

Steel

scalur[®]+Z

Product information for hot-dip galvanized product with very tight thickness tolerances



thyssenkrupp

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Areas of application

scalur[®]+Z is a hot-dip galvanized flat product from thyssenkrupp with very tight thickness tolerances. Thickness tolerances as low as ± 0.06 mm are constant and lower than with comparable conventional cold-rolled sheet.

scalur[®]+Z allows tight manufacturing tolerances, increases yield and provides ease of processing with consistently high product quality.

thyssenkrupp offers scalur[®]+Z in various grades of microalloyed steels, mild unalloyed steels and structural steels as well as the complex-phase steel HDT760C to DIN EN 10346. These grades are available in thicknesses of 1.50 to 4.00 mm and widths of 900 to 1,550 mm.

scalur[®]+Z is particularly suitable for components with increased tolerance requirements such as stamped parts, profiles, telescopic rails and container floors.

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Available steel grades

thyssenkrupp supplies scalur®+Z in the following steel grades:

Mild steel for cold forming DIN EN 10346

Steel grade

DX51D

DX52D

Hot-dip coated structural steel DIN EN 10346

Steel grade

S220GD

S250GD

S280GD

S320GD

S350GD

S390GD¹S420GD¹S450GD¹

Micro-alloyed steel DIN EN 10346

Steel grade

HX260LAD

HX300LAD

HX340LAD

HX380LAD

HX420LAD

HX460LAD

HX500LAD

Complex-phase steel DIN EN 10346

Steel grade

HDT760C²

² In coatings 100 and 140 g/m².

¹ The steel grades scalur®+Z S390GD, scalur®+Z S420GD and scalur®+Z S450GD are, in general, fully approved by the building authorities.

Comments

scalur®+Z can be ordered with trimmed edges. Surfaces for scalur®+Z steel grades are available to DIN EN 10346 in A (normal surface) and B (improved surface) quality. By arrangement surface treatment type O (oiled – light, normal or heavily oiling), C (chemically passivated) and CO (chemically passivated and oiled) can be supplied.

Thickness tolerances

thyssenkrupp supplies the following tolerances depending on thickness ordered:

Tolerances depending on thickness ordered

Sheet thickness t [mm]	Tolerance [mm]
$1.50 \leq t \leq 2.00$	± 0.06
$2.00 < t \leq 2.50$	± 0.07
$2.50 < t \leq 4.00$	± 0.08

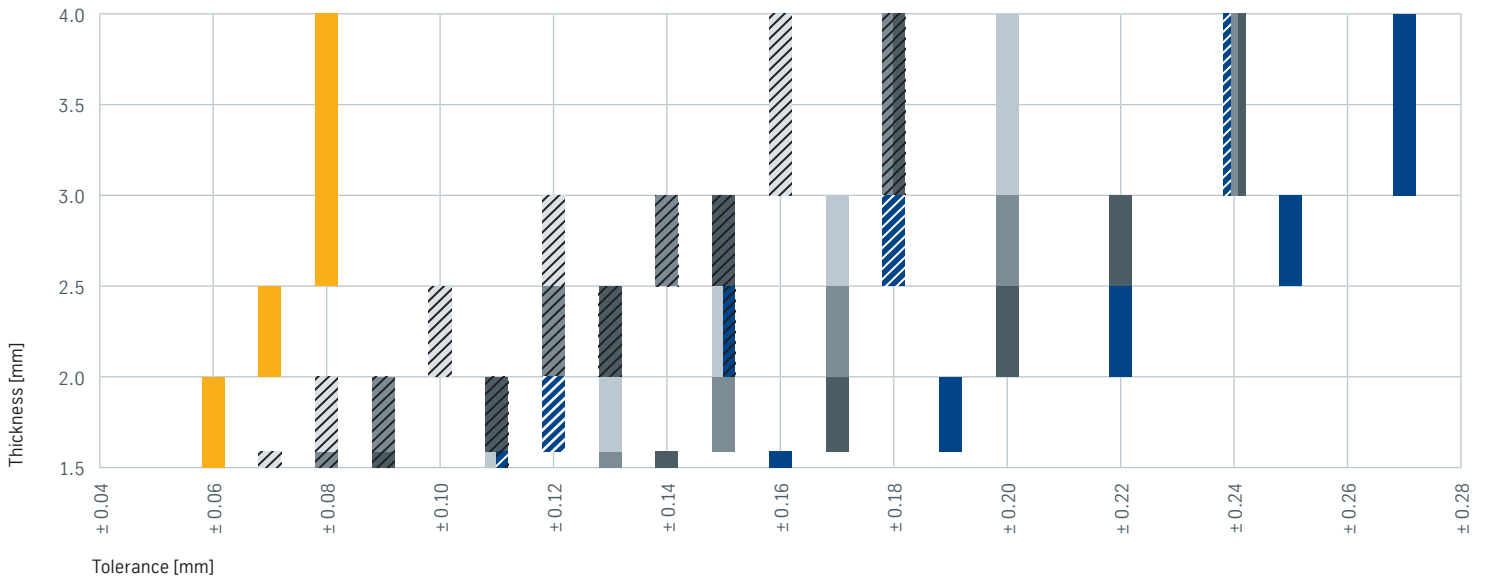
scalur®+Z coatings

scalur®+Z can be supplied with various coatings. Depending on the grade, 100, 140, 200 and 275 g/m² may be selected. Further coatings or different coatings on each side can be supplied subject to agreement.

Roughness

Basically no guarantees can be made in respect of roughness for scalur®+Z. Exception: By special agreement, for certain applications for example telescopic rails median roughness value $R_a < 0.5 \mu\text{m}$ can be produced.

Thickness tolerances of hot-dip galvanized steel in comparison – normal and restricted tolerances to DIN EN 10143¹ and scalur®+ Z



¹ Dimensional tolerances for nominal width w in mm: 1,200 < w ≤ 1,500.

