aldur®

High-strength quenched and tempered fine-grained steels

Technical terms of delivery for heavy plates

voestalpine Grobblech GmbH
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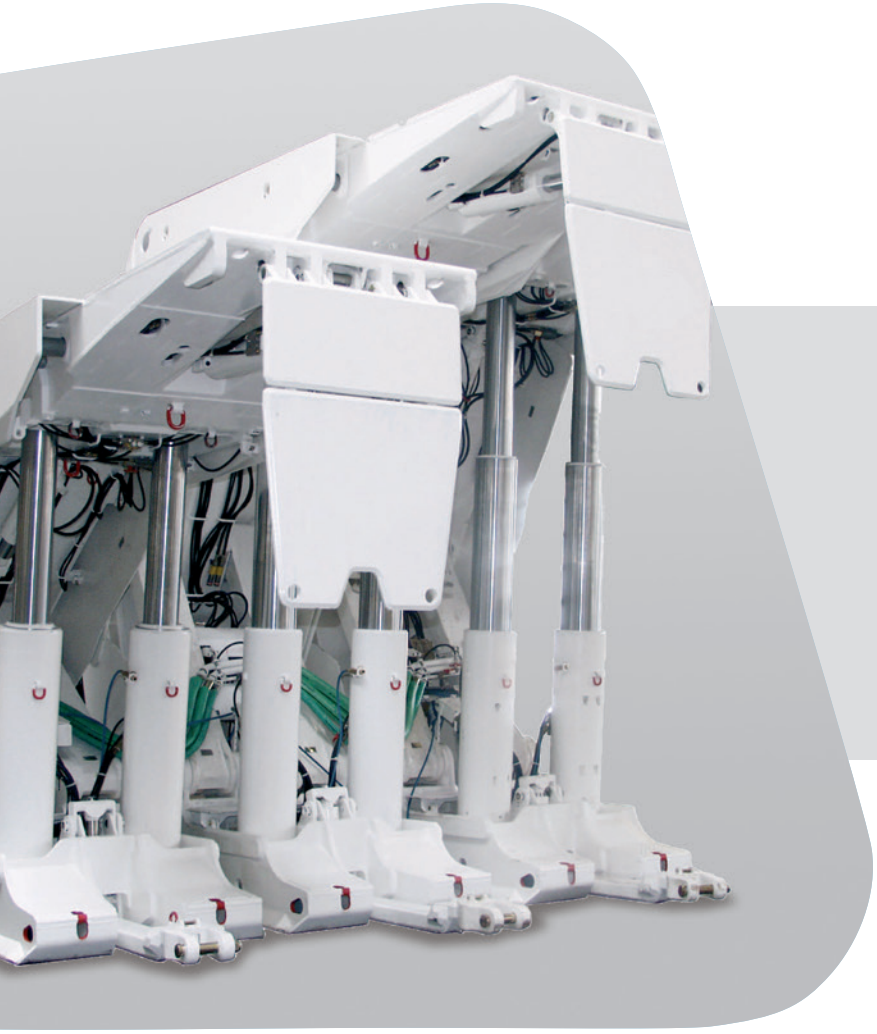
aldur®

High-strength quenched and tempered fine-grained steels



aldur® Q

Stahlsorten

- aldur 500 Q, QL, QL1
- aldur 550 Q, QL, QL1
- aldur 620 Q, QL, QL1
- aldur 700 Q, QL, QL1
- aldur 900 Q, QL
- aldur 960 Q, QL

Subject to change pursuant to further development.
The current version is available at www.voestalpine.com/grobblech.

aldur® Q

The grades of the aldur® Q series are water-quenched and tempered, high-strength, weldable fine-grained structural steels. Main applications are welded structures subjected to extreme loads, e.g. in crane and vehicle manufacturing, for steel construction, in pressure vessel and pressure piping systems.

