 1-1/2" and 3" depths; 22 to 16 gauge
- Interlocking side laps; sheets cut to the length ordered
- G90 galvanized, galvanneal or prepainted (white underside)
- Acoustic version with perforated webs (DS-27)

DEPTHS	RIB PITCH	COVER	GAUGES	FINISH	LENGTHS
1-1/2" · 3"	6" · 8" · 12"	24" · 32" · 36"	22 · 20 · 18 · 16	G90 · galvanneal · paint	Cut to order

1 FOUR NAMES, ONE PRODUCT

Roof deck
Our product name: the steel sheet that spans the roof structure and carries the roof.

Steel deck · metal deck
The general names on drawings and specifications.

Wide-rib · deep-rib deck
By shape: the 1-1/2" wide-rib deck and the 3" deep-rib deck.

Fluted deck
A site name, from the ribs (flutes) that run the length of the sheet.

2 THE PARTS OF THE DECK

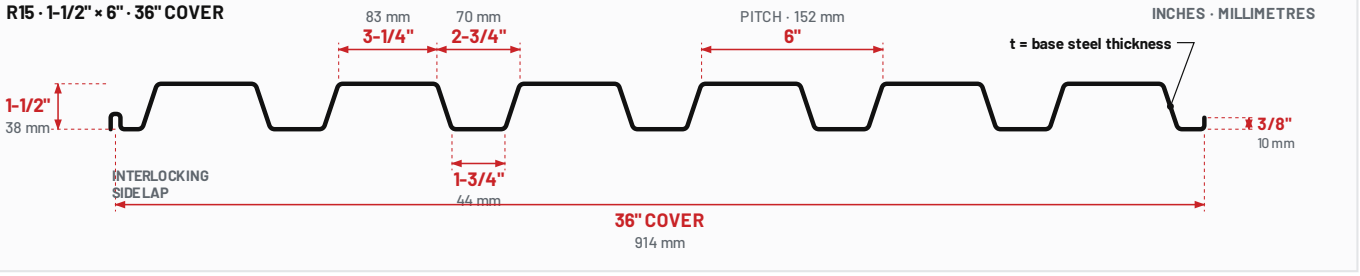
1. **Top flats.** carry the insulation; the wider they are, the easier the roofing
2. **Webs.** the sloped sides of each rib; depth sets the span
3. **Bottom flats.** bear on the joists and take the support fasteners
4. **Side lap.** an interlocking bead and lip join sheet to sheet

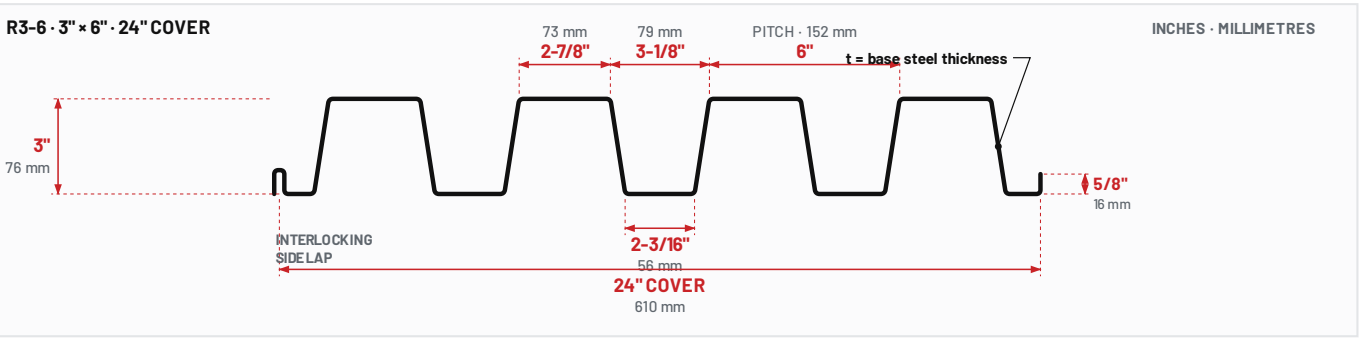
FOUR PROFILES	SPANS	DIAPHRAGM	CUT TO ORDER
1-1/2" and 3" deep	Joist to joist	One stiff plate	Every sheet

