

Steel

scalur[®]

Product information for pickled hot-rolled steel with very tight thickness tolerances



thyssenkrupp

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Areas of application

scalur[®] is a pickled hot-rolled steel from thyssenkrupp with very tight thickness tolerances that is suitable for direct processing. Thickness tolerances as low as ± 0.05 mm are constant and lower than with comparable conventional hot-rolled steel, with a very flat profile.

scalur[®] displays uniform properties and a homogeneous microstructure over the strip length and width, and has very low levels of sulfide inclusions. As a result, the material allows tight manufacturing tolerances, increases yield and provides ease of processing with consistently high product quality. thyssenkrupp offers scalur[®] in various grades of mild steels to EN 10111, general structural steels to EN 10025 and thermomechanically rolled steels to EN 10149 as well as the complex-phase steel CP-W[®] 800 as a special mill grade.

Depending on the strength, these grades are available in thicknesses of 1.20 to 9.00 mm and widths of 900 to 1,600 mm.

scalur[®] is particularly suitable for stamped parts, as used for example in belt retractor housings, seat belt buckles, profiles and parts of car seats.

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Available steel grades

thyssenkrupp supplies scalur® in the following steel grades:

To DIN EN 10111 Mild steel

Steel grade

DD11

DD12

DD13

DD14

To DIN EN 10025-2 Structural steel

Steel grade

S235JR¹⁾

S235J0¹⁾

S235J2¹⁾

¹⁾ Delivery condition "as rolled" (+AR).

To DIN EN 10149-2 High-strength steel

Steel grade

S315MC

S355MC

S420MC

S460MC

S500MC

S550MC

S600MC

S650MC

S700MC

Special mill grade Complex-phase steel

Steel grade

CP-W® 800

Thickness tolerances

thyssenkrupp supplies scalur® with the following tolerances depending on the thickness ordered:

Tolerances depending on thickness ordered

Sheet thickness t [mm]	Tolerance [mm]
$1.20 \leq t \leq 2.00$	± 0.05
$2.00 < t \leq 2.50$	± 0.06
$2.50 < t \leq 6.00$	± 0.07
$6.00 < t \leq 9.00$	± 0.08

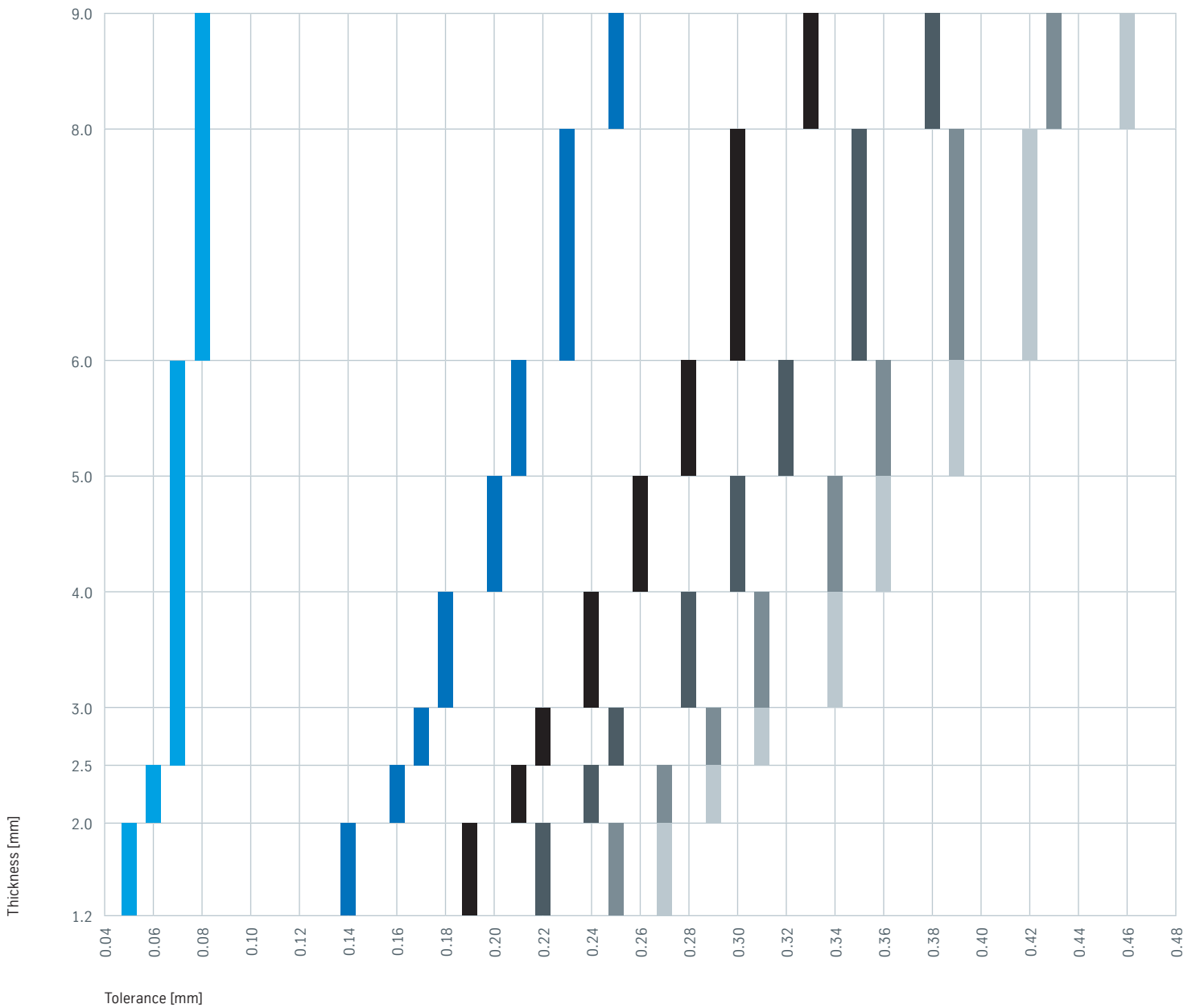
Comments

By arrangement, the grades DD11 to DD14, S315MC to S700MC as well as S235JR, S235J0 and S235J2 can be supplied with category A galvanizing properties.

scalur® is a pickled hot-rolled steel which can be ordered with mill or trimmed edges. The scalur® S600MC to S700MC grades are only available with trimmed edges. The material is available dry or with light, normal or heavy oiling.

thyssenkrupp supplies scalur® with the following tolerances depending on the thickness ordered:

Thickness tolerances of hot-rolled steel – Dimensional tolerances to DIN EN 10051¹⁾ and for scalur®



¹⁾ Tolerances for nominal width w in mm: 1,200 < w ≤ 1,500.

