

alform®



Premium quality with
reduced carbon footprint

alform®
greentec steel

DESIGNED
TO SUCCEED.

voestalpine Steel Division
www.voestalpine.com/alform

voestalpine

ONE STEP AHEAD.

alform®

UNLEASH YOUR POTENTIAL WITH alform®

Premium steel for maximum efficiency
and freedom of design

Successful light-weight design requires the utilization of high-strength and ultra-high-strength steels. Our innovative premium alform® steels lead to comprehensive weight reduction and provide exceptional advantages in processing. With their reduced material thicknesses and excellent weldability, alform® steels provide cost savings from procurement to manipulation and processing.



Find out more about
alform® on our website at
www.voestalpine.com/alform/en



Stella Sustainable keeps you informed of
greentec steel products, environmental
protection and sustainability in the
voestalpine Steel Division:
www.voestalpine.com/stella/en

SEE FOR YOURSELF WHAT **alform**® CAN DO FOR YOU.

Higher lifting and load capacity based on
innovative light-weight design



S355J2C (sheet thickness 15 mm)



alform 960 x-treme (sheet thickness 4 mm)

Rectangular hollow profile section 120 mm x 80 mm x thickness, longitudinally welded, V seam, bending moment 50 kNm

Advantages over other steel grades. This figure shows the potential savings achieved by implementing ultra-high-strength steels, for example in a bending beam under static load.

alform® is now available in the greentec steel Edition in proven quality with a reduced carbon footprint.



Premium quality with
reduced carbon footprint

alform®
greentec steel

- 73 % strip thickness
- 93 % weld volume

Premium alform® steels are excellently suited to applications in

- » railcars
- » knuckle-boom cranes
- » spreaders
- » concrete pumps
- » agricultural and forestry machinery
- » mobile cranes
- » long-wall mining systems
- » trailers
- » push-off trailers
- » scrap skips
- » pipes and profile sections



BEST PROCESSING PROPERTIES

Extreme performance at low weights. The alform® steel grades include both cold-rolled and thermomechanically rolled products that are ideally suited for welding and cold forming.



Weight and volume reduction

The reduced material thickness leads to light weight and smaller volume, which is a cost-saving advantage in all alform® steel grades.



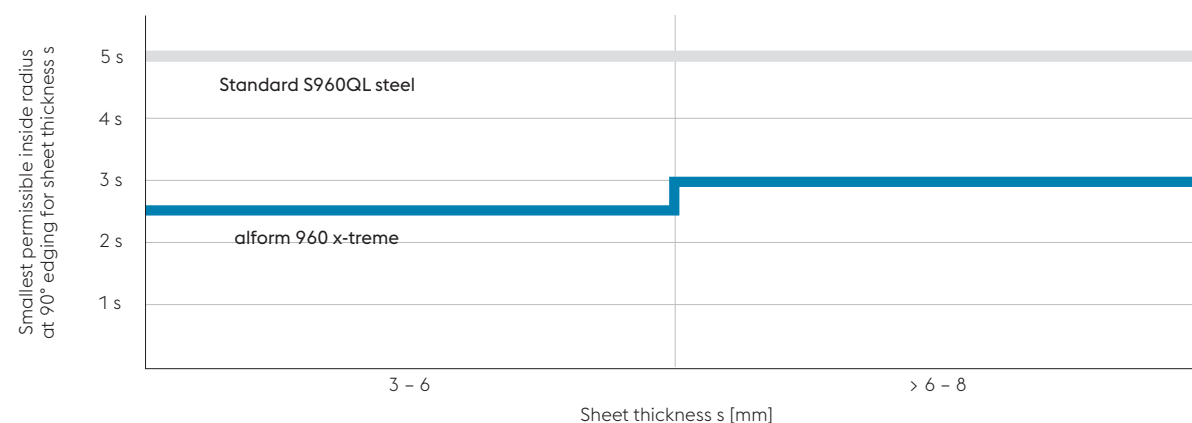
Best cutability

We have designed the production technologies used in making high-strength and ultra-high-strength alform® steel grades to minimize and avoid residual stresses during thermal cutting. The low carbon content and homogeneous surface make these high-strength and ultra-high-strength premium alform® steel grades suitable for all conventional cutting methods.



