



# weatherfit

## weather-resistant structural TM-steels

### Cost savings and sustainable environmental protection in steel and bridge construction

Weather-resistant structural TM-steel from voestalpine combines top quality, an appealing, natural look as well as cost-saving potential and sustainable environmental protection.

With the new edition of EN 10025-5 in 2019, it is now also possible to use this exceptional material in its delivery condition thermomechanically rolled for your individual projects.

The inclusion in the European standard makes it possible to use the convincing advantages of TM also in combination with weather-resistant steel. The steel grades S355 J2W+M, S420 J2W+M and S460 J2W+M convince with their low carbon content and significantly improved toughness, even at low temperatures. Excellent weldability compared to the normalized grades is preassigned. The grades J0W, K2W, J4W and J5W, which differ in their specified impact energy requirements, also benefit from these advantages.

The visually appealing, weather-resistant patina makes painting with corrosion protection completely unnecessary. In this context, maintenance

work or repainting is therefore also unnecessary. This sustainable and environmentally friendly solution saves up to 10% in life cycle costs, such as processing and maintenance.

#### Convincing advantages:

- » Cost savings due to omission of corrosion coating
- » Weather-resistant due to phosphorus, copper, nickel, chromium or molybdenum
- » Stable oxide layer as corrosion protection
- » Higher toughness & excellent weldability



PREMIUM QUALITY  
WITH REDUCED  
CARBON FOOTPRINT

## Chemical composition

Heat analysis in mass %

Steel grade	Plate thickness [mm]	C <sup>1)</sup> max.	Si max.	Mn max.	P <sup>1)</sup> max.	S <sup>1)</sup> max.	Cr max.	Cu max.	CEV <sup>2)</sup> max.	CET <sup>3)</sup> max.
S355 J2W+M	8 ≤ 60	0.06	0.50	1.50	0.015	0.004	0.80	0.55	0.33	0.18
	> 60 ≤ 100								0.36	0.19
S420 J2W+M	8 ≤ 60	0.06	0.65	1.35	0.015	0.004	0.80	0.55	0.40	0.22
	> 60 ≤ 100								0.40	0.24
S460 J2W+M	8 ≤ 60	0.06	0.65	1.40	0.015	0.004	0.80	0.55	0.41	0.22
	> 60 ≤ 100								0.44	0.24

<sup>1)</sup> EN 10025-5 allows significantly higher values: C (S355/420+460) 0.16/ 0.20; P max. 0.030; S max. 0.025

<sup>2)</sup> CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15, acc. IIW

<sup>3)</sup> CET = C + (Mn + Mo)/10 + (Cr + Cu)/20 + Ni/40, acc. SEW 088

## Mechanical properties: Notch impact energy

Impact values in delivery condition according to standard

Steel grade	Plate thickness [mm]	Test temperature [°C]	Notch impact energy <sup>4)</sup> Av [Joule] min. Testing direction longitudinal
S355 - 460 J0W+M	8 ≤ 100	0	27
S355 - 460 J2W+M	8 ≤ 100	-20	27
S355 - 460 K2W+M	8 ≤ 100	-20	40
S355 - 460 J4W+M	8 ≤ 100	-40	27
S355 - 460 J5W+M	8 ≤ 100	-50	27

<sup>4)</sup> Impact test according to EN ISO 148-1 on Charpy-V longitudinal specimens.

The mean value of the three test results must meet the specified requirements. No individual value may be less than 70% of the minimum mean value.

For thicknesses < 12 mm, undersize specimens with dimensions 10 x 7.5 mm are tested.

The guarantee value decreases proportionally to the specimen cross-section.

The steel grades listed above are available on request up to class K5 with an average value of the impact energy of 40 J or L5 with 60 J from quarter thickness.

## Mechanical properties: Tensile test

Standard values for as-delivered condition

Steel grade	Yield strength R <sub>eH</sub> <sup>5)</sup> [MPa] min.					Tensile strength R <sub>m</sub> <sup>5)</sup> [MPa]	Fracture elongation A5 <sup>5)</sup> L <sub>0</sub> = 5.65 √ S <sub>0</sub> [%]		
	8 ≤ 16	> 16 ≤ 40	> 40 ≤ 63	> 63 ≤ 80	> 80 ≤ 100		8 ≤ 40	> 40 ≤ 63	> 63 ≤ 100
S355 J2W+M	355	345	335	325	315	470 – 630	20	19	18
S420 J2W+M	420	400	390	380	370	500 – 660	17	16	15
S460 J2W+M	460	440	430	410	400	530 – 710	15	14	13

<sup>5)</sup> Tensile test in accordance with EN ISO 6892-1 on transverse samples.

## Available dimensions <sup>6)</sup>

Steel grade	Plate thickness [mm]	Max. width [mm]	Max. length [mm]	As-delivered condition
S355 J2W+M	8 – 100	3,850	18,700	TM
S420 J2W+M				
S460 J2W+M				

<sup>6)</sup> Additional dimensions upon request.

# OUR PATH TO A GREENER FUTURE

## Premium products in the greentec steel Edition

With greentec steel, voestalpine is pursuing an ambitious step-by-step plan in the long-term decarbonization of steel production. The declared objective is to achieve carbon-neutral production by 2050, and the initial steps have already been taken. Process-optimized production operations already prevent up to 10% of the direct CO<sub>2</sub> emissions at the Linz site. The material and processing properties of the steel are not affected in any way in this production route. Each voestalpine heavy plate product is available in premium quality in the greentec steel Edition with a reduced carbon footprint and unique benefits.



Premium quality with reduced carbon footprint

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

Max. carbon footprint 2.21 kg CO<sub>2</sub>e per kg of steel <sup>1)</sup>

<sup>1)</sup> per EN 15804+A2 (EPD methodology) cradle to gate

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