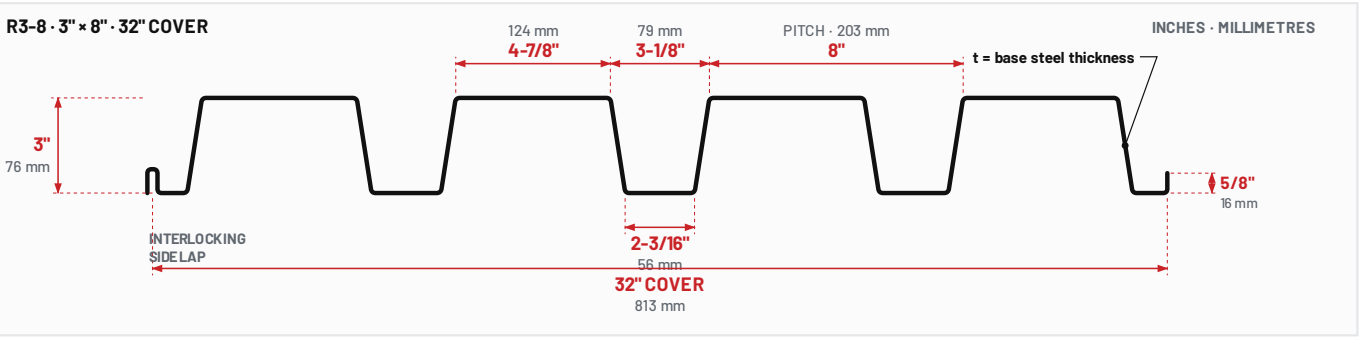
PROFILES

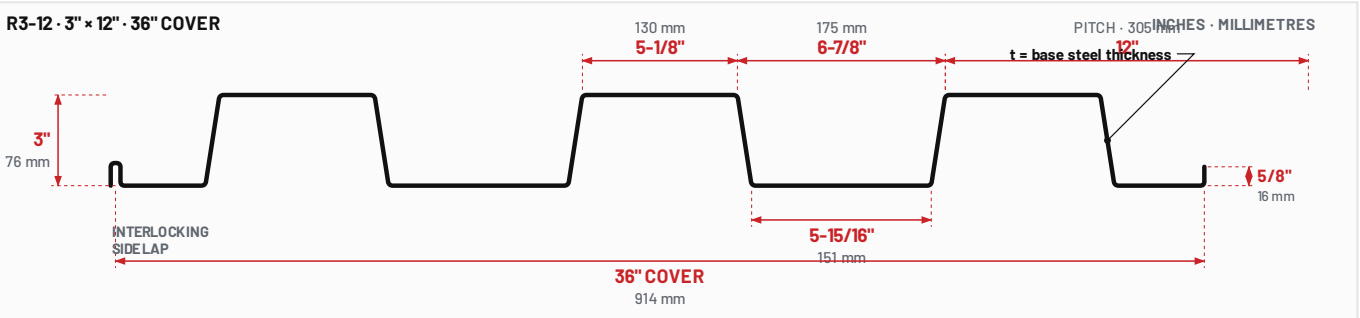
Dimensioned sections of the 1-1/2" and 3" roof deck profiles, inches and millimetres

3 THE FOUR PROFILES









PROFILE	DEPTH	RIB PITCH	COVER	TOP FLAT	RIB OPENING	BOTTOM FLAT	RIBS / SHEET	EDGE LIP
R15	1-1/2" · 38 mm	6" · 152	36" · 914	3-1/4" · 83	2-3/4" · 70	1-3/4" · 44	6	3/8" · 10
R3-6	3" · 76 mm	6" · 152	24" · 610	2-7/8" · 73	3-1/8" · 79	2-3/16" · 56	4	5/8" · 16
R3-8	3" · 76 mm	8" · 203	32" · 813	4-7/8" · 124	3-1/8" · 79	2-3/16" · 56	4	5/8" · 16
R3-12	3" · 76 mm	12" · 305	36" · 914	5-1/8" · 130	6-7/8" · 175	5-15/16" · 151	3	5/8" · 16

Nominal profile dimensions; rib opening is the width between top flats. An interlocking bead on one edge, a lip on the other.

