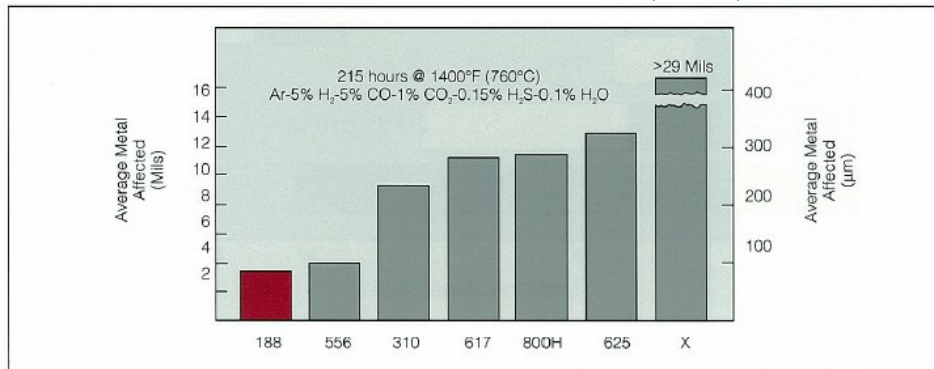


HAYNES® 188 alloy

Sulfidation Resistance

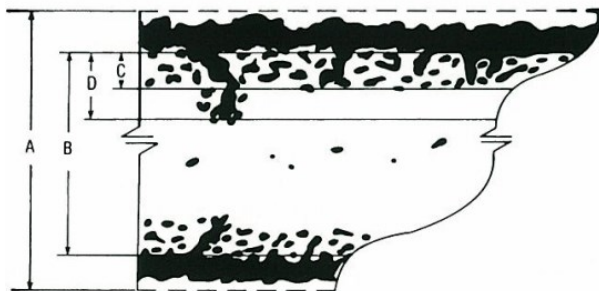
HAYNES® 188 alloy has very good resistance to gaseous sulfidation environments encountered in various industrial applications. Tests were conducted at 1400°F (760°C) in a gas mixture consisting of 5 percent H₂, 5 percent CO₁, 1 percent CO₂, and 0.15 percent H₂S, balance Ar. Coupons were exposed for 215 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		Average Metal Affected		Metal Loss		Average Metal Affected	
	mils	µm	mils	µm	mils	µm	mils	µm
25	0.5	13	1.5	38	1.1	28	5.3	135
188	1.6	41	3.3	84	1.7	44	5.7	145
556®	3.1	77	4.9	124	6.2	157	16.4	417
310	6.2	157	9.1	231	8.3	211	14.1	358
617	5.0	127	10.8	274	3.8	97	17.2	437
800H	7.1	180	11.2	284	7.9	201	>27.6	>701
625	6.6	168	12.6	320	Partially Consumed			
X	-	-	>29.5	>749	-	-	>21.7	>551

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