- scalur®
- Mild steels (DD11 – 14)
- $R_m \leq 300$ MPa
- $300 < R_m \leq 360$ MPa
- $360 < R_m \leq 420$ MPa
- $420 < R_m \leq 900$ MPa

Technical features

Mechanical properties – Mild steels

Test direction transverse to rolling direction	Yield strength	Tensile strength	Elongation			
	R _e [MPa]	R _m max. [MPa]	A ₈₀ min. [%]			
			t < 1.5	1.5 ≤ t < 2.0	2.0 ≤ t < 3.0 [mm]	t ≥ 3.0 [mm]
						A min. [%]

To DIN EN 10111

Steel grade

Steel grade	Yield strength	Tensile strength	Elongation			A min. [%]
DD11	170–340	440	22	23	24	28
DD12	170–320	420	24	25	26	30
DD13	170–310	400	27	28	29	33
DD14	170–290	380	30	31	32	36

Mechanical properties – Structural steels

Test direction transverse to rolling direction	Yield strength	Tensile strength	Elongation				Notch impact toughness min.		
	R _{eH} min. [MPa]	R _m [MPa]	A ₈₀ min. [%]				A min. [%]	[J]	Test temperature [°C]
			t ≤ 1.5	1.5 < t ≤ 2.0	2.0 < t ≤ 2.5	2.5 < t < 3 [mm]	t ≥ 3.0 [mm]		

To DIN EN 10025-2

Steel grade

Steel grade	Yield strength	Tensile strength	Elongation				Notch impact toughness min.		
S235JR+AR	235	360–510	16	17	18	19	24	27	20
S235J0+AR	235	360–510	16	17	18	19	24	27	0
S235J2+AR	235	360–510	16	17	18	19	24	27	–20

R_{eH} Yield strength

R_m Tensile strength

A Percentage elongation after fracture using a proportional specimen with L₀ = 5.65 √S₀ for sheet thicknesses ≥ 3.0 mm

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

Mechanical properties – Thermomechanically rolled steels

Test direction in rolling direction	Yield strength	Tensile strength	Elongation	
	R _{p0.2} min. [MPa]	R _m [MPa]	A ₈₀ min. [%]	A min. [%]
To DIN EN 10149				
Steel grade				
S315MC	315	390–510	20	24
S355MC	355	430–550	19	23
S420MC	420	480–620	16	19
S460MC	460	520–670	14	17
S500MC	500	550–700	12	14
S550MC	550	600–760	12	14
S600MC	600	650–820	11	13
S650MC	650	700–880	10	12
S700MC	700	750–950	10	12

Mechanical properties – Complex-phase steel

Test direction transverse to rolling direction	Yield strength	Tensile strength	Elongation	
	R _{p0.2} [MPa]	R _m min. [MPa]	A ₈₀ min. [%]	A min. [%]
Special mill grade CP-W®				
Steel grade				
CP-W® 800	680–830	780	10	12

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

R_m Tensile strength

A Percentage elongation after fracture using a proportional specimen with L₀ = 5.65 √S₀ for sheet thicknesses ≥ 3.0 mm

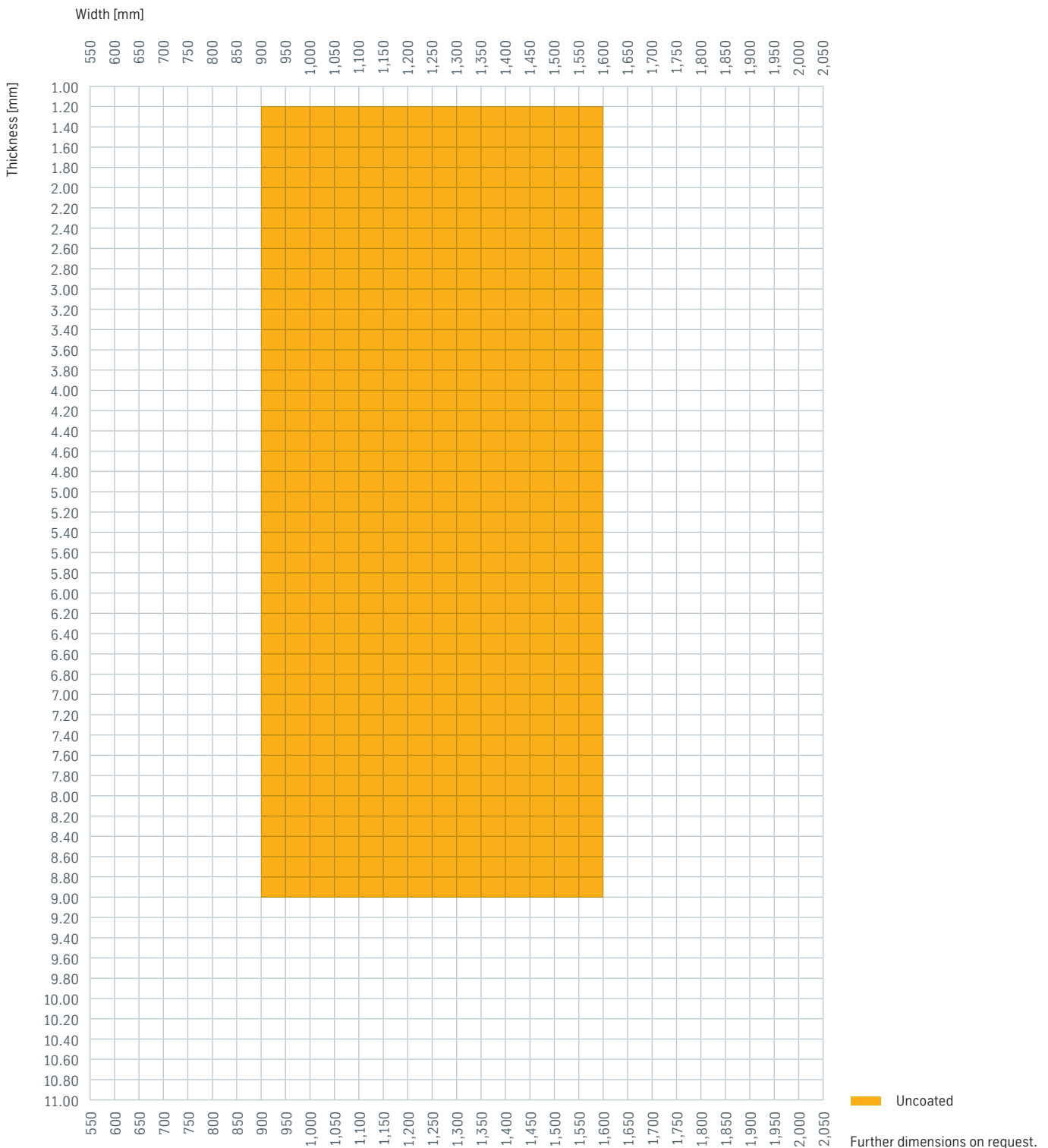
A₈₀ Percentage elongation after fracture using a specimen with gauge length L₀ = 80 mm for sheet thicknesses < 3.0 mm

