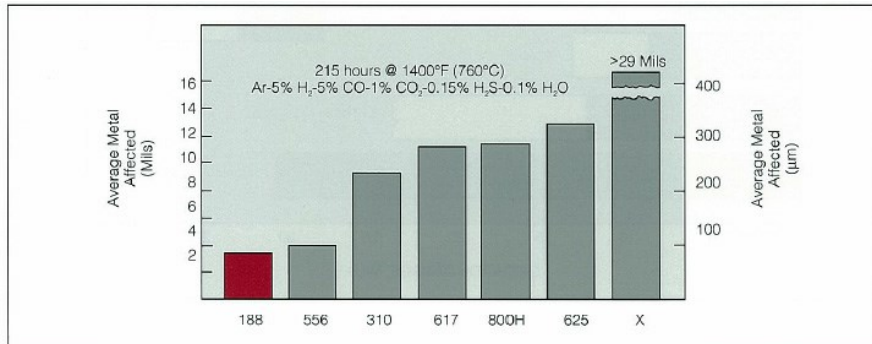


HAYNES® 188 alloy

Sulfidation Resistance

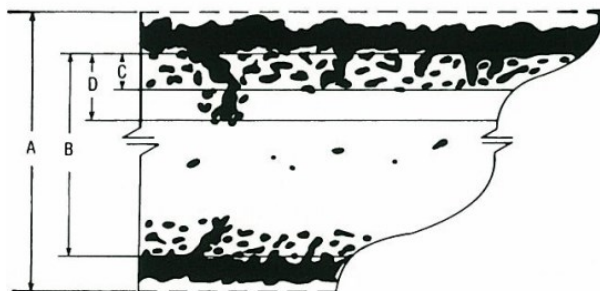
HAYNES® 188 alloy has very good resistance to gaseous sulfidation environments encountered in various industrial applications. Tests were conducted at 1400°F (760°C) in a gas mixture consisting of 5 percent H₂, 5 percent CO₁, 1 percent CO₂, and 0.15 percent H₂S, balance Ar. Coupons were exposed for 215 hours. This is a severe test, with equilibrium sulfur partial pressure of 10⁻⁶ to 10⁻⁷ and oxygen partial pressures less than that needed to produce protective chromium oxide scales.

Sulfidation Resistance at 1400°F (760°C)



Alloy	215 hours in an atmosphere of 5% H ₂ + 5% CO + 0.15% H ₂ S + Balance Ar			
	1400°F (760°C)		1600°F (871°C)	
	Metal Loss mils	Average Metal Affected µm	Metal Loss mils	Average Metal Affected µm
25	0.5	13	1.5	38
188	1.6	41	1.7	44
556®	3.1	77	6.2	157
310	6.2	157	8.3	211
617	5.0	127	3.8	97
800H	7.1	180	7.9	201
625	6.6	168	Partially Consumed	
X	-	-	>29.5	>749

Schematic Representation of Metallographic Technique Used for Evaluating Environmental Tests



1. Metal Loss = (A - B)/2
2. Average Internal Penetration = C
3. Maximum Internal Penetration = D
4. Average Metal Affected = ((A - B)/2) + C
5. Maximum Metal Affected = ((A - B)/2) + D