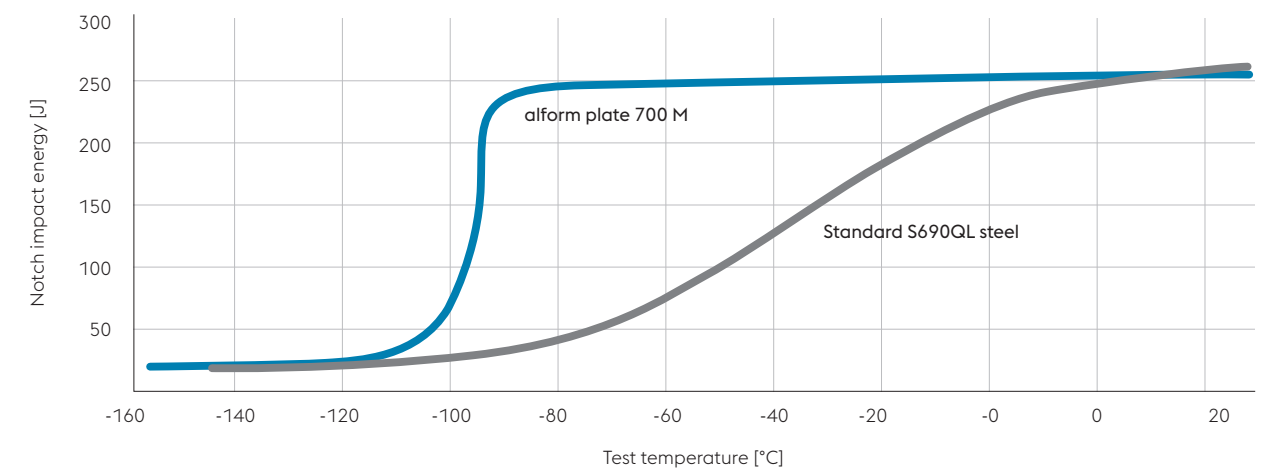
Very good cold formability

The homogeneous and fine-grained microstructure lends our alform® steel grades their decidedly improved forming behavior with more than twice the minimum yield strength than that of conventional structural steels.



Excellent toughness

During the development of our hot-rolled alform® steel grades, special emphasis was placed on the requirements of the crane building industry. Thermomechanical rolling and accelerated cooling lend our hot-rolled alform® steel grades a fine-grained structure and excellent toughness that make it possible for us to enter into agreements that exceed the applicable standards.



Perfect flatness

Excellent flatness is achieved through precisely controlled rolling processes in combination with modern leveling units and production-route-based temper softening. Freedom from inner tension is highly advantageous during cutting and further processing and achieves optimized dimensional accuracy of the manufactured components.



Clean surface

A uniform layer of rolling scale forms on the sheet surface of hot-rolled sheets and heavy plates when they come directly from the rolling heat during production. This natural protective layer acts against corrosion during transport and can easily be removed through sand blasting. Cold-rolled steel strip is always delivered in pickled condition.



Outstanding weldability

The combination of thermomechanical rolling and micro-alloying of hot-rolled sheets and heavy plates makes it possible to achieve very low carbon content. The chemical composition leads to adequate carbon equivalents that enable excellent welding suitability of high-strength and ultra-high-strength alform® steel grades.

These properties lead to the following advantages:

- » Broad welding range
- » Reduced tendency to temper softening in the heat-affected zone
- » Low temper annealing in the heat-affected zone
- » Reduced susceptibility to cold cracking

THERMOMECHANICAL ROLLING

For outstanding mechanical properties

Properties

We are the specialists in thermomechanical rolling with accelerated cooling. This process leads to a fine-grained structure that provides high strength, high toughness levels and good cold formability.

Rolling process

Our heavy plates (produced on reversing four-high rolling stands) and hot-rolled strips (cross-cut after rolling) are precision-rolled while ensuring that the temperature and forming processes are perfectly coordinated with each other. Heavy plates and steel strips are accelerated-cooled directly after hot rolling.

