

HOT-ROLLED CUT SHEETS

LASER-ALFORM

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voestalpine - Division **Stahl**

LASER-ALFORM

ONE STEP AHEAD.

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STAHL GMBH

LASER-ALFORM[®]

by voestalpine

- EXCELLENT LASER CUTTING CAPABILITIES
 - NARROWEST TOLERANCES
 - UNIVERSAL APPLICATION
-

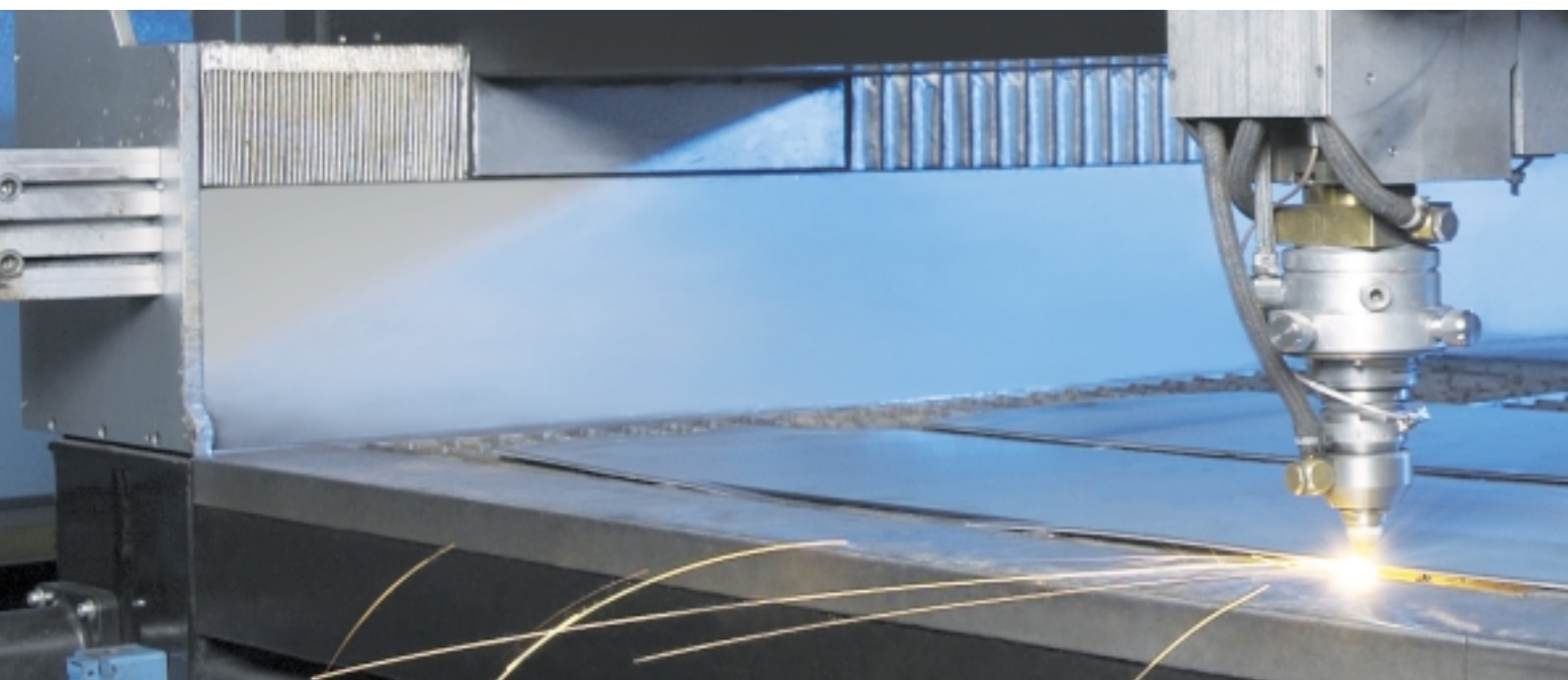
The steel grades of the **LASER-ALFORM**[®] series are thermomechanically or normalised hot-rolled steels with excellent cold formability which are especially suitable for laser cutting. Minimum yield strengths of 180 up to 420 N/mm² are offered.