SPECIFICATIONS & SECTION PROPERTIES

Steel, gauges, finishes, weights, gross section properties, specifying and standards

4 SPECIFICATIONS

STEEL	Structural quality steel sheet, ASTM A653 / A653M, 33 ksi (230 MPa) minimum yield
GAUGES	22, 20, 18, 16 (0.030", 0.036", 0.048", 0.060" base steel)
FINISHES	G90 (Z275) galvanized · A25 (ZF75) galvanneal · prepainted, white underside on request
LENGTHS	Cut to the length ordered; long sheets limited by transport and handling
SIDE LAP	Interlocking bead and lip; plain edge on request
DESIGN	CSA S136 · CSSBI 10M (roof deck) · load tables as published for the deck product

5 WEIGHT PER SQUARE FOOT OF ROOF

GAUGE	BASE STEEL	R15	R3-6	R3-8	R3-12
22	0.030" · 0.76 mm	1.78 psf · 8.7 kg/m²	2.49 psf · 12.1 kg/m²	2.18 psf · 10.7 kg/m²	1.90 psf · 9.3 kg/m²
20	0.036" · 0.91 mm	2.12 psf · 10.4 kg/m²	2.96 psf · 14.4 kg/m²	2.60 psf · 12.7 kg/m²	2.27 psf · 11.1 kg/m²
18	0.048" · 1.21 mm	2.80 psf · 13.7 kg/m²	3.90 psf · 19.0 kg/m²	3.43 psf · 16.7 kg/m²	2.99 psf · 14.6 kg/m²
16	0.060" · 1.52 mm	3.47 psf · 16.9 kg/m²	4.84 psf · 23.6 kg/m²	4.25 psf · 20.8 kg/m²	3.71 psf · 18.1 kg/m²

Calculated from the nominal profile with G90 zinc; galvanneal and painted sheets are a little lighter.

6 NOMINAL GROSS SECTION PROPERTIES, PER FOOT OF WIDTH

GAUGE	R15 A in²/ft	I in⁴/ft	S in³/ft	R3-6 A in²/ft	I in⁴/ft	S in³/ft	R3-8 A in²/ft	I in⁴/ft	S in³/ft	R3-12 A in²/ft	I in⁴/ft	S in³/ft
22 · 0.030"	0.501	0.192	0.220	0.699	0.973	0.633	0.614	0.891	0.510	0.535	0.884	0.548
20 · 0.036"	0.601	0.228	0.262	0.837	1.162	0.757	0.736	1.064	0.609	0.641	1.056	0.655
18 · 0.048"	0.799	0.298	0.344	1.114	1.535	0.999	0.979	1.406	0.804	0.854	1.396	0.866
16 · 0.060"	0.995	0.366	0.422	1.389	1.901	1.237	1.222	1.741	0.996	1.066	1.729	1.073

Gross properties calculated from the nominal profile and base steel thickness: steel area A, moment of inertia I and the smaller section modulus S. Metric: A × 2117 = mm²/m · I × 1366 = ×10³ mm⁴/m · S × 53.8 = ×10³ mm³/m. They compare the profiles and size a deck roughly. **Design (effective) properties and the load tables for the deck product on your order come with the quotation**; they are lower for thin gauges and govern the design.

7 SPECIFICATION GUIDE

Steel roof deck: Saturn Metal [R15 1-1/2" × 6", 36" cover] [R3-6 3" × 6", 24"] [R3-8 3" × 8", 32"] [R3-12 3" × 12", 36"] galvanized steel roof deck, ASTM A653 / A653M 33 ksi, [22] [20] [18] [16] gauge, [G90] [galvanneal] [prepainted] finish, interlocking side laps, lengths as scheduled. Install with ribs across supports, end laps on supports, fastened to supports and at side laps as shown on the structural drawings; accessories as detailed.

