EN 8 CARBON STEEL FORGED OR WROUGHT 60.000 MINIMUM YIELD

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EN 8 CARBON STEEL FORGED OR WROUGHT

60,000 MINIMUM YIELD

1.0 SCOPE

1.1 EN-8 carbon steel forgings and wrought shapes heat-treated to 60,000 PSI minimum yield strength for standard service.

1.2 Product forms covered by this specification are closed die, Open die and ring forgings bar and mill shapes.

2.0 REQUIREMENTS

2.1 The requirements of specification CES. 26-128 shall apply in addition to the following specific requirements.

2.1.1 Chemical composition: Chemical composition limits are listed below. An analysis of each heat of steel be made by the manufacturer, preferably from a ladle sample taken at or near the time of pouring. The listed elements shall be reported in weight percent. Reporting of residual elements is not required, but total residuals must not exceed 1%.

ELEMENTS	COMPOSITION RANGE (%)
Carbon (C)	0.35-0.45
Manganese (Mn)	0.60-1.00
Silicon (Si)	0.05-0.35
Sulphur (S)	0.06 (max.)
Phosphorus (P)	0.06 max.)

2.1.2 Mechanical Properties: Mechanical property requirements are listed below. Each heat shall be tasted and the listed mechanical properties shall be reported.

MECHANICAL PROPERTIES	RANGE
TENSILE STRENGTH	80,000 PSI (552 MPa) Min.
YIELD STRENGTH	60,000 PSI (414 MPa) Min.
ELONGATION IN 2" Gage Length	22% Min.
REDUCTION IN AREA	35% Min.
BRINELL HARDNESS	187-237 BHN

2.1.3 Heat Treatment:

PROCESS	ATMOSPHERE / MEIDA	TEMPERATURE	TIME AT TEMPERATURE
Austenitizing (See note)	Air or Nitrogen	1550°F (843 °C) minimum.	Vz hour per inch maximum of through thickness. One hour minimum
Quench	Water	100 °F (38 °C) maximum before quenching 120 °F (49 °C) maximum after quenching	
	Polymer	50 °F (10 °C) minimum before quenching	
	Oil		
Temper	Air or Nitrogen	1150°F (621°C) Minimum.	% hour per inch of maximum through thickness. One hour minimum.

Slow cool to room temperature

2.1.4 Tempering chart

Tempering Temp. °C	Hardness HRC	Elongation %
150	48-55	10
200	45-48	12
250	42-45	14
300	38-42	16
350	34-38	18
400	30-34	20
450	27-30	22
500	24-20	24

Note: The minimum start temperature of 50 °F (10 °C) for oil and polymer Quenchants shall be followed except when a lower minimum start temperature is permitted for specific quenchant by the quenchant manufacturer. The start temperature shall be documented for all products.

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