The **LASER-ALFORM**[®] series of voestalpine Stahl GmbH is characterised by

- uniform surface and interior condition due to the extremely high degree of purity with respect to non-metallic inclusions
- minimum residual stress of the sheets to prevent distortions to the greatest possible extent during cutting

- optimum laser cutting capabilities in respect of cutting speed and cut quality due to limited phosphorus and sulphur contents as well as a maximum silicon content of 0.03 %
- limited flatness tolerances for the flattest possible blanks
- best surface quality due to a thin, homogeneous scale layer as a result of thermomechanical or normalised rolling

The use of **LASER-ALFORM**[®] steels has proven successful in fields requiring extremely precise cuts, burr-free cut edges and parts free of distortion.



SPECIFICATION

LASER-ALFORM® steels are supplied both in normalised and thermomechanically rolled condition. In the event that further processing requires a heat treatment exceeding 580°C, this would lead to a decrease in the minimum yield strength for thermomechanically rolled steels (M series).

In such a case normalised rolled steels (N series) could be offered, but only up to a minimum yield strength of 380 N/mm² (However, flame straightening up to 800°C is possible also for thermomechanically rolled steels).

DIMENSIONS

Minimum width: 900 mm

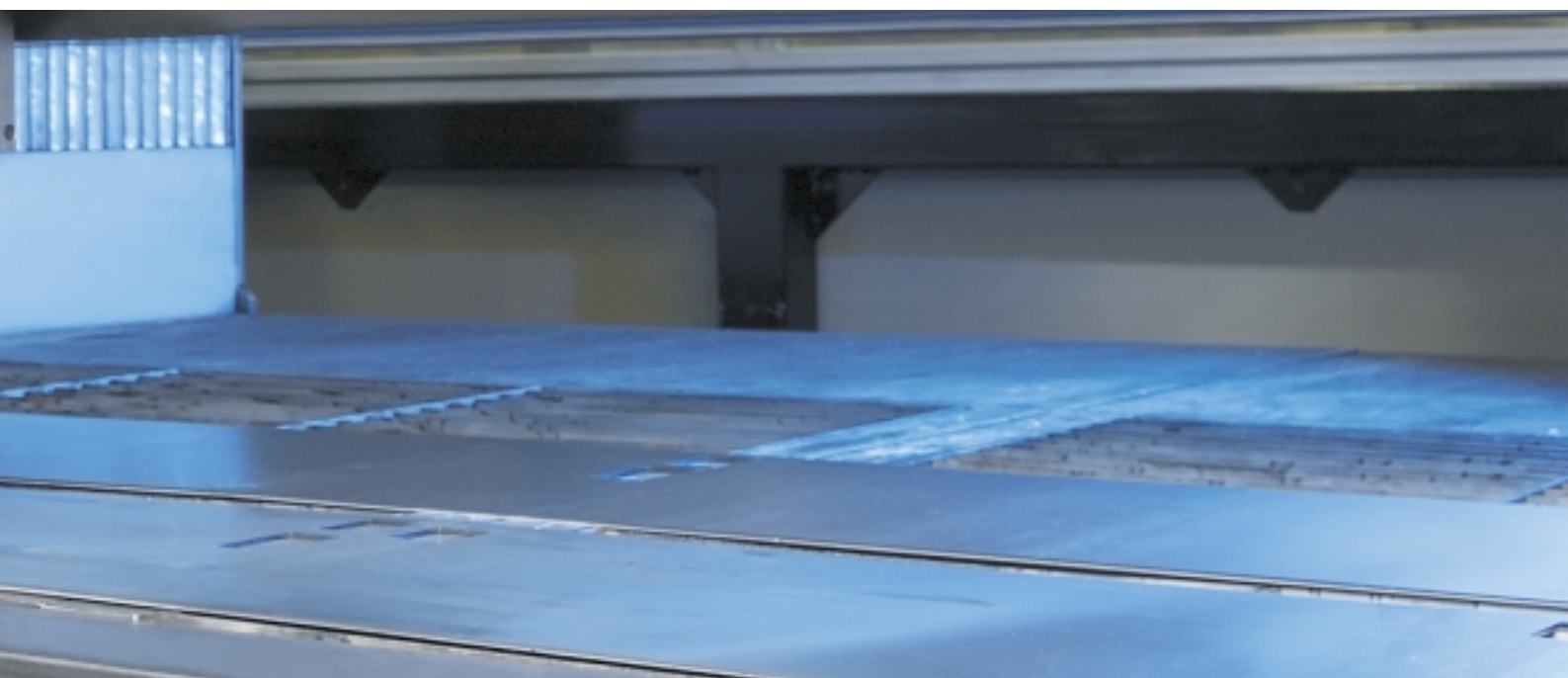
Maximum width in mm for **Laser-Alform®** steels

