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|--|--|--------------------------------|--|---------------|--------|
|  |  | SARA ENGINEERING SPECIFICATION |  |               |        |
| Section: SES 26 – 615  |  |                                |  |               |        |
| Issue: "C",  |  |                                |  | Rev. No.: "2" |        |
| Eff. Date: 20-09-2022  |  |                                |  | Page          | 1 of 3 |

MATERIAL SPECIFICATION  
FOR AISI 1008 LOW CARBON STEEL

| Rev | Reason of Change                 | Date       | Prepared By | Reviewed By | Approved By | Status   |
|-----|----------------------------------|------------|-------------|-------------|-------------|----------|
| 1   | Change in referred spec          | 20-10-2011 | USR         | J Gulati    | KKD         | Released |
| 2   | Amended as per API 6A Addendum 3 | 20-09-2022 | NK          | USR         | JG          | Released |



20/09/22

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**MATERIAL SPECIFICATION**  
**FOR AISI 1008 LOW CARBON STEEL**

**1.1 SCOPE**

**1.2** It is the purpose of this material specification to list in concise form of the material requirement for AISI 1008 Low Carbon Steel bar stock, forgings for Ring Gaskets.

**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** It is the responsibility of raw material/metal supplier/machined parts supplier of carbon, low alloy and martensitic stainless steel to have practices and procedures in place to assure that raw materials/parts delivered to SARA SAE do not have excessive amounts of residual magnetism. Excessive residual magnetism is defined as greater than 3 gauss. Residual magnetism can occur due to factors such as lifting with magnets, magnetic particle inspection or stray welding current. The supplier's procedures/testing methods will be subject to verification during supplier audits.

**2.3** The raw material supplier shall assure that SARA SAE does not receive material with greater than background level of radioactivity.

**3.0 Chemical composition:** Chemical composition limits are listed below. An analysis of each heat of steel shall 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.

| ELEMENTS       | COMPOSITION RANGE (%) |
|----------------|-----------------------|
| Carbon (C)     | 0.100 (max)           |
| Manganese (Mn) | 0.30-0.50             |
| Silicon (Si)   | 0.34 (max)            |
| Sulphur (S)    | 0.050 (max)           |
| Phosphorus (P) | 0.040 (max)           |

**3.1** Elements that are not included in the application material specification but that may have been intentionally added by the mill shall be reported and are limited as follows. Total residuals must not exceed 1%.

| ELEMENTS                              | COMPOSITION RANGE (%) |
|---------------------------------------|-----------------------|
| Vanadium (V)                          | 0.08 (max)            |
| Aluminum (Al)                         | 0.055 (max)           |
| Nitrogen (N)                          | 0.010 (max)           |
| Hydrogen (H)                          | 0.010 (max)           |
| Niobium(Columbium)+Titanium +Vanadium | 0.12 (max)            |
| Boron                                 | 0.0005 (max)          |



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

| MECHANICAL PROPERTIES       | RANGE                |
|-----------------------------|----------------------|
| TENSILE STRENGTH *          | 340 MPa (49313 PSI)  |
| YIELD STRENGTH *            | 285 MPa (41336 PSI)  |
| ELONGATION *                | 20%                  |
| HARDNESS (SOFT IRON)        | 56 HRB (101 HB) Max. |
| HARDNESS (LOW CARBON STEEL) | 68 HRB (121 HB) Max. |

\* These properties are not required for Ring Gaskets

#### **5.0 HEAT TREATMENT**

| PROCESS   | ATMOSPHERE/MEDIA | TEMPERATURE                       | TIME AT TEMPERATURE   |
|---|------------------|-----------------------------------|---|
| Annealing   | Air              | 1550 °-1650 °F<br>(845° - 900 °C) | 1/2 hour per inch of maximum through Thickness. One hour minimum. |
| <p><b>Note:</b> Maximum holding time shall not exceed Five times (5X) the minimum 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")</p> |                  |                                   |   |
| Furnace cool to below 1300 °F (700 °C)  |                  |                                   |   |

#### **6.0 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.

Suppliers shall retain heat treat charts in a secure area for a period of no less than 10 years (e.g. electronic or paper).

#### **7.0 TESTING TO BE CARRIED OUT BY SARA SAE**

**7.1** Recheck hardness.

**7.2** NDT: - LPT to be performed after machining on 2% of lot size.



#### **8.0 WORKMANSHIP**

Material shall be inspected in accordance with part QA Plan. Material shall be free of injurious defects that are detrimental to the integrity of the final product, such as laps, scabs cracks and exogenous inclusions.