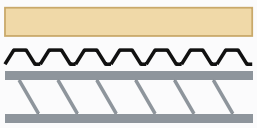
8 STANDARDS

CSA S136	Design of cold-formed steel structural members
CSSBI 10M	Standard for steel roof deck
ASTM A653	Steel sheet, zinc-coated (galvanized) or zinc-iron alloy-coated
FM 4451	Approval standard for profiled steel roof deck, where required

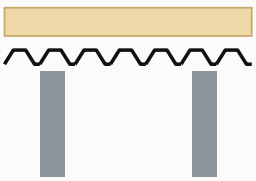
WHERE IT GOES & HOW IT IS DESIGNED

Roof types, the build-up, spans and load tables

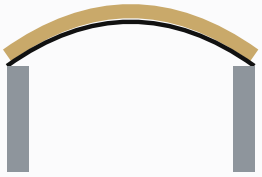
9 WHERE IT GOES



WAREHOUSES & PLANTS
long roofs on open-web joists



RETAIL & OFFICE
flat roofs over steel frames

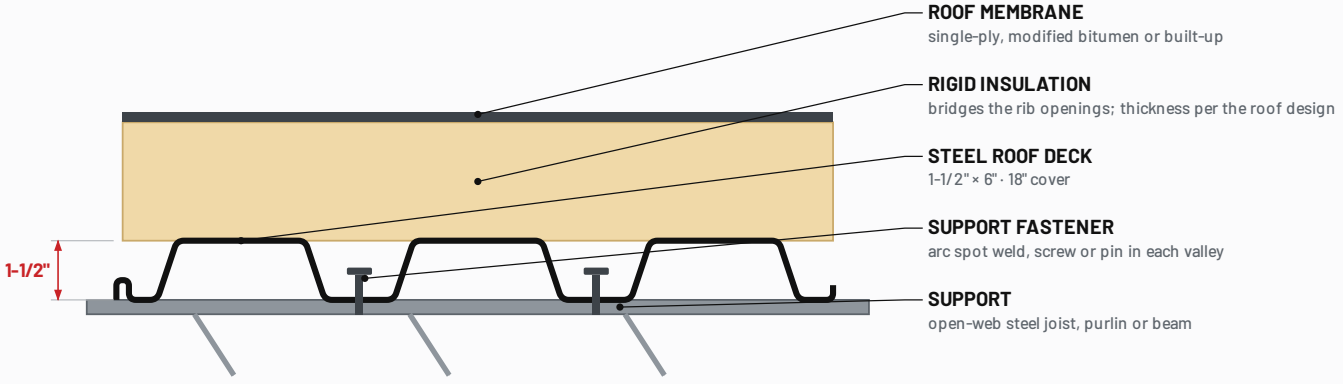


SCHOOLS & ARENAS
wide spans with 3" deck



CANOPIES & MEZZANINES
light roofs and platforms

10 THE ROOF, IN SECTION



ROOF MEMBRANE
single-ply, modified bitumen or built-up

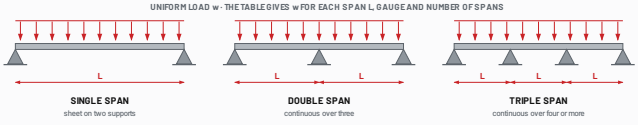
RIGID INSULATION
bridges the rib openings; thickness per the roof design

STEEL ROOF DECK
1-1/2" × 6" · 18" cover

SUPPORT FASTENER
arc spot weld, screw or pin in each valley

SUPPORT
open-web steel joist, purlin or beam

11 SPANS



12 READING A LOAD TABLE



13 DESIGN NOTES

Span and gauge

The load tables give, for each profile and gauge, the uniform load the deck carries on single, double and triple spans. Longer spans or heavier loads call for the 3" deck or a heavier gauge.

Strength and deflection

Row S is the factored load the deck resists; row D is the specified load at which it deflects L/240. The designer checks both.

Wind uplift

Where the roof must meet an FM wind-uplift class (1-60, 1-75, 1-90), the deck, its gauge, span and fastener pattern must match the listing for that deck product.

