

Chemical Resistance Charts

WARNING

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DANGER

Variations in chemical behavior due to factors such as temperature, pressure, and concentration can cause equipment to fail, even though it passed an initial test.

SERIOUS INJURY MAY RESULT.

Use suitable guards and/or personal protection when handling chemicals.

Ratings—Chemical Behavior

- A – No effect
- B – Minor effect
- C – Moderate effect
- D – Severe effect; not recommended
- No data available

CHEMICAL	Plastics										Elastomers					Metals					Non-metals																
	ABS plastic	Acetal (Delrin®)	CPVC	Epoxy	Hytrel®	LDPE	NORLYL®	Nylon	Polycarbonate	Polypropylene	PPS (Ryton®)	PTFE (Teflon®)	PVC	PVDF (Kynar®)	Buna N (Nitrile)	EPDM	Hypalon®	Kel-F®	Natural rubber	Neoprene	Silicone	Tygon® (R-3603)	Viton®	304 stainless steel	316 stainless steel	Aluminum	Brass	Bronze	Carpenter 20	Cast iron	Copper	Hastelloy-C®	Titanium	Carbon graphite	Ceramic Al ₂ O ₃	Ceramic magnet	
Acetaldehyde	D	A	D	A	-	C	-	A	C ¹	A ¹	A	A	D	D	D	A	C	A	C	C	A	D	D	A	A	B	A	A	-	C	-	-	A	A	-	-	
Acetamide	-	A	-	A	-	A	-	A	D	A	A	A	D	D	C	A	C	A	C	C	D	B	D	B	A	B	A	A	-	D	-	-	-	A	-	-	
Acetate Solvent	-	-	C	A	-	A	D	A	-	B ¹	A	A	D	C	C	A	C	A	C	C	B	D	D	D	B	A	A	C	A	D	A	A	A	A	-	-	
Acetic Acid	D	D	C	C	-	A ²	A	D	B ¹	B	A	A	D	C	C	A	C	A	C	C	C	B	D	B	D	B	B	D	C	A	D	B	A	A	A	A	A
Acetic Acid 20%	C	C	A	A ¹	-	A	A	D	A ¹	A	A	A	D	C	B	A	A	A	B	B	C	B	D	B	D	B	B	D	C	A	D	B	A	A	A	A	A
Acetic Acid 80%	D	D	C	B ¹	-	D	A	D	B ¹	A ¹	A	A	C	C	C	A	C	A	C	C	C	B	D	B	D	B	B	D	C	A	D	B	A	A	A	A	A
Acetic Acid, Glacial	D	D	D	B ¹	B ¹	A ¹	D	A	B	B ¹	A ¹	A	A	D	B ¹	C	B	A	A ²	C	D	B	D	C	B	A	B	-	A	D	B	A	A	A	A	A	
Acetic Anhydride	C ¹	D	D	C	C	D	D	A	D	B ¹	A	A	D	B ¹	D	B	A	A	C	C	A	C	D	D	B	A	A	D	C	B	D	B	A	A	A	A	A
Acetone	D	A	D	B ¹	B	B ¹	D	A	D	A	A	A	D	D	D	A	C	A	C	C	C	D	D	D	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetyl Bromide	-	-	-	-	-	D	-	D	-	-	-	A	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Acetyl Chloride (dry)	D	D	C	D	-	D	D	B	D	D	A	A	C	A ²	D	D	D	A	D	D	C	D	A	A	A	D	D	-	B	B	A	A	-	-	-	-	
Acetylene	-	A	C	A	A	D	-	A	D	A ¹	-	A	A	C	B	A	B	A	D	D	B	B	A ¹	A	A	A	B	C	A	A	D	-	-	A	A	-	
Acrylonitrile	D	-	A	A	-	A	-	A ¹	D	A ¹	-	A	B ¹	A ¹	D	D	C	-	B ¹	C	C	D	D	A ¹	A ¹	B ¹	A	-	A ¹	A ¹	A	B	-	A ²	-	-	
Adipic Acid	-	-	A ²	A	-	A	-	-	-	B ²	-	A	A ²	A ²	C	A ²	-	A ¹	A ¹	C	-	D	A ²	A ¹	A ²	A	A	-	-	A	D	-	-	A ²	-	-	
Alcohols: Amyl	-	A	A ²	B	-	B ²	C	A ¹	B ¹	B ¹	A	A	A ²	A	C	A	A	B	B	A	D	A ²	B	A	B	A	A	A	B	A	A	B	A	A	A		
Benzyl	D	A	A	C	-	D	D	B ¹	-	A	A	A	A ²	A	D	B	C	A	B	D	C	-	D	A	B	B	B	-	A	A	B	B	A	A	A	A	A
Butyl	A ¹	A	A ²	A	-	A	A	D	A ²	A	A	A	A ²	A	C	B	A	-	A	C	B	-	D	A	A	B	A	-	A	A	B	A	A	A	A	A	A
Diacetone	B ¹	A	-	A	-	B ¹	A	A	-	B ²	-	A	B ¹	A ¹	D	A	D	B ¹	D	D	D	B ¹	D	A	A	A ¹	A	A	A	A	-	A	A	A	A	-	
Ethyl	B ¹	A ¹	B	A ²	-	B	A ¹	A ¹	B ²	A	-	A	C	-	C	A	A	A	A	A	B	C	A	A	A	B	A	A	A	B	A	A	A	A	A	A	
Hexyl	-	A	-	A	-	A	A	A	-	-	-	A	A ²	-	A	C	B	-	A	A	B	-	A	A	A	A	-	A	A	A	-	A	A	-	-	-	
Isobutyl	B	A	-	A	-	A ²	A	A ¹	-	A ¹	-	A ²	A ¹	-	B	A	A	-	A	B	A	A ¹	A	A	B	B	-	A	A	C	-	A	B	A	A	A	
Isopropyl	-	A	C	A	-	A ²	A ¹	D	A ²	A ¹	-	A ²	A ¹	-	B	A	A	-	A	B	A	A ¹	A	A	B	B	-	A	A	A	B	A	B	A	A	A	
Methyl	D	A	A	B ¹	B	A ¹	A	A	B ¹	B ¹	A ²	A	A	A ¹	A	A	B	A	A ¹	A	B	A	A	A	A	A ¹	A	A	A	A	B ¹	A	B	A	A	A	
Octyl	A	A	B ¹	A	-	A	A	A	-	-	-	-	-	-	B	A	B	-	B	B	B	-	B	A	A	A	-	A	A	A	A	C	A	A	-	-	
Propyl	B ¹	A	A ²	A	-	A ²	A ²	D	-	A	A	A	A ¹	A ²	A	A	A	-	A	A	A	A ¹	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Aluminum Chloride	A	-	A	A ¹	C	B ²	A	D	A ¹	A	A	A	A ²	A	A	A	B	A	A	A	B	A ²	A	B	D	D	D	D	B ¹	D	B	A	B	A	A	-	
Aluminum Chloride 20%	-	C	A	A ¹	-	B ²	A	D	A ¹	A	A	A	A ²	A	A	A	B	A	A	A	B	A ¹	A	D	C ¹	D	D	D	C ¹	D	-	A	B	A	A	B	
Aluminum Fluoride	A	C	A	B ¹	-	A ²	A ¹	A ¹	-	A	-	A	A ²	A	A	A	A	-	B	D	A	B ²	A	D	D	B ¹	-	-	C ¹	D	D	B	A	A	-	B	
Aluminum Hydroxide	B	A	A	B ¹	-	A ²	A	A ¹	B ¹	A	-	A	A ²	A	A	A	A ²	A ¹	D	A	A	-	A ²	A	A ¹	C ¹	B ¹	B	C	A ¹	A	D	B	B ¹	A	-	-
Aluminum Nitrate	-	B ¹	A	A ²	-	A ²	-	A ¹	A ¹	A ²	-	A	B ²	A ²	A ²	A ²	A ²	A ¹	A ¹	A ¹	B ¹	B ²	A ²	A	A	D	-	-	-	-	-	-	-	A ²	-	-	
Aluminum Potassium Sulfate 10%	-	C	B	A ¹	-	A ²	A ²	D	A ¹	A	-	A	A ²	B	A	A	A	A	A	A	A	A ²	A	A	A	C	A	-	A	D	A ²	C	A	A	-	-	
Aluminum Potassium Sulfate 100%	-	C	B	A ¹	-	A ²	A ²	D	A ¹	A	-	A	A ²	B	A	A	A	A	A	A	A	A ²	A	D	B ²	C	-	-	B	D	B	C	A	A	-	-	
Aluminum Sulfate	A ²	B ¹	A ²	A ²	B ¹	A ²	A	A ²	A	A	A	A	A ²	A	A	A	A	-	A	A	A ²	A	B	B ²	B ¹	B	B	B	D	A ²	B	A	A	A	-		
Alums	-	-	A	A	D	A	-	A	-	A	-	A	-	-	A	A ¹	-	-	-	B	A ¹	-	A	A	A	-	A	-	A	D	C	B	A	-	-	-	
Amines	-	D	D	A ²	A ¹	C ¹	D	D	D	B ²	B	A ²	D	-	D	B	D	A	B	B	B	D	D	A	A	B	B ¹	D	B	D	-	B	B	A	-	-	
Ammonia 10%	-	D	A	A ²	-	C ¹	A ¹	A	D	A ²	A ¹	A	B ¹	A	C	A	D	A	D	C	-	B ¹	D	A	A	A ²	-	D	A ¹	A	-	A	C	A	A	-	
Ammonia Nitrate	-	C	B	A	-	A	A ¹	D	-	A	A	A	B	A	A	A	D	-	-	C	-	B	D	A	A	C	-	D	A	A	-	-	-	-	-	-	
Ammonia, anhydrous	D	D	A ¹	A	D	B ²	B ¹	A ¹	D	A	A ¹	A	A ²	A	B	A	D	A	D	A	C	B	D	A	A ²	A ¹	D	D	A	A	D	B	C	A	A	-	
Ammonia, liquid	-	D	A	A ¹	-	C ¹	-	B ¹	D	A ²	A ¹	A	A ¹	A	C	A	D	A	D	A	-	A ²	D	B ²	A ²	A ¹	D	D	B ²	A	-	B	C	A	A	-	
Ammonium Acetate	-	-	A	-	-	A	-	A	-	A	-	A	-	-	B	A	-	-	-	A	-	A	-	B	A	A	D	D	-	-	-	-	-	-	-	-	
Ammonium Bifluoride	A ²	D	A	A ¹	-	A ²	A	-	-	A	-	A	A ²	A	B	A ²	-	-	-	D	-	A ²	A	D	B ¹	B	-	D	B	D	-	B	-	A	-	-	
Ammonium Carbonate	A ²	D	A	A ²	-	B ²	A ²	A ¹	-	A	A	A	A ²	A	B	A	-	-	A	A	C	A ²	A	B	B	B	D	D	B	B	D	B	A	A	A	A	
Ammonium Caseinate	-	D	-	A	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ammonium Chloride	A ²	B	A ²	A ¹	A ¹	A ²	A	B	A ²	A	A	A	A ²	A	B	A	A	A	A	A	B	C	A ²	A	C	B ²	B ²	D	D	B	D	D	B	A	A	A	A
Ammonium Hydroxide	B	C	A	A ¹	C	A ¹	A	A	D	A	A	A	A	A	D	A	A	A	D	A	A	A	B	A ¹	A ¹	B ²	D	D	A	D	D	B	A	A	A	A	
Ammonium Nitrate	-	A ²	A ²	A ²	B ¹	A ¹	A	A ¹	-	A	A	A	A ²	A	A	A	A	A	C	B	C	A ²	A	A	A	B ¹	D	D	A	B	D	B	A	A	A	-	
Ammonium Oxalate	-	B	-	A	-	-	-	-	A ¹	A	-	A	-	A	D	A	-	-	-	A	-	A	-	A	A	-	-	D	A	D	C	A	-	-	-	-	
Ammonium Persulfate	A ²	D	A	A ¹	-	A ²	A																														

