

CHEMICAL REACTION CHART



The original Frelon® J has almost universal chemical inertness. Only molten sodium and fluorine at elevated temperatures and pressures show any signs of attack. It is approved for use with liquid oxygen, N2O2 hydrazine, UDMH, hydrocarbon fuels, high strength hydrogen peroxide, etc.

The Frelon GOLD® material is a composite of PTFE and a bearing filler. The PTFE is chemically inert. The chemical resistance shown in the chart below is defined by the compatibility of the filler with the various chemicals.

Other data in the chart below applies to the bearing shell and pillow block materials. The table is provided as a reference only. The data given will be affected by factors such as temperature, PV, degree of contact, strength of solution, etc. In each specific application, it is always advisable to conduct specific testing to determine suitability of use. This table only addresses general corrosion, NOT galvanic, SCC, or other types of corrosion. Corrosion rates are at room temperature unless otherwise noted.

Standard and hard coat data only apply when the coating is intact. If the coating is worn through or damaged, an area of galvanic and pitting corrosion will be created. Then use the bare aluminum data.

Standard Simplicity products use aluminum alloy, which is known to have the best corrosion resistance of the high strength aluminum alloys. The sulfuric bath

anodizing and nickel acetate sealing provide the best corrosion resistance available in anodized coatings. They can withstand a rigorous 14-day exposure in a 5% salt spray solution at 96°F per military specifications without significant damage. With the coating intact, it is considered to be inert in most fluids with a pH value between 5 and 8. Hard coat anodizing provides the same chemical resistance but is applied to a .002" thickness, providing a more durable surface that will stand up to greater abuse. However, if the coating is penetrated, the resistance is reduced.

Special stainless steel bearings use AISI 316 stainless, which has superior resistance over 303, 304, 420, 440, 17-4PH, and most other common stainless grades. 316 is generally considered to be the most corrosion resistant of conventional stainless steels.

PERFORMANCE	WEAR
E = Excellent	< .002" per year
G = Good	< .020" per year
S = Satisfactory	< .050" per year
U = Unsatisfactory	> .040" per year

CHEMICAL	FRELON GOLD®	BARE A	STANDARD & HARD COAT ANODIZED ALUMINUM	316 STAINLESS STEEL
Acetic Acid, 20%	U	G	G	E
Acetone	G	E	E	E
Ammonia, anhydrous	G	E	E	E
Ammonium hydroxide, 10%	U	U	U	E
Ammonium chloride, 10%	U	U	U	G
Ammyl acetate (122°F / 50°C)	G	E	E	E
Barium hydroxide	U	U	U	G
Beer	G	E	E	E
Boric acid solutions	G	E	E	G
Butane	G	G	G	G
Calcium chloride, 20%	G	G	G	G
Calcium hydroxide, 10%	G	G	G	G
Carbon dioxide	G	E	E	G
Carbon monoxide	G	E	E	E
Chlorine gas, dry	G	G	G	G
Chlorine gas, wet	U	U	U	U
Chromic acid, 10%	U	G	E	E
Citric acid, 5%	G	E	E	E
Ethyl acetate	G	E	E	G
Ethyl alcohol	G	E	E	G
Ethylene glycol	G	E	E	G
Ferric chloride, 50%	U	U	U	U
Formic acid - Anhydrous	U	E	E	E
Gasoline, Unleaded	G	G	G	G
Hydrochloric acid, 20%	U	U	U	U
Hydrochloric acid, 35%	U	U	U	U
Hydrocyanic acid, 10%	U	G	G	G
Hydrofluoric acid - dilute	U	U	U	U
Hydrofluoric acid, 48%	I	U	U	U
Hydrogen	G	E	E	E
Hydrogen peroxide - dilute	U	E	E	G

CHEMICAL	FRELON GOLD®	BARE ALUMINUM	STANDARD & HARD COAT ANODIZED ALUMINUM	.316 STAINLESS STEEL
Hydrogen sulfide, dry	U	G	E	E
JP-4	G	G	G	G
Kerosene	G	G	G	G
Lactic acid, 10%	G	G	G	E
Magnesium chloride, 50%	G	U	U	G
Mercury	U	U	U	E
Methyl alcohol	G	G	G	G
Methyl ethyl ketone	G	G	G	G
Methylene chloride	G	E	E	G
Mineral oil	G	G	G	G
Naptha	G	G	G	G
Nitric acid, 70%	U	U	U	E
Phosphoric acid, 10%	U	U	U	E
Sodium chloride	G	U	U	E
Sodium hydroxide, 20%	G	U	U	G
Sodium hypochlorite, 20%	U	G	G	U
Sodium peroxide, 10%	U	G	G	G
Steam (see water)	-	-	-	-
Sulfur dioxide, wet	U	U	U	G
Sulfur dioxide, dry	G	G	G	G
Sulfur trioxide	U	G	G	G
Sulfuric acid, 50%	U	U	U	U
Sulfurous acid	U	G	G	E
Toluene (122°F / 50°C)	G	E	E	E
Turpentine	G	G	E	E
Water, demineralized	U	G	E	E
Water, distilled	G	U	S	G
Sea Water	G	G	E	G
Water, sewage	G	U	S	G
Xylene	G	G	G	G
Zinc chloride solutions	U	U	U	G

NOTE: This information was compiled for Pacific Bearing® Company by Materials Engineering, Inc. of Virgil, IL. This specification information is believed to be accurate and reliable, however, no liability is assumed. INFORMATION IS FOR REFERENCE ONLY. USER MUST TEST SPECIFIC APPLICATIONS.