Chemical composition – complex-phase steel

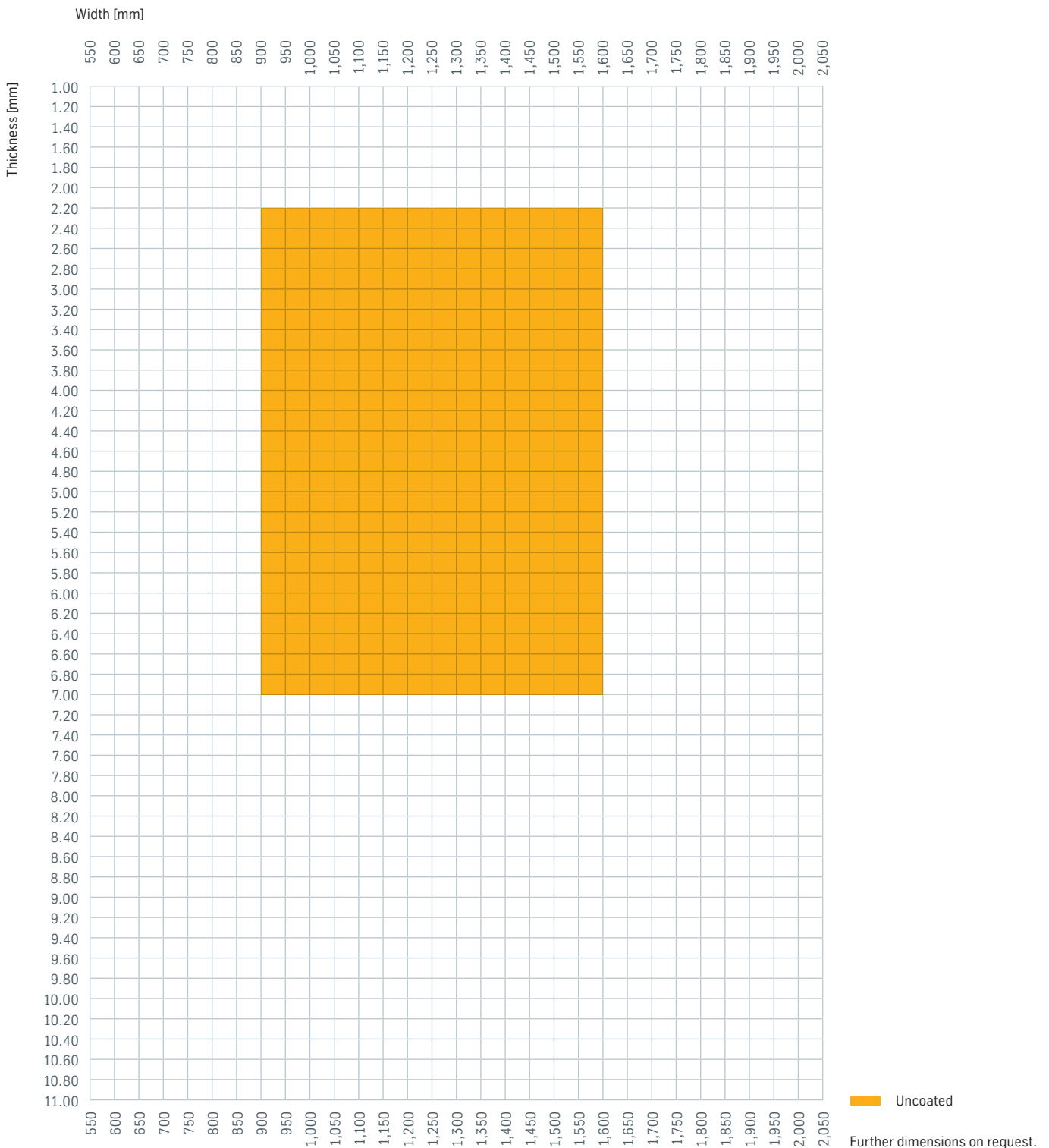
Mass fractions in ladle analysis	C [%] max.	Si [%] max.	Mn [%] max.	P [%] max.	S [%] max.	Al [%] total	Ti + Nb [%] max.	Cr+Mo max.	V max.	B max.
Special mill grade CP-W®										
Steel grade										
CP-W® 800	0.18	1.00	2.50	0.080	0.015	0.015–2.0	0.25	1.00	0.20	0.005

Available dimensions

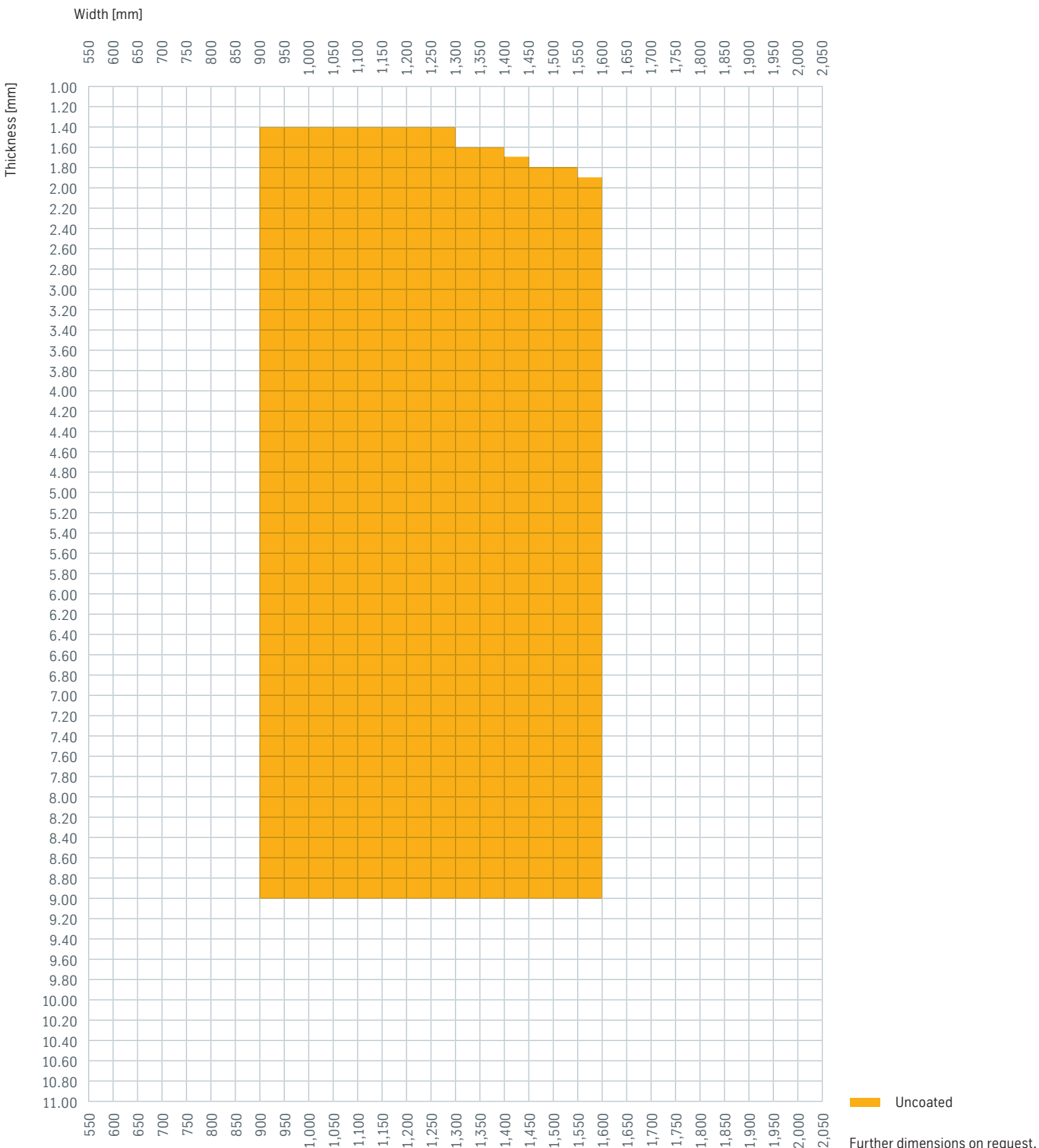
scalur® DD11, scalur® DD12, scalur® DD13, scalur® DD14