The steel grades are supplied in three groups:

- **Basic series aldur® ... Q**
  with guaranteed notch impact toughness at –20 °C
- **Low temperature series aldur® ... QL**
  with guaranteed notch impact toughness at –40 °C
- **Special low-temperature series aldur® ... QL1**
  with guaranteed notch impact toughness at –60 °C

The technical terms of delivery apply for plate thicknesses from 12 - 110 mm. For aldur 900 Q, QL from 30 to 60 mm and for aldur 960 Q, QL from 30 to 50 mm.

Steel grades

Steel grades

Table 1: Steel grades

Steel grades	Designation according EN 10025-6	Material number
aldur 500 Q	S500Q	1.8924
aldur 500 QL	S500QL	1.8909
aldur 500 QL1	S500QL1	1.8984
aldur 550 Q	S550Q	1.8904
aldur 550 QL	S550QL	1.8926
aldur 550 QL1	S550QL1	1.8986
aldur 620 Q	S620Q	1.8914
aldur 620 QL	S620QL	1.8927
aldur 620 QL1	S620QL1	1.8987
aldur 700 Q	S690Q	1.8931
aldur 700 QL	S690QL	1.8928
aldur 700 QL1	S690QL1	1.8988
aldur 900 Q	S890Q	1.8940
aldur 900 QL	S890QL	1.8983
aldur 960 Q	S960Q	1.8941
aldur 960 QL	S960QL	1.8933

Production process

aldur® Q steels are produced via the LD-route.

Chemical composition

Heat analysis

Guaranteed values

Table 2: Chemical composition

Steel grades	mass in %															
	C max.	Si max.	Mn max.	P max.	S max.	$Al_{tot.}$ min.	N max.	Cr max.	Ni max.	Mo max.	Cu max.	V max.	Nb max.	Ti max.	B max.	Zr max.
aldur 500 Q, QL, QL1 aldur 550 Q, QL, QL1 aldur 620 Q, QL, QL1 aldur 700 Q, QL, QL1 aldur 900 Q, QL aldur 960 Q, QL	0.20	0.80	1.70	0.020	0.010	0.018	0.015	1.50	2.00	0.70	0.50	0.12	0.06	0.05	0.0050	0.15

Carbon equivalent

Depending on the analyses employed, the following carbon equivalents result for varying plate thicknesses.

Table 3: carbon equivalent

Standard values

Steel grades		Carbon equivalent mass in % plate thickness in mm ≤ 25	> 25 ≤ 50	> 50 ≤ 100
aldur 500 Q, QL, QL1	CEV[1] max. acc. EN 10025-6	0.47	0.47	0.70
	CEV[1] standard value	0.40	0.46	0.46
	CET[2] standard value	0.25	0.29	0.29

Steel grades		≤ 50	> 50
aldur 550 Q, QL, QL1	CEV[1] max. acc. EN 10025-6	0.65	0.77
	CEV[1] standard value	0.45	0.46
	CET[2] standard value	0.29	0.29

Steel grades		< 50	> 50 ≤ 70	> 70
aldur 620 Q, QL, QL1	CEV[1] max. acc. EN 10025-6	0.65	0.77	0.77
	CEV[1] standard value	0.46	0.46	0.52
	CET[2] standard value	0.29	0.29	0.32

Steel grades		< 30	> 30 ≤ 50	> 50 ≤ 110
aldur 700 Q, QL, QL1	CEV[1] max. acc. EN 10025-6	0.65	0.65	0.77
	CEV[1] standard value	0.46	0.52	0.54
	CET[2] standard value	0.29	0.32	0.35

Steel grades		≥ 30 ≤ 60
aldur 900 Q, QL	CEV[1] max. acc. EN 10025-6	0.82
	CEV[1] standard value	0.66
	CET[2] standard value	0.39

Steel grades		≥ 30 ≤ 50
aldur 960 Q, QL	CEV[1] max. acc. EN 10025-6	0.82
	CEV[1] standard value	0.66
	CET[2] standard value	0.39

[1] CEV = C + Mn/6 + (Cr + Mo +V)/5 + (Ni + Cu)/15, nach IIW

[2] CET = C + (Mn + Mo)/10 + (Cr + Cu)/20 + Ni/40, nach SEW 088

As-delivered condition

The plates are delivered in water-quenched and tempered condition. Direct hardening after hot rolling is permitted.