Tolerances on dimensions for scalur®+ Z:

Orange = normal

Tolerances on dimensions to DIN EN 10143:

- Light Grey: $R_{p0.2} < 260$ MPa normal
- Diagonal lines (top-left to bottom-right): $R_{p0.2} < 260$ MPa restricted
- Dark Grey: $260 \text{ MPa} \leq R_{p0.2} < 360$ MPa normal
- Diagonal lines (bottom-left to top-right): $260 \text{ MPa} \leq R_{p0.2} < 360$ MPa restricted
- Medium Grey: $360 \text{ MPa} \leq R_{p0.2} \leq 420$ MPa normal
- Diagonal lines (bottom-left to top-right): $360 \text{ MPa} \leq R_{p0.2} \leq 420$ MPa restricted
- Dark Blue: $420 \text{ MPa} < R_{p0.2}$ normal
- Diagonal lines (bottom-left to top-right): $420 \text{ MPa} < R_{p0.2}$ restricted

No tight tolerances are guaranteed for the first 5 meters at each end of the coil.

Technical features

Chemical composition

Mass fractions in ladle analysis	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Al [%] min.	Ti [%] max.	Nb [%] max.
Micro-alloyed steel DIN EN 10346								
Steel grade								
HX260LAD	0.11	0.50	0.60	0.030	0.025	0.015	0.12	0.09
HX300LAD	0.11	0.50	1.00	0.030	0.025	0.015	0.15	0.09
HX340LAD	0.11	0.50	1.00	0.030	0.025	0.015	0.15	0.09
HX380LAD	0.11	0.50	1.40	0.030	0.025	0.015	0.15	0.09
HX420LAD	0.11	0.50	1.40	0.030	0.025	0.015	0.15	0.09
HX460LAD	0.15	0.50	1.70	0.030	0.025	0.015	0.15	0.09
HX500LAD	0.15	0.50	1.70	0.030	0.025	0.015	0.15	0.09

Mechanical properties

Test direction transverse to rolling direction	Yield strength ¹ R _{p0.2} [MPa]	Tensile strength R _m [MPa]	Elongation A ₈₀ min. [%]
Micro-alloyed steel DIN EN 10346			
Steel grade			
HX260LAD	260–330	350–430	26
HX300LAD	300–380	380–480	23
HX340LAD	340–420	410–510	21
HX380LAD	380–480	440–560	19
HX420LAD	420–520	470–590	17
HX460LAD	460–560	500–640	15
HX500LAD	500–620	530–690	13

¹ If the yield strengths are pronounced, the values for the lower yield strength R_{eL} apply.

R_{p0.2} Proof strength at 0.2% plastic elongation

R_m Tensile strength

A₈₀ Percentage elongation after fracture using a specimen with gauge length L₀ = 80 mm for sheet thicknesses < 3.0 mm

Mechanical properties

Test direction transverse to rolling direction	Yield strength ¹ R _e [MPa]	Tensile strength R _m [MPa]	Elongation A ₈₀ min. [%]
Mild steel for cold forming			
DIN EN 10346			
Steel grade			
DX51D	–	270–500	22
DX52D	140–300 ²	270–420	26

¹ If the yield strengths are not pronounced, the values for the 0.2% offset yield strength R_{p0.2} apply; if the yield strength is pronounced, the values for the lower yield strength R_{el} apply.

² For surface class A, the maximum value of the yield strength is R_e = 360 MPa.

Mechanical properties

Test direction in rolling direction	Yield strength ¹ R _{p0.2} min. [MPa]	Tensile strength ² R _m min. [MPa]	Elongation A ₈₀ min. [%]
Hot-dip coated structural steel			
DIN EN 10346			
Steel grade			
S220GD	220	300	20
S250GD	250	330	19
S280GD	280	360	18
S320GD	320	390	17
S350GD	350	420	16
S390GD	390	460	16
S420GD	420	480	15
S450GD	450	510	14

¹ If the yield strengths are pronounced, the values for the upper yield strength apply.

² A range of up to 140 MPa can be expected.

Mechanical properties

Test direction in rolling direction	Yield strength R _e [MPa]	Tensile strength R _m min. [MPa]	Elongation A ₈₀ min. [%]
Complex-phase steel			
DIN EN 10346			
Steel grade			
HDT760C	660–830	760	10

R_e Yield strength

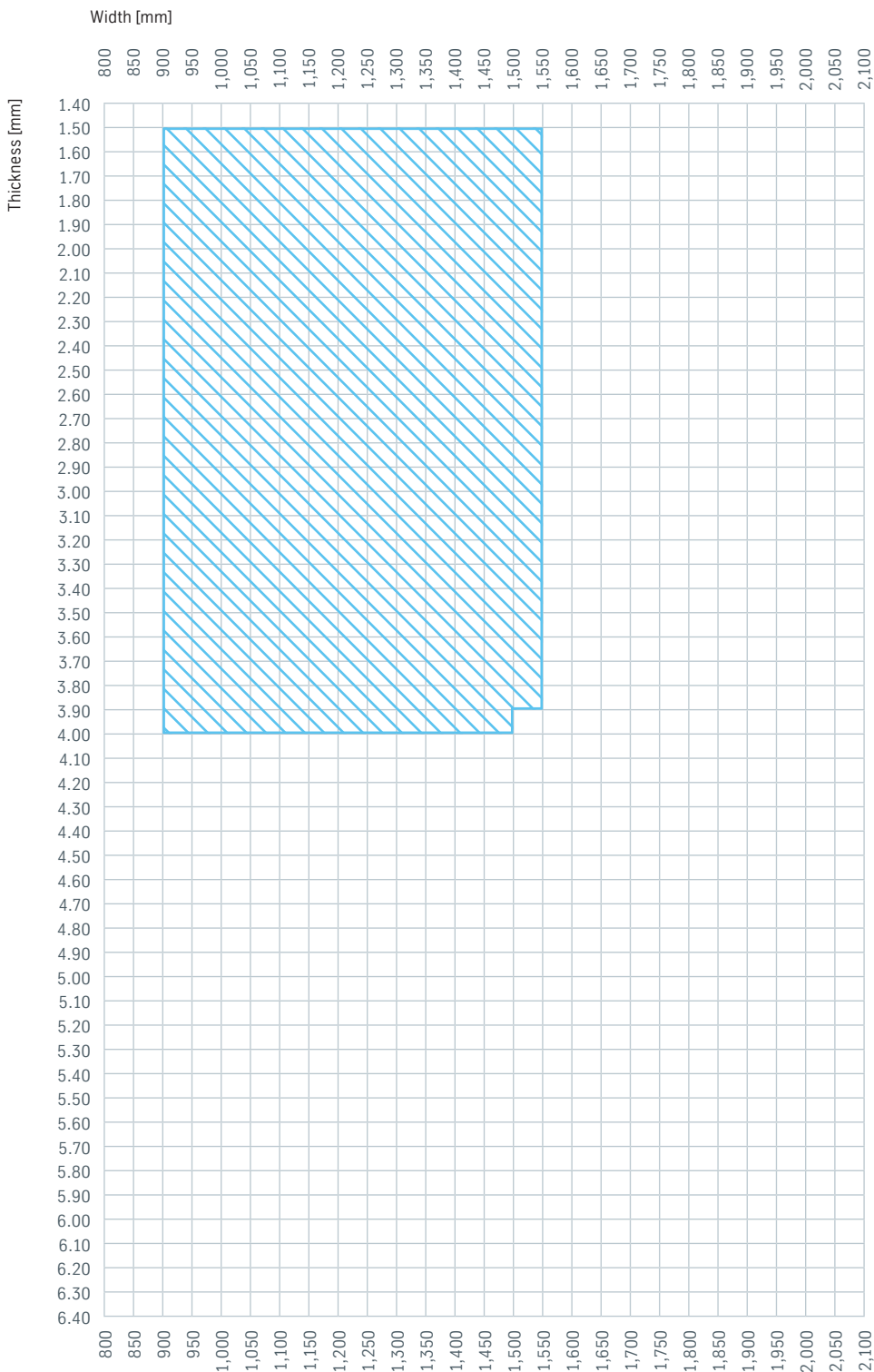
R_{p0.2} Proof strength at 0.2% plastic elongation