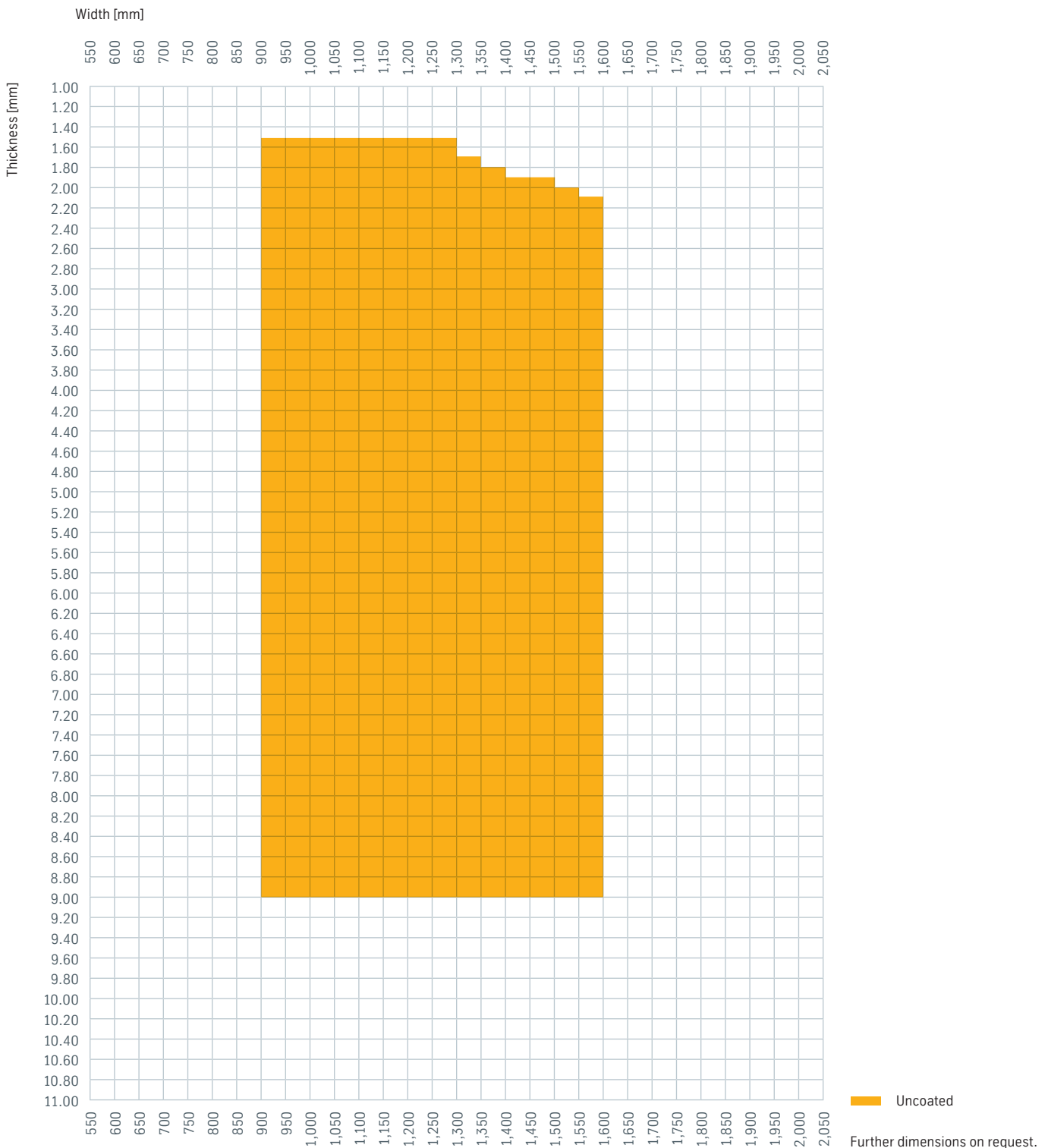
scalur® S235



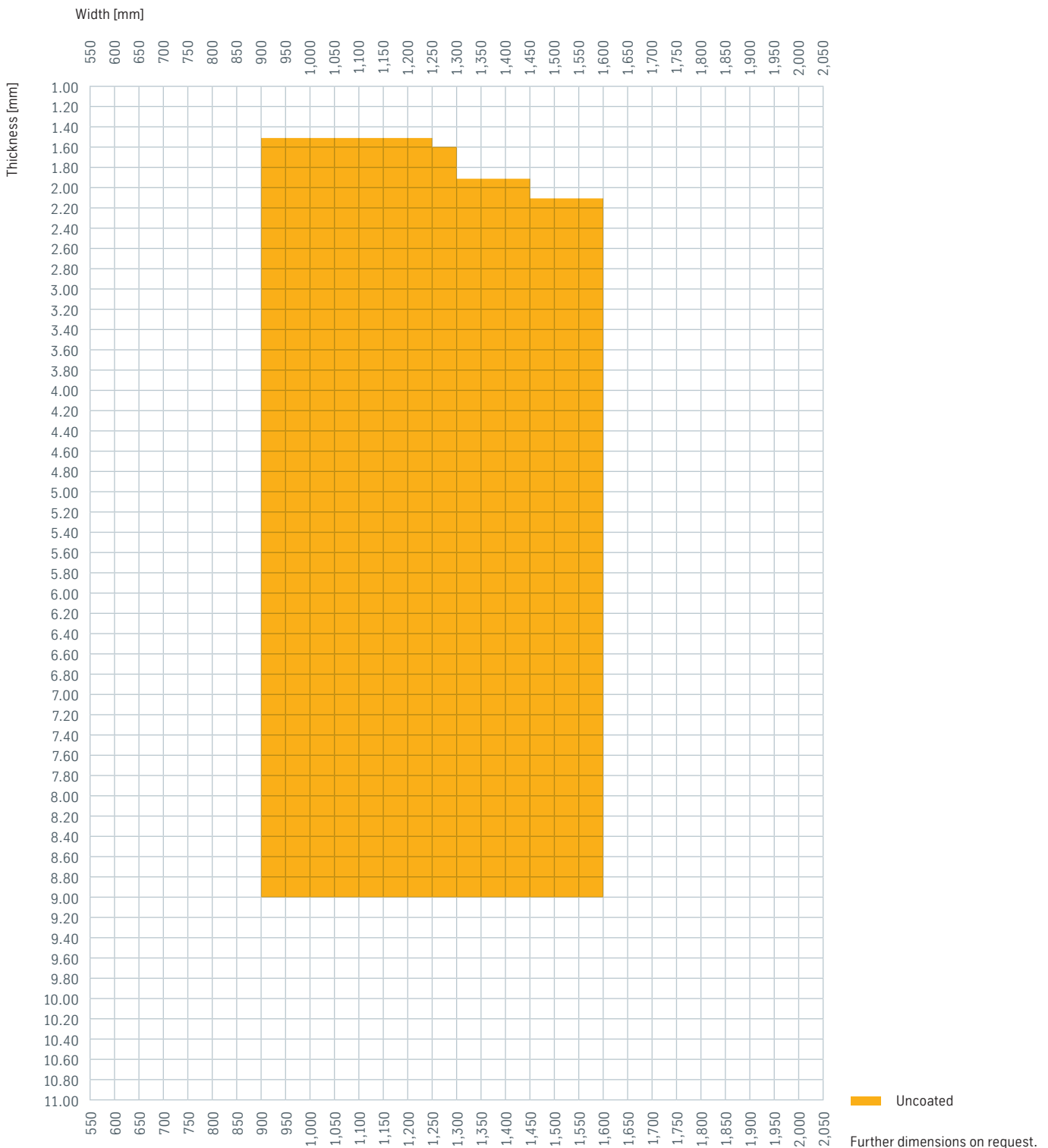
scalur® S315MC



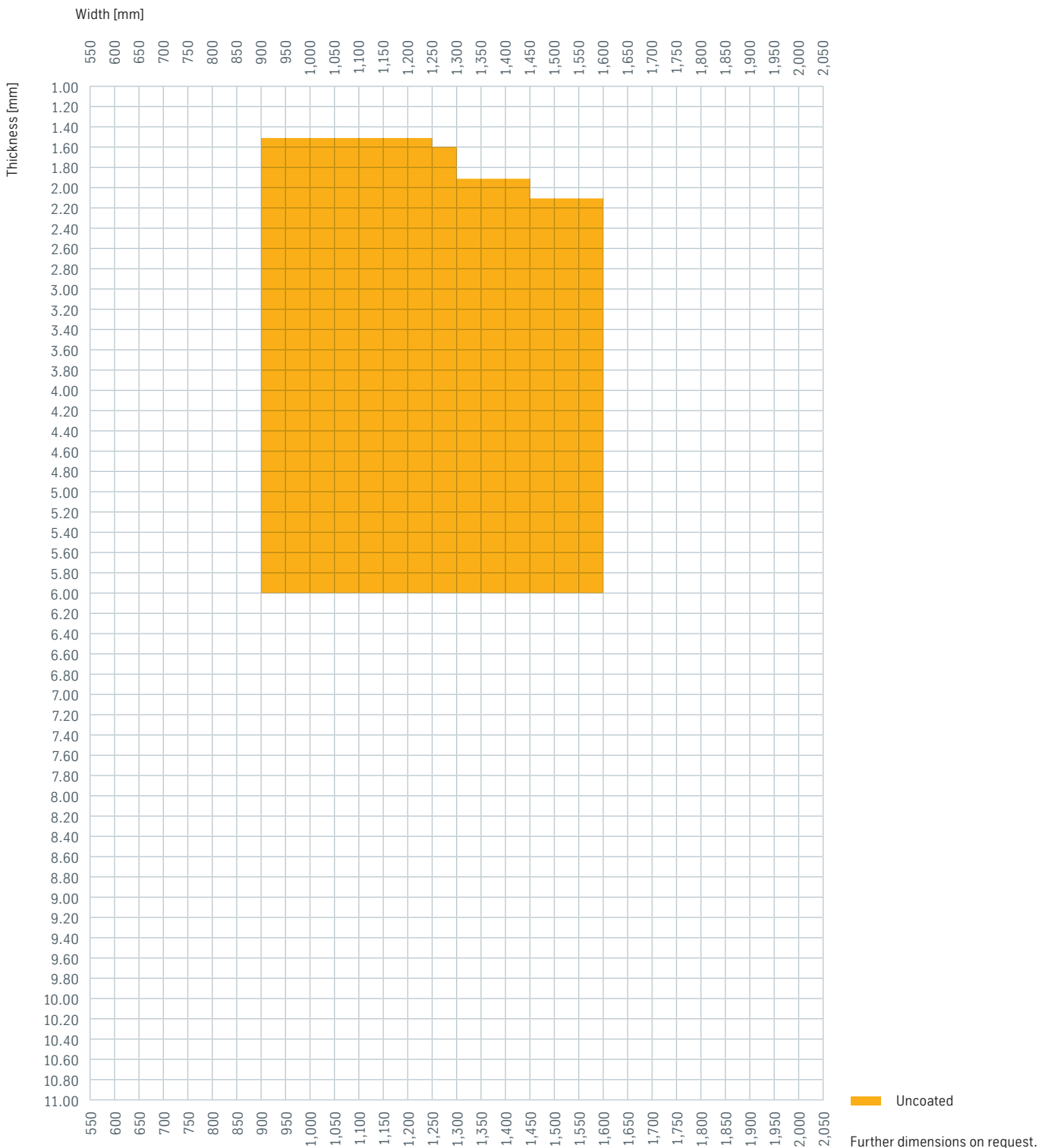