Mechanical properties

Table 4: Mechanical properties

Mechanical properties at ambient temperature

Steel grades	Material-number	Yield strength YS[1] MPa, min. plate thickness in mm ≤ 50	Yield strength YS[1] MPa, min. plate thickness in mm > 50 ≤ 100[2]	Tensile strength UTS MPa plate thickness in mm ≤ 50	Tensile strength UTS MPa plate thickness in mm > 50 ≤ 100[2]	Fracture elongation $L_0 = 5.65 \sqrt{S_0}$ min. %
aldur 500 Q	1.8924	500	480	590 - 770	590 - 770	17
aldur 500 QL	1.8909					
aldur 500 QL1	1.8984					
aldur 550 Q	1.8904	550	530	640 - 820	640 - 820	16
aldur 550 QL	1.8926					
aldur 550 QL1	1.8986					
aldur 620 Q	1.8914	620	580	700 - 890	700 - 890	15
aldur 620 QL	1.8927					
aldur 620 QL1	1.8987					
aldur 700 Q	1.8931	700	650	770 - 940	760 - 930	14
aldur 700 QL	1.8928					
aldur 700 QL1	1.8988					
aldur 900 Q	1.8940	890	830	940 - 1100	880 - 1100	11
aldur 900 QL	1.8983					
aldur 960 Q	1.8941	960		980 - 1150		10
aldur 960 QL	1.8933					

[1] Where there is no distinct yield strength, the 0.2 %-proof stress (Rp 0.2) is established.

[2] aldur 700 Q, QL, QL1: > 50 ≤ 110

Table 5: Notch impact energy

Notch impact energy (valid for Charpy V-notch samples)

Steel grades	Sample direction	Notch impact energy AV[1] J, min. testing temperature in °C –60	–40	–20	± 0
aldur 500 Q, 550 Q, 620 Q, 700 Q, 900 Q, 960 Q	longitudinal	–	–	30	40
	transversal	–	–	27	30
aldur 500 QL, 550 QL, 620 QL, 700 QL, 900 QL, 960 QL	longitudinal	–	30	40	50
	transversal	–	27	30	35
aldur 500 QL1, 550 QL1, 620 QL1, 700 QL1	longitudinal	30	40	50	60
	transversal	27	30	35	40

[1] Notch impact test according to EN 10045 at longitudinal samples. Mean value from 3 individual samples must reach the specified requirements. No individual value may be below 70 % of the guaranteed mean value. Testing temperature is –20 °C for the basic series aldur Q, –40 °C for the low-temperature series aldur QL and –60 °C for the special low-temperature series aldur QL1.

Quality test

Test unit

Unless otherwise agreed upon ordering, 40 t of a heat or a smaller portion is used as test unit for the mechanical properties. The test unit must consist of plates with the same steel grade and the same thickness range for the yield strength according to table 4. The thickness of the plate in the test unit may not differ more than 5 mm from the thickness of the sample.

Position of test samples

The sample position in the rolled plate is at one end and at a quarter of the width.

Scope of testing

The following tests are carried out on the test samples:
- Tensile test at ambient temperature on transverse samples
- Notch impact test on longitudinal samples

The heat analysis is provided as proof of the chemical composition.

A transverse sample has to be taken for the tensile test at ambient temperature. Usually flat samples are used for thicknesses up to 42 mm (aldur 500, 550, 620) resp. up to 20 mm (aldur 700); at least one rolled surface shall remain on the sample. Round samples are permitted. For plate thicknesses higher than mentioned above as well as for the steel grades aldur 900 and 960 round samples are used in any case.