R_m Tensile strength

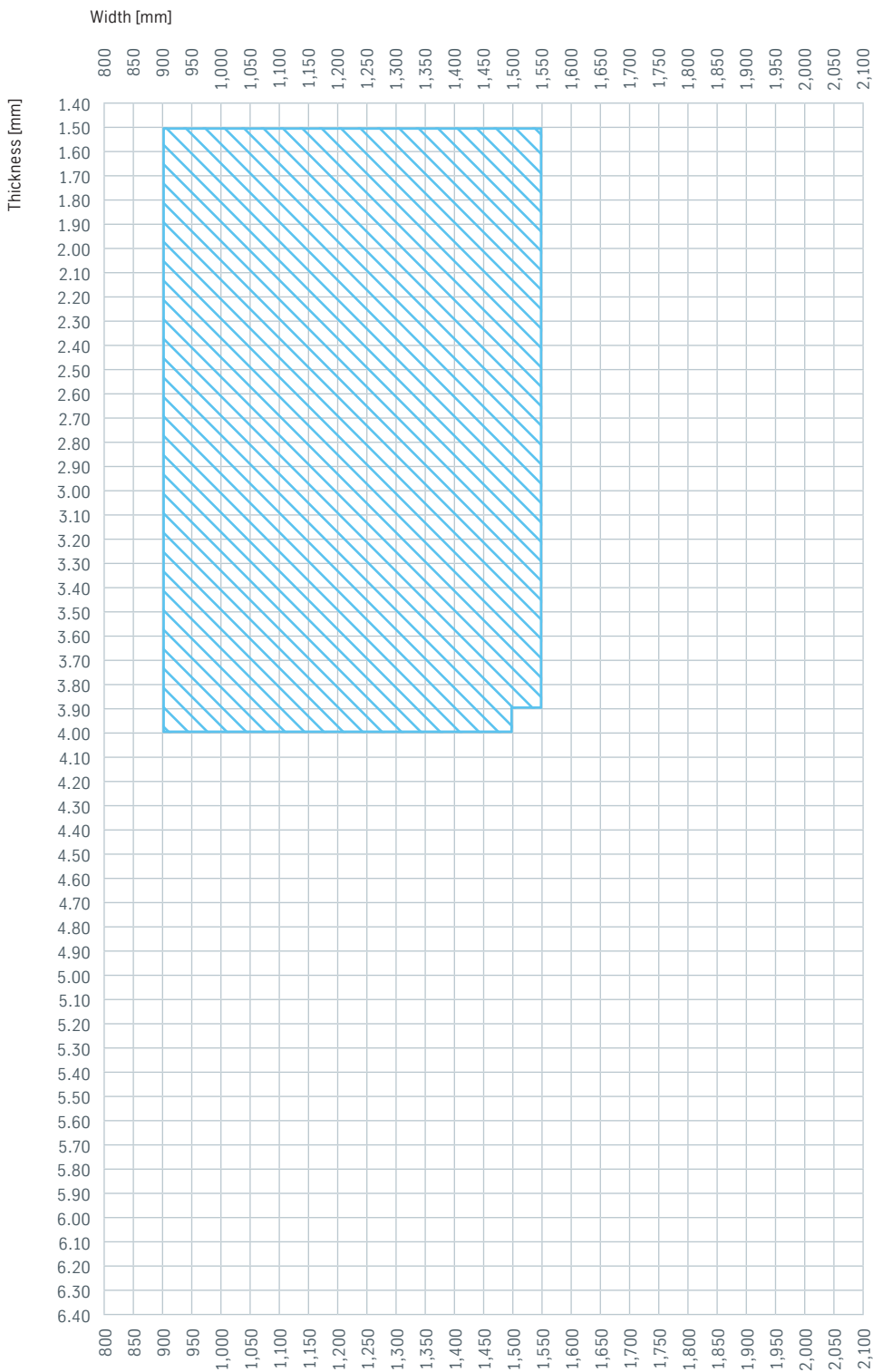
A₈₀ Percentage elongation after fracture using a specimen with gauge length L₀ = 80 mm for sheet thicknesses < 3.0 mm