Temper softening

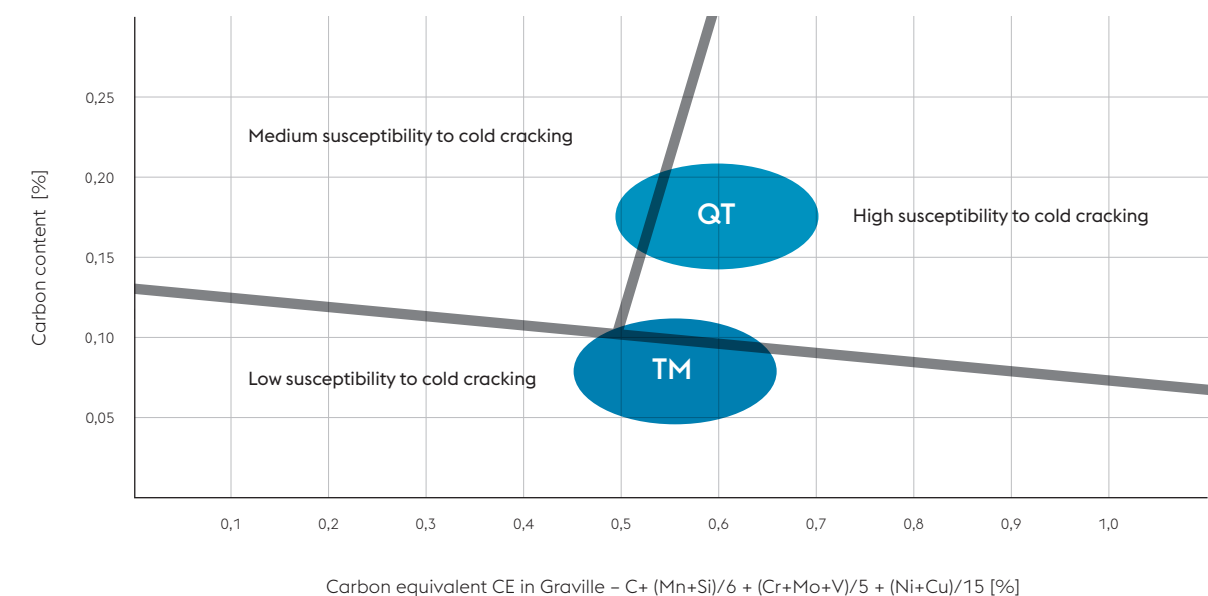
The chemical composition and microstructure of the thermomechanically rolled steel grades are finely tuned to achieve the desired material properties, even after final annealing.

Surfaces and thickness tolerances

Our direct processes permit the use of modern alloying strategies with low carbon content and provide good surface characteristics by avoiding furnace scale and narrow thickness tolerances.

DIFFERENT MATERIAL GRADES
ARE CHARACTERIZED BY A
VARIETY OF WELDING BEHAVIORS.

Comparison: Thermomechanical rolling (TM) and quenched and tempered (QT)



Three ranges with different levels of susceptibility to cold cracking are differentiated according to Graville in dependence on carbon content and carbon equivalent. When compared with conventional quenched and tempered steels, thermomechanically rolled alform® steel grades achieve especially low carbon content at minimum yield strengths ranging from 700 to 960 MPa. For this reason, alform® steel grades do not tend as readily to harden in the heat-affected zone (HAZ) and have low susceptibility to cold cracking. The benefits are achieved by means of a modern analysis strategy, thermomechanical rolling and accelerated cooling.



THE 2023/2024 alform® PARTNER

For whatever is being built anywhere in the world: SCHWING-Stetter is on board. For more than 85 years, the company has been passionate about the world's most important building material: Concrete. SCHWING-Stetter offers premium products for the entire range of ready-mix concrete technology from production to transport, placement and environmentally friendly concrete recycling.



„THE TREND IS CLEARLY TOWARD EVEN SLIMMER AND LIGHTER COMPONENTS, WE ARE CONTINUALLY OPTIMIZING OUR EXPERTISE IN THE PERFECT PARTNER FOR US IN THIS RESPECT.“

Horst Jöbstl
(Managing Director of SCHWING GmbH St. Stefan)



Photograph from left to right: Daniel Neumann (Schwing GmbH), Horst Jöbstl (Schwing GmbH), Wolfgang Mitterdorfer (voestalpine Steel Division), Arnold Ackerlauer (voestalpine Steel & Service Center GmbH), Jürgen Lechfellner (voestalpine Steel Division)