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⚠ WARNING

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- C – Moderate effect
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Barium Chloride	A ²	A	A ¹	A ²	B ¹	A ¹	A	A	A	A	A	A	D	A	A	A	A	A	A	A	B	A	A	A ¹	A ¹	D	B ¹	B ¹	B	B	B ¹	B	A	A	A	A	
Barium Cyanide	B	D	A	—	—	B	—	A ¹	D	—	—	A ¹	D	—	C	A	A	—	—	C	—	—	—	A ¹	A ²	C ¹	C ¹	C ¹	A	D	B	A ¹	B	A	—	—	
Barium Hydroxide	A ²	D	A ²	A ²	B ¹	B ²	A ²	A ¹	D	B	A	A	A ²	A	A	A	A	A	A	A	A	—	—	B ¹	B	D	D	D	D	B ¹	D	—	B	B	A	—	—
Barium Nitrate	B ²	A	A ¹	—	—	B ²	A	A ¹	D	A	A	A ¹	A	—	A ²	A	—	A	A	A	B	—	—	B ¹	B	D	D	D	D	B	A	B	—	A	A	—	—
Barium Sulfate	A ²	B ²	B ¹	A ²	D	B ²	A ¹	A ¹	D	B ¹	A	A	B ¹	A	A	A	A	A	A	A	A	—	—	B ¹	B ¹	B	B	C	B	B	B	A	B	A	—	—	
Barium Sulfide	A ²	A	A ²	B ²	—	B ²	A ²	A ¹	—	B	—	A	A ²	A	A	A	A	A	A	A	A	—	—	B ¹	B ²	D	D	D	D	A ¹	D	D	—	A	A	—	—
Beer	A ²	A ¹	A ²	A ²	A ¹	A ²	A ¹	A ¹	A ²	A ¹	A ²	A	A ²	A	A	A	A	A	A	A	A	—	—	A	A	A	B	A ¹	A	D	B	A ¹	B	A	—	—	
Beet Sugar Liquids	B	B	A ²	A ¹	—	A ¹	A	A	—	A ¹	A ¹	A ²	A	A	A	A	A	A	A	A	A	—	—	A	A	A	—	C	A	A	—	A	A	—	—		
Benzaldehyde	B	A	D	D	B	A ¹	B	A ¹	D	D	A	A ¹	D	A ²	D	A	D	A	D	D	D	D	D	B	B	B	—	A	A	A	B	A	A	—	—		
Benzene	D	A ¹	D	C ¹	C	D	D	A ¹	D	D	A	A	C ¹	A ²	D	D	D	B	D	D	D	D	A	B	B	B	—	A	A	A	B	B	A	—	—		
Benzene Sulfonic Acid	—	—	D	B	B	A ¹	A	D	D	D	A	A	A	—	D	D	D	—	A	D	D	D	A	B	B	D	—	—	A	—	—	B	B	A	—	—	
Benzoic Acid	—	B	A	A ¹	D	A ¹	B	D	B ¹	B ¹	A ¹	A ²	A	A	D	D	D	A	D	B	D	A	B	B	D	—	B	A	D	—	B	B	A	—	—		
Benzoic Acid	D	A	—	A ¹	C	C ¹	B	D	D	B	A	A	—	A	D	D	D	A	D	D	D	C ¹	A	A ¹	A ¹	B ¹	—	A	A	A	B	B	A	—	—		
Benzol	D	A	—	—	—	—	—	—	—	A ¹	—	A ²	—	—	—	—	—	A ²	—	—	A ¹	—	—	D	D	—	—	—	—	—	C	—	—	—	—		
Benzonitrile	D	A	—	—	—	—	D	A ²	—	C ¹	—	—	—	—	D	D	D	—	D	D	D	—	—	C ¹	B ¹	D	—	D	—	—	D	C	—	—	—	—	
Benzyl Chloride	D	A	—	—	—	—	D	A ²	—	C ¹	—	—	—	—	D	D	D	—	D	D	D	—	—	C ¹	B ¹	D	—	D	—	—	D	C	—	—	—	—	
Bleaching Liquors	—	—	—	D	—	A ¹	—	C	—	A	—	A ¹	—	—	D	A	A	—	D	B	—	A	—	—	—	—	—	—	A	—	—	—	A	—	—		
Borax (Sodium Borate)	—	B	A	A ¹	A ¹	A ²	A ¹	A	—	B	—	A	A ¹	A	B	A	A	A	A	A	B	—	—	A	A	B ¹	—	B	A	—	B	B	A	—	—		
Boric Acid	—	A	A	A ¹	A ¹	A ²	A ¹	B	—	A	—	A	A ²	A	A	A	A	A	A	D	A	A	A	B ²	A ¹	D	—	B	B ²	D	B	A	A	—	—		
Brewery Slop	—	B	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	D	A	—	—	A	A	—	—	A	A	—	—	—	—	—	—		
Bromine	D	D	D	D	D	D	A ¹	D	C ¹	D	D	A	C ¹	A	D	D	D	A	D	D	D	A	D	D	D	D	—	D	D	—	D	A	A	—	—		
Butadiene	—	A	A ¹	A ¹	—	D	D	C ¹	D	C	A ¹	A ²	C ¹	A	D	C	B	A	D	B	D	A	B	A	A ¹	A	—	C	A	—	C	—	—	—	—		
Butane	B	A	C ¹	A ¹	—	C ¹	D	A ²	D	A ¹	A	A	C ¹	A	A	D	B	A	D	A	D	A	A	A ²	A ²	A	—	C	A	—	C	A	A	—	—		
Butanol (Butyl Alcohol)	—	A	A	D	B ¹	B ²	A	B ¹	B ¹	A ¹	A	A ²	C ¹	A	A	A	A	A ¹	A	A	B	D	A	A	A ¹	B	—	A	A	—	B	B	A	—	—		
Butter	B	A	—	A	—	—	B	—	—	—	—	A	—	—	A	A	B	—	D	B	B	A	A	C	A	A	—	D	—	—	—	—	—	—	—		
Buttermilk	B	A	A ¹	A ¹	—	A ¹	A	B ¹	A ¹	A ¹	—	A	A ¹	—	A	A ¹	—	A	D	B	A	A	A	A	A	A	—	D	—	—	A	—	—	—	—		
Butyl Amine	—	C ¹	—	B ²	—	C ¹	D	A ²	D	B ¹	D	A ²	D	A ¹	—	—	—	D	D	B ¹	D	D	—	A	A ²	—	B	—	—	—	B ²	B ²	A ²	—	—		
Butyl Ether	—	D	D	A ¹	—	—	D	A ²	—	D	A ²	A ¹	A ²	A ¹	B ²	D	—	A ¹	D	D	D	A ²	D	—	A ¹	A ¹	—	—	—	—	—	—	—	—	—		
Butyl Phthalate	—	—	D	B ²	—	C ¹	A ²	A ²	D	B ²	A	A ²	—	B ¹	D	B ²	D	A ¹	D	D	A ¹	—	C ¹	B ¹	B ²	B ²	—	—	—	—	B ²	B	A ²	—	—		
Butylacetate	—	A	C ¹	B ¹	B	C ¹	B	A	D	B ¹	A	A	D	B ²	D	B	D	A ¹	D	D	D	D	D	B	A	A	A	A	A	B ¹	A	A	A	A	—	—	
Butylene	—	A	A	A ¹	—	B ¹	—	B ¹	D	—	A	A	A ¹	A	A	D	D	B ¹	D	D	D	—	A	A	A	A	—	D	—	—	A	—	—	—	—		
Butyric Acid	D	A	D	A	B ¹	D	D	C ¹	D	B ¹	A	A ²	B ¹	A	D	B	D	A	D	D	D	B ¹	A	B ²	B ²	B	—	D	B	D	C	A ¹	A	—	—		
Calcium Bisulfate	—	—	—	A	—	—	—	—	D	—	—	—	—	—	A	A	—	—	A	C	—	—	—	—	A	—	—	C	—	—	—	—	—	—	—		
Calcium Bisulfide	—	D	A ¹	A	B ¹	B ¹	A	A	—	A	—	A ²	A	A	A ¹	C	—	A	D	A	C	—	A	B	B	C	—	C	B	—	—	A	A	—	—		
Calcium Bisulfite	—	D	A ¹	A ¹	B	A ¹	A ¹	A ²	D	A	A	A	B ²	A	A	D	A	A	D	A	A	—	A	B	A	D	—	—	B ¹	—	—	B	A	—	—		
Calcium Carbonate	—	A	A	A ¹	—	B ¹	A ²	A	C ²	A	—	A	C ²	A	A	A	A	—	A	A	A	—	A	A ¹	B	D	—	A	A	—	B	B	A	—	—		
Calcium Chlorate	—	A	A ¹	—	—	—	—	—	—	—	—	A	B ²	A	A	A	B	—	A	—	—	A	—	—	—	—	—	—	—	A	—	—	—	—	—		
Calcium Chloride (30% in water)	B	D	A ²	A ¹	A ¹	B ²	A	A ¹	—	A ²	A	A	C	A	A	A	A	A	A	A	A	A	A	C ¹	B ²	D	—	A	B	C	B	A	A	—	—		
Calcium Hydroxide	—	D	A ²	A ¹	B ¹	A ²	A ²	A ²	D	A ²	A	A	B	A ²	A	A	A	A	A	A	B ²	A	A	B ¹	B	C ¹	—	D	B	A	—	A	A	—	—		
Calcium Hypochlorite	—	D	B ¹	A ¹	C ¹	A ¹	A	D	D	A ¹	A	A	B ¹	A	C ¹	B ¹	A	B ¹	D	D	B	A	A	C ¹	B ¹	D	—	D	C	D	—	B	A ¹	A	—	—	
Calcium Nitrate	A	D	A ²	A ²	—	A ¹	A ²	A ¹	A ²	A ¹	A	A ²	A ²	A ²	A ²	A ²	A ¹	A ¹	A ¹	A ²	B ¹	A ²	A ²	A ²	B ¹	A ²	—	B ²	—	—	—	B ²	A ²	A	—		
Calcium Oxide	D	A	A	A	A	B ¹	A	B	—	A	A	A	B	A	A	A	A	—	B	A	C	B	A	A	A	C	—	D	A	—	A	A	—	—	—		
Calcium Sulfate	C	D	A ²	A ²	—	B ¹	A	D	A ²	A	A	A	B ²	A	A ²	A	A	A	B	B	—	A	A	B	B	C	—	A	B ¹	A	—	B	A	—	—		
Calgon	—	A	—	A	—	—	A	A	—	A	—	—	—	—	A	A	A	—	A	A	—	A	—	A	A	—	—	C	—	—	—	—	—	—	—		
Cane Juice	—	A	A ²	A	—	—	A	—	A	C ¹	—	A	A ¹	A ¹	A	A	A	—	A	A	A	A	A	A	A	B	—	A	A	—	—	—	—	—	—		
Carbolic Acid (Phenol)	D	D	B																																		