Available dimensions

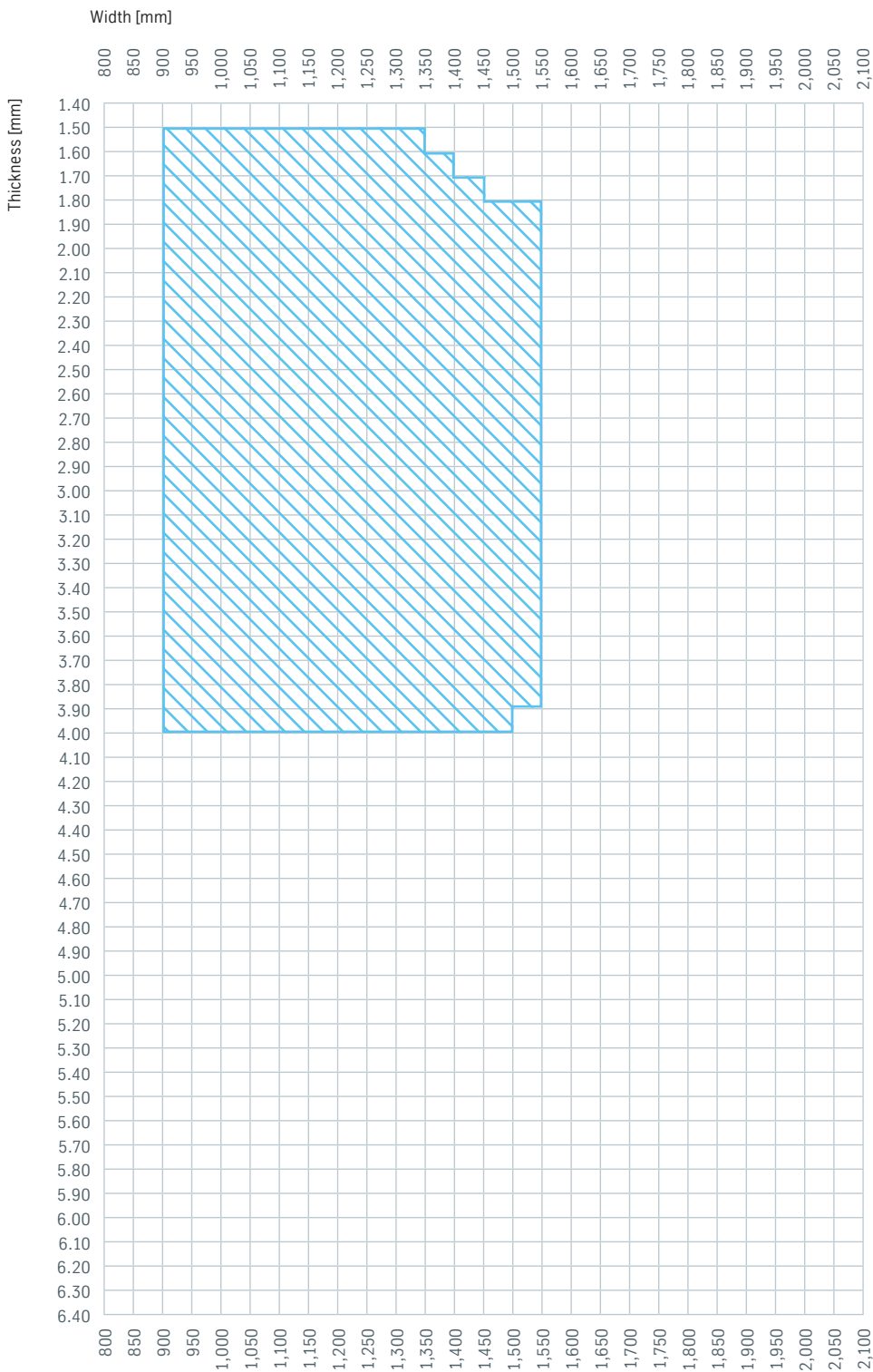
scalur®+Z DX51D, scalur®+Z DX52D



scalur®+Z S220GD, scalur®+Z S250GD, scalur®+Z S280GD