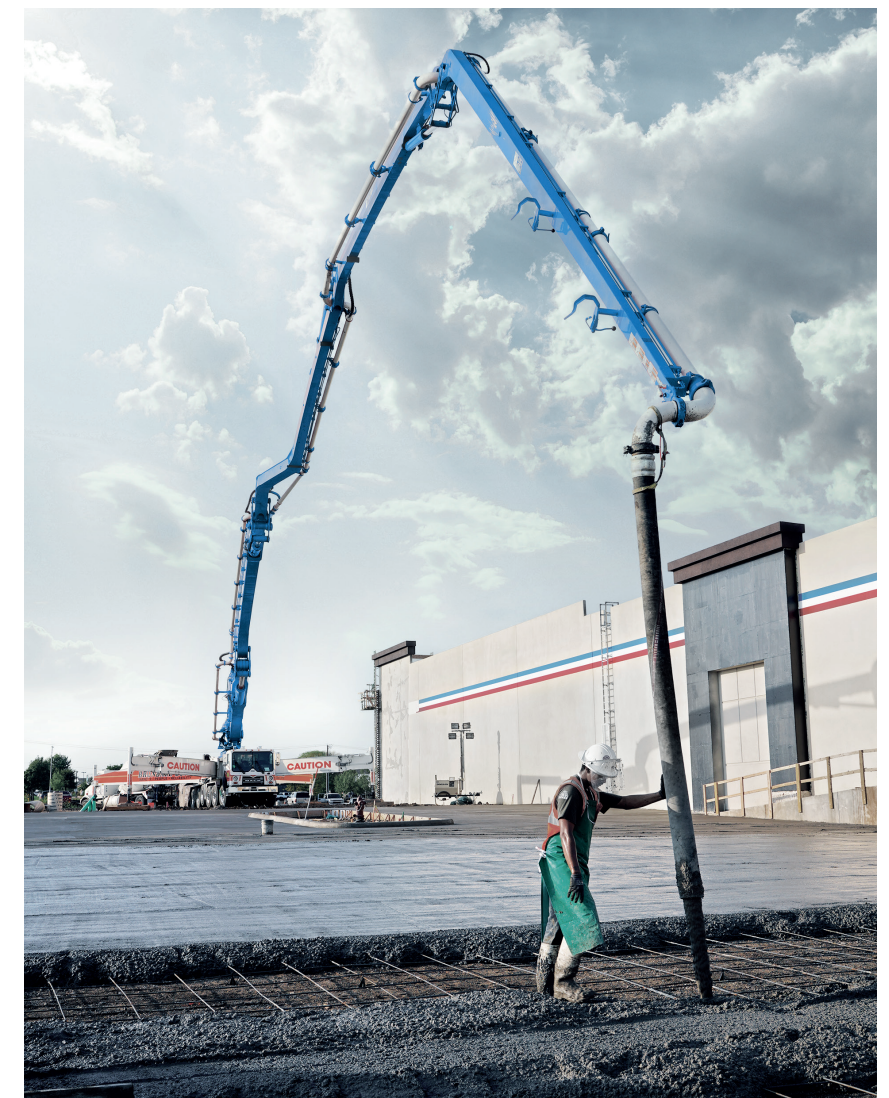
A SOLID PARTNERSHIP.

SCHWING-Stetter is found worldwide in more than 75 countries with production and service locations. The site in St. Stefan houses the largest SCHWING production plant for truck-mounted concrete pumps and is the center of competence for hydraulics and machine components. voestalpine supplies high-strength and ultra-high-strength steels for dynamically stressed components.

But the joint venture goes beyond that: In collaboration with technical universities, SCHWING-Stetter and voestalpine have continuously developed welding processes and have become the technology leader in this field.










„PRODUCT INNOVATION AND ENTHUSIASM FOR TECHNOLOGY AND SUSTAINABILITY DRIVE US FORWARD. THESE VALUES HAVE ALWAYS CONNECTED SCHWING-STETTER AND voestalpine AND ARE THE BASIS FOR OUR SUCCESSFUL PARTNERSHIP.“