Unless otherwise agreed, 3 longitudinal samples are taken from each position for the notch impact tests. For plate thicknesses of up to 40 mm, one side of the sample must be as near as possible to the rolled surface. In the case of plate thicknesses above 40 mm, the samples are taken in such a manner that their longitudinal axes are at a distance of a quarter of the plate thickness from the surface, or as near as possible to this point. The notch must be vertical to the plate surface.

Tolerances and surface finish

Unless otherwise agreed, tolerances according to EN 10029 (thickness tolerance according to class A, flatness tolerance according to class N) and surface finish according to EN 10163-A1 are valid.

Marking

In general, marking consists of:
- voestalpine symbol
- Steel grade designation
- Heat number
- Plate number

Material testing certificate

Type of certificate according to EN 10204 must be agreed upon ordering.

Processing guidelines

Cold forming

aldur® Q plates are well-suited for the standard cold forming processes in general steel construction work.

Recommended minimum bending radii

Table 6: Minimum bending radii

Bending line	transverse	parallel	to the rolling direction
Bending radius	≥ 3	≥ 4	x plate thickness
Bending radius aldur 900 Q, QL und 960 Q, QL	≥ 4	≥ 5	

The recommended minimum bending radius is only valid on condition that cut edges have been removed and that the bending process is done professional.

Hot forming

Hot forming at temperatures above the permissible maximum stress-relief temperature (560 °C) can influence the original tempered condition. In that case water-quenching and tempering must be repeated after hot forming.

Welding

General information
A prerequisite for high-quality welding is adherence to the generally valid and accepted rules for the welding of low-alloyed, higher-strength fine-grain structural steels, according to EN 1011-2 and STAHL-EISEN Werkstoffblatt (SEW) 088.

Weld preparation, thermal cutting
Weld preparation can be done by machining or flame cutting. In general aldur Q plates do not require preheating for workpiece temperatures above +5 °C. We always recommend preheating to at least 75 °C in the area of the cut for plate thicknesses exceeding 50 mm and for aldur 900/960 Q(L) throughout the entire plate thickness.

Welding process
All standard automatic and manual welding processes can be employed, particularly shielded metal arc, inert gas shielded and submerged arc welding.

Filler materials and welding conditions (preheating, welding parameters)
The filler materials should be selected in that way, that the weld material matches the mechanical-technological properties of the base material. We recommend using the welding consumables designated in Table 7. For preventing of cold cracking, care should be taken to ensure a low hydrogen content of HD < 5 ml/100 g WM. This is generally guaranteed by inert gas shielded welding with solid wire. Basic electrodes and welding powder must be subjected to secondary drying in accordance with manufacturers instructions.

In avoiding excessive hardening of the microstructure in the heat-affected zone (HAZ) and achieving higher resistance to hydrogen-induced cold cracks, preheating according to the values presented in Tables 8, 9 and 10 is recommended in addition to monitoring the hydrogen content in the welding consumables. Because the required preheating temperature is dependent on the carbon equivalent, hydrogen content of the weld metal and heat input, we recommend that each case be separately determined pursuant to EN 1011-2. A higher carbon equivalent in the weld metal as compared to that of the base material is a deciding factor in determining the preheating temperature.

Because of the longer cooling time $t_{8/5}$, preheating reduces excessive hardening in the microstructure of the HAZ and has a dominating effect on the time available for hydrogen effusion from the weld seam in the temperature range below 300 °C. In order to avoid cracking in the HAZ and in the weld metal, soaking is recommended for plate thicknesses exceeding 50 mm and for aldur 900/960Q(L) throughout the entire plate thickness according to the conditions set forth in Tables 8, 9 and 10. Multi-pass welding is to be used in order to achieve the high strength and toughness values in the HAZ.

Welding conditions, which lead to cooling times $t_{8/5}$ of 5 - 20 seconds, have proved effective. Following appropriate checks, welding can take place with other cooling times if the requirements on the component are fulfilled.