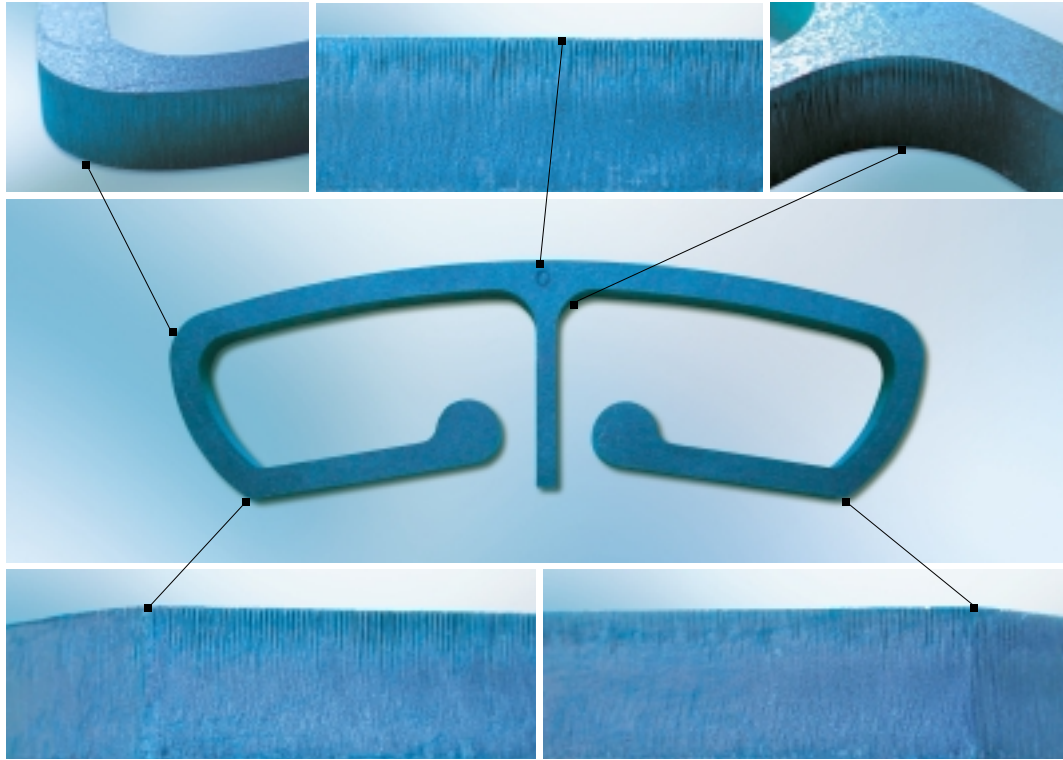
Sheet thickness [mm]	LASER-ALFORM	LASER-ALFORM	LASER-ALFORM	LASER-ALFORM	LASER-ALFORM
	180 N	200 N 240 N	380 N	355 M 380 M	420 M
1.50 - 1.74	1100	1250	–	1000	–
1.75 - 1.89	1200	1360	–	1050	–
1.90 - 2.24	1260	1440	1100	1120	1000
2.25 - 2.49	1625	1625	1180	1340	1150
2.50 - 2.74	1625	1625	1240	1625	1300
2.75 - 2.99	1625	1625	1300	1625	1550
3.00 - 3.24	1625	1625	1350	1625	1625
3.25 - 3.49	1625	1625	1410	1625	1625
3.50 - 3.74	1625	1625	1475	1625	1625
3.75 - 4.50	1625	1625	1540	1625	1625
4.51 - 12.00	1625	1625	1625	1625	1625

