

# EN 10088-3 - 1.4460

## PRODEC®

### A stainless austenitic-ferritic steel

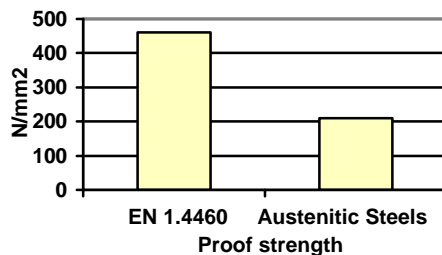
Typical analysis %	C 0,025	Cr 25,4	Ni 5,75	Mo 1,5
Delivery condition	Solution annealed			

( Replaces SS 2324 -02 )

### Mechanical properties

Values for solution annealed condition to EN 10088 - 3

Tensile strength Rm	N/mm <sup>2</sup>	620 - 880
Proof strength Rp <sub>02</sub>	N/mm <sup>2</sup>	min 460
Elongation A <sub>5</sub>	%	min 20
Impact energy KV - RT	J/cm <sup>2</sup>	Min 85
Hardness	HB	Max 260



### Physical properties

Temperature	20 <sup>0</sup> C	100 <sup>0</sup> C	200 <sup>0</sup> C	300 <sup>0</sup> C
Density Kg/dm <sup>3</sup>	7,8			
Modulus of elasticity kN/mm <sup>2</sup>	200	194	186	180
Mean coeff. of thermal expansion 20 <sup>0</sup> C -Temp. 10 <sup>-6</sup> K <sup>-1</sup>	-	13,0	13,5	14,0
Specific Thermal Capacity W/m <sup>0</sup> C	15			
Electrical Resistivity Ω mm <sup>2</sup> /m	0,8			
Specific heat J/kg <sup>0</sup> C	500			

The steel is susceptible to embrittlement when applied in the temperature range of 300 - 900<sup>0</sup> C. Scaling temperature in air is approx. 1070<sup>0</sup> C.

EN 1.4460 PRODEC® is an acid resistant austenitic-ferritic steel that is characterized by:

- ⇒ Excellent resistance to pitting corrosion, crevice corrosion, stress corrosion and corrosion fatigue
- ⇒ High strength
- ⇒ Excellent machinability
- ⇒ High toughness

### Typical application areas

- Propeller shafting
- Pump shafting
- Pump parts
- Valve parts
- Pistons
- Spindles
- Stirrers
- Bolting
- Nuts

### Corrosion resistance

EN 1.4460 shows very good corrosion resistance particularly in chloride-bearing environments. Its resistance to chloride caused attacks such as pitting, crevice corrosion, stress corrosion and corrosion fatigue is much better than that of fully austenitic stainless steels of T316 type. Also in most cases EN 1.4460 is much better than T316 type with regard to general corrosion resistance in reducing and oxidizing acids.

Besides the two-phase microstructure and the low carbon content render EN 1.4460 better resistance to intercrystalline corrosion after sensitisation within the temperature interval 500 - 900<sup>0</sup> C.

When extremely high demands are imposed on resistance to pitting and crevice corrosion it is recommended that machining of the steel surface be followed by pickling or passivation.

### Heat treatment

#### Solution annealing

950 - 1000<sup>0</sup> C. Holding time at solution annealing temperature approx. 30 min., followed by cooling in water.

## Machining

Turning	Cemented carbide toolsg	
	Rough	Fine
ISO machining group	P15-P25	P10-P15
Cutting depth mm	2 - 5	0,5 - 2
Feed mm/rev	0,3 - 0,6	0,05 - 0,3
Cutting speed m/min	150 - 180	180 - 280
	High speed tools	
Cutting depth mm	0,5 - 2	
Feed mm/rev	0,05 - 0,2	
Cutting speed m/min	25 - 33	

Lathe thread cutting	Cemented carbide tool	
	Exterior	Interior
	100 - 130	70 - 90
	High speed steel tools	
	Exterior	Interior
	18 - 23	13 - 18

Drilling				
Drill dia mm	5 - 10	10 - 20	20 - 30	30 - 40
<b>Uncoated HSS</b>				
Cutting speed m/min	13 - 18	13 - 18	13 - 18	13 - 18
Feed mm/rev	0,2-0,3	0,3-0,4	0,4-0,5	0,5-0,6
<b>Coated HSS</b>				
Cutting speed m/min	14 - 20	14 - 20	14 - 20	14 - 20
Feed mm/rev	0,2-0,3	0,3-0,4	0,4-0,5	0,5-0,6
<b>Short range drill</b>				
Cutting speed m/min			200-250	200-250
Feed mm/rev			0,08-0,12	0,1-0,14

• Milling	• Tap threading
• Sawing	• Cutting off
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## PRODEC®

EN 1.4460 PRODEC® as such is not a "stainless free cutting steel" but a high class norm steel. It is an "easy to machine steel", considered for parts where extensive machining is required.

## Welding

EN 1.4460 possesses good weldability and can be welded in the same manner as austenitic material. Welding should be carried out without preheating and with small weld beads, i.e. with as little heat supply as possible. It is not necessary to use welding consumables of the same steel grade but also austenitic ones can be used.

Welding of EN 1.4460 and subsequent application in highly corrosive environments could lead to a reduction in corrosion resistance. After annealing at 980<sup>0</sup> C and quenching in water the corrosion resistance of the weld will be just as high as that of the base material.

## Bar finish

EN 10088-3/95 - 1.4460 is available with a machined or ground surface.

## Stock standard

Please refer to our stock standard leaflet.

## Technical service

VALBRUNA NORDIC AB will be helpful in giving further advice and recommendations concerning choice of materials, cutting data, welding, heat treatment etc.