Recommended welding consumables

Base material			Welding process – consumable					
							SAW	
voestalpine aldur	EN 10025-6	Material-number	SMAW	GTAW	GMAW	FCAW	wire	flux
500 Q 500 QL 500 QL1	S500 Q S500 QL S500 QL1	1.8924 1.8909 1.8984	Böhler Fox EV 65 Phoenix SH Ni 2 K 90	Böhler NiMo 1-IG	Böhler NiMo 1-IG Union Ni 2.5	Böhler Ti 60 T-FD Ti 60-FD HL 53 T-MC	Union S 2 NiMo 1 Union S 3 NiMo 1	UV 421 TT
550 Q 550 QL 550 QL1	S550 Q S550 QL S550 QL1	1.8904 1.8926 1.8986	Böhler Fox EV 65 Fox EV 75 Phoenix SH Ni 2 K 100	Böhler NiMo 1-IG	Böhler NiMo 1-IG Union MoNi	Böhler Ti 70 Pipe T-FD Ti 70 Pipe FD HL 65 T-MC	Union S 3 NiMo 1	UV 421 TT
620 Q 620 QL 620 QL1	S620 Q S620 QL S620 QL1	1.8914 1.8927 1.8987	Böhler Fox EV 75 Fox EV 85 Phoenix SH Ni 2 K 100	Böhler NiCrMo 2.5-IG	Böhler NiCrMo 2.5-IG Union MoNi	Böhler Ti 75 T-FD HL 75 T-MC	Union S 3 NiMoCr	UV 421 TT
700 Q 700 QL 700 QL1	S700 Q S700 QL S700 QL1	1.8931 1.8928 1.8988	Böhler Fox EV 85 Phoenix SH Ni 2 K 100	Böhler NiCrMo 2.5-IG	Böhler NiCrMo 2.5-IG Union NiMoCr	Böhler 700 T-MC Union MV NiMoCr	Union S 3 NiMoCr Subarc T85 T80 HP	UV 421 TT UV 422 TT-LH
900 Q 900 QL	S890 Q S890 QL	1.8940 1.8983	Phoenix SH Ni 2 K 130	-	Böhler X 90-IG Union X 90	Böhler 900 T-MC	Subarc T95 [2]	UV 422 TT-LH
960 Q 960 QL	S960 Q S960 QL	1.8941 1.8933	Phoenix SH Ni 2 K 130 [1]	-	Union X 96	-	Subarc T105 [2]	UV 422 TT-LH

[1] The low strength values and the related undermatching should be noted.

[2] Currently being developed. Please direct your technical inquiries to the welding specialists at Böhler Welding Group GmbH.

Table 7: Recommended welding consumables

You will find more information at www.boehler-welding.com. Experienced welding engineers are at your disposal.

Recommended fillers and heat control during welding

aldur 500 und 550 Q, QL, QL1

Welding process	Filler material		Preheating [°C] [1]	Interpass temp. [°C] [3]	Post heating [°C] – [hrs] [4]	$t_{8/5}$-range [s]
	AWS-Standard	Designation				
SMAW	A5.5	E8018 E9018 E10018 (E11018)	60-150 [2]	≤ 150	250 – 3 s ≥ 50 mm	5 – 20
GMAW / GTAW	A5.28	ER90S				
FCAW	A5.36	E81T E91T E80T E90T				
SAW	A5.23	F8 F9				

Table 8: Fillers and heat control aldur 500 und 550 Q, QL, QL1

aldur 620 und 700 Q, QL, QL1

Welding process	Filler material		Preheating [°C] [1]	Interpass temp. [°C] [3]	Post heating [°C] – [hrs] [4]	$t_{8/5}$-range [s]
	AWS-Standard	Designation				
SMAW	A5.5	E10018 E11018	60-150 [2]	≤ 150	250 – 3 s ≥ 50 mm	5 – 20
GMAW / GTAW	A5.28	ER100S ER110S				
FCAW	A5.36	E101T E111T E100T E110T				
SAW	A5.23	F10 F11				

