

Dura 420/4021

General characteristics

Very popular martensitic grade. Corrosion resistant in water and steam. Low-medium hardness for applications such as cutting utensils, surgical instruments, press plates, brake discs and mechanical parts.

Typical applications

- Springs
- Cutting utensils and surgical instruments
- Press plates
- Brake discs
- Mechanical parts
- Wear resistant applications

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	0.40-5.00	30-1250	0.40-5.00	350-1250
2BB	Bright-pickled	0.50-3.50	30-1350	0.50-3.50	600-1500
2C	Cold rolled, heat treated	0.80-4.50	30-1500		
2D	Cold rolled, heat treated, pickled	0.50-4.50	30-1350	0.50-4.50	600-1500
2E	Cold rolled, heat treated, mech. desc. pickled	0.50-4.50	30-1350	0.50-4.50	600-1500
2G	Ground	0.50-3.00	30-1350	0.50-3.00	600-1350
2H	Work hardened	0.50-3.00	30-1350	0.50-3.00	600-1350
2J	Brushed or dull polished	0.50-3.00	30-1350	0.50-3.00	600-1350
2R	Cold rolled, bright annealed	0.05-3.00	3-1250	0.40-3.00	350-1250

Continuous hot rolled products, available dimensions (mm)

Surface finish		Coil / Strip		Plate / Sheet	
		Thickness	Width	Thickness	Width
1C	Hot rolled, heat treated, not descaled	2.00-8.00	50-1530		
1D	Hot rolled, heat treated, pickled	2.50-7.00	30-1250	2.50-7.00	350-1250

Chemical composition

The chemical composition is shown in the table below.

The chemical composition is given as % by weight.

	C	Mn	Cr	Ni	Mo	N	Other
Typical	0.20		13.0				
ASTM A240	0.15-	≤1.00	12.0-14.0	≤0.75	≤0.50		
ASTM A240	0.15-	≤1.00	12.0-14.0	≤0.75	≤0.50		
EN 10088-2	0.16-0.25	≤1.5	12.0-14.0				
EN 10088-3	0.16-0.25	≤1.50	12.00-14.00				
EN 10088-4	0.16-0.25	≤1.5	12.0-14.0				

Corrosion resistance

For more information, see Outokumpu Corrosion Handbook.

Pitting corrosion resistance		Crevice corrosion resistance
PRE	CPT	CCT
13	<10	<0

PRE Pitting Resistant Equivalent calculated using the formula: $PRE = \%Cr + 3.3 \times \%Mo + 16 \times \%N$

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

CCT Critical Crevice Corrosion Temperature is the critical crevice corrosion temperature which is obtained by laboratory tests according to ASTM G 48 Method F

Mechanical properties

The mechanical properties of the available products are given in the table below.

Cold rolled coil and sheet	R _{p0.2} MPa	R _{p1.0} MPa	R _m MPa	Elongation ¹⁾ %	Impact strength J	Rockwell	HB	HV
Typical (thickness 1 mm)	350	375	580					
ASTM A240			≤ 690			≤ 96HRB	≤ 217	
ASTM A240			≤ 690			≤ 96HRB	≤ 217	
EN 10088-2			≤ 700	≥ 15				

Hot rolled coil and sheet	R _{p0.2} MPa	R _{p1.0} MPa	R _m MPa	Elongation ¹⁾ %	Impact strength J	Rockwell	HB	HV
Typical (thickness 4 mm)	360	405	575	29			83	
EN 10088-2			≤ 700	≥ 15				

Hot rolled quarto plate	R _{p0.2} MPa	R _{p1.0} MPa	R _m MPa	Elongation ¹⁾ %	Impact strength J	Rockwell	HB	HV
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Typical (thickness 15 mm)	500	580	650	20				
Wire rod	R _{p0.2} MPa	R _{p1.0} MPa	R _m MPa	Elongation ¹⁾ %	Impact strength J	Rockwell	HB	HV
Typical	500	580	650	20				

¹⁾Elongation according to EN standard:

A₈₀ for thickness below 3 mm.

A for thickness = 3 mm.

Elongation according to ASTM standard A₂₋ or A₅₀.

Physical properties

Data according to EN 10088, EN 10095 or typical values.

Density kg/dm ³	Modulus of elasticity GPa	Thermal exp. at 100 °C 10 ⁻⁶ /°C	Thermal conductivity W/m°C	Thermal capacity J/kg°C	Electrical resistance μΩm	Magnetizable
7.7	215	10,5	30	460	0.60	Yes

Fabrication

Welding

The microstructure of 4021 comprises tempered martensite and some carbide. The steel is normally not considered to be weldable, but if thinner gauges are occasionally welded, the use of low-hydrogen methods (MAG or TIG) is to be preferred to avoid cold cracking. Any electrodes used must be of the basic type. The martensitic steels must be preheated to temperatures above MS typically (250-400°C). The interpass temperature should be in the same range. The heat input should not be too high or too low (0.5-1.5 kJ/mm).

Austenitic fillers are most commonly used. This avoids the post weld heat treatment that is necessary when compositionally matched filler is used. Much depends on the composition of the steel and the degree of restraint used. When there is no preheating, post weld heat treatment is necessary. However, it may be possible to weld very thin gauges without preheating.

Standards & approvals

The most commonly used international product standards are given in the table below.

Standard	Designation
ASTM A240/A240M	UNS S42000; UNS S42000
EN 10088-2	1.4021
EN 10088-3	1.4021
EN 10088-4	1.4021

Contacts & Enquiries

Contact your nearest sales office

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