

# **Steel GD223** X60NiMnCr13-5-3

# SPECIFICATIONS\_

European standards: - X60NiMnCr13-5-3 BS: S131

# COMPOSITION

Carbon	0.60
Nickel	11.00
Manganese	5.00
Chromium	3.00
Molybdenum	0.40

# **APPLICATIONS** -

- Fasteners used for assembly of light alloy components working at high temperatures
- Distribution tubes for valveless engines with pistons and cylinders in light alloys
- Precombustion chambers fitted to light alloy piston heads for diesel engines

# **CHARACTERISTICS**

- Steel with a coefficient of expansion close to that of aluminum
- Mechanical properties can be enhanced by work hardening

### **TYPICAL MECHANICAL PROPERTIES**

#### HEAT TREATMENT REFERENCE

 Annealed condition: Heat to 1100°C followed by oil quenching:

- UTS:	700 N/mm <sup>2</sup>
- 0.2 % Yield strength:	300 N/mm <sup>2</sup>
- Elongation (5d):	55 %
- Impact strength KCU:	300 J/cm <sup>2</sup>

 Work hardened condition: strength can reach 1300 N/mm<sup>2</sup>.
For fastener applications the metal is work hardened to Obtain the following properties:

- UTS:	1000 N/mm <sup>2</sup>
- 0.2 % Yield strength:	800 N/mm <sup>2</sup>
- Elongation (5d):	35 %

### **HEAT TREATMENT**

Cannot be hardened by heat treatment

### PHYSICAL PROPERTIES

Density:

7.9

- Mean coefficient of expansion in m/m.°C:
  - between 20°C and 200°C: 20.2 x 10<sup>-6</sup>
  - between 20°C and 400°C:  $21.0 \times 10^{-6}$
  - between 20°C and 600°C: 21.3 x 10<sup>-6</sup>
  - between 20°C and 800°C: 21.6 x 10<sup>-6</sup>

### FORGING \_

• 1150/950°C

Contact:

#### www.aubertduval.com

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