Chemical Resistance Charts

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Variations in chemical behavior due to factors such as temperature, pressure, and concentration can cause equipment to fail, even though it passed an initial test.

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Ratings— Chemical Behavior

- A – No effect
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- No data available

CHEMICAL	Plastics								Elastomers						Metals					Non-metals																							
	ABS plastic	Acetal (Delrin®)	CPVC	Epoxy	Hytrel®	LDPE	NORYL®	Nylon	Polycarbonate	Polypropylene	PPS (Ryton®)	PTFE (Teflon®)	PVC	PVDF (Kynar®)	Buna N (Nitrile)	EPDM	Hypalon®	Kei-F®	Natural rubber	Neoprene	Silicone	Tygon® (R-3603)	Viton®	304 stainless steel	316 stainless steel	Aluminum	Brass	Bronze	Carpenter 20	Cast iron	Copper	Hastelloy-C®	Titanium	Carbon graphite	Ceramic Al ₂ O ₃	Ceramic magnet							
Chloroform	D	A	D	C	D	C	D	A	D	C	A	A	D	A	D	D	D	B	D	D	D	D	A	A	A	B	B	B	A	B	A	A	A	A	A	A	A						
Chlorosulfonic Acid	-	D	D	C	D	D	D	A	C	D	D	A	D	D	D	D	D	A	D	D	D	D	D	D	D	B	B	D	D	D	D	D	A	A	A	A	A						
Chocolate Syrup	-	A	-	A	-	-	A	A	A	A	-	A	-	-	A	A	-	-	-	D	D	-	-	D	D	A	A	-	D	D	D	D	-	-	-	-	-						
Chromic Acid 5%	B	D	A	D	D	D	A	-	B	D	A	A	A	A	D	A	B	A	B	D	C	B	A	B	B	D	D	B	D	D	D	B	A	A	A	A	A						
Chromic Acid 10%	B	D	A	D	D	D	A	-	B	D	A	A	A	A	D	C	C	A	D	D	C	C	B	B	B	D	D	B	D	D	D	D	A	A	A	A	A						
Chromic Acid 30%	B	D	A	D	D	D	D	-	C	D	B	A	A	A	D	B	C	A	D	D	C	B	A	B	B	D	D	D	D	D	D	D	A	A	A	A	-						
Chromic Acid 50%	D	D	D	D	D	D	D	-	D	D	A	A	D	A	D	B	C	A	D	D	C	B	A	C	B	D	D	D	D	D	D	D	B	A	A	A	A						
Chromium Salts	-	-	-	-	B	B	-	B	-	-	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Cider	-	A	-	A	B	B	A	-	A	A	-	A	-	-	A	A	C	A	-	A	B	-	A	A	B	-	-	-	A	D	-	-	-	-	-	-	-						
Citric Acid	D	B	B	A	A	D	A	A	A	A	-	A	B	A	A	A	C	A	A	A	A	-	A	A	A	A	C	D	B	D	D	A	A	A	A	A	A						
Citric Oils	-	B	-	A	-	-	A	-	-	-	-	-	-	-	A	B	-	-	-	D	-	-	A	A	A	C	-	A	D	D	-	-	-	-	-	-	-						
Clorox® (Bleach)	B	D	A	D	-	-	A	A	-	D	D	A	A	-	D	B	B	D	D	B	-	B	A	A	A	A	-	-	A	D	-	-	-	-	-	-	-						
Coffee	-	A	A	A	-	-	A	A	-	A	-	-	-	-	A	A	A	-	A	A	-	-	A	A	A	A	-	-	D	-	-	-	-	-	-	-	-						
Copper Chloride	A	A	A	A	A	-	A	D	-	A	A	A	A	A	A	A	C	A	C	A	A	A	A	D	D	-	-	D	B	A	-	-	-	-	A	A	A						
Copper Cyanide	-	A	A	B	-	B	A	D	D	A	A	A	A	A	A	A	C	-	A	A	A	-	A	A	B	D	D	D	D	B	-	-	-	-	A	A	A						
Copper Fluoroborate	-	B	A	A	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	A	-	A	A	D	D	-	-	-	D	D	-	-	-	-	-	-	-						
Copper Nitrate	-	A	A	A	-	B	A	D	D	A	A	A	A	A	A	-	-	A	C	A	-	B	A	A	A	D	D	D	A	D	D	B	B	A	A	A	A						
Copper Sulfate 5%	-	D	A	A	A	A	A	D	A	A	A	A	A	A	A	A	C	A	C	A	A	A	A	B	B	D	D	B	A	D	B	A	A	A	A	A	A						
Copper Sulfate >5% Cream	-	A	A	A	-	-	A	A	-	A	-	A	-	-	A	-	-	-	-	D	-	-	A	A	A	A	-	A	D	D	-	-	-	-	-	-	-						
Cresols	D	D	D	A	D	C	D	D	D	D	A	-	D	A	D	D	D	A	D	D	D	D	A	A	A	A	-	A	A	C	A	B	B	A	A	-	-						
Cresylic Acid	-	D	D	-	-	B	-	D	D	A	-	A	D	B	D	D	D	-	D	D	D	-	A	A	A	B	-	D	A	C	A	B	B	A	A	-	-						
Cupric Acid	-	-	-	A	2	B	1	A	2	A	A	A	A	2	B	2	A	2	B	2	A	2	A	2	D	B	2	-	-	D	D	-	-	-	-	A	2	-					
Cyanic Acid	-	D	-	A	1	-	-	-	-	-	-	A	-	-	C	-	-	-	-	C	A	1	-	A	A	-	-	-	D	D	-	-	-	-	-	-	-						
Cyclohexane	-	A	D	A	2	A	1	B	1	D	A	B	D	A	A	D	A	D	B	D	D	A	D	D	D	A	A	1	A	A	B	A	2	B	B	B	A	A	-	A			
Cyclohexanone	D	A	D	C	-	D	D	A	D	D	A	A	D	D	D	B	-	A	1	D	B	D	D	D	A	1	A	B	-	B	B	A	1	A	A	A							
Detergents	B	A	A	A	1	D	A	A	1	A	A	A	A	A	A	B	A	B	D	B	A	A	B	A	A	A	-	B	A	2	-	-	-	-	A	A	A						
Diacetone Alcohol	-	-	D	A	-	A	-	A	1	D	A	D	D	-	A	D	D	D	D	D	-	D	D	D	-	-	-	-	-	-	-	-	-	A	-	-							
Dichlorobenzene	D	-	D	A	-	-	-	D	D	C	1	-	-	-	A	D	D	D	D	D	-	D	D	D	-	-	-	-	-	-	-	-	-	A	2	-							
Dichloroethane	D	A	D	D	-	C	1	A	1	D	A	-	-	-	A	1	D	A	D	-	D	C	B	B	B	B	D	-	-	-	-	-	-	A	A	-							
Diesel Fuel	-	A	A	1	A	-	C	1	A	2	A	1	-	A	A	A	1	A	A	A	A	1	A	A	A	A	-	A	A	A	A	B	B	A	A	-	-						
Diethyl Ether	D	-	D	D	C	-	-	A	1	D	A	1	-	A	A	D	A	1	A	D	D	C	D	D	D	-	D	B	1	B	B	A	1	A	2	-							
Diethylamine	D	B	D	A	-	D	-	A	D	D	A	-	-	D	D	D	D	A	C	B	C	A	A	A	B	A	A	A	A	B	A	A	A	A	A	-	-						
Diethylene Glycol	B	A	A	1	C	-	B	2	A	1	B	1	A	2	-	D	C	1	A	A	2	B	1	A	2	A	1	A	B	1	-	A	A	-	-	-	-	A	2	-			
Dimethyl Aniline	D	D	D	A	1	-	-	D	A	D	D	A	A	A	1	D	B	2	-	A	2	D	D	D	D	D	B	2	B	2	A	2	A	2	-								
Dimethyl Formamide	D	D	D	D	-	A	D	A	D	A	A	A	D	D	D	B	D	A	C	D	C	D	C	A	B	A	1	-	-	-	-	-	-	-	-	-	-						
Diphenyl	-	D	-	-	-	-	-	-	-	D	-	A	-	-	D	D	B	B	D	B	D	-	A	2	B	B	B	B	-	-	-	-	-	-	-	-	-						
Diphenyl Oxide	-	D	-	A	-	-	-	-	-	D	-	A	1	D	B	2	-	-	-	-	D	C	D	A	B	1	A	B	1	-	A	A	A	B	1	A	-	-	-				
Dyes	-	C	-	A	-	-	A	A	-	-	-	-	B	-	-	-	-	-	-	C	-	C	A	A	B	A	-	-	C	-	-	-	-	-	-	-	-						
Epsom Salts (Magnesium Sulfate)	B	2	B	A	1	A	-	A	2	A	1	A	1	A	A	A	A	A	B	A	A	A	A	A	B	A	A	A	C	A	A	B	A	1	A	-	-						
Ethane	-	A	1	A	1	-	-	-	D	-	D	-	-	-	-	A	1	A	A	D	B	-	D	B	D	A	A	A	A	-	-	-	-	A	-	-							
Ethanol	B	1	A	B	A	2	-	B	1	A	1	B	2	A	-	A	C	-	-	C	A	A	A	B	A	B	C	A	A	B	A	A	A	A	A	A	A						
Ethanolamine	-	D	-	A	1	-	-	A	A	-	D	-	-	-	A	1	D	C	1	B	B	C	A	D	B	A	B	-	A	A	-	D	B	B	A	A	-	-					
Ether	D	A	1	D	A	1	-	D	A	A	1	D	B	1	A	D	C	D	B	1	D	D	D	D	C	B	A	A	B	1	B	1	A	A	-	-							
Ethyl Acetate	D	A	D	A	B	A	A	A	2	D	A	1	-	A	A	D	D	A	D	B	D	A	1	C	B	B	A	B	A	A	A	A	A	A	A	A	A						
Ethyl Benzoate	D	-	D	-	-	C	2	A	2	-	D	B	1	-	A	D	D	D	D	-	-	-	D	D	D	A	1	-	-	-	-	-	-	-	-	-							
Ethyl Chloride	D	A	1	D	C	C	C	1	D	A	1	D	D	A	A	D	A	D	A	A	D	B	D	A	A	D	A	A	B	B	B	A	A	A	C	B	B	1	A	A	-	-	
Ethyl Ether	D	A	1	D	A	2	-	D	D	A	1	-	D	A	A	D	A	2	A	A	D	A	2	A	A	D	A	B	B	B	1	B	A	A	A	C	A	B	1	A	A	2	-
Ethyl Sulfate	D	-	-	A	1	-	-	-	-	-	-	-	-	-	A	-	-	-	A	-	-	A	-	-	-	-	-	A	-	-	-	-	-	A	-	-							
Ethylene Bromide	D	-	D	-	-	D	-	-	D	D	-	A	D	A	-	A	D	A	D	C	C	B	C	C	D	D	A	A	A	B	-	B	B	A	-	-							
Ethylene Chloride	D	A	1	D	D	-	D	D	A	D	C	1	-	A	A	D	A	A	D	D	A	D	D	-	B	B	B	B	-	A	-	-	-	B	1	A	A	-	A				
Ethylene Chlorohydrin	D	D	D	D	-	D	-	D	D	D	-	A	D	A	D	B	C	-	C	A	C	D	A	B	A	C	D	A	C	C	D	A	B	A	A	-	-						
Ethylene Diamine	D	D	D	A	1	-	A	D	A	2	-	-	-	A	A	D	B	A	A	A	B	D	B	B	A	-	B	B	1	B	1	D	B	-	-	-	D	C	A	-	-	-	
Ethylene Dichloride	D	B	1	D	D	C	C	D	D	A	1	D	D	A	A	D	A	A	D	C	D	A	1	D	D	D	D	A	B														

