

## STAINLESS STEEL BAR

### TYPICAL APPLICATIONS

Used where higher mechanical properties than 410 are required and where corrosive conditions are not too severe. Typically: valve parts, centrifuge bowls, chemical equipment, bolts and screws, in aerospace, defence and high technology markets.

### PRODUCT DESCRIPTION

S80 is a 16% chromium stainless steel modified by the addition of nickel, in the British Standard Aerospace series of alloys. It is designed to develop high mechanical properties by conventional heat treatment methods and provide good corrosion resistance. This grade is manufactured by electric melting process. It is magnetic in all conditions and can therefore be used for parts which may be subject to magnetic inspection. The designation S80D denotes material in the hardened and tempered condition.

### RELATED SPECIFICATIONS

AISI 431  
UNS S43100 in ASTM A276  
AMS 5628

### STOCK RANGE

Round Bar : 1/16" to 4" Diameter  
(1.59 to 101.6mm)

### CUT TO SIZE SAWN BLANKS

Cut to length in house to tolerances - Nil + 1.0mm

### MACHINABILITY / FORMABILITY

Type 431 has better machining characteristics than the chromium-nickel grades. It has a machinability rating of 45%, with 1212 rated 100%. Surface cutting speed on automatic screw machines is approximately 75 ft/min. This material can be cold formed. If a cold forming operation is undertaken then a stress relieving treatment should be applied.

### CORROSION RESISTANCE

The corrosion resistance of Type 431 is superior to that of the standard chromium grades such as Types 410 and 416. This grade has excellent resistance to corrosion in all conditions of heat treatment from mild acids and alkalis, neutral and basic salts, food acids, and atmosphere. Maximum resistance is obtained by hardening and polishing.

### WELDABILITY

May be welded by all the commercial processes except forge or hammer welding. Large sections should be preheated prior to welding. Because of air-hardening properties, this grade should be annealed after welding.

### PRODUCTION TOLERANCES

Manufacturing limits are as stated in the Table BS 4S100 For further assistance please contact our Sales Dept / Laboratory.

### CHEMICAL COMPOSITION (WEIGHT %)

	C	Si	Mn	P	S	Cr	Ni
Min	0.12					15.0	2.0
Max	0.20	1.0	1.0	0.030	0.025	18.0	3.0

### MECHANICAL PROPERTIES (MINIMA UNLESS STATED FOR 'D' CONDITION)

Tensile Strength (MPa)	0.2% Proof Stress (MPa)	Elongation On 5.65 √ S <sub>0</sub> (%)	Brinell Hardness (HB)	*Izod Impact (ft.lbf)	
				≤63mm	>63mm
880 / 1080	690	12	255 / 321	25	15

\* The Charpy U notch values obtained may be expected to be not less than 20J for ≤63mm and not less than 10J for >63mm ruling section.

### TECHNICAL SALES ASSISTANCE

Our resident team of qualified metallurgists and engineers will be pleased to assist further on any technical topic.

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