Different dimensions upon request only.

Depending on their application, **LASER-ALFORM®** steels can be supplied with pickled or unpickled surface.

Upon request, pickled **LASER-ALFORM®** cut sheets can also be supplied with oiled surface.





Sample cut LASER-ALFORM 355 M, thickness 10 mm

CHEMICAL COMPOSITION

Steel grade	C max.	Si max.	Mn max.	P max.	S max.	Al min.	Nb ¹⁾ max.	V ¹⁾ max.	Ti ¹⁾ max.
LASER-ALFORM 180 N	0.08	0.03	0.35	0.018	0.020	0.020	–	–	–
LASER-ALFORM 200 N	0.10	0.03	0.45	0.018	0.020	0.020	–	–	–
LASER-ALFORM 240 N	0.12	0.03	0.70	0.018	0.020	0.020	–	–	–
LASER-ALFORM 380 N	0.18	0.03	1.60	0.025	0.012	0.015	0.05	0.05	0.05
LASER-ALFORM 355 M	0.10	0.03	1.20	0.018	0.010	0.020	0.05	0.05	0.05
LASER-ALFORM 380 M	0.10	0.03	1.20	0.018	0.010	0.020	0.05	0.05	0.05
LASER-ALFORM 420 M	0.10	0.03	1.40	0.018	0.010	0.020	0.05	0.05	0.05

¹⁾ The total content of Nb, V and Ti may not exceed 0.22%.

MECHANICAL PROPERTIES

Steel grade	testing direction tensile test	yield strength [N/mm ²] ReH	tensile strength [N/mm ²] Rm	fracture elongation [%] min.		bending test 180° transv. s = thickness mandrel Ø	admissible minimum inner radius for 90° edging and thickness s		
				A80	A5		s < 3	s = 3 - 6	s > 6
LASER-ALFORM 180 N	transverse	180 - 290	280 - 360	32	38	0.0 s	0.25 s	0.5 s	1.0 s
LASER-ALFORM 200 N	transverse	200 - 320	320 - 400	28	34	0.0 s	0.25 s	0.5 s	1.0 s
LASER-ALFORM 240 N	transverse	240 - 360	360 - 440	26	32	0.0 s	0.25 s	0.5 s	1.0 s
LASER-ALFORM 380 N	transverse	380 - 520	510 - 610	20	25	0.0 s	0.25 s	0.5 s	1.0 s
LASER-ALFORM 355 M	longitudinal	355 - 480	430 - 530	20	25	0.0 s	0.25 s	0.5 s	0.8 s
LASER-ALFORM 380 M	longitudinal	380 - 510	450 - 550	20	24	0.5 s	0.25 s	0.5 s	0.8 s
LASER-ALFORM 420 M	longitudinal	420 - 550	480 - 580	18	22	0.5 s	0.50 s	1.0 s	1.0 s