Diaphragm

Fastened to the frame and lapped sheet to sheet, the deck carries wind and seismic forces to the braced frames and walls; the fastener pattern sets its strength.

ON SITE

Delivery, storage, placing, fastening, openings and safety

14 ON SITE

Delivery and storage

Bundles arrive banded and labelled by profile, gauge and length. Store them off the ground, tilted to drain, and under a ventilated cover. Damp bundles can show white storage stain: a surface mark, not damage.

Placing

Set the sheets with the ribs across the supports, starting at one end. Keep every end lap on a support and the bearing lengths the tables assume. Lap the side edges bead over lip.

Fastening to supports

Arc spot welds, self-drilling screws or powder-actuated pins in the bottom flats at every support, in the pattern the design shows (every valley is common).

Side laps

Screws, button punching or welds between supports at the spacing the design shows. Side-lap fasteners are part of the diaphragm.

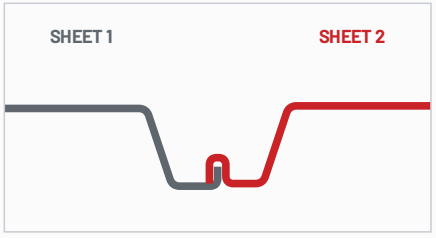
Openings

Cut small openings after the deck is fastened; frame openings larger than the design allows with angles or channels to the supports.

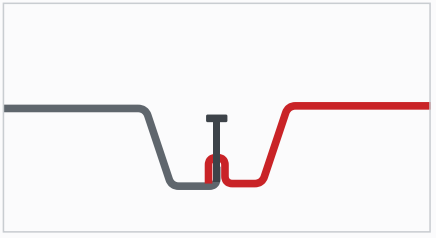
Safety

Sheets are sharp, slippery when wet and can lift in wind. Fasten each sheet before leaving it; keep bundles tied down; follow the site fall-protection plan.

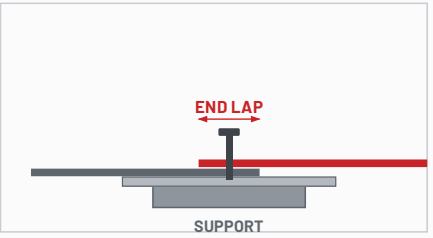
15 LAPS



INTERLOCKING SIDE LAP
the bead on one sheet hooks over the lip of the next

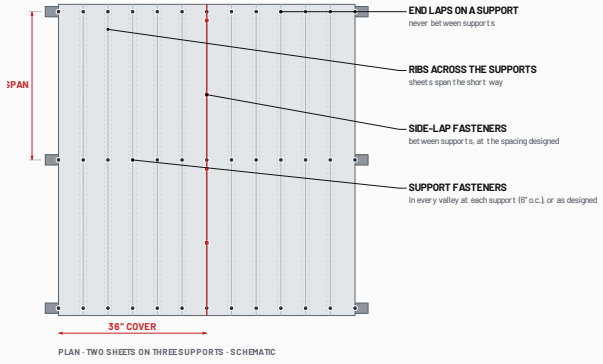


SIDE-LAP FASTENER
screw, button punch or weld, at the spacing designed



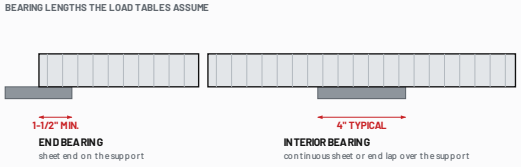
END LAP ON A SUPPORT
sheet ends overlap on the support, fastened through both

16 FASTENING PATTERN



PLAN · TWO SHEETS ON THREE SUPPORTS · SCHEMATIC

17 BEARING



Load tables assume a minimum bearing at each support: commonly 1-1/2" at the ends and 4" at interior supports for 1-1/2" deck, 3" and 6" for 3" deck. Less bearing needs a web crippling check by the designer.