Arnold Ackerlauer
(voestalpine Steel & Service Center GmbH)













alform®

RANGE OF SUPPLY

Steel grade		Sheet thickness	Maximum width	Maximum length
		[mm]	[mm]	[mm]
alform 700 M / ME		2,0 < 2,5	1.250	14.000
		2,5 < 3,0	1.375	
		3,0 < 4,0	1.500	
		4,0 ≤ 10,0	1.750	
		> 10,0 ≤ 12,0	1.620	
		> 12,0 ≤ 15,0	1.380	
alform plate 700 M		6,0 < 8,0	2.500	18.700
		8,0 ≤ 15,0	3.000	18.700
		> 15,0 ≤ 20,0	3.500	18.700
		> 20,0 ≤ 50,0	3.800	18.700
		> 50,0 ≤ 60,0	3.800	16.000
alform 900 x-treme		3,5 < 4,0	1.550	14.000
		4,0 < 8,0	1.620	
alform plate 900 M x-treme		6,0 ≤ 30,0	2.500	16.000
alform 960 CR x-treme		1,5	1.580	6.000
		2,0	1.180	
alform 960 x-treme		3,5 < 4,0	1.400	14.000
		4,0 < 4,5	1.500	
		4,5 < 8,0	1.620	
alform plate 960 M x-treme		6,0 ≤ 30,0	2.500	16.000
alform 1100 x-treme		4,0 < 5,0	1.300	14.000
		5,0 ≤ 7,0	1.500	
		> 7,0 ≤ 8,0	1.450	
alform plate 1100 M x-treme		8,0 ≤ 15,0	2.000	16.000
		> 15,0 ≤ 25,0	2.500	

Steel grade		Sheet thickness	Yield strength R _{eh} min.	Yield strength R _{p0,2} min.	Tensile strength R _m	Total elongation [%] min.	
		[mm]	[MPa]	[MPa]	[MPa]	A ₈₀	A ₅
alform 700 ME		2,0 ≤ 12,0	700 ¹⁾	-	750 – 930	11	14
alform 700 M		2,0 ≤ 15,0	700 ¹⁾	-	750 – 930	11	14
alform plate 700 M		6,0 ≤ 15,0	-	700	770 – 1.050	-	10
		> 15,0 ≤ 50,0	-	680	770 – 1.050	-	12
		> 50,0 ≤ 60,0	-	650	770 – 1.050	-	12
alform 900 x-treme		3,5 ≤ 8,0	900	-	940 – 1.100	-	10
alform plate 900 M x-treme		6,0 ≤ 30,0	-	900	940 – 1.100	-	11
alform 960 CR x-treme		1,5<= 2,0	960	-	1.180 – 1.350	5	-
alform 960 x-treme		3,5 ≤ 8,0	960	-	980 – 1.150	-	10
alform plate 960 M x-treme		6,0 ≤ 30,0	-	960	1.160 – 1.350	-	10
alform 1100 x-treme		4,0 ≤ 8,0	1.100	-	1.120 – 1.300 1.100 – 1.300	-	8
alform plate 1100 M x-treme		8,0 ≤ 20,0	-	1.100	-	-	8
		> 20,0 ≤ 25,0	-	1.080	-	-	8

Steel grade		Sheet thickness [mm]	Notch impact energy Av [Joule] min.				Cantri Ri min. at 90° edging, position of the bending edge related to direction of rolling (s = sheet thickness)	
			Test temperature of – 20 °C		Test temperature of – 40 °C		Longitudinal	Transverse
			Longitudinal	Transverse	Longitudinal	Transverse		
alform 700 ME		2,0 ≤ 3,0 3,0 ≤ 6,0 > 6,0 ≤ 12,0	- 40 40	- - -	- 27 27	- - -	0,8 s 1,2 s 1,6 s	0,8 s 1,2 s 1,6 s
alform 700 M		2,0 ≤ 3,0 3,0 ≤ 6,0 > 6,0 ≤ 15,0	- 40 40	- - -	- - -	- - -	0,8 s 1,2 s 1,6 s	0,8 s 1,2 s 1,6 s
alform plate 700 M		6,0 ≤ 15,0 > 15,0 ≤ 50,0 > 50,0 ≤ 60,0	- - -	- - -	40 40 30	30 30 27	4,0 s 4,0 s 4,0 s	3,0 s 3,0 s 3,0 s
alform 900 x-treme		3,5 ≤ 6,0 > 6,0 ≤ 8,0	40 40	30 30	30 30	27 ²⁾ 27 ²⁾	2,5 s 3,0 s	2,5 s 3,0 s
alform plate 900 M x-treme		6,0 ≤ 30,0	-	-	30	27	5,0 s	4,0 s
alform 960 CR x-treme		1,5<= 2,0	-	-	-	-	3,5 s	-
alform 960 x-treme		6,0 ≤ 30,0	40 40	30 30	30 30	- -	2,5 s 3,0 s	2,5 s 3,0 s
alform plate 960 M x-treme		4,0 ≤ 6,0 > 6,0 ≤ 8,0	-	-	30	27	5,0 s	4,0 s
alform 1100 x-treme		8,0 ≤ 25,0	27 27	27 27	27 27	27 ²⁾ 27 ²⁾	3,5 s 5,0 s	- -
alform plate 1100 M x-treme			-	-	30	27	6,0 s	5,0 s