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Latex	B	B	-	A	-	-	-	A ¹	-	A ²	-	A	-	A	A	A	-	-	-	-	-	-	A ²	A ²	D	-	-	-	A	-	-	-	-	-	-	-	-	-	-		
Lead Acetate	B	B	A ²	A	-	A ²	A ¹	A	-	A ¹	A	-	A ²	A	A	B	D	A	-	A	A	B	D	A	A	D	-	-	-	A	-	-	-	-	-	-	-	-	-		
Lead Nitrate	B	-	A ²	-	-	A ²	A ¹	-	-	A ¹	A	-	A ²	A	A	B	D	A	-	A	A	B	D	A	A	D	-	-	-	A	-	-	-	-	-	-	-	-	-		
Lead Sulfamate	-	A	-	A	-	A ¹	-	B ¹	A ¹	A ²	-	B	B	A	A	A	-	B	A	-	A	B	A	A	C	C	C	C	-	-	-	-	-	-	-	-	-	-	-	-	
Ligroin	-	B	-	A	-	A	-	D	-	A ²	-	A	-	A	A	D	C	-	D	-	A	D	A	A	A	D	-	-	-	A	-	-	-	-	-	-	-	-	-	-	
Lime	-	B	-	A	-	A	-	A ¹	-	-	-	A ¹	B	A	A	D	-	-	-	-	-	-	-	A	A	A	-	-	-	A	-	-	-	-	-	-	-	-	-	-	
Linoleic Acid	A	B	A ²	-	-	A	-	-	-	B ¹	-	A	A ²	A ²	B ¹	D	D	-	D	-	B ¹	A ¹	A ²	B ¹	B	A	A ²	A	-	D	-	-	-	-	-	-	-	-	-		
Lithium Chloride	-	A	A ²	-	-	A ²	-	-	-	B ¹	A ²	-	A	D	A ²	A ²	A ¹	-	-	-	B ¹	A ¹	A ¹	A ²	A ¹	A ¹	A ²	D	-	-	-	-	-	-	-	-	-	-	-		
Lithium Hydroxide	-	-	-	-	-	-	-	-	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lubricants	-	A	-	-	A	D	C ¹	A ¹	A ¹	A ¹	A ¹	A	A	B ²	A	A	D	A	-	D	D	B	A	A ²	A ²	A ²	-	-	-	A	A	A	A	A	A	A	A	A	-	-	
Lye: KOH Potassium Hydroxide	A	A	A	A	D	A	A ¹	C	D	A	A	A	B	A	A	B	A	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Lye: NaOH Sodium Hydroxide	C	C	A	A	C	D	D	A	A	D	A	A	A	D	A	A	A	A	A	A	B ¹	A ²	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Lye: Ca(OH) ₂ Calcium Hydroxide	-	D	A ²	A ¹	B ¹	A ²	A ²	A ²	D	A ²	A ²	A	A	B ²	A ²	A	A	A	A ²	B ²	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium Bisulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium Carbonate	B	A	A ²	A	-	B	A ²	-	A ¹	A	A	-	A ¹	B	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium Chloride	B	B ¹	A	A	C	A ¹	A ¹	A ¹	A ²	A ²	A ¹	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Magnesium Hydroxide	B	A	A	A	C	A ²	A ²	B ¹	A ¹	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Magnesium Nitrate	B	A	A	-	-	A ²	A ¹	A ¹	A ¹	A	A	A	A ²	A	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium Oxide	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Magnesium Sulfate (Epsom Salts)	B ²	B	A ¹	A	-	A ²	A ¹	A ¹	A ¹	A	A	A	A ¹	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Maleic Acid	-	A	A	-	-	B ²	A ¹	A	-	A	-	A	A ²	A	D	D	D	-	B	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Maleic Anhydride	-	D	A	-	-	D	-	-	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Malic Acid	-	A	-	-	-	B ²	-	-	-	A ¹	-	A	A ²	A	A	D	D	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese Sulfate	B ²	A ¹	A	-	-	A ¹	A ²	A ²	A ¹	-	A ²	A	C	A ²	A ²	A	A	-	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mash	-	A	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mayonnaise	-	A	-	A	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Melamine	-	A	A ²	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercuric Chloride (dilute)	B	B	A	A	B	A	A ²	D	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Mercuric Cyanide	B	-	A	A	-	A	-	A ²	-	B	A	B	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercurous Nitrate	C ²	-	A ²	-	-	A	A ²	-	A ²	A	-	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	B	A	A	A	-	A	A ¹	A	D	B	-	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methane	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanol (Methyl Alcohol)	D	A	A	B ¹	B	A ¹	A	B ¹	B ¹	A ²	A	A	A ¹	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Methyl Acetate	D	B	-	D	-	B ¹	-	A ²	D	D	-	A	D	B ¹	D	B	D	A	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Methyl Acetone	-	D	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Acrylate	-	B	-	A	-	-	-	-	-	D	-	-	-	-	B ¹	D	B	D	-	D	B	D	-	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Methyl Alcohol 10%	D	A	A	B ¹	B	A ¹	A ²	B ¹	B ¹	A ²	A	A	A ¹	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Methyl Bromide	D	D	D	B	-	C ¹	-	-	-	B ¹	-	A	D	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Butyl Ketone	-	D	-	C	-	-	-	-	-	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Cellosolve	-	D	D	C	-	-	-	-	-	C	D	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Chloride	D	B	D	A	-	C ¹	D	B ¹	D	D	B	A	D	A	D	D	D	A	D	D	D	D	A ¹	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Methyl Dichloride	-	D	-	A	-	-	-	-	-	C	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	D	C	D	C ¹	B	D	D	A ¹	D	B ²	A	A	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Methyl Ethyl Ketone Peroxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	D	-	D	C	B	C	D	B ²	D	A	A	A	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Methyl Isopropyl Ketone	-	-	-	A	-	D	D	A	D	-	-	A	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Methacrylate	-	D	-	A	-	-	-	-	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylamine	D	D	-	A	-	A ¹	-	-	-	A																															

Chemical Resistance Charts

WARNING

Ratings— Chemical Behavior

- A – No effect
- B – Minor effect
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- D – Severe effect; not recommended
- No data available

DANGER

Variations in chemical behavior due to factors such as temperature, pressure, and concentration can cause equipment to fail, even though it passed an initial test.