scalur®+Z S320GD

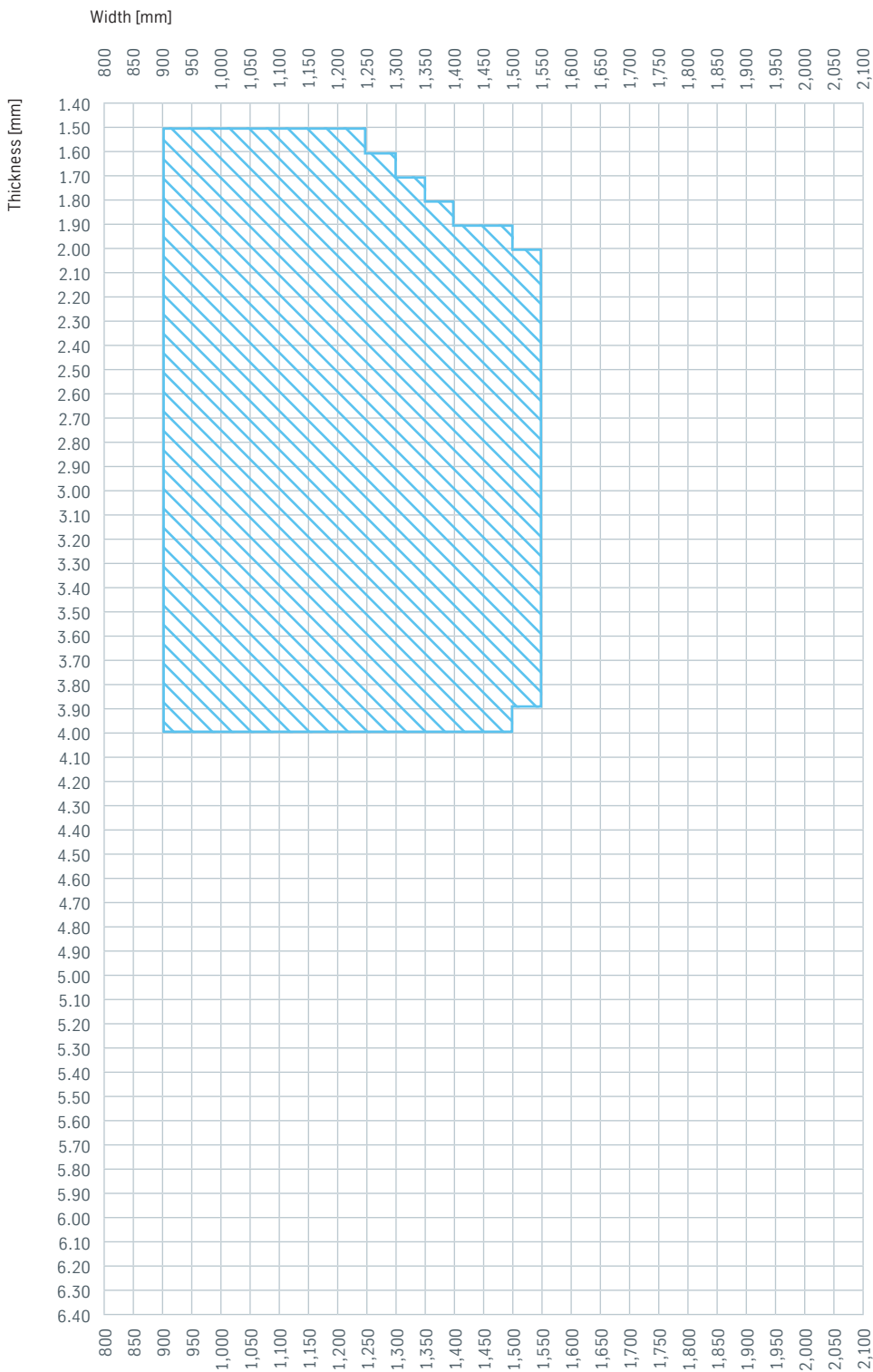


GI Hot-dip zinc coating

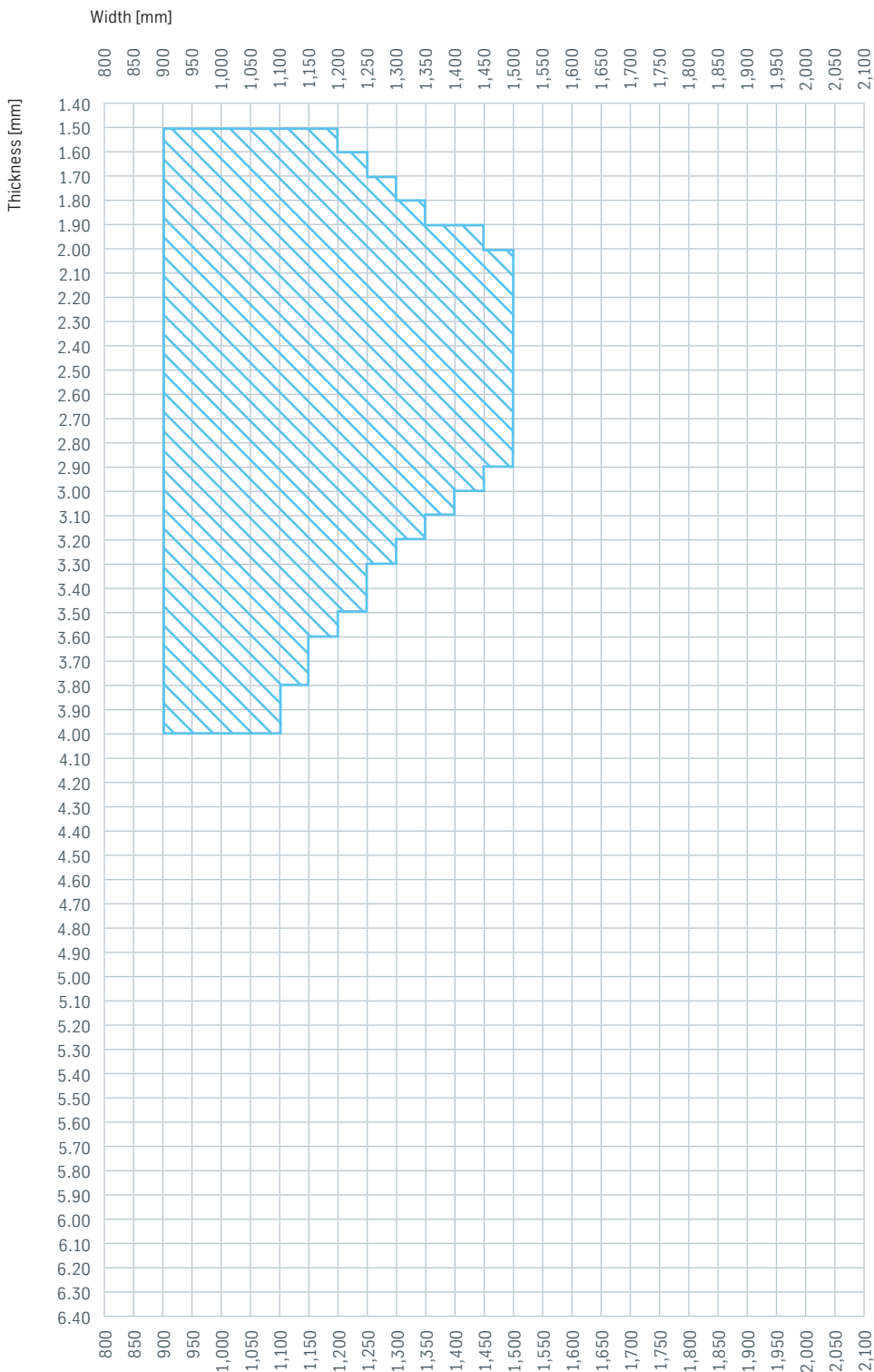
 GI trimmed

Further dimensions on request.