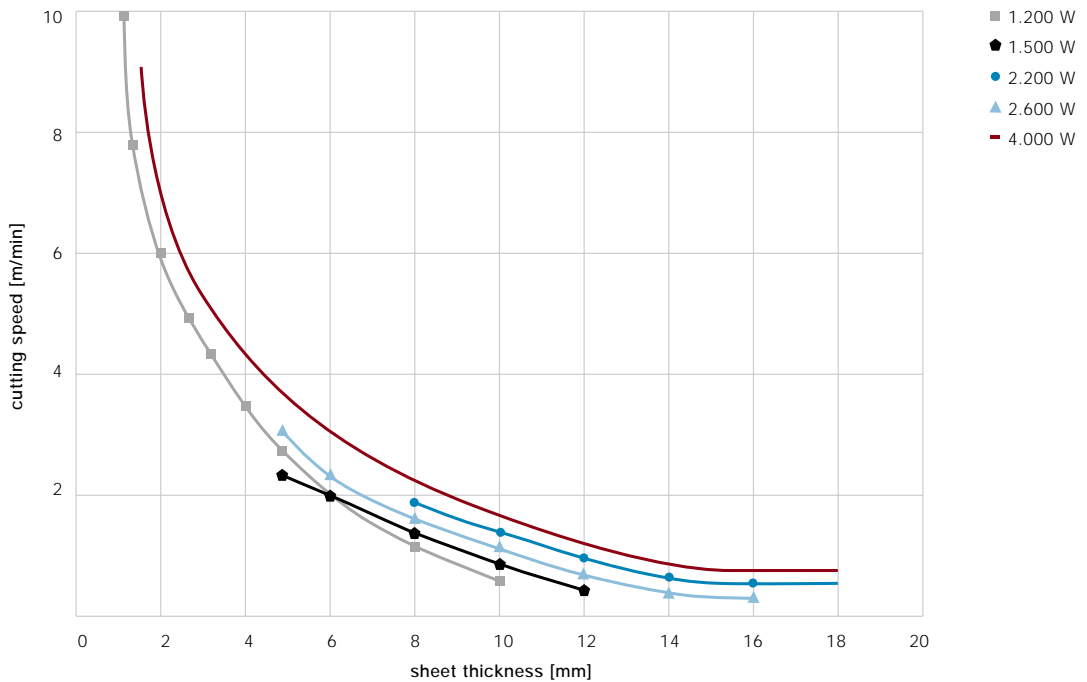
Upon ordering, the notch impact energy is determined on Charpy-V samples for thicknesses of 6 mm and higher, if requested: a mean value of 40 J min. taken from 3 longitudinal samples at -20°C related to a sample cross-section of 10 x 10 mm is guaranteed.

THE ADVANTAGES

CUTTING CAPABILITIES

- as a result of additional special inspections with respect to surface, dimension tolerances and flatness
- as a result of highest cutting speeds and optimum shape of the cut edges due to the optimised chemical composition
- as a result of the high degree of purity with respect to non-metallic inclusions (leads to vertical cut edges without undercuts)
- as a result of the homogeneous and uniform layer of secondary scale that ensures trouble-free operation of laser cutting units and fine drag lines of small depth of roughness
- as a result of optimised production conditions from the hot strip mill to cutting to size and straightening on the shearing lines (guaranteed flatness deviations ≤ 3 mm per meter)
- as a result of limited thickness tolerances (50 % of EN 10051, Tables 3 and 4)

MAXIMUM CUTTING SPEEDS WITH OPTIMUM CUTTING PARAMETERS



EXCELLENT WELDABILITY

- due to a large range of welding parameters
- due to cold cracking resistance without preheating
- due to optimum mechanical-technological properties equivalent to the base material of the welds
- due to excellent formability of the welds
- due to a higher tempering resistance than heat-treatable steels
- due to a low tendency to excessive hardening

UNIFORM MECHANICAL PROPERTIES

- the high constancy of the mechanical properties of **LASER-ALFORM**[®] steels guarantees trouble-free processing even during automatic operation