18 DO & DON'T

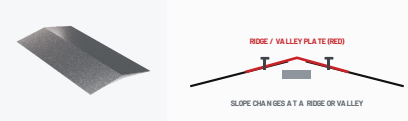
DO	Run the ribs across the supports and keep every end lap on a support.
DO	Fasten each sheet down before the end of the shift.
DON'T	Stack bundles or materials on an unfastened deck.
DON'T	Cut large openings before the deck is fastened and the framing is in.

ACCESSORIES, QUESTIONS & NOTICE

Ridge and valley plates, cover plates, sumps, closures, angles and cants; common questions

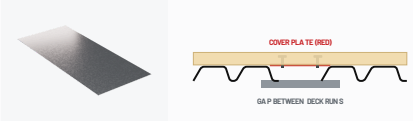
19 DECK ACCESSORIES

Galvanized accessories that finish a roof deck, cut to length. Fasteners and sealants by the roofing and decking trades, as the design shows.



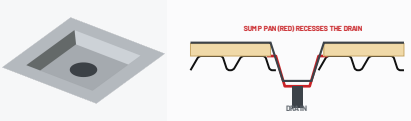
Ridge & valley plate

A bent galvanized plate that covers the gap where the deck changes slope at a ridge or a valley, so insulation and membrane stay supported.



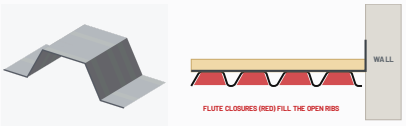
Cover plate

A flat galvanized strip that bridges the gap where deck runs meet, change direction or stop short at a beam.



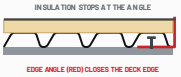
Sump pan

A recessed galvanized pan set into the deck at a roof drain, so the membrane slopes into the drain.



Flute closures

Metal or foam closures that fill the open ribs where the deck ends at a wall, parapet, curb or beam: they stop air, concrete, insulation and fire-stopping from passing through.



Edge angle

A galvanized angle along the deck edge that closes the ribs and gives the insulation or the slab edge a stop.



Cant strip

A triangular strip at walls and curbs that eases the membrane up the vertical surface.

20 COMMON QUESTIONS

1-1/2" or 3" deck?

1-1/2" deck for the usual joist spacings of about 4' to 7'; 3" deck when supports are farther apart or the roof is heavier. The load tables decide.

Which gauge?

The lightest gauge that carries the load on the span, from the table; wind uplift and diaphragm demands can call for a heavier one.

Painted underside?

A white prepainted underside brightens an exposed deck ceiling; galvanneal takes field paint and spray fireproofing well.

Is the deck FM Approved?

Approvals are listed by deck product, gauge, span and fastening. Where the roof must meet a wind-uplift class, tell us: we provide the listing for the deck on your order.

What is the diaphragm?

Fastened down and lapped, the deck becomes one stiff plate that carries wind and seismic forces to the frames and walls. The fastener pattern sets its strength.

How do I estimate?

Roof area ÷ cover width ÷ sheet length, plus laps and waste; add accessories by the length of edges, ridges and valleys.

Related: DS-03 cold-formed joists · DS-24 flat stock · DS-27 acoustic roof deck · DS-28 composite floor deck · DS-29 form deck

Technical questions and quotes: +1 (416) 746-8000 · Sales@SaturnMetal.ca · www.SaturnMetal.ca

IMPORTANT NOTICE

This data sheet gives general product information only. It is not engineering, design or installation advice. A qualified design professional must review every application, and the building code and project documents always govern. Deck profile, gauge, span, fastening, bearing, openings, diaphragm design and approvals must follow the structural design and the load tables and listings published for the deck product on the order. Drawings are schematic and not to scale unless noted; dimensions are nominal and subject to standard tolerances. Values marked typical, approximate or commonly specified are for reference only. Standards are referenced by name for identification; always use the edition required by the governing code. Saturn Metal may change products and information without notice; confirm current data before ordering or specifying. Warranties and remedies, if any, are only those in Saturn Metal's written terms of sale. Names of standards bodies belong to their owners. Saturn Metal is a metal products manufacturer and/or supplier; this sheet does not mean the product is manufactured by Saturn Metal. © Saturn Metal