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CHEMICAL	Plastics										Elastomers						Metals					Non-metals														
	ABS plastic	Acetal (Delrin®)	CPVC	Epoxy	Hytrel®	LDPE	NORYL®	Nylon	Polycarbonate	Polypropylene	PPS (Ryton®)	PTFE (Teflon®)	PVC	PVDF (Kynar®)	Buna N (Nitrile)	EPDM	Hypalon®	Kei-F®	Natural rubber	Neoprene	Silicone	Tygon® (R-3603)	Viton®	304 stainless steel	316 stainless steel	Aluminum	Brass	Bronze	Carpenter 20	Cast Iron	Copper	Hastelloy-C®	Titanium	Carbon graphite	Ceramic Al ₂ O ₃	Ceramic magnet
Nitric Acid (20%)	B	D	A ²	B ¹	D	C	B ²	D	B ¹	A ²	C	A	A ¹	A	D	A ¹	D	A ¹	D	D	D	D	A	A	A	D	D	A ¹	D	D	D	A ¹	A ¹	A	A	—
Nitric Acid (50%)	C	D	B ¹	D	D	B ¹	B ²	D	B	B	C	A	B ¹	A ¹	D	D	D	A	D	D	D	D	A	A ²	A ¹	D	D	A ¹	D	D	D	A ¹	A ¹	D	A	C
Nitric Acid (Concentrated)	D	D	D	D	D	C ¹	B ¹	D	C ¹	D	C	A	B ¹	A ¹	D	D	D	A ¹	D	D	D	D	A	A ¹	A ¹	D	D	A ²	D	D	D	B ¹	A ¹	D	A	C
Nitrobenzene	D	C	D	C ¹	D	C ¹	D	B ¹	D	B ¹	A ²	A	D	A ¹	D	B ¹	D	A ¹	D	D	D	D	B	B	B	—	A	C	C	B	D	A	B	—	—	
Nitrogen Fertilizer	—	—	—	—	—	—	—	—	—	—	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Nitromethane	D	A	—	—	C	A	D	B ¹	D	B ²	A ²	A	B ²	A ²	D	B ²	—	A	B ¹	D	D	D	D	A	A ¹	—	—	—	—	—	A	A	—	A ²	—	—
Nitrous Acid	D	—	A	D	—	—	—	—	—	—	—	A	A	B	—	A	—	B	C	D	—	A	B	B	B	D	D	B	A	—	C	D	—	—	—	—
Nitrous Oxide	—	—	—	—	—	C	—	C	—	D	—	A	A	D	—	A	—	—	A	A	—	A	B	B	B	B	B	D	B	—	B	B	—	C	—	—
Oils: Aniline	D	D	—	A	D	—	D	A	—	A	—	A	D	A	D	B	D	—	D	D	D	D	C	A	A	D	D	A	A	A	D	B	D	—	—	—
Anise	—	D	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	D	—	—	—	—	—	—	—	—	A	A	—	—	—	—	—	—
Bay	—	D	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	D	—	—	—	—	—	—	—	—	A	A	—	—	—	—	—	—
Bone	—	D	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	D	—	—	—	—	—	—	—	—	A	A	—	—	—	—	—	—
Castor	A	A	C	A	B ¹	—	—	A	—	A	—	A	A	A	B	B	A	—	A	A	A	A	A	A	A	A	A	—	A	A	A	—	A	—	—	A
Cinnamon	—	D	—	A	—	D	—	D	D	A	—	A	D	A	—	—	—	—	—	C	—	—	A	A	A	—	—	A	—	—	—	—	—	—	—	
Citric	D	A	—	A	—	A	A	A	D	A	—	A	B	A	D	B	—	—	—	D	—	D	A	A	A	A	B	—	D	D	—	A	—	—	—	—
Clove	—	—	—	A	—	—	—	—	—	—	—	A	—	—	A	—	—	—	—	C	—	—	A	A	A	B	—	A	—	—	—	—	—	—	—	
Coconut	A	A	A ¹	A	—	A	—	—	—	A ¹	—	A	A ¹	A	A	D	C	—	D	C	A	A	A	A	A	A	—	A	A	—	—	—	—	—	—	
Cod Liver	A	B	A ¹	A	—	—	—	—	—	A ¹	—	A	A ¹	A	A	A	B	—	D	B	B	—	A	A	A	A	—	A	—	—	—	—	—	—	—	
Corn	B	A	—	A	A	A	A	A	—	A ²	—	A	B	A	D	C	B	—	D	C	A	B	B	A	A	A	—	C	A	B	A	—	—	—	—	
Cottonseed	A	A	A	A ¹	A ¹	A	A	B	—	A	A	A	B ²	A	A	D	B	A ²	D	C	A	B	A	A	A	A	—	A	A	A	A	—	A	A	A	
Creosote	—	D	—	A	D	C	D	D	—	C	—	A	C	—	D	D	D	A	D	C	D	—	A	B	B	B	—	C	—	—	B	A	A	—	—	
Diesel Fuel (20, 30, 40, 50)	—	D	—	A ¹	A ¹	A	D	A	—	C ¹	A	A	B	A	A	D	B	A ¹	D	B	D	A	A	A	A	A	—	A	A	—	B	B	A	—	—	
Fuel (1, 2, 3, 5A, 5B, 6)	D	D	—	A ¹	A	B	A ¹	A	B	B	A	A	A ²	B	B	D	D	A	D	D	C	A	B	A	A	C ¹	B	A	A	A	A	A ¹	B	A	—	—
Ginger	—	A	—	A	—	—	—	—	—	—	—	A	—	A	A	A	—	—	—	A	—	—	A	D	D	—	D	D	—	—	—	—	—	—	—	
Hydraulic Oil (Petro)	—	B	—	A	—	C	—	A ¹	—	D	D	A	A	A	A	D	A	—	D	A	B	A	A	A	A	A	A	A	A	A	A	—	A	—	—	
Hydraulic Oil (Synthetic)	—	—	—	A	—	A	—	A ¹	—	D	—	A	A	A	D	A	A	—	D	A	B	A	A	A	A	A	A	A	A	A	A	—	A	—	—	
Lemon	C	D	—	A	—	—	—	—	—	—	—	A	—	A	—	D	—	—	—	D	—	—	A	A	A	A	—	A	—	—	—	—	—	—	—	
Linseed	—	A	C	A	B ¹	A	A ¹	A ¹	—	A	B	A	A ²	A	A	D	C	—	D	D	A	A	A	A	A	B	B	A	A	—	B	B	A	A	A	A
Mineral	A	A	A	A	A	B ¹	A ¹	A	B	A	A	A	B	A	A	D	B	A	D	B	C	B	A	A	A	A	A	A	—	B	A	—	A	—	—	
Olive	A	A	C	A	—	A ¹	A ²	A ¹	A ²	A	—	A ¹	C	—	D	D	B	—	D	B	D	B	A	A	A	A	—	A	—	—	A	A	A	A	A	
Orange	—	D	—	A	—	C ¹	—	C ¹	—	A	—	C ¹	A	—	A	—	—	—	—	C	D	—	A	A	A	—	A	A	—	—	—	—	—	—	—	
Palm	A	A	A	A	—	A	—	—	—	A	—	A	A	A	A	A	—	—	—	D	—	—	A	A	A	—	A	A	A	A	A	—	A	—	—	
Peanut	—	A	C	A	—	A	—	—	—	D	—	A	A ¹	A	A	D	B	—	D	B	A	A	A	A	A	A	—	A	A	A	A	—	A	—	—	
Peppermint	D	D	—	A	—	—	—	—	—	—	—	A	—	A	D	—	—	—	—	D	—	—	A	A	A	D	—	A	A	—	—	—	—	—	—	—
Pine	D	A	A	A	—	D	—	A	A	B	—	A	D	A	D	D	D	—	D	D	D	D	A	A	A	A	—	D	C	—	—	A	—	—	—	
Rapeseed	—	—	A	A	—	D	—	—	D	—	—	A	—	A	D	A	D	—	D	B	D	—	A	A	A	—	A	A	—	—	—	—	—	—	—	
Rosin	—	—	—	A	—	B ²	—	A ¹	—	A ²	—	A	C ¹	A	A	—	—	—	—	—	—	—	A	A ¹	A ¹	B ¹	—	B ¹	A	—	B	A	—	A	—	—
Sesame Seed	A	D	A	A	—	—	—	—	—	A	—	A	A	A	A	—	—	—	—	D	—	—	A	A	A	—	A	A	A	—	—	—	A	—	—	
Silicone	A	A	A	A	A	A	A ¹	A ¹	—	A	A ¹	A	A	A	A	A	A	—	D	D	C	A	A	A	A	A	—	A	A	A	—	A	A	A	A	
Soybean	A	A	A ²	A	B	A ¹	—	A	—	A ¹	—	A	A ¹	A	A	C	C	—	D	C	A	B	A	A	A	A	—	A	A	A	—	A	A	A	A	
Sperm (whale)	A	D	A	A	—	—	—	—	—	—	—	A	—	A	A	—	—	—	—	D	—	—	A	A	A	—	A	A	—	—	—	—	—	—	—	
Tanning	—	D	—	A	—	—	—	—	—	—	—	—	—	—	A	—	—	—	—	D	—	—	A	A	A	—	A	A	—	—	—	—	—	—	—	
Transformer	—	A	A	B	—	C ¹	—	A ¹	—	B	—	A	B	A	A	D	—	—	D	B	B	—	A	A	A	—	A	A	—	—	—	—	A	—	—	
Turbine	—	A	A	A	—	C	—	A	—	B ¹	—	A	A ¹	A	B	A	D	—	D	D	D	A	A	A	A	A	—	A	A	A	—	A	—	—	—	
Oleic Acid	D	A	A	A	—	C ²	A ¹	A	—	B ¹	A	A	C ²	A	B	B	C	B	D	C	D	D	B	A	A	D	B ¹	C	—	A	A ²	B	A	A	—	
Oleum 25%	—	D	D	D	C	D	—	D	—	D	A ¹	A	D	C ¹	D	D	D	A	D	D	D	D	A	B ²	B	B	—	B	D	—	—	A	D	D	—	—
Oleum 100%	D	D	D	D	—	D	A ¹	D	—	D	A ¹	A	D	D	D	D	D	A	D	D	D	C	A	A	A	—	D	D	—	—	D	D	D	—	—	
Oxalic Acid (cold)	A	B	A	A	D	A ²	A ¹	B ²	—	A ²	A	A ¹	B	B	D	A	B	D	B	D	B	C	A	B	A	A	D	B ²	A	C	B	B	A	A	—	—
Ozone	B	C	A	—	C	C ¹	—	D	A ¹	B	—	A	B	A	D	A	A	A	D	C	A	A	A	B	A	B	—	B	—	—	A	—	—	—	—	—