scalur® S355MC, scalur® S420MC



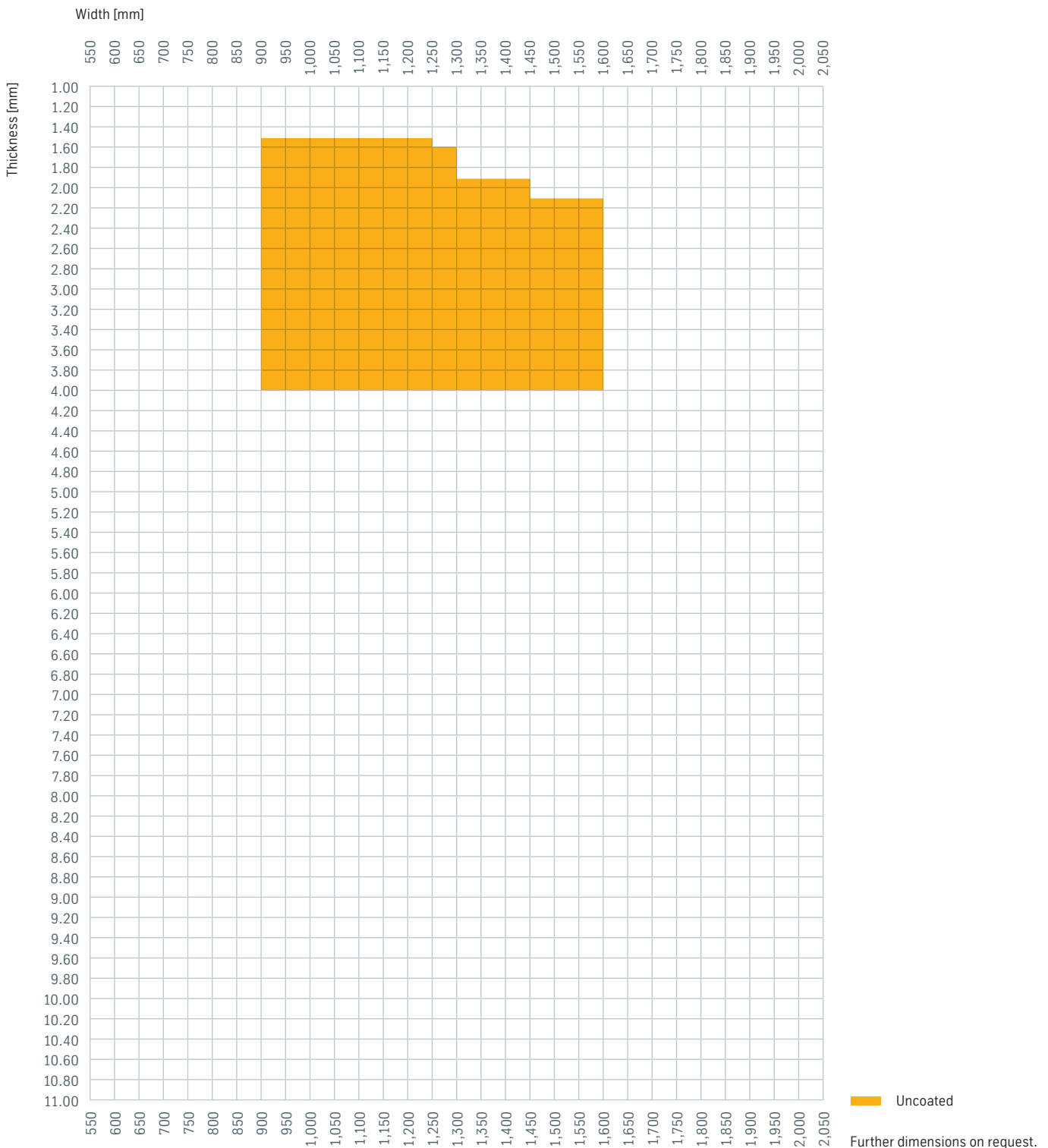
scalur® S460MC



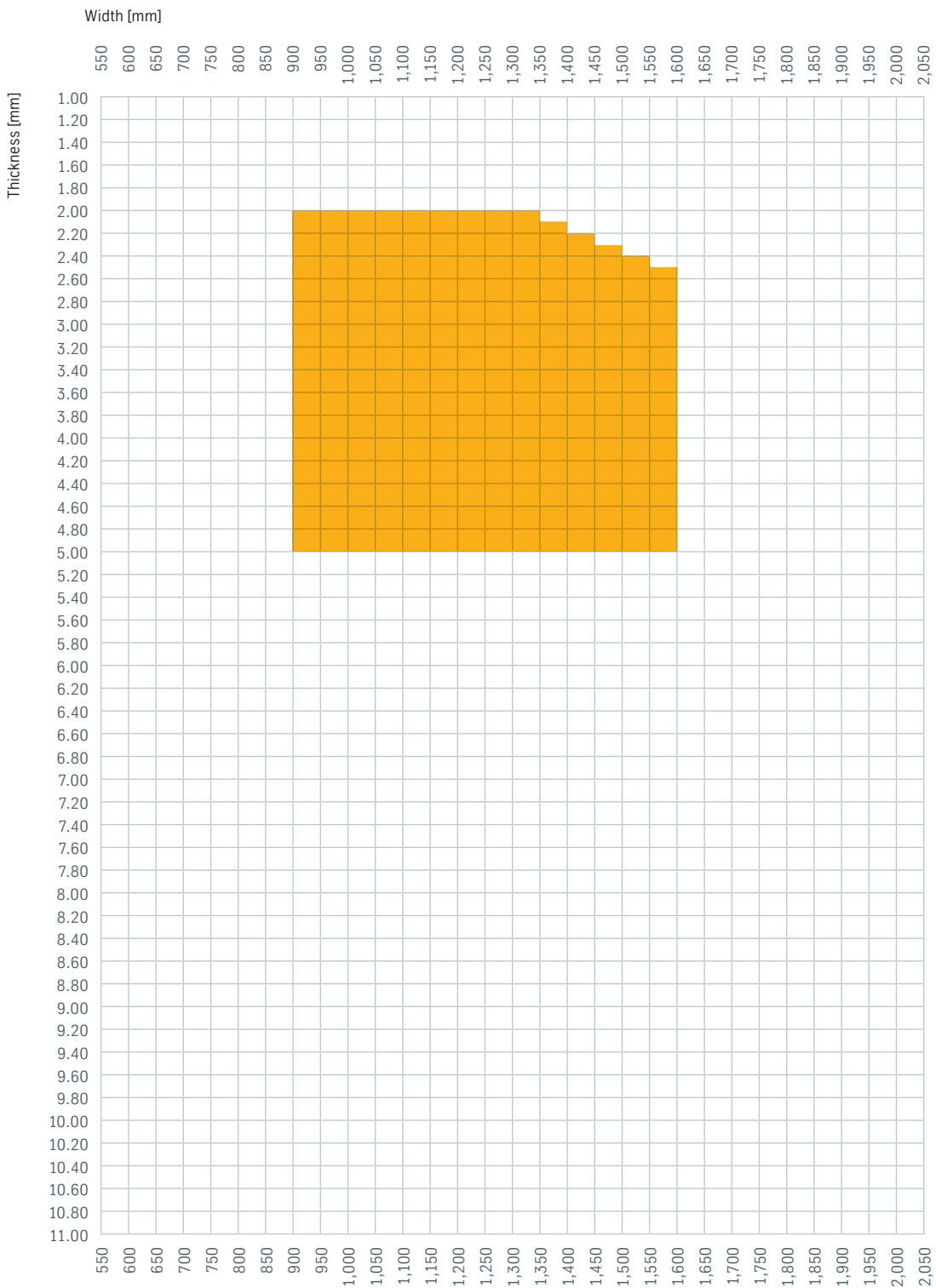
scalur® S500MC