 Cut-to-length sheets made of cold-rolled steel strip  Cut-to-length sheets made of hot-rolled steel strip  Heavy plates

- 1) The yield strength may be lower by 20 MPa for thicknesses > 8 mm. Longitudinal tensile test; minimum values for R_{eh} and R_m also apply in cross direction.
- 2) Transverse values at 40 °C only guaranteed upon agreement and when ordered as such. Notch impact energy can be measured from a plate thickness of ≥ 3 mm upon request. Notch impact energy tests on thicknesses < 6 mm do not comply with respective Euronorm standards.

Additional dimensions upon request.



Premium quality with reduced carbon footprint

alform®
greentec steel

Cut-to-length sheets made of hot-rolled steel strip – greentec steel Edition

Max. carbon footprint 1,95 kg CO₂e per kg of steel ¹⁾

Cut-to-length sheets made of cold-rolled steel strip – greentec steel Edition

Max. carbon footprint 1,97 kg CO₂e per kg of steel ¹⁾

Heavy plates (excl. bottoms and clad plates) – greentec steel Edition

Max. carbon footprint 2,21 kg CO₂e per kg of steel ¹⁾

¹⁾ per EN 15804+A2 (EPD methodology) cradle to gate

All products, dimensions and steel grades listed in each voestalpine supply range are available in the greentec steel edition.



TRY IT
NOW

alform 1300 x-treme
now available as
a trial sample



Conversion table

The following values are Anglo-
American yield strength data:

1 ksi	~ 7 MPa
100 ksi	~ 690 MPa
130 ksi	~ 896 MPa
140 ksi	~ 965 MPa
160 ksi	~ 1.103 MPa

See the pertinent data sheets for
further information:

[www.voestalpine.com/alform/en/
Downloads](http://www.voestalpine.com/alform/en/Downloads)





MORE THAN JUST A QUALITY PRODUCT

When solutions are in demand

Our material and processing expertise has made us your reliable partner in the machinery industry for many years as we provide innovative product solutions in addition to our full service, best-possible support and process performance.

alform® SERVICE & EFFICIENCY

BENEFIT FROM THE
COMPREHENSIVE EXPERTISE
OF OUR SPECIALISTS!



alform® technical support

Our large pool of technical experts will be happy to assist you in every detail, whether it be help with the adjustment of your production facilities, technical consultation in selecting the correct product or any other issue.



alform® inhouse welding expertise

In collaboration with our economic and scientific partners, we are continuously optimizing our expertise in the most modern welding processes. We use the most innovative welding systems, welding robots and a thermal welding simulator when conducting our practical welding tests.



voestalpine Steel & Service Center

We offer tailor-made customer solutions and quickly deliver trial samples for welding and edging tests. Urgent and small orders, including those for cut shapes, can be filled quickly as a result of our modern warehouse logistics systems.



Short processing times

The excellent flatness and surface of our premium alform® steels ensure higher productivity through significantly increased cutting speeds and reduced downtimes as a result of optimized work processes.



Reduction of revision work

The homogeneous properties of our materials lead to reproducible processing results, thus guaranteeing optimized dimensional accuracy, and revision work is eliminated almost entirely.



Reduction of transport and logistics costs

alform® steels allow for low material thicknesses that reduce transport weights and required volumes. This makes smaller transports possible, reduces lifting equipment requirements and saves fuel.



MORE THAN JUST PERFECT WELD JOINTS

System solution in a new dimension

The alform® welding system is the world's first custom-matched system of steels and consumables for high-strength and ultra-high-strength welded structures. This opens up an entirely new dimension of our alform® steels with respect to material expertise.

alform® WELDING SYSTEM

BENEFIT FROM STATE-
OF-THE-ART WELDING
EXPERTISE!