Chemical Resistance Charts

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CHEMICAL	Plastics								Elastomers					Metals					Non-metals				
	Abs plastic Acetal (Delrin®) CPVC Epoxy Hytrel®	LDPE NORYL® Nylon Polycarbonate Polypropylene	PPS (Ryton®) PTFE (Teflon®) PVC PVDF (Kynar®)	Buna N (Nitrile) EPDM Hypalon® Kel-F® Natural rubber	Neoprene Silicone Tygon® (R-3603) Viton®	304 stainless steel 316 stainless steel Aluminum Brass Bronze	Carpenter 20 Cast iron Copper Hastelloy-C® Titanium	Carbon graphite Ceramic Al ₂ O ₃ Ceramic magnet															
Phosphorus Trichloride	D	D	D	A ¹	—	B	—	—	C	—	A	A ²	D	A ²	D	A ¹	A ²	D	A ²	A	A	—	—
Photographic Developer	B	D	A	A	—	A	A	A	A ¹	—	A	B	A	A	A ¹	A	A	A	A	A	A	A	A
Photographic Solutions	—	D	A	B ²	B	A	A ¹	A ¹	A ²	A ²	B	A ¹	A ¹	A ²	A	B	A	D	D	B	B	A ¹	
Phthalic Acid	B	C	B	—	—	B ²	—	B ¹	—	A	A ²	—	A ²	A	B ²	A	B ²	A	A	A	A	—	—
Phthalic Anhydride	B	C	D	—	—	—	—	A ¹	D	—	A	D	A	A	A	A	A	A	—	—	A	—	—
Picric Acid	A	A	D	A	—	A	—	C ¹	D	B ¹	A	A	D	A ¹	A	B	C	—	—	D	A	B	A
Plating Solutions																							
Antimony Plating 130°F	—	A	A	B	—	—	A	D	—	A	—	A	A	A	A	A	A	A	—	A	A	—	—
Arsenic Plating 110°F	—	A	A	B	—	—	—	A	—	A	—	A	A	A	A	A	A	A	—	A	A	—	—
Brass Plating:																							
Regular Brass Bath 100°F	—	A	A	B	—	B	A	A	—	A	—	A	A	B	A	A	A	—	A	A	—	A	A
High-Speed Brass Bath 110°F	—	A	A	B	—	B	A	A	—	A	—	A	B	A	A	A	A	—	A	A	—	A	A
Bronze Plating:																							
Cu-Cd Bronze Bath R.T.	—	A	A	B	—	—	A	A	—	A	—	A	A	A	A	A	A	—	A	A	—	A	A
Cu-Sn Bronze Bath 160°F	—	B	D	C	—	—	A	A	—	A	—	D	A	A	A	A	A	—	A	A	—	A	D
Cu-Zn Bronze Bath 100°F	—	A	A	B	—	—	A	A	—	A	—	A	A	A	A	A	A	—	A	A	—	A	A
Cadmium Plating:																							
Cyanide Bath 90°F	—	A	A	B	—	—	A	A	—	A	—	A	A	A	A	A	A	—	A	A	—	A	A
Fluoborate Bath 100°F	—	C	A	B	—	—	A	D	—	A	—	A	A	A	A	A	A	—	A	D	—	D	D
Chromium Plating:																							
Barrel Chrome Bath 95°F	—	D	A	C	—	—	D	D	—	A	—	A	C	D	—	—	C	—	D	C	—	D	C
Black Chrome Bath 115°F	—	D	A	C	—	—	D	D	—	A	—	A	C	C	—	—	C	—	C	A	—	D	A
Chromic-Sulfuric Bath 130°F	—	D	A	C	—	—	D	D	—	A	—	A	C	D	—	—	C	—	C	A	—	D	A
Fluoride Bath 130°F	—	D	A	C	—	—	D	D	—	A	—	A	C	D	—	—	C	—	D	C	—	D	C
Fluosilicate Bath 95°F	—	D	A	C	—	—	D	D	—	A	—	A	C	D	—	—	C	—	C	C	—	D	C
Copper Plating (Cyanide):																							
Copper Strike Bath 120°F	—	A	A	B	—	—	A	A	—	A	—	A	B	A	—	—	A	—	—	A	—	—	—
High-Speed Bath 180°F	—	B	D	C	—	—	A	A	—	A	—	D	A	A	—	—	A	—	—	A	D	—	—
Rochelle Salt Bath 150°F	—	B	D	C	—	—	A	A	—	A	—	D	A	A	—	—	A	—	—	A	D	—	—
Copper Plating (Acid):																							
Copper Fluoborate Bath 120°F	—	C	A	D	—	—	A	D	—	A	—	A	A	B	—	—	A	—	D	D	—	D	D
Copper Sulfate Bath R.T.	—	A	A	D	—	—	A	D	—	A	—	A	A	A	A	—	—	A	—	D	A	D	A
Copper Plating (Misc):																							
Copper Pyrophosphate	—	A	A	B	—	—	A	A	—	A	—	A	A	A	A	—	—	A	—	A	—	A	A
Copper (Electroless)	—	D	A	B	—	—	A	A	—	A	—	A	A	A	D	—	D	A	—	—	—	—	A
Gold Plating:																							
Acid 75°F	—	—	A	A	—	—	A	A	—	A	—	A	—	A	—	C	—	—	—	—	—	A	A
Cyanide 150°F	—	—	D	D	—	—	A	A	—	A	—	A	D	—	—	A	—	—	—	—	—	A	A
Neutral 75°F	—	—	A	A	—	—	A	A	—	A	—	A	—	A	—	C	—	—	—	—	—	A	A
Indium Sulfamate Plating R.T.	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	C	—	—	—	—	—	A	A
Iron Plating:																							
Ferrous Am Sulfate Bath 150°F	—	—	D	D	—	—	A	D	—	A	—	A	D	—	—	C	—	—	—	—	—	A	A
Ferrous Chloride Bath 190°F	—	—	D	D	—	—	A	D	—	C	—	A	D	—	—	D	—	—	—	—	—	D	A
Ferrous Sulfate Bath 150°F	—	—	D	D	—	—	A	D	—	A	—	A	D	—	—	C	—	—	—	—	—	A	A
Fluoborate Bath 145°F	—	—	D	D	—	—	A	D	—	A	—	A	D	—	—	C	—	—	—	—	—	B	D
Sulfamate 140°F	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	D	—	—	—	—	—	B	A
Sulfate-Chloride Bath 160°F	—	—	D	D	—	—	A	D	—	A	—	A	D	—	—	D	—	—	—	—	—	D	A
Lead Fluoborate Plating																							
Nickel Plating:																							
Electroless 200°F	—	—	D	B	—	—	D	D	—	D	—	A	D	—	—	C	—	—	—	—	—	—	—
Fluoborate 100-170°F	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	C	—	—	—	—	—	A	D
High-Chloride 130-160°F	—	—	D	D	—	—	A	D	—	A	—	A	D	—	—	C	—	—	—	—	—	A	A
Sulfamate 100-140°F	—	—	A	A	—	—	A	A	—	A	—	A	—	A	—	C	—	—	—	—	—	A	A
Watts Type 115-160°F	—	—	D	D	—	—	A	A	—	A	—	A	D	—	—	C	—	—	—	—	—	A	A
Rhodium Plating 120°F																							
Silver Plating 80-120°F	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	D	—	—	—	—	—	D	D
Tin-Fluoborate Plating 100°F	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	C	—	—	—	—	—	A	A
Tin-Lead Plating 100°F	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	C	—	—	—	—	—	A	D
Zinc Plating:																							
Acid Chloride 140°F	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	D	—	—	—	—	—	D	A
Acid Fluoborate Bath R.T.	—	—	A	A	—	—	A	D	—	A	—	A	—	A	—	C	—	—	—	—	—	A	D
Acid Sulfate Bath 150°F	—	—	D	D	—	—	A	D	—	A	—	A	D	—	—	C	—	—	—	—	—	A	A
Alkaline Cyanide Bath R.T.	—	—	A	A	—	—	A	A	—	A	—	A	—	A	—	C	—	—	—	—	—	A	A
Potash (Potassium Carbonate)	A	B	A	A	D	A ¹	A	A	—	A	—	A	A	A	B	B	D	—	B	B	B	B	A
Potassium Bicarbonate	A	—	A	A	—	A	A ¹	A ¹	—	A	A	A	A	B	A	A	A	—	B	A	B	B	A
Potassium Bromide	A ¹	A	A	A	—	A	A ¹	A ¹	A ¹	A	A	A	A	A	A	A ¹	B	A	B	D	B	B	A
Potassium Chlorate	A	B	A	A	—	A ¹	A ¹	A ¹	C ¹	A ¹	A	A	A	A	A	A	B	B	A	B	C	B ¹	B
Potassium Chloride	A	A	A	A	B	A ¹	A ¹	A ¹	A	A	A	A	A	A	A	A	A	A	—	A	A	B	A

Explanation of footnotes:

1. Satisfactory to 72°F (22°C)

2. Satisfactory to 120°F (48°C)

Chemical Resistance Charts

WARNING

Ratings— Chemical Behavior

- A – No effect
- B – Minor effect
- C – Moderate effect
- D – Severe effect;
not recommended
- No data available

DANGER

Variations in chemical behavior due to factors such as temperature, pressure, and concentration can cause equipment to fail, even though it passed an initial test.

SERIOUS INJURY MAY RESULT.

Use suitable guards and/or personal protection when handling chemicals.

The information in this chart has been supplied to Cole-Parmer by other reputable sources and is to be used **ONLY** as a guide in selecting equipment for appropriate chemical compatibility. Before permanent installation, test the equipment with the chemicals under the specific conditions of your application. **For further information, see pages 18 and 19 in this catalog.**

Ratings of chemical behavior listed in this chart apply to a 48-hour exposure period; Cole-Parmer has no knowledge of possible effects beyond this period. Cole-Parmer does not warrant (neither expressed nor implied) that the information in this chart is accurate or complete or that any material is suitable for any purpose.