scalur® S550MC

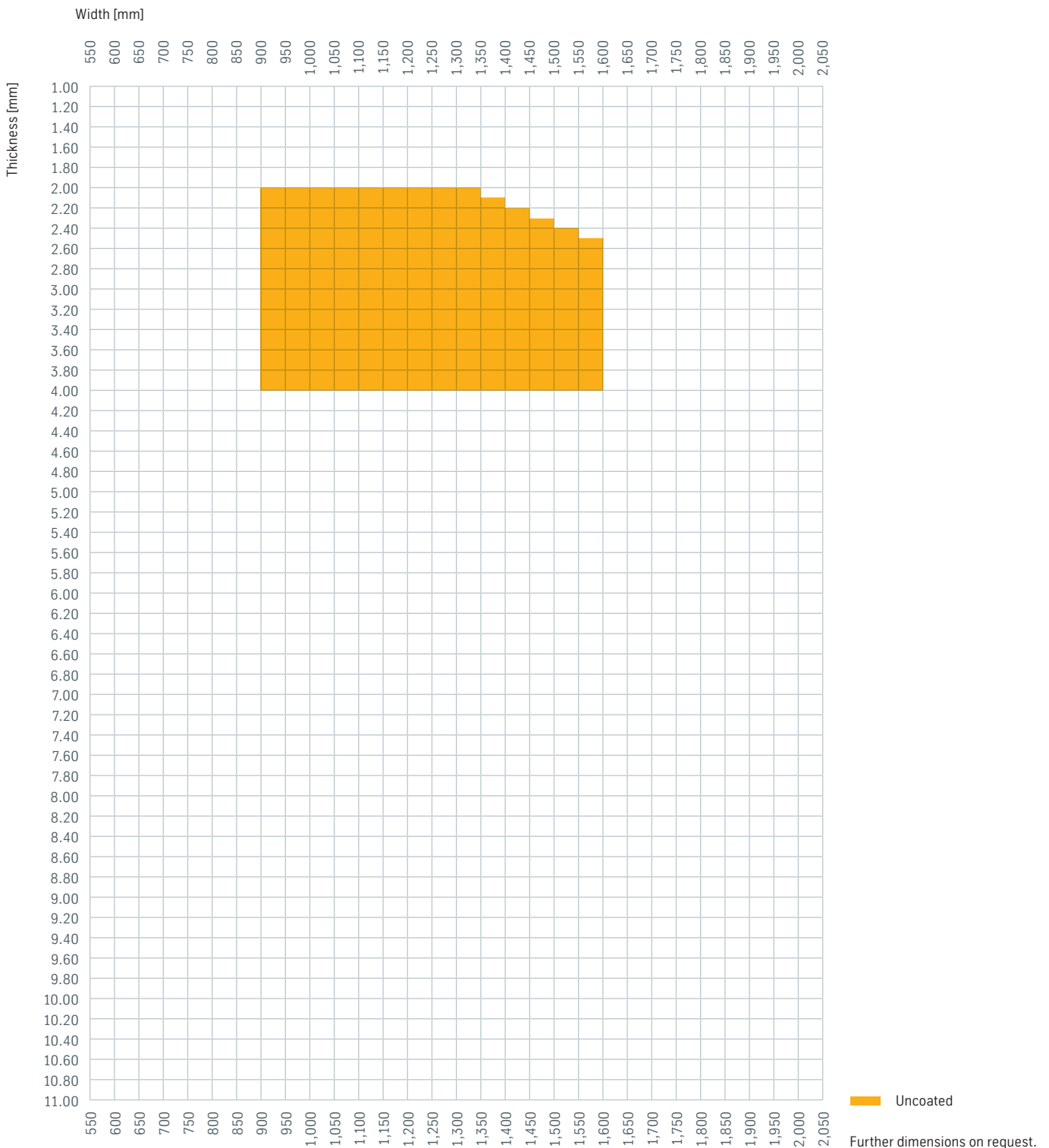


scalur® S600MC

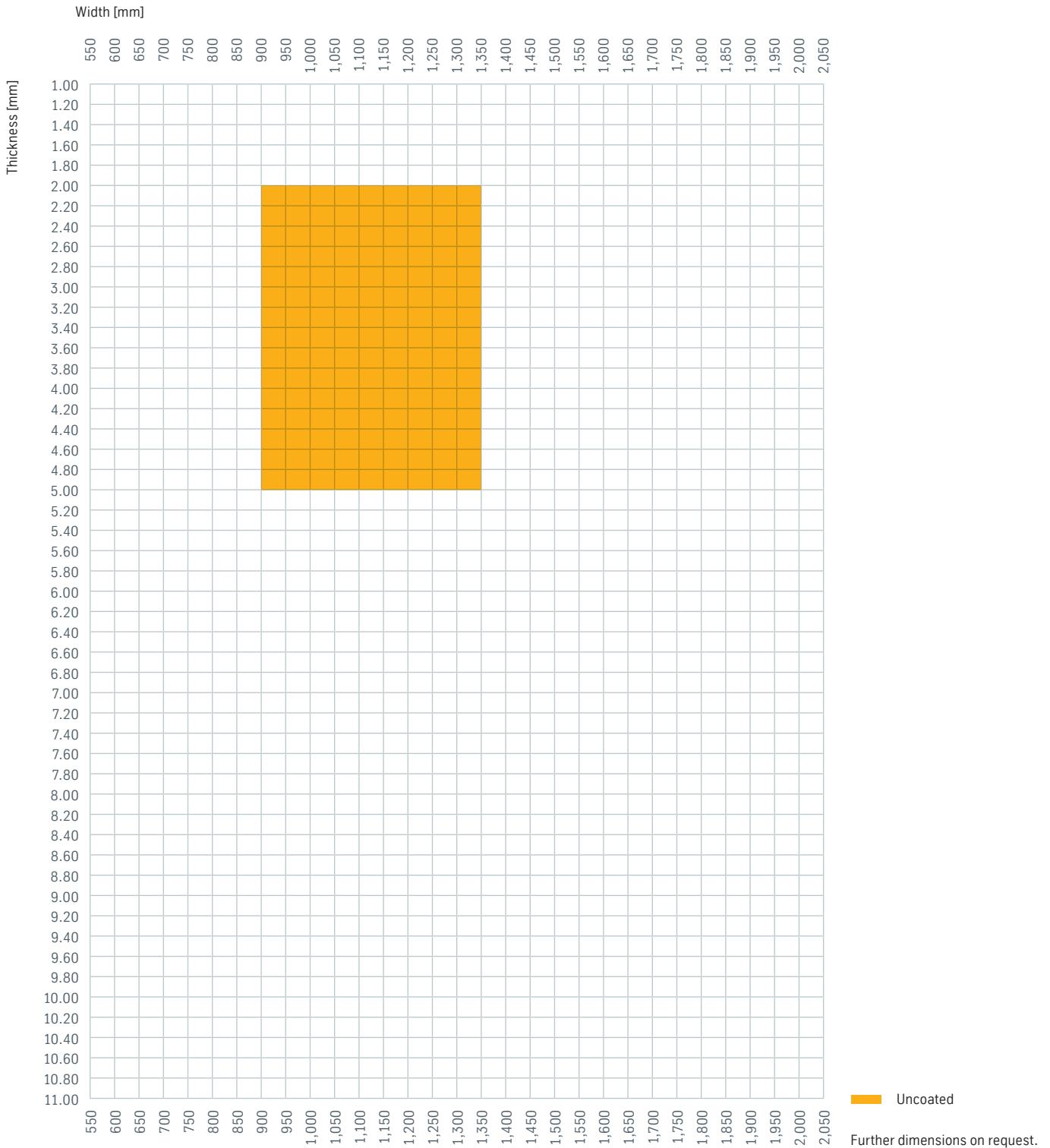


Further dimensions on request.