Exceptional strength

Our optimized system of tempering-resistant steel grades and adapted filler metals guarantees strength values in the welded joint across a wide range of parameters. These values meet the demands of the respective base materials.

Operational reliability

The steel grades and welding consumables in our system allow weld seams (heat-affected zone and filler metals) with excellent toughness. The excellent values guarantee high operating safety at low temperatures under complex loading conditions.

Best product quality

The alform® welding system stands for consistently high product quality in the base material and welding consumables. The proven system solution guarantees optimized component property profiles. The extended welding range achieves reduced costs and increased production reliability. Our highly professional consultation services for your applications and comprehensive processing expertise perfectly round off the package.



voestalpine Welding Calculator now available free of charge

Get the free voestalpine Welding Calculator app on your smartphone or desktop! Register to benefit from additional benefits and to flexibly calculate your material parameters.

Please find more information about the voestalpine Welding Calculator at:
www.voestalpine.com/alform/en/insights/voestalpine-welding-calculator-for-best-welding-results




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alform® WELDING SYSTEM PROCESSING INFORMATION

COLD-ROLLED STEEL STRIP

	Procedures	Filler material		Protective gas	t _{8/5} -range [s] ¹⁾
alform® 960 CR x-treme	MAG 135 138	BÖHLER alform® 960-IG BÖHLER alform® 960 L-MC	G 89 5 M21 Mn4Ni2,5CrMo (nach EN ISO 16834-A) T 89 4 ZMn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	5 – 20

HOT-ROLLED STEEL STRIP

	Procedures	Filler material		Protective gas	t _{8/5} -range [s] ¹⁾
alform® 700 M / ME	MAG 135 138	BÖHLER alform® 700-IG BÖHLER alform® 700 L-MC	G 79 5 M21 Mn4Ni1,5CrMo (nach EN ISO 16834-A) T 69 6 Mn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	5 – 25
	MAG 135	z. B. BÖHLER X70-IG BÖHLER ECOspark 690	G 69 5 M21 Mn3Ni1CrMo (nach EN ISO 16834-A) G 69 5 M21 Mn4Ni1,5CrMo (nach EN ISO 16834-A)	M20/M21	5 – 20
alform® 900 x-treme	MAG 135 138	BÖHLER alform® 700-IG BÖHLER alform® 700 L-MC	G 89 6 M21 Mn4Ni2CrMo (nach EN ISO 16834-A) T 89 5 ZMn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	5 – 20
	MAG 135	z. B. Union X90	G 89 6 M21 Mn4Ni2CrMo (nach EN ISO 16834-A)	M20/M21	5 – 15
alform® 960 x-treme	MAG 135 138	BÖHLER alform® 960-IG BÖHLER alform® 960 L-MC	G 89 5 M21 Mn4Ni2,5CrMo (nach EN ISO 16834-A) T 89 4 ZMn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	5 – 20
	MAG 135	z. B. Union X96	G 89 5 M21 Mn4Ni2,5CrMo (nach EN ISO 16834-A)	M20/M21	5 – 15
alform® 1100 x-treme	MAG 135 138	BÖHLER alform® 1100-IG BÖHLER alform® 1100 L-MC	G 89 5 M21 Mn4Ni2,5CrMo (nach EN ISO 16834-A) T Z 2 ZMn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	5 – 20
	MAG 135	z. B. Union X96	G 89 5 M21 Mn4Ni2,5CrMo (nach EN ISO 16834-A)	M20/M21	5 – 15

1) Cooling time between 800 °C and 500 °C, measured pursuant to EN 1011-2




Note

The various production routes and alloying strategies for each thickness range result in specific product advantages for cut sheets made of hot-rolled steel strip and heavy plate produced on the 4.2-meter four-high stand. This also results in different processing instructions. Please refer to the respective data sheets and delivery conditions.