CHEMICAL	Plastics										Elastomers						Metals					Non-metals															
	ABS plastic	Acetal (Delrin®)	CPVC	Epoxy	Hytrel®	LDPE	NORYL®	Nylon	Polycarbonate	Polypropylene	PPS (Ryton®)	PTFE (Teflon®)	PVC	PVDF (Kynar®)	Buna N (Nitrile)	EPDM	Hypalon®	Kel-F®	Natural rubber	Neoprene	Silicone	Tygon® (R-3603)	Viton®	304 stainless steel	316 stainless steel	Aluminum	Brass	Bronze	Carpenter 20	Cast iron	Copper	Hastelloy-C®	Titanium	Carbon graphite	Ceramic Al ₂ O ₃	Ceramic magnet	
Potassium Chromate	-	C	A	C	-	A	A ²	B	-	A	-	A ¹	A	B	A ¹	A ²	-	-	B	A	-	B	A	B ¹	B ¹	B ¹	-	B ¹	B	A	-	A	-	A	B	-	
Potassium Cyanide Solutions	A	C	A	C	B	A	A ¹	A ¹	-	A	A	A	A	A	A ¹	A ¹	A ¹	A	A	B	A	A	A	A	B ¹	B ¹	D	D	D	B	A	B	B	A	A	B	-
Potassium Dichromate	B	B ¹	A	A	C	A	A	B ¹	A ¹	A	A	A	A	A	D	A	A ¹	A ¹	A	B	A	A	-	A	B ¹	B ¹	B ¹	-	B ²	B	B	B	B	A	A	B	A
Potassium Ferricyanide	-	-	B	A	-	A ²	A ²	B ¹	-	A ²	-	A ²	A	A ²	D	A	A	A	A	A ¹	-	B	A	B ¹	B ¹	B ²	-	B ²	B	C	B	B	A	A ²	A	A	
Potassium Ferrocyanide	-	-	B	A	-	A ¹	A	B ¹	-	A	-	A	A	A	D	A	-	-	A	A ¹	-	B	A	B ¹	B ¹	B ²	-	B ²	B	C	B	B	A	A ²	A	A	
Potassium Hydroxide (Caustic Potash)	A	A	A	A	D	A	A ¹	C ¹	D	A	A	A	A ¹	A	B ¹	A ²	A	B	B	B	C	B	B	B	A ¹	D	D	D	B	B ²	B	B ¹	D	C	D	A	
Potassium Hypochlorite	-	-	-	-	-	C ¹	-	B ¹	-	-	A	A ²	B ¹	A ¹	A ¹	A ¹	A ¹	-	C ¹	B ²	-	B ¹	-	C ¹	B	D	D	D	A	A	D	B ²	A ¹	-	D	-	
Potassium Iodide	B	-	A	-	-	B ¹	-	A ¹	-	A ²	A ²	A ²	A ²	A ²	A ¹	A	A ²	-	B	A	-	B	A	A	A ¹	B ¹	-	A ¹	A	A	A	B ¹	A ¹	A ¹	B	-	
Potassium Nitrate	B	A	A	A	B	A	A ¹	B ¹	A ¹	A	A	A	A	A	A ²	A	A	-	A	A	A	A	A	B	B	B	B	B	B	A	A	B ¹	A	A	B	-	
Potassium Oxalate	-	-	-	-	-	-	-	-	-	-	-	A ²	-	-	-	-	-	-	-	-	-	-	-	B	B ¹	B ¹	-	A ¹	B	A	B	A ¹	A ¹	A ¹	A	-	
Potassium Permanganate	B ¹	A	A ¹	A	D	A	A ²	D	A ²	A ¹	A	A	A ¹	A	C	A	-	-	A ¹	A	-	B	A	B ¹	B	C ¹	-	A ¹	B	A	A	A ¹	A	B ¹	A	-	
Potassium Sulfate	B	B	A	A	B	A ²	A	D	A	A	A	A	A ²	A	A ²	A ¹	A	A ¹	A	A	A	A	A ²	B ¹	B	C	D	A ¹	A	A	B	B ¹	A	A	B	A	
Potassium Sulfide	B	-	A ²	-	-	A ²	A	D	-	A	A	A	A	A	A	A	B	A	B	A	A	-	A	B	B	D	-	D	A	B	D	-	A	A	A	-	
Propane (liquefied)	-	-	A	A ¹	A	A	C ¹	A ¹	C ¹	A	-	A	A ¹	A	A	D	-	A	D	C	D	-	A	B	A	A	A	A ²	A	A	A	A	-	A	A	-	
Propylene	B	-	-	-	-	-	-	-	-	-	-	A ²	B ¹	-	D	D	D	-	D	C	D	D	A	B	B	B	-	A	A	A	B	B	A	A	A	-	
Propylene Glycol	B	B	C ¹	B	-	B ²	-	B	A	B ¹	A ²	-	A	C ¹	-	A	A	D	-	A	C	A	A	A	B	B	B	-	A	A	A	B	B	A	-	A	A
Pyridine	-	-	B	D	A	C	-	-	-	-	A	A	D	D	D	B	D	A ¹	D	D	D	D	D	A	A	B	B	B	A	A	B	B	B	A	A	-	
Pyrogallol Acid	-	D	A	A	-	-	-	-	-	-	-	A	A	A	-	B	-	-	A	-	-	-	-	B ²	B	B	-	A	B	D	B	B	A	A	A	-	
Resorcinol	A	-	-	-	D	B ²	-	D	B ¹	A ²	-	A ²	C	-	-	B ¹	-	-	-	D	-	C	A ¹	-	-	-	-	-	-	-	-	-	-	A ²	-	-	
Rosins	-	B	C ¹	A	-	B ¹	-	A ¹	-	A ²	-	A	C ¹	-	A ²	-	B	A	-	A	A	-	A	A ¹	A ¹	B ¹	-	B	B	D	B	-	-	A	-	-	
Rum	-	A	A	A	-	-	A	A	-	A	-	-	-	-	A	A	-	-	A	A	A	-	A	A	A	-	-	A	-	-	-	-	-	-	-	-	
Rust Inhibitors	-	A	-	A	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	C	-	-	-	A	A	-	-	A	B	C	-	-	-	-	-	-	
Salad Dressings	-	A	-	A	-	-	A	A	-	A	-	-	-	-	A	-	-	-	-	-	-	-	-	A	B	D	-	-	B	D	-	-	-	-	-	-	
Salicylic Acid	A	D	-	-	-	B ²	-	A ¹	A ¹	A ¹	-	A ²	B ¹	A	B	A	A	A ¹	A	-	-	B ¹	A ¹	-	-	-	-	A	B	A	A	A ²	A ¹	A ²	-	-	
Salt Brine (NaCl saturated)	-	-	-	A ²	A	A ¹	A	A	A	A	A	A ²	A	A	A	A	A ²	-	A	A ²	A ¹	-	A ²	B ¹	A ²	B ¹	-	B ²	B	D	B	-	-	A ²	-	-	
Sea Water	-	A	A	A	A	A ²	A ¹	A ²	A ²	A	A	A	A ²	A	A ²	A ²	A	A	A ¹	B ²	A ¹	-	-	A	C	C	B	D	A	A	D	B	A	A	A	-	-
Shellac (Bleached)	-	A	-	A	-	A ¹	-	A ¹	-	A	-	A	-	-	A ²	A ²	A	-	A ¹	B ²	-	-	-	A	A	B	B	A	A	A	A	-	-	A	-	-	
Shellac (Orange)	-	A	-	A	-	A ¹	-	A ¹	-	A	-	A	-	-	A	A	-	-	D	D	-	-	-	A	A	A	B	A	A	A	A	-	-	A	-	-	
Silicone	D	A	A	A	A	-	A ¹	A ¹	A ²	A	A ¹	A	A	A	A	A	A	-	C	A	C	-	-	A	A	A	-	-	A	A	A	-	-	A	-	-	
Silver Bromide	-	C	-	A	-	A	A	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	D	D	D	-	D	A	D	-	-	-	-	-	-	
Silver Nitrate	B	A	A	A	-	A	A	A ¹	A ²	A ¹	A	A	A ¹	A	B	A	A	A	A	B	A	B	A	B	B	D	-	B	C	C	-	-	-	A	-	-	
Soap Solutions	A	A	A	A	-	D	A ¹	A ¹	A ¹	A	A	A	A	A ¹	A	A	A	-	B	B	A	A	A	A	A ¹	C	-	B	C	C	-	-	-	A	A	A	
Soda Ash (see Sodium Carbonate)	B	A	A	C	B	B	A	B	A	A	A	A	A	A	A ¹	A ²	A	-	A	A ¹	A	-	A	A	A	D	-	B	A	B	-	-	-	-	-	-	
Sodium Acetate	B	B	A	A	-	A	A ¹	B ¹	A ¹	A	A	A	B ¹	A	A	A	-	-	A	B	D	A	D	B	B ¹	B	B	B	A	B	A	A	A	A	A	-	
Sodium Aluminate	-	B	-	A	-	-	A	A ¹	-	-	-	-	-	-	A	-	-	-	B	A	-	-	-	A	-	-	-	A	B	A	-	-	-	A	-	-	
Sodium Benzoate	A	-	A ²	A ²	-	A ²	-	B ¹	A ²	A ²	-	A ²	B ¹	A ²	B	A	B	-	A	A ¹	-	B ¹	A ¹	-	-	-	-	A	-	-	-	-	-	A ²	-	-	
Sodium Bicarbonate	A	A	A ²	A	-	A ²	A	A	A ²	A	A	A	A ²	A	A ¹	A ²	A	A	A	A	A	B	A	A	A ¹	D	D	A	A	C	B	B ¹	A ²	A	A	-	
Sodium Bisulfate	A	B	A ²	A	C	A ²	A ¹	A ¹	A ¹	A	A	A	A ²	A	A	A ²	A	A ²	A	A	A	B	A	A	D	C	D	A ²	C	D	B	B ²	A	A	A	-	
Sodium Bisulfite	A	C	A ²	A	B	A ²	A ¹	C ¹	A ¹	A	A	A	A ²	A	A	A ²	A	-	A	A	A	B	A	B ¹	B ¹	D	-	B ¹	B	D	B	B	A	A	A	-	
Sodium Borate (Borax)	A	-	A ²	A	B	A ²	A ¹	A ¹	A ¹	A ²	A	A	A ²	A	A ¹	A	-	-	A	A	-	-	-	B ²	B	C	-	A	A	-	B	A	B	A	A	-	
Sodium Bromide	B	A	A ²	A	-	A ²	A ²	B ¹	-	-	-	A ²	B ²	A ²	-	A	B	A ¹	A ¹	A ¹	-	B ²	A ¹	C	C	D	-	A	B	C	D	-	A ¹	A ²	-	-	
Sodium Carbonate	B	A	A ¹	A ²	C ¹	-	B ²	A	B ¹	A ²	A	A	A	A ²	A	A	A ²	A	A	A	A	B	A	A	A	D	B	A ²	B	B	A	-	-	A	A	-	
Sodium Chlorate	A	A	A ¹	A	-	B ²	A ¹	D	A ¹	A	A	A	A ¹	A	B	A	A	-	A	A	C	B	A	A	A	B	-	B ¹	B	-	B	B ¹	A	C	A	-	
Sodium Chloride	A	A ¹	A ²	A	A	A ²	A	A ¹	A ²	A	A	A	A	A	A	A	A	A	A	A	A	B	A	B	B	C	D	B	B	D	B	A	A	A	A	-	
Sodium Chromate	-	D	-	C	-	-	A	C	A ²	-	A	A	-	-	A	-	C	A	B	A	-	-	-	B ¹	B	-	-	B	B	A	B	-	-	A	-	-	
Sodium Cyanide	A	A	A ²	A	B	A ²	A ¹	A ¹	-	A	A	A	A ²	A	A	A ²	A	A	A	A ¹	A	A	A ²	A ¹	B ¹	D	D	D									

Chemical Resistance Charts

WARNING

The information in this chart has been supplied to Cole-Parmer by other reputable sources and is to be used **ONLY** as a guide in selecting equipment for appropriate chemical compatibility. Before permanent installation, test the equipment with the chemicals under the specific conditions of your application. **For further information, see pages 18 and 19 in this catalog.**

Ratings of chemical behavior listed in this chart apply to a 48-hour exposure period; Cole-Parmer has no knowledge of possible effects beyond this period. Cole-Parmer does not warrant (neither expressed nor implied) that the information in this chart is accurate or complete or that any material is suitable for any purpose.

