

Valve Spring Material Corrosion Resistance Guide

Fluid Type/ Chemical Formula		Spring Materials												
		Hastelloy C-276	316/316L stainless steel	Inconel X-750	Inconel 600	Inconel 718	17-7 PH stainless steel	MP35N	Duplex stainless steel	Nimonic 90	302 stainless steel	Elgiloy	Waspaloy	
Nitric Acid	HNO3	X	X	X	X	X	X	X	X	X	X	X	X	X
Sulfuric Acid	H2SO4	O	O	O	O	O	O	X	O	X	O	X	X	
Phosphoric Acid	H3PO4	O	O	O	O	O	O	X	O	X	O	X	X	
Acetic Acid	CH3CO2H	O	X	O	O	X	O	O	X	X	O	O	X	
Sodium Hydroxide	NaOH	O	O	X	O	X	O	X	O	X	O	X	X	
Iron Chloride - Ferric Chloride	FeCl3	O	O	X	O	X	O	X	O	X	O	X	X	
Salt Spray	NaCl	O	X	X	X	O	X	O	O	O	X	O	O	
Sea Water	N/A	O	O	O	O	O	X	O	O	X	X	O	X	
Sour Oil/Gas - mostly Hydrogen Sulfide	H2S	O	O	X	O	X	O	O	X	O	X	O	O	
Humidity	N/A	O	O	O	O	O	O	O	O	X	O	O	X	
Flue Gas (Chimney Gas) - mostly Sulfur Dioxide	SO2	O	X	O	X	X	O	O	X	O	X	O	O	
Bleach (Sodium hypochlorite), mineral acids, organic & inorganic chloride, hypochlorite, chlorine dioxide solutions, formic and acetic acids, acetic anhydride, sea water and brine solutions.	N/A	O	O	X	O	X	O	X	O	X	O	O	X	

O = Excellent; X = Good; O = Moderate; X = Poor

Important Note: The following 4-level rating scale (poor, moderate, good, and excellent) is intended for comparative purposes only. Corrosion testing is recommended; factors which affect corrosion resistance include temperature, concentration, pH, impurities, aeration, velocity, crevices, deposits, metallurgical condition, stress, surface finish and dissimilar metal contact.

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