

**SARA SAE ENGINEERING SPECIFICATION****Section: SES 26 – 801****ISSUE "A"****REV "0"****EFF. DATE: 18.05.2016****Page 1 of 3****MATERIAL SPECIFICATION FOR AISI 4340 HIGH TENSILE STEEL**

Rev	Reason of Change	Date	Made By	Reviewed By	Approved By	Status
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Page 2 of 3

## MATERIAL SPECIFICATION FOR AISI 4340 HIGH TENSILE STEEL

### **1.0 PURPOSE**

- 1.1** It is the purpose of this material specification to list in concise form of the material requirement for AISI 4340 bar stock, forgings, castings.
- 1.2** This material specification is intended to aid the purchasing department in procuring and the vendor in supplying a material which meets the needs of its intended use, and the quality control department in the inspection and release of incoming material.

### **2.0 REQUIREMENTS**

- 2.1** The requirements of specification SES 26-590, SES 26-740 & SES 26-744 shall apply in addition to the following specific requirements.
- 2.2** **Chemical composition:** The listed elements shall be reported in weight percent. Reporting of residual elements is not required, but total residuals must not exceed 1%.

	<b>AISI 4340</b>
Carbon	.38 to .43
Manganese	.60 to .80
Phosphorous	.025 max.
Sulfur	.025 max.
Silicon	.15 to .35
Chromium	.70 to .90
Nickel	1.65 to 2.00
Molybdenum	.20 to .30

### **3.0 Mechanical Properties:**

The mechanical properties must be obtained from specimens machined and tested in accordance with ASTM A370. The specimens must be from the same heat as the intended part and heat treated in the same cycle. Shipment requiring more

	SARA SAE ENGINEERING SPECIFICATION		
	Section: SES 26 – 801		
	ISSUE "A"	REV "0"	
	EFF. DATE: 18.05.2016	Page	3 of 3

than one heat treatment lot will require specimens and complete identification from each lot. The following minimum requirements must be met:

Tensile strength (psi)	120,000
Yield strength (psi)	95,000
Elongation, 2" gauge length, (%)	13
Reduction of area, %	35
Brinell Hardness, HB	248-302
Rockwell "C" Hardness (HRC)	24-32

#### **4.0 HEAT TREATMENT:** -

PROCESS	ATMOSPHERE/MEDIA	TEMPERATURE	TIME AT TEMPERATURE
Normalized	Air	1598 °F – 1697 °F (870 °C – 925 °C)	30 Minutes / Inch of T, Minimum Time is 30 Minutes.
Still air cool to below 400 degrees F (204 degrees C) before further processing			
Austenitize	Air	1562 °F - 1652 °F (850 °C – 900 °C)	30 Minutes / Inch of T, Minimum Time is 30 Minutes.
Quench			
Temper	Oil, Polymer	104 °F (40 °C) - 158 °F (70 °C)	
	Air	1100 °F – 1256 °F (593 °C – 680 °C)	1 hour per inch of maximum through thickness. One-hour Minimum.

**Note:** Maximum holding time shall not exceed Five times (5X) the maximum holding time. In all case, holding time shall not start until parts or materials have reached specified heat treatment temperature. The 5X rule does not apply to the separate QTC (e.g. ER 5")

#### **5.0 DOCUMENTATION REQUIRED:**-

Each shipment shall be accompanied by material certifications for each lot of material, certifications must be positively relatable to the lot of material represented. Recheck of Chemical properties to be carried out by Sara Sae.