Please find more information in our data sheets.
www.voestalpine.com/alform/en/Downloads

HEAVY PLATES

	Procedures	Filler material		Protective gas	t _{8/5} -range [s] ¹⁾
	MAG 135 138	BÖHLER alform® 700-IG BÖHLER alform® 700 L-MC	G 79 5 M21 Mn4Ni1,5CrMo (nach EN ISO 16834-A) T 69 6 Mn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	3 – 15
	MAG 135 135 135 135 138	Union NiMoCr Union X85 Böhler NiCrMo 2,5-IG BÖHLER ECOspark 690 diamondspark 700 MC	G 69 6 M21 Mn4Ni1,5CrMo (nach EN ISO 16834-A) G 79 5 M21 Mn4Ni1,5CrMo (nach EN ISO 16834-A) G 69 6 M Mn3Ni2,5CrMo (nach EN ISO 16834-A) G 69 5 M21 Mn4Ni1,5CrMo (nach EN ISO 16834-A) T 69 6 Mn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	3 – 12
	MAG 136	diamondspark 700 RC	T 69 6 Z P M21 1 H5 (nach EN ISO 18276-A)	M21	3 – 12
	UP 121 121	Union S 3 NiMoCr + UV 422 TT LH diamondspark S 700 HP + UV 422 TTLH	S 69 6 FB SZ3Ni2,5CrMo H5 (nach EN ISO 26304-A) S 69 6 FB TZ H4 (nach EN ISO 26304-A)	–	3 – 15
	E- HAND 111 111	BÖHLER Fox EV 85 Böhler Fox EV 90	E 69 6 Mn2NiCrMo B 4 2 H5 (nach EN ISO 18275-A) E 69 5 Mn2NiCrMo B 4 2 H5 (nach EN ISO 18275-A)	–	3 – 12
	WIG 141	BÖHLER NiCrMo 2,5-IG	W 69 6 I1 Mn3Ni2,5CrMo (nach EN ISO 16834-A)	I1	
alform® plate 700 M	MAG 135 138	Böhler alform® 900-IG Böhler alform® 900 L-MC	G 89 6 M21 Mn4Ni2CrMo (nach EN ISO 16834-A) T 89 5 ZMn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21 M20/M21	3 – 12
	MAG 135	z. B. Union X90	G 89 6 M21 Mn4Ni2CrMo (nach EN ISO 16834-A)	M20/M21	3 – 12
	UP 121	diamondspark S 900 HP + UV 422 TTLH	S 89 6 FB TZ3Ni2,5CrMoMn1,9 H4 (nach EN ISO 26304-A)	–	3 – 12
alform® plate 900 M x-treme	E- HAND 111	Böhler Fox EV 105	E 89 4 Mn2Ni1CrMo B 4 2 H5 (nach EN ISO 18275-A)	–	3 – 12
	MAG 135 138 135 121	BÖHLER alform® 960-IG BÖHLER alform® 960 L-MC Union X96 diamondspark S 960 HP + UV 422 TTLH	G 89 5 M21 Mn4Ni2,5CrMo (nach EN ISO 16834-A) T 89 4 ZMn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A) G 89 5 M21 Mn4Ni2,5CrMo (nach EN ISO 16834-A) S 89 5 FB TZ3Ni2,5CrMoMn H4 (nach EN ISO 26304-A)	M20/M21	3 – 12
alform® plate 960 M x-treme	MAG 135 138	BÖHLER alform® 1100-IG BÖHLER alform® 1100 L-MC	G 89 5 M Mn4Ni2,5CrMo (nach EN ISO 16834-A) T Z 2 ZMn2NiCrMo M M21 1 H5 (nach EN ISO 18276-A)	M20/M21	3 – 12

1) Cooling time between 800 °C and 500 °C, measured pursuant to EN 1011-2

Note: Heavy plate grades are always identified as such in the steel grade designation.

PREHEATING

The combination of thermomechanical rolling and microalloys makes it possible to achieve very low carbon content and carbon equivalents. The associated lower hardening tendency in the heat-affected zone (HAZ) leads to higher resistance to cold cracking. This generally results in lower preheating temperatures, which enables more economical processing.

For each respective case, an estimation is recommended pursuant to EN 1011-2, C.3 method B or SEW 088 (CET method) and/or AWS/ANSI D 1.1 (Pcm method). The

necessity of preheating tends to increase with higher carbon equivalents (CET), higher plate thicknesses, higher hydrogen content in the weld metal and lower heat input.

Depending on atmospheric conditions (temperature below dew point, condensation of humidity), edge drying is recommended immediately before welding.

The interpass temperature should be selected so that the respectively recommended t_{8/5} range is maintained.

