EN 24 HARDENING ALLOY STEEL WITH HIGH TENSILE STRENGTH AND 95,000 PSI OF MININIMUM YIELD STRENGTH

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EN 24 HARDENING ALLOY STEEL WITH HIGH TENSILE STRENGTH AND 95,000 PSI OF MINIMUM YIELD STRENGTH

1.0 SCOPE

1.1 EN-24 high tensile alloy steel forgings/castings and wrought shapes heat-treated to 95,000 PSI minimum yield strength for standard service.

1.2 Product forms covered by this specification have good impact properties at low temperatures and suitable for a variety of elevated temperature application.

2.0 REQUIREMENTS :

2.1 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
Nickle (Ni)	1.30-1.80
Manganese (Mn)	0.45-0.70
Silicon (Si)	0.10-0.35
Sulphur (S)	0.05 (max.)
Phosphorus (P)	0.05 (max.)
Chromium (Cr)	0.9-1.40

Note: The manufacturer shall provide a TC from an NABL certified lab for the Same.

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2.2 Mechanical Properties: The steel components are subjected to proper heat treatment processes till the desired properties are achieved. Each heat shall then be tested and the recorded mechanical properties shall be reported.

MECHANICAL PROPERTIES	RANGE
TENSILE STRENGTH	850-1000 MPa
YIELD STRENGTH	650 MPa
0.2 % PROOF STRESS	635 MPa
ELONGATION IN 2" Gage Length	13 %
IMPACT KCV	35 J (min.)
BRINELL HARDNESS	248-302 Brinell

NOTE: 1) The above mentioned mechanical properties are those that are recorded For En 24 steel components subjected to tempering.
2) The manufacturer shall provide a TC from an NABL certified lab for the Same.

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2.3 **Heat Treatment:** The guidelines to be followed during the heat treatment Processes that are to be carried out are as given below.

PROCESS	TEMPERATURE	PROCEDURE
Forging	1000-1100 °C	Preheat carefully. Do not forge the steel below 850-1100 °C
Annealing	840-860 °C	Soak well and allow to cool in the furnace to 580 °C before withdrawing.
Stress Relieving	650-670 °C	Soak well before cooling in furnace or in air.
Hardening	830-850 °C	Annealed En 24 is heated and after adequate soaking quenched in oil.
Tempering	660 °C	Soak at this temperature for 2 hours per 25mm of ruling section and then cool in air. (Tempering in the range 250-375 °C is not advised as can seriously reduce impact value)

NOTE: 1) Heat treatment processes including rate of heating, cooling and soaking time will vary due to factors such as shape and size of each steel component. Other factors affecting are type of furnace, quenching medium and work piece transfer facilities. Therefore the above mentioned conditions are just for guidance and is left to the discretion of the heat treatment provider to achieve the required properties.

2) HTT curves shall be supplied.

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