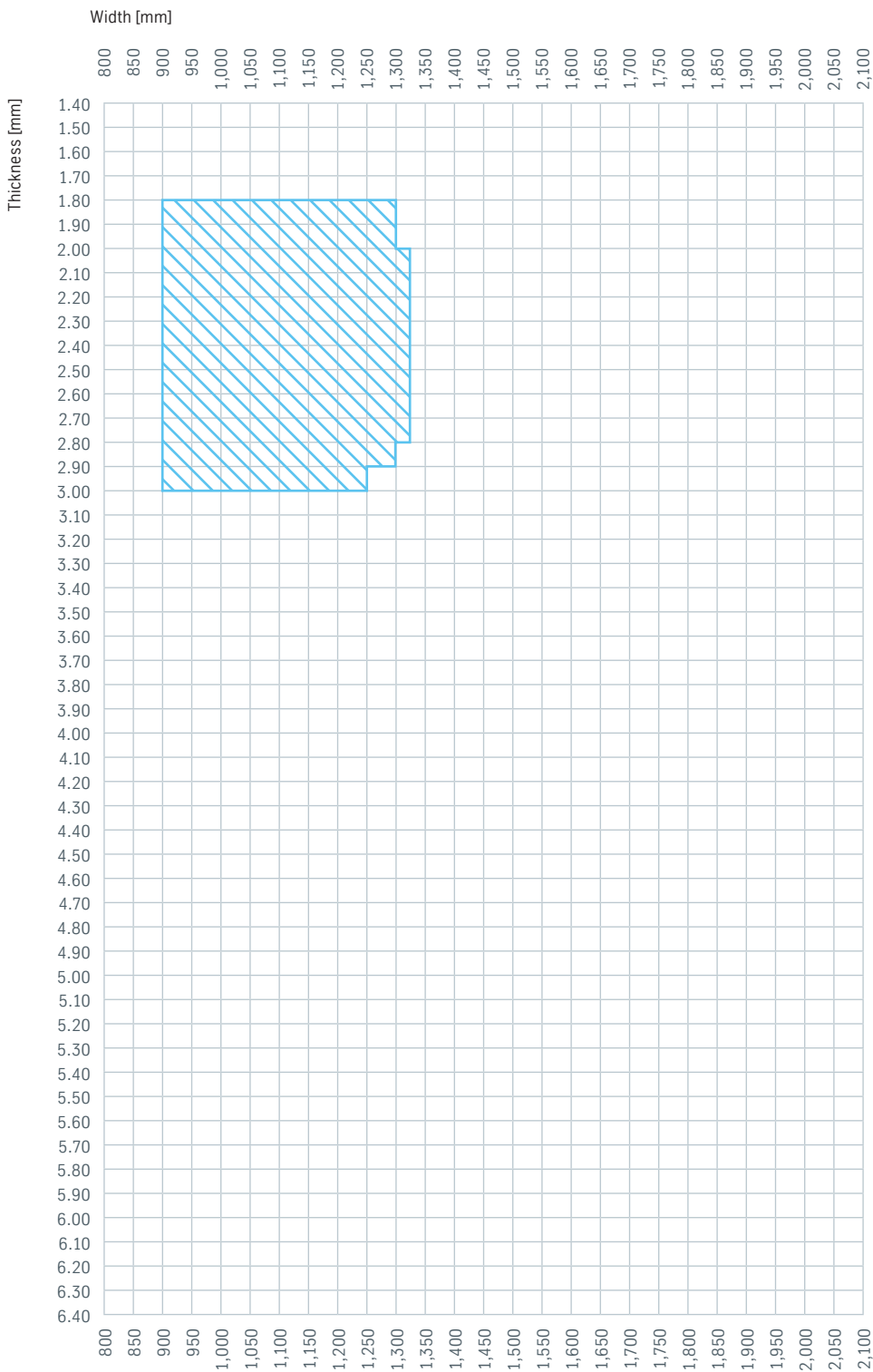
scalur®+Z S350GD



scalur®+Z S390GD, scalur®+Z S420GD, scalur®+Z S450GD



scalur[®]+Z HDT760C

