

**MATERIAL SPECIFICATION FOR ALLOY STEEL ASTM-A  
182 GRADE F 5 FOR RING JOINT GASKET (FORGING)  
 OF API 6A.**

**1.0 SCOPE.**

This specification covers material requirements for Alloy steel ASTM-A 182 Grade F5 at a 0 deg. F to 250 deg. F of operating temperature. This material meets the requirement of API 6A.

**2.0 REFERENCES.**

- 2.1 API SPEC. 6A - 17th Edition, February 1, 1996.
- 2.2 SWI 27-002J - Hardness testing of Ring Gasket.
- 2.3 SWI 27-002K - Material qualification testing of Ring Gasket.
- 2.4 ASTM E 10-84 - Standard test method for Brinell hardness of metallic materials.
- 2.5 ASTM E 29-88 - Standard practice for using significant digits in test data to determine conformance with specification.
- 2.6 ASTM A 182-88 - Standard specification for forged or rolled Alloy steel pipe Flanges, Forged fittings, and valves and parts for high temperature service.

**3.0 MATERIAL AND MANUFACTURE.**

**3.1 CHEMISTRY.**

Chemical composition shall be limited to the following grade with the accompanying ranges:

ASTM-A 182 F 5	C %	Mn. %	P %	S %	Si %	Ni. %	Cr %	Mo. %
GRADE 4 to 6% Chromium.	0.15 Max	0.30 to 0.60	0.03 Max.	0.03 Max.	0.50 Max.	0.50 Max.	4.0 to 6.0	0.44 to 0.65

**3.2 HOT WORKING PRACTICES.**

Forging shall be mechanically hot worked by a press

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## 3.2 (Contd.).

or hammer of sufficient capacity to work the metal throughout its section above the recrystallization temperature. Forging shall be free from cracks, flakes, brusts, laps, seams, piping, tears or other injurious imperfections.

## 4.0 HEAT TREATMENT.

Ring Joint Gasket forging shall be either annealed or normalised as the last stage of material processing prior to final machining; to meet the hardness requirement of Sec.5.1.

## 5.0 MECHANICAL PROPERTIES.

5.1 All material supplied under this specification shall meet following properties.

Material with grade	Tensile strength.	Hardness maximum.	
		HRB (100 Kg load and 1/16" ball dia)	BHN (3000 kg load and 10 mm ball dia).
ASTM-A 182-F5 (4 to 6% chromium)	-	55	100

5.2 Hardness of heat treated material shall be (maximum) 55 HRB or 100 BHN when tested in accordance with ASTM E-10 and SARA instruction SWI 27-\$2J.

## 6.0 CERTIFICATE.

6.1 Certificate for chemical analysis with Heat No. as per Section 3.1.

6.2 Certificate of Heat treatment and hardness as per Section 4.0.

*Chamra*  
17/9/99.