

Element	C	Si	Mn	P	S	Cr	Ni	N
Chemical composition (in % by weight)	0,015	0,70	0,70	Max. 0,025	Max. 0,005	Min. 12,00	0,50	0,018

(Standard analysis)

Product description: Reinforcing steel with increased corrosion resistance

Classification: Stainless steel according to DIN EN 10088

Applications

- Leaner construction thanks to a reduction of the concrete cover required in structural engineering
- Flawless exposed concrete – prevention of rust stains
- Prevention of corrosion caused by high chloride levels
- Extends the service lifetime and durability of components –reduced lifecycle costs
- Prevents need for maintenance

Approval

- SIA 262 (Swiss Code):
 - Top12-500 and Top12-670 listed in the “Register normkonformer nichtrostender Betonstähle”.
- DIN 488 (German Code):
 - Top12-500 and Top12-670 have a national technical approval from german approval body “Deutsches Institut für Bautechnik”.
 - Approval number: Z-1.4-266; Z-1.4-272

Labelling

Top12 reinforcing steel is labeled with the Swiss Steel mark (“country-code 2, no. 19”) and the product name “Top12”. Swiss Steel AG also provides distributors with product-specific labels.

Physical properties (EN 10088)

Density in kg/dm ³	Electrical resistance at 20°C in (Ω mm ²)/m	Magnetisability	Thermal conductivity at 20°C in W/(m K)	Specific heat capacity at 20°C in J/(kg K)	Young's modulus in GPa at 20°C	Mean thermal expansion coefficient in 10 ⁻⁶ K ⁻¹ by 20°C · 100°C
7,7	0,6	yes	25	430	220'000	10,4

Mechanische Eigenschaften

	Yield strength $R_{p0,2}$	Yield to tensile strength ratio $R_m / R_{p0,2}$	Elongation at maximum load A_{gt}
	[MPa]	[-]	[%]
Top12-500	≥ 500	$\geq 1,08$	$\geq 5,0$
Top12-670	≥ 670	$\geq 1,08$	$\geq 5,0$

* For dimensioning according to german national technical approval Z-1.4-266, 160 GPa is to be used for the Young's modulus. For dimensioning according to approval Z-1.4-272, 180 GPa is to be used for the Young's modulus.

Corrosion resistance

Top12 reinforcing steel is durable and corrosion resistant in carbonated standard and lightweight concrete. This property is particularly advantageous in applications using prefabricated elements which use either porous concrete or very minimal concrete cover.

In non-carbonated concrete, Top12 reinforcing steel is stable and resistant to corrosion up to a content of at least 2 weight % Cl in concrete. Its corrosion resistance to chlorine-induced Pitting is thus much higher compared to the standard Reinforcing steel B500B. Consequently, the length of time until initiation of corrosion is much longer when Top12 is used.

In carbonated concrete, the simultaneous exposure to chloride adversely affects durability. Top12 is thus superior to the standard reinforcing steel B500B under these conditions. However, this advantage decreases as carbonation increases. A 35 mm concrete cover combined with current concrete qualities should ensure that there is no carbonation of the concrete through to the reinforcement and that the steel retains its high resistance to corrosion.

Weldability

Top12 is generally weldable. Welding can reduce the corrosion resistance of Top12 and should be avoided as far as possible. After german national technical approval (Z-1.4-266; Z 1.4-272) it is not allowed to weld Top12.

Combined use of carbon steel and stainless steel reinforcement in concrete

Top12 can be used with conventional reinforcing steel.

Handling

Like conventional reinforcing steel, no special handlings on construction sites are necessary. To guarantee the best possible quality in concrete, we recommend the following measures:

- Use stainless steel binding wire
- Store standard and stainless reinforcing steel separately
- Keep Top12 covered during storage and when not in concrete.

These measures protect the product from damaging environmental impact such as contamination with rust / iron particles from standard reinforcing steel and chlorides.

Delivery condition

Small surface contaminations on the steel surface (e.g. superficial corrosion phenomena) do not constitute a defect, cf. ECISS / TC 104 / WG 3 Doc N 235. If contaminations can be removed by wire brush, no change in durability properties is to be expected.

Delivery options

	Infrastructure		Geotechnics
	Top12 (8 – 14 mm)	Top12 (16 – 36 mm)	Top12 (28 – 43 mm)
Wire rod (pickled, coiled)	Ø 8 / 10 / 12 / 14 mm	–	–
Steel bar (pickled)	–	Ø 16 / 20 / 28 / 36 mm	–
Steel bar (coiled)	–	–	Ø 28 / 36 / 43 mm

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