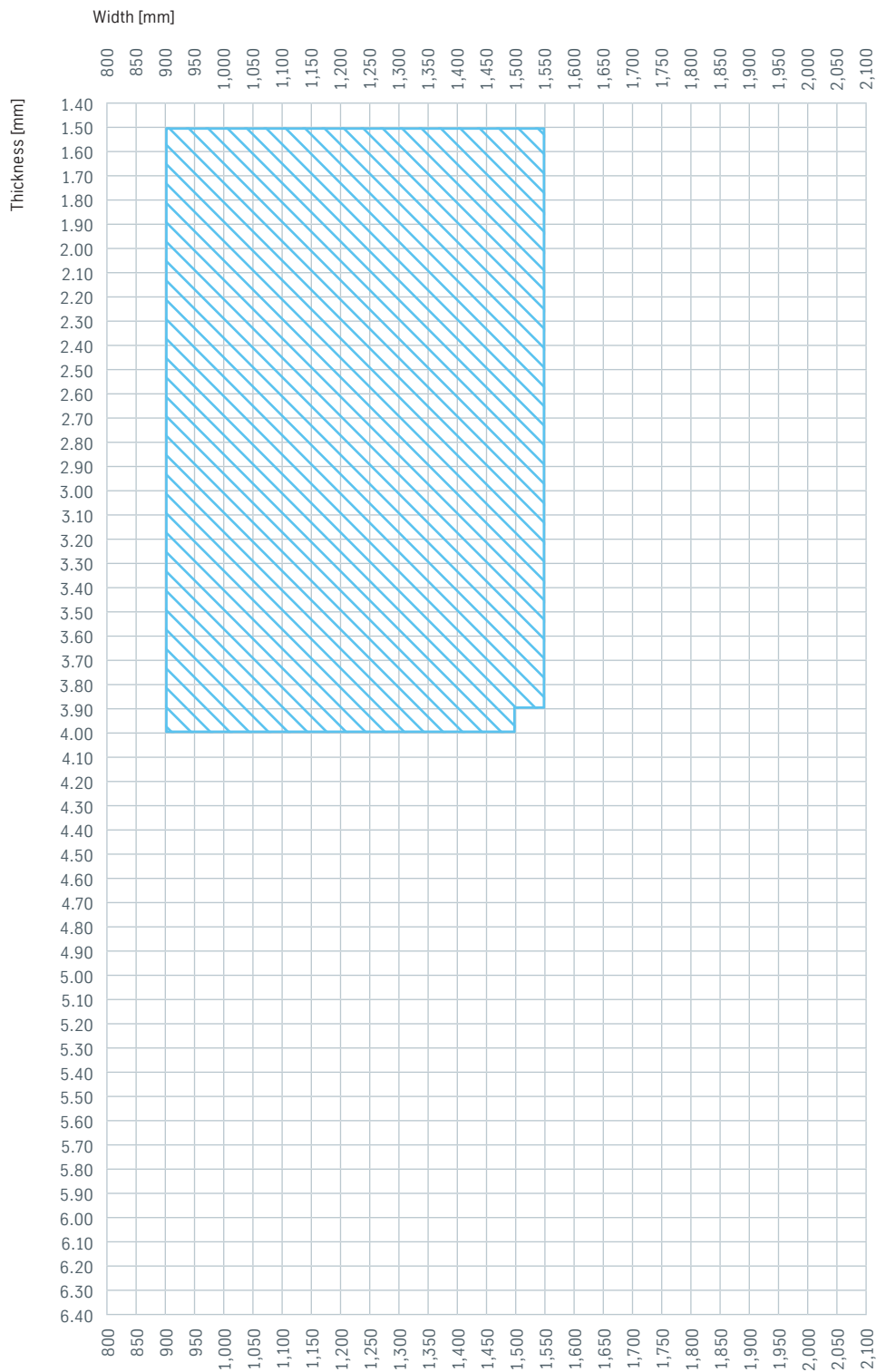


GI Hot-dip zinc coating

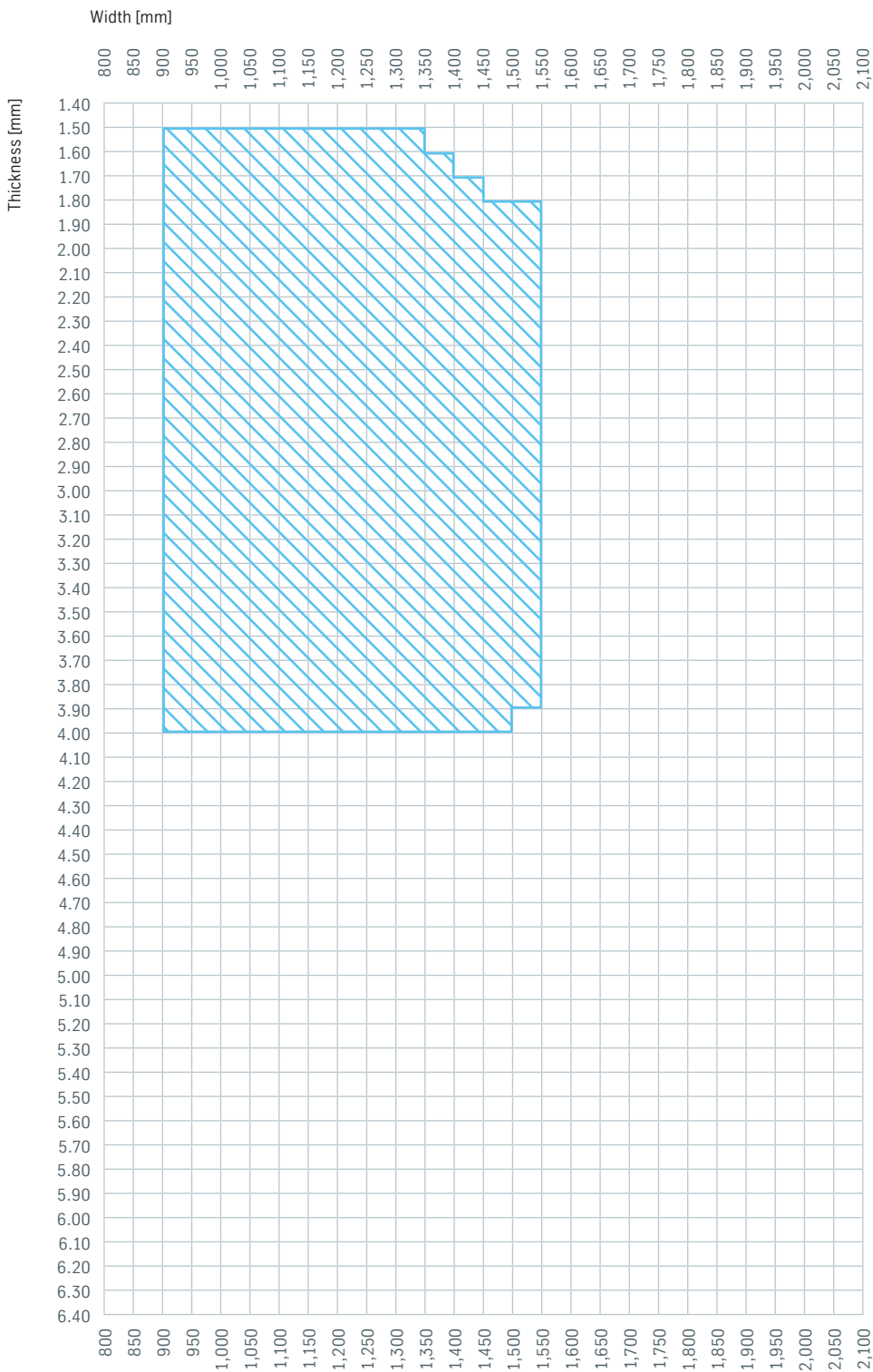
 GI trimmed

Further dimensions on request.