Table 9: Fillers and heat control aldur 620 und 700 Q, QL, Q1

aldur 900 und 960 Q, QL

Welding process	Filler material		Preheating [°C] [1]	Interpass temp. [°C] [3]	Post heating [°C] – [hrs] [4]	$t_{8/5}$-range [s]
	AWS-Standard	Designation				
SMAW	A5.5	E12018	120-150	≤ 150	250 – 3	5 – 20
GMAW / GTAW	A5.28	ER120S				
FCAW	A5.36	E120				
SAW	A5.23	F12				

Table 10: Fillers and heat control aldur 900 und 960 Q, QL

[1] The necessity of preheating increases along with a higher strength value (higher carbon equivalent), larger plate thickness, higher hydrogen content in the weld metal and lower heat input. Determination of each case separately pursuant to EN 1011-2 is recommended for this reason. Should the carbon equivalent CET of the base material not exceed that of the weld metal by at least 0.03 %, the CET of the weld metal must be applied in calculating the preheating temperature and must be increased by 0.03 %.

[2] When component temperatures fall below +5 °C or components are subject to higher humidity, the pre-drying of fusion faces immediately prior to welding is recommended (60 °C with electric heating mat or 80 °C with acetylene, propane or natural gas burner).

[3] A maximum interpass temperature of 150 °C is recommended for special requirements in strength and stiffness of the weld metal and in the weld joint.

[4] In addition to preheating, soaking is recommended immediately following the welding process for larger plate thicknesses and higher strength classes.

Stress-reliefing

Where stress-relief annealing is required due to the structure and/or processing conditions, temperatures < 560 °C must be used. For optimum toughness properties of the weld we recommend stress relief annealing up to max. 520 °C.

Dimensions

aldur 500 Q, QL, QL1 und aldur 550 Q, QL, QL1

Thickness (mm)																										
100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
95		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
85		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
65		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
60		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
55		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
50		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
45		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
40		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
35		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
30		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
25		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
20		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
12		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Width (mm)		1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	

Maximum length: 13,200 mm

Different dimensions on request.

Dimensions

aldur 620 Q, QL, QL1

Thickness (mm)	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800
100	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
95	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
90	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
85	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
80	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
75	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
70	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
65	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
60	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
55	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
50	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
45	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
40	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
35	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
20	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
12	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								

Maximum length: 13,200 mm

Different dimensions on request.

Dimensions

aldur 700 Q, QL, QL1

Thickness (mm)	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800
110	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
100	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
95	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
90	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
85	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
80	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
75	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
70	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
65	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
60	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
55	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
50	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
45	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
40	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
35	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
25	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
20	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
12	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
Width (mm)																								

Maximum length: **16,000 mm for thicknesses of up to 30 mm (18,000 mm on request)**
13,200 mm for thicknesses > 30 - 110 mm

Different dimensions on request.

Dimensions

aldur 900 Q, QL

Thickness (mm)																										
110																										
100																										
95																										
90																										
85																										
80																										
75																										
70																										
65																										
60																										
55																										
50																										
45																										
40																										
35																										
30																										
25																										
20																										
12																										
Width (mm)		1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	

Maximum length: 13.200 mm

Different dimensions on request.

Dimensions

aldur 960 Q, QL

Thickness (mm)																										
110																										
100																										
95																										
90																										
85																										
80																										
75																										
70																										
65																										
60																										
55																										
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45																										
40																										
35																										
30																										
25																										
20																										
12																										
Width (mm)		1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	

Maximum length: 13.200 mm

Different dimensions on request.

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If you're reading this, your successful future has already begun.

Together with us, you are always one step ahead because we offer more than optimized products made of high-quality material.

- If you are looking for customized solutions, we will be pleased to work with you on the creation of new products and services.
- If you are looking for new ideas on materials, technologies and services, we want to help you find them.
- If you are looking for a fair and reliable partner, you are at the right place. We know that we can only be successful together with our customers when they benefit as much as we do from our partnership.
- Our customers take advantage of the most widely used technology: Two thirds of the steel produced worldwide is made using the LD process, and we're rather proud of that.

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