	SARA SAE ENGINEERING SPECIFICATION	
	SECTION SES 26 – 725	
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**MATERIAL SPECIFICATION ASTM A-193 Gr. B7**  
**FOR ALLOY STEEL & BOLTING MATERIAL**

**1.0 PURPOSE**

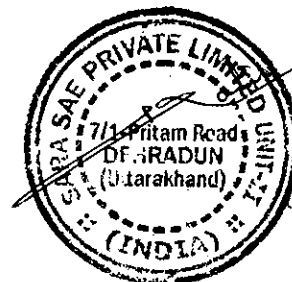
- 1.1 It is the purpose of this material specification to list in concise form of the material requirement for ASTM A-193.
- 1.2 This material specification is intended to aid the purchasing department in procuring and the vendor in supplying a material which meets the needs of its intended use, and the quality control department in the inspection and release of incoming material.


**2.0 REQUIREMENTS**

- 2.1 The requirements of specification S.E.S. 26-590 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 is 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)	0.37 – 0.49
Manganese (Mn)	0.65 – 1.10
Silicon (Si)	0.15 – 0.35
Sulfur (S)	0.040 (max.)
Phosphorus	0.035 (max.)
Chromium (Cr)	0.75 – 1.20
Molybdenum (Mo)	0.15 – 0.25



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2.1.b) **Mechanical Properties:** Mechanical property requirements are listed below. Each heat shall be tested and the listed mechanical properties shall be reported.

<u>MECHANICAL PROPERTIES</u>	<u>RANGE</u>		
	Size up to 2 ½”	Size 2 ½ - 4”	Size 4 – 7”
TENSILE STRENGTH, KSI	125	115	100 Min.
YIELD STRENGTH, KSI	105	95	75
ELONGATION IN 2” Gage Length	16 % Min	16 % Min	18 % Min
REDUCTION IN AREA	50 % Min	50 % Min	50 % Min
HARDNESS	35 HRC (321 BHN)	35 HRC (321 BHN)	35 HRC (321 BHN)

2.1.c) **Melt practice:** The steel shall be made by the electric furnace process or vacuum induction melting (VIM) or open-hearth, basic-oxygen shall also be acceptable.

2.1.d) **Condition:** All product shall be quenched and tempered ferrite material that is subsequently cold drawn for dimensional control shall be stress relieved after cold drawing. The minimum stress relief temperature shall be 55 °C (100 °F) below the tempering temperature.

3. **Product Marking:** Grade and manufacturer’s identification symbols shall be applied to one end of studs 3/8” in diameter and larger and to the heads of bolts ¼” in diameter and larger. If the available area is inadequate, the grade symbol may be marked on one end and the manufacture’s identification symbol marked on the other end.

#### 4. DOCUMENTATION REQUIRED:-

4.1 Each shipment shall be accompanied by material certifications for each lot of material, certifications must be positively relatable to the lot of material represented

4.2 Recheck of Chemical properties to be carried out by SARA SAE.