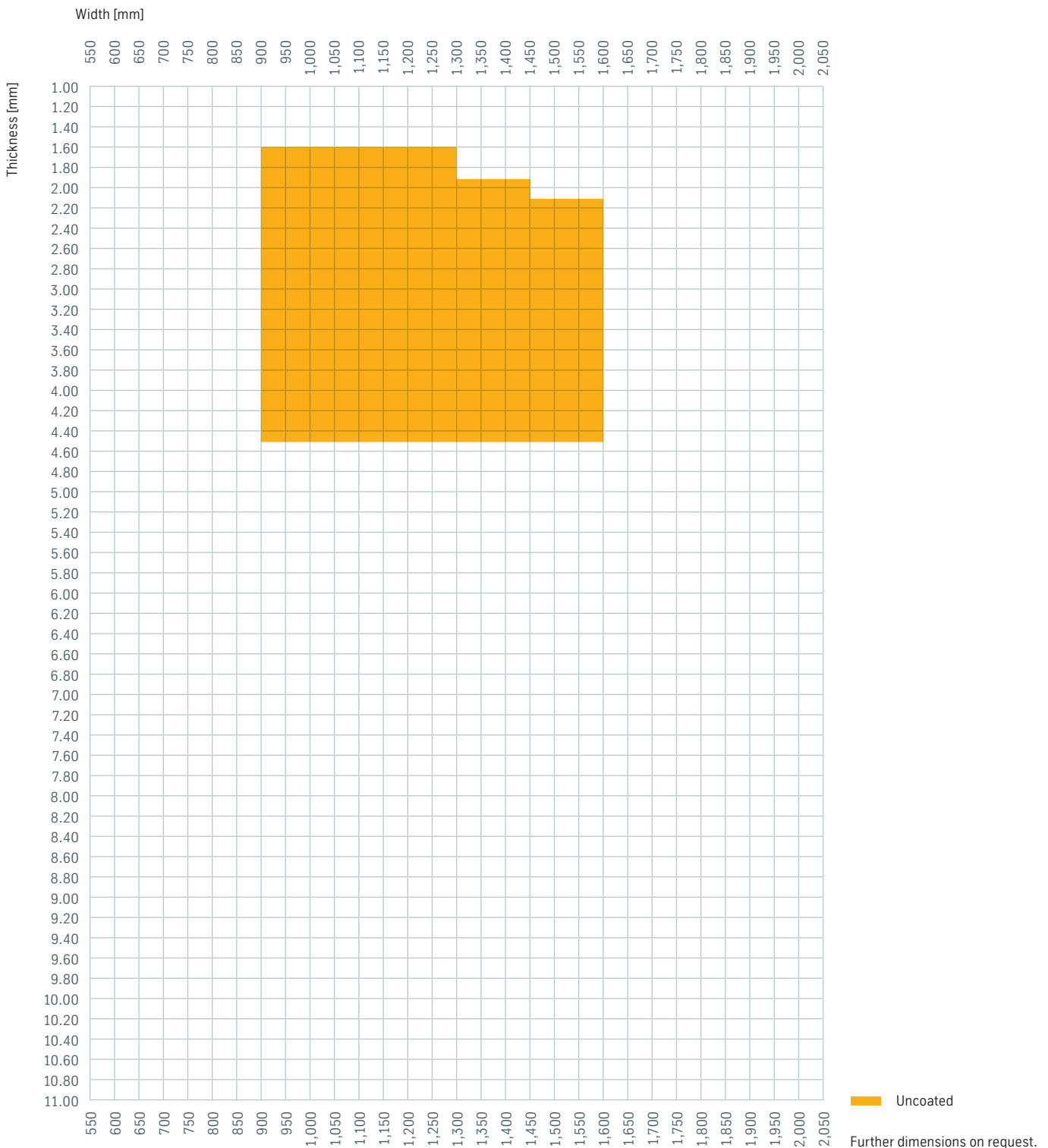
scalur® S650MC



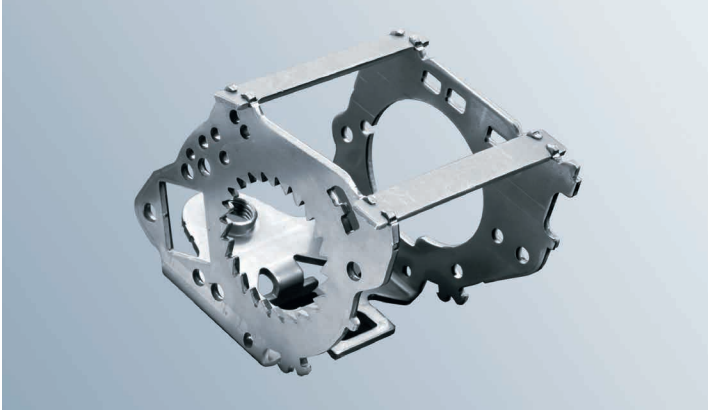
scalur® S700MC



scalur® CP-W® 800



Sample applications



Belt retractor housing.



Profiles.



Stamped parts in cars.

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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