scalur®+Z HX260LAD, scalur®+Z HX300LAD



scalur®+Z HX340LAD

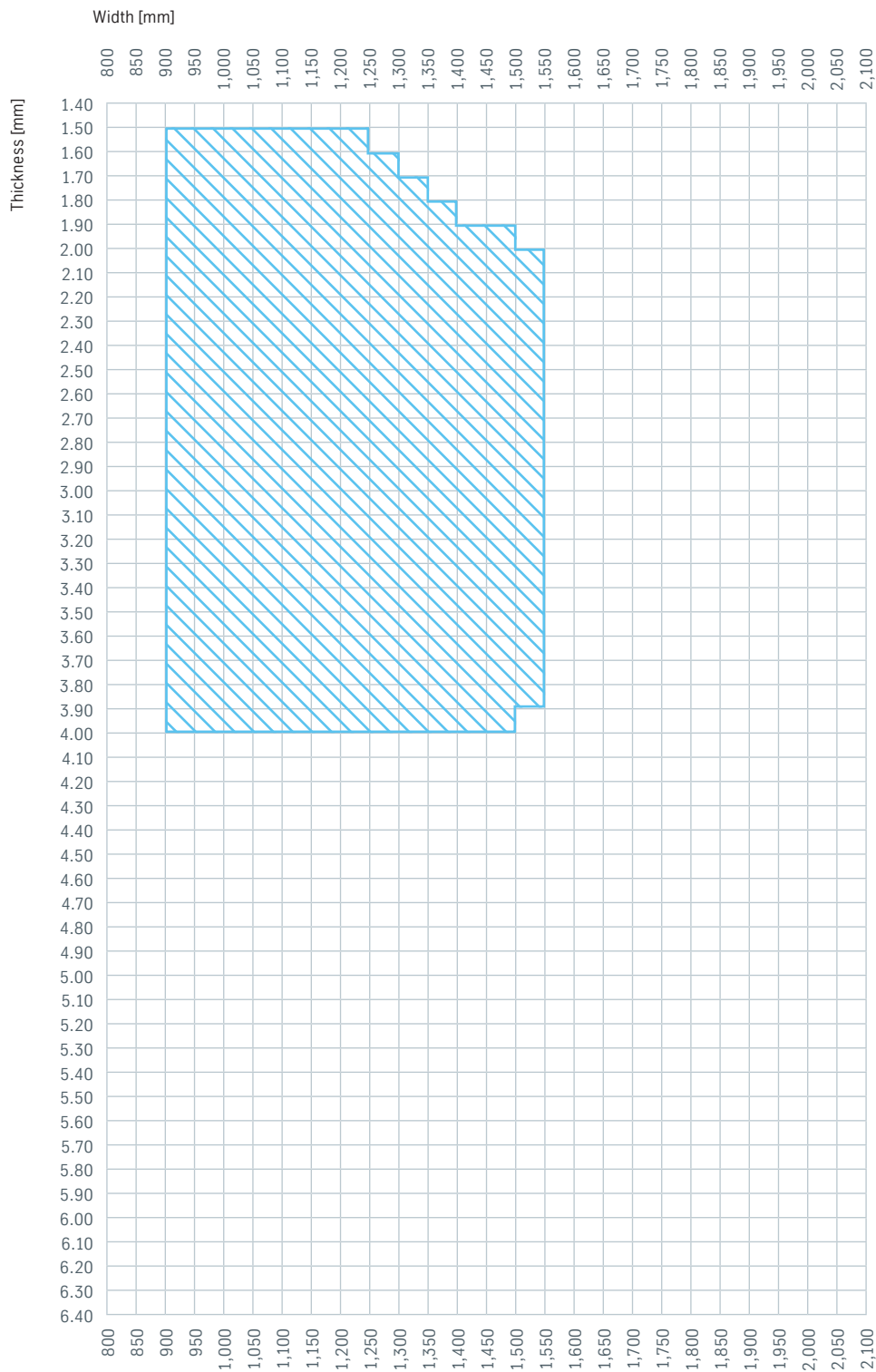


GI Hot-dip zinc coating

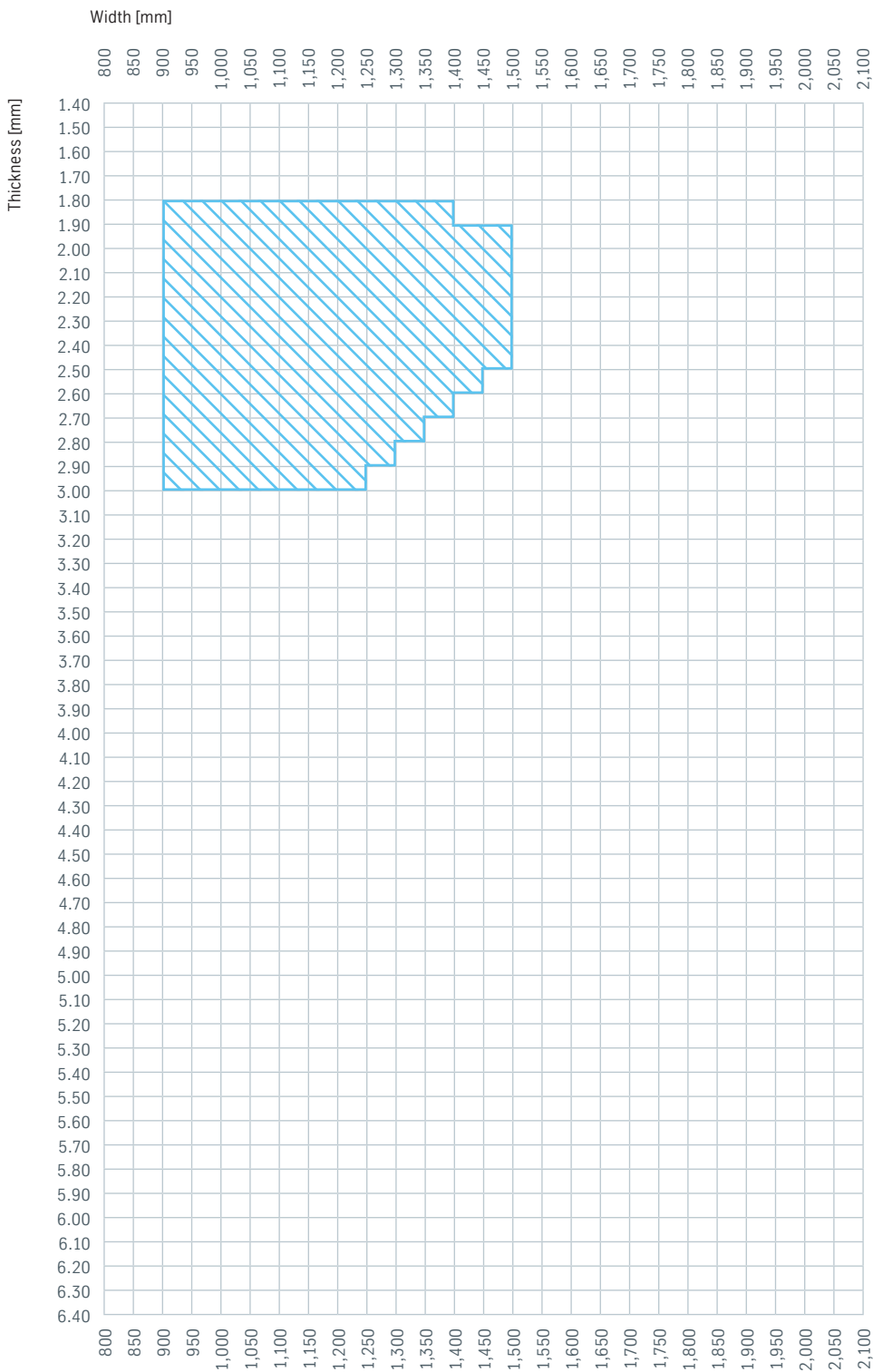
 GI trimmed

Further dimensions on request.

scalur®+Z HX380LAD, scalur®+Z HX420LAD



scalur®+Z HX460LAD, scalur®+Z HX500LAD



Sample applications



Stamped parts.



Telescopic rails.



Container floors.

Special mill grades are supplied subject to the special conditions of thyssenkrupp. Other delivery conditions not specified here will be based on the applicable specifications. The specifications used will be those valid on the date of issue of this product information brochure.

General information

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