
	SARA SAE ENGINEERING SPECIFICATION	
	Section: SES 26 – 810	
	Issue: "A"	Rev No: "0"
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**ALLOY 925, 105 KSI (724 MPA), FORGING/BARSTOCK,
H2S COMPATIBLE**

Rev	Reason of Change	Date	Made By	Reviewed By	Approved By	Status
0	Initial release	12-12-2016	MN	AS	KKD	Released

7/1/2017



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1.0 Scope

PRODUCT FORM: Forging/Barstock

This specification covers requirements for UNS N09925 forgings and bar stock. This material is compatible for H₂S service for temperatures up to 275°F (135°C). For use above these limits, consult materials engineering.

2.0 Reference Specifications

Documents	Descriptions
ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
NACE MR0175/ISO 15156	Petroleum and natural gas industries Materials for use in H ₂ S-containing Environments in oil and gas production
ISO 10423 / API 6A	Specification for Wellhead and Christmas Tree Equipment
UNS N09925	Unified Numbering System of chemistry

3.0 Melting

The material shall be melted by electric furnace or vacuum induction melting (VIM), followed by vacuum arc remelting (VAR) or electroslag remelt (ESR). Melting practices shall facilitate production of homogenous ingot with minimal non-metallic inclusions, banding, flake, pipe or other defects.


4.0 Chemistry Requirements

The chemistry shall meet the requirements listed in Table 2.

Table 2: Chemical Requirements. (All are maximums unless otherwise noted)

Elements	Wt. Percentage (%)
Nickel	40.0 - 46.0
Chromium	19.5 - 23.5
Iron	Balance
Molybdenum	2.5 - 3.5
Carbon	0.030
Titanium	1.9 - 2.4
Copper	1.5 - 3.0
Manganese	1.0
Silicon	0.5
Sulfur	0.030
Phosphorus	0.030
Aluminum	0.1 - 0.50
Niobium	0.50



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5.0 Mechanical Properties

Tensile testing shall be done to ASTM A370. The material shall meet the mechanical requirements of Table 3.

Table 3: Mechanical Requirements. (All are minimums unless otherwise noted)

Tensile strength	140,000 psi (965 Mpa)
Yield strength	105,000 psi (724 Mpa)
Elongation in 2"	17%
Reduction of Area	20%
Rockwell Hardness	26-38 HRC

Charpy V-notch testing shall be performed according to ASTM A370. The material shall meet the requirements of table 4.

Table 4: Impact Energy Requirement

Test temperature	-50°F (-46°C)
Impact Energy (average), min	31 ft-lb (42 J)
Impact Energy (single), min	21 ft-lb (28 J)
Lateral Expansion, min	Report

6.0 Heat Treatment


Heat treatment temperatures shall be in accordance with the temperatures in table 5.

NOTE: Unless otherwise specified any of the options below are acceptable.

Table 5: Heat Treatment Parameters

	Anneal	Quench	Age	Cool
Option 1 (Continuous)	1825° - 1875°F 0.5 - 4 hours	For sizes < 1 inch, air cool or water quench. For sizes > 1 inch, water quench.	1350°-1380°F (730 - 750°C) for 5 - 9 hours. Furnace cool to 1150°F (620°C), and hold at between 1135°F (610°C) and 1165°F (630°C) for a total aging time of 12 hours.	Air cool or water quench
Option 2 (Continuous)	1850° - 1950°F (1010 - 1065°C) 5 - 20 minutes/inch of maximum thickness.	water quench.	1325° - 1400°F (720-760°C) for 5 - 8 hours.	Air cool



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Option 3 (Batch)	1850° - 1950°F (1010 - 1065°C) for a minimum of one hour at temperature.	For sizes ≤3", air cool or water quench. For sizes >3", water quench.	1325° - 1400°F (720 - 760°C) for 5 - 9 hours followed by furnace cooling to 1250° - 1150°F (620 - 675°C). Hold for total aging time of 18 hours minimum.	Air cool
Option 4 (Hot work and age)*	Cool to ambient following completion of hot work.		1370°F - 1410°F (745 - 765 °C) for 4 to 12 hours, followed by furnace cooling to a temperature between 1165°F and 1240°F (630 and 670°C), holding at this temperature for 4 to 12 hours.	Air cool

*Maximum hardness for this condition is 40 HRC.

7.0 Repair

Repair by welding is not acceptable.

