

# Forta H400

EN 1.4376

## General characteristics

Forta H400 has higher strength than standard Core 304/4301 and a lower nickel content, making it a cost-effective and lightweight austenitic product for the automotive industry. It has been used in automotive applications for over 10 years.

Forta H400 is an austenitic stainless steel, which belongs to the austenitic low-nickel CrMn stainless steel family, in which manganese replaces part of the nickel that is normally alloyed to CrNi standard grades. This variant has low carbon content. Due to its high nitrogen content, Forta H400 has increased mechanical strength. Forta H400 is optimized for strong work hardening on mechanical deformation.

The corrosion resistance of the austenitic CrMn grades is usually slightly below that of the austenitic CrNi standard grades. Forta H400 is used in applications where a combination of high mechanical strength and good formability, as well as corrosion resistance, is needed. Due to its strong tendency to work hardening, Forta H400 can absorb a high amount of energy during deformation. It can be delivered in the temper rolled condition with different strength levels.

## Typical applications

- Cross members
- Strut domes
- Bumpers

# Products & dimensions

## Cold rolled products, available dimensions (mm)

Surface finish		Coil / Strip		Plate / Sheet	
		Thickness	Width	Thickness	Width
2B	Cold rolled, heat treated, pickled, skin passed	1.50-3.00	30-1500	1.50-3.00	350-1500
2BB	Bright-pickled	0.50-3.50	30-1500	0.50-3.50	600-1500
2C	Cold rolled, heat treated	0.50-6.00	30-1500		
2D	Cold rolled, heat treated, pickled	0.50-6.00	30-1500	0.50-6.00	600-1500
2E	Cold rolled, heat treated, mech. desc. pickled	0.50-6.00	30-1500	0.50-6.00	600-1500
2G	Ground	0.50-3.00	30-1500	0.50-3.00	600-1500
2J	Brushed or dull polished	0.50-3.00	30-1500	0.50-3.00	600-1500

## Continous hot rolled products, available dimensions (mm)

Surface finish		Coil / Strip		Plate / Sheet	
		Thickness	Width	Thickness	Width
1C	Hot rolled, heat treated, not descaled	3.50-8.00	50-1550		
1D	Hot rolled, heat treated, pickled	3.00-6.00	50-1500	3.00-6.00	350-1500
1U	Black hot rolled	3.50-8.00	50-1550		

# Chemical composition

The typical chemical composition for this grade is given in the table below, together with composition limits given for the product according to different standards. The required standard will be fully met as specified on the order.

The chemical composition is given as % by mass.

	C	Mn	Cr	Ni	Mo	N	Other
<b>Typical</b>	<b>0.04</b>	<b>6.8</b>	<b>17.5</b>	<b>4.0</b>		<b>0.20</b>	
EN 10088-2	≤0.10	5.0-8.0	17.0-20.5	2.0-4.5		≤0.30	

# Corrosion resistance

Forta H400 has excellent corrosion resistance in solutions of many halogen-free organic and inorganic compounds over a wide temperature and concentration range. It can withstand many organic and sufficiently diluted mineral acids depending on the temperature of the solution. Forta H400 may suffer from uniform corrosion in mineral acids and hot strong alkaline solutions.

In aqueous solutions containing halogenides, e.g. chlorides or bromides, pitting and crevice corrosion may occur depending on halogenide concentration, temperature, pH-value, concentration of oxidizing compounds, or crevice geometry, if applicable. The resistance against pitting and crevice corrosion of Forta H400 is, however, slightly lower than of the basic austenitic CrNi standard grades. The presence of corrosion-inhibiting or accelerating compounds like transition metal ions or organic compounds may influence the corrosion behavior of Forta H400.

Forta H400 is prone to chloride-induced stress corrosion cracking at temperatures over about 50 °C depending on the applied stress and the chloride concentration in the environment. Prior cold deformation of the structure under load increases the risk of stress corrosion cracking.

Forta H400 can be used for indoor and outdoor applications in rural areas and urban environments where chloride contamination is low. The best material performance is reached usually with the help of adequate design, correct post-weld treatment, and regular cleaning

during use (if applicable).

For more information on corrosion resistance, please refer to the Outokumpu Corrosion Handbook or contact our corrosion experts.

Pitting corrosion resistance		Crevice corrosion resistance
PRE	CPT	CCT
21	<10	<0

Pitting Resistance Equivalent (PRE) is calculated using the following formula:  $PRE = \%Cr + 3.3 \times \%Mo + 16 \times \%N$

Corrosion Pitting Temperature (CPT) as measured in the Avesta Cell (ASTM G 150), in a 1M NaCl solution (35,000 ppm or mg/l chloride ions).

Critical Crevice Corrosion Temperature (CCT) is obtained by laboratory tests according to ASTM G 48 Method F

## Mechanical properties

Cold rolled coil and sheet	R <sub>p0.2</sub> MPa	R <sub>p1.0</sub> MPa	R <sub>m</sub> MPa	Elongation <sup>1)</sup> %	Impact strength J	Rockwell	HB	HV
<b>Typical (thickness 1 mm)</b>	<b>405</b>	<b>455</b>	<b>740</b>					
EN 10088-2	≥ 400	≥ 420	600 - 900	≥ 40				

Hot rolled coil and sheet	R <sub>p0.2</sub> MPa	R <sub>p1.0</sub> MPa	R <sub>m</sub> MPa	Elongation <sup>1)</sup> %	Impact strength J	Rockwell	HB	HV
<b>Typical (thickness 4 mm)</b>	<b>410</b>	<b>460</b>	<b>715</b>	<b>57</b>			<b>86</b>	
EN 10088-2	≥ 400	≥ 420	600 - 900	≥ 40				

<sup>1)</sup>Elongation according to EN standard:

A<sub>80</sub> for thickness below 3 mm.

A for thickness = 3 mm.

Elongation according to ASTM standard A<sub>2</sub> or A<sub>50</sub>.

## Physical properties

Density	Modulus of elasticity	Thermal exp. at 100 °C	Thermal conductivity	Thermal capacity	Electrical resistance	Magnetizable
kg/dm <sup>3</sup>	GPa	10 <sup>-6</sup> /°C	W/m°C	J/kg°C	μΩm	
7.9	200	16,0	15	500	0.73	No

## Fabrication

More detailed information concerning welding procedures can be obtained from the Outokumpu Welding Handbook, available from our sales offices.

## Standards & approvals

Standard	Designation
EN 10088-2	1.4376

## Contacts & Enquiries

Contact your nearest sales office

[www.outokumpu.com/contacts](http://www.outokumpu.com/contacts)

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