DANGER

Variations in chemical behavior due to factors such as temperature, pressure, and concentration can cause equipment to fail, even though it passed an initial test.

SERIOUS INJURY MAY RESULT.

Use suitable guards and/or personal protection when handling chemicals.

Ratings— Chemical Behavior

- A – No effect
- B – Minor effect
- C – Moderate effect
- D – Severe effect; not recommended
- No data available

CHEMICAL	Plastics								Elastomers						Metals					Non-metals																		
	ABS plastic Acetal (Delrin®)		CPVC	Epoxy	HyTel®	LDPE	NORYL®	Nylon	Polycarbonate	Polypropylene	PPS (Ryton®)	PTFE (Teflon®)	PVC	PVDF (Kynar®)	Buna N (Nitrile)	EPDM	Hypalon®	Kel-F®	Natural rubber	Neoprene	Silicone	Tygon® (R-3603)	Viton®	304 stainless steel	316 stainless steel	Aluminum	Brass	Bronze	Carpenter 20	Cast iron	Copper	Hastelloy-C®	Titanium	Carbon graphite	Ceramic Al ₂ O ₃	Ceramic magnet		
Sodium Tetraborate	-	B	A	A	-	A ²	A	A	-	-	-	A	A ²	-	A	A	A	-	A	B	A	-	A	A ²	A	C	-	A	-	-	B	-	-	-	A	-	-	
Sodium Thiosulfate (hypo)	-	C ¹	A ²	A	-	A ¹	A	B	D	A ²	A	A	A ²	A	A	B	A	-	A	B	A	-	A	A ²	B	A	D	A ²	-	D	C	D	-	A	A	-	-	
Sorghum	-	A	-	A	-	-	-	-	-	-	-	-	-	-	A	-	-	-	A	-	-	-	-	A	A	-	-	-	D	D	A	-	-	-	-	-	-	
Soy Sauce	-	A	-	A	-	-	-	-	-	-	-	-	-	-	A	-	-	-	A	-	-	-	-	A	A	-	-	-	A	D	-	-	-	-	-	-	-	
Stannic Chloride	-	C	A ²	A	-	A ²	A ¹	B ¹	A ¹	A	A	A	A ²	A	A	A	C ¹	-	A	-	-	-	-	A	D	D	-	-	D	D	-	-	-	-	A	A	-	
Stannic Fluoroborate	-	C	-	A	-	-	A	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	A	-	-	-	D	D	-	-	-	-	-	-	-	
Stannous Chloride	-	-	A ²	A	C	B ²	A ²	C ¹	-	A	A ¹	-	A ¹	A	A	C	A ¹	-	A	A	A	-	-	C ²	A ²	D	-	-	A ¹	D	-	-	-	-	-	-	A	A
Starch	-	A	A	A	-	B	A ²	A ¹	-	A ²	-	-	-	-	A	A	A	-	A	A	-	-	-	A	A	A	-	-	A	C	-	-	-	-	A	A	A	
Stearic Acid	-	A	B ²	B	C	B ¹	A	A ²	A ¹	A ²	-	A	B ²	A	B	B	C	-	-	-	-	-	B	A	B	D	B	C	C	D	B	A	-	A	-	-		
Stoddard Solvent	B	A	C ¹	A	-	C ²	D	A	A ²	C	A	A	A ²	A	A	D	-	-	A	D	-	-	-	C ¹	D	C	A	-	A	A	A	A	A	-	A	A	-	
Styrene	-	A	D	A	D	-	A	A ¹	D	-	-	A	D	-	D	D	D	-	D	D	-	B	A	A	A	-	-	A	A	B	D	-	-	A	-	-		
Sugar (Liquids)	B	A	-	A	-	-	A ²	A ¹	-	A	-	A	-	-	A	A	A	-	A	A	-	-	-	A	A	A	-	-	A	-	-	-	-	-	A	-	-	
Sulfate (Liquors)	-	D	B	A	-	A ²	-	B ¹	-	A	-	-	B	A	A ²	A	B	-	B	B	-	A ¹	A	B	D	-	B	D	C	D	B	-	-	A	-	-		
Sulfur Chloride	-	D	C ¹	C	-	C ¹	A	A ¹	-	C ¹	-	A	A ¹	A ¹	D	D	-	-	A	D	-	-	-	D	D	D	D	B	D	D	B	A	D	-	D	-	-	
Sulfur Dioxide	-	B	A ²	A ¹	C	A ¹	A	B ¹	A ¹	A ¹	A	A	A ²	A	D	A ²	-	-	A	C	-	-	-	D	A	B	D	B	A	A	A	B	A	-	A	-	-	
Sulfur Hexafluoride	-	-	-	-	-	B	-	B	-	-	-	-	B	-	B	B	B	-	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sulfur Trioxide	-	-	A	A	-	-	D	D	-	C	-	-	A	-	D	C ²	D	-	C	D	-	-	-	A	C	A	D	C	A	B	-	-	-	-	B	-	-	
Sulfur Trioxide (dry)	-	D	A	A	-	C ¹	D	A ¹	-	D	-	A	A ¹	C ¹	D	D	C ¹	-	-	-	-	-	-	D	A	A	A	B	B	A	B	B	D	-	B	-	-	
Sulfuric Acid (<10%)	B	D	A	A ¹	A	A ¹	A	C ¹	A ¹	A ²	A	A	A ¹	A	A ¹	A	A	A	A ¹	B ²	C	A	A	D	A	B	D	B	D	A	C	-	-	-	A ¹	A	-	
Sulfuric Acid (10-75%)	B	D	A	A ¹	-	A ¹	A	D	B ¹	A ¹	A	A	D	A	B ¹	B ²	B	A	C	C	A ²	-	-	D	D	D	-	B	A ²	D	-	B ¹	D	-	C ¹	A	-	
Sulfuric Acid (75-100%)	-	-	C	C ¹	C	C	A	D	B ¹	C ¹	A ¹	A	D	A	C	B ¹	C	A	D	D	D	A ¹	-	C	D	D	-	B	A ²	D	D	B ¹	D	-	A ²	A	A	
Sulfuric Acid (cold concentrated)	-	-	D	D	B	D	A	D	D	-	A ²	A	D	A	D	C	C	A	D	D	D	B	-	C	B	B	-	B	A ²	D	-	-	A ¹	D	D	-	-	
Sulfuric Acid (hot concentrated)	-	-	D	D	-	D	D	D	D	D	D	A	D	C	D	D	D	A	D	D	D	A ²	-	D	C	D	-	A ²	D	D	D	D	D	-	D	-	-	
Sulfurous Acid	-	C	A ²	A	-	B ²	A	D	-	A	A	A	A ²	A	B ¹	B	A	A	B	C	D	B	A	B ¹	B	B ¹	-	B	D	D	D	B	A	-	A	-	-	
Sulfuryl Chloride	-	A	-	A	-	-	-	-	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tallow	-	A	-	A	-	C	A	A ¹	-	A ²	-	-	-	-	A	A	C	-	-	-	-	-	-	A	A	A	-	-	-	-	-	-	-	-	A	-	-	
Tannic Acid	-	B	A ¹	A	A	B ²	A ²	C ¹	C	A	A	A	A ¹	B	A	B	A	A	A	A	B	B	A	B ¹	A	C	B	B	A	C	A	B ¹	A	-	A	A	A	
Tanning Liquors	-	B	A ¹	A	-	A ¹	A ²	A ¹	-	A ¹	-	-	A	-	B ¹	B	A	-	C	A	B	B	A	A	A ²	A ²	A	-	A ²	A	-	-	B	A	-	A	-	-
Tartaric Acid	-	B	A ¹	A	C	A ¹	A ¹	B ²	-	A	A	A	A ¹	B	A	B	A	A ²	A	A ²	A	B	A	C ²	C ²	B ¹	D	B ¹	A	C	A	B	A ¹	-	A	A	A	
Tetrachloroethane	-	A	C	-	-	-	D	C ¹	-	C	-	A	C	-	D	D	D	A	D	D	D	-	A	B	A	C	-	-	-	A	A	A	A	-	A	-	-	
Tetrachloroethylene	-	A	D	-	-	B	D	A ¹	D	D	-	A	D	-	D	D	D	A	D	D	D	-	A	-	A	-	-	-	-	A	A	-	-	-	A	-	-	
Tetrahydrofuran	-	A	D	A	B	C ¹	D	A	D	C ²	A	A	D	B ¹	D	D	D	A ¹	D	D	D	-	A	A	-	-	-	-	D	-	-	-	-	-	A	A	-	
Tin Salts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	B	A	-	A	-	B	A	-	-	D	D	-	-	-	-	-	-	-	-	-	-	-	
Toluene (Toluol)	D	C ¹	D	B ¹	B	C ¹	D	A ¹	D	C ¹	A	A	D	A ¹	D	D	D	B ²	D	D	D	C	-	A	A	A	A	A	A	A	A	A	A	-	A	A	A	
Tomato Juice	B	B	-	A	-	A ¹	A	A ²	-	A ¹	A	A	D	D	A	-	-	-	B	A	-	-	-	A	A	A	-	A ²	C	-	-	-	-	-	A	-	-	
Trichloroacetic Acid	-	-	-	D	-	A	-	C	D	A	A	A	B	B	-	B	-	-	A	C	-	-	-	D	C	D	-	-	-	D	D	B	D	-	A	-	-	
Trichloroethane	-	A	-	A	-	-	D	C ¹	D	C	-	A	C	A	D	D	D	A	D	D	D	A	-	B	B	D	-	A	A	B	-	-	-	-	A	-	-	
Trichloroethylene	D	D	C ¹	C	-	D	D	C ¹	-	C ¹	A ¹	A	D	B	D	D	D	A	D	D	D	A	-	B	B	D	-	B	A	C	A ¹	A	A	-	A	A	A	
Trichloropropane	D	A	-	A	-	-	D	-	-	-	-	A ¹	-	-	D	-	-	-	A	D	-	-	-	A	A	D	-	A	A	A	A	A	-	-	-	-	-	
Tricresylphosphate	B	C	D	A	-	B ¹	A	A ²	-	A ¹	-	A	D	D	D	A	D	-	B	A	-	-	-	B	B	D	-	A ²	A	B	B	A	B	-	A	D	-	
Triethylamine	-	D	A	A	-	-	B	A ¹	-	D	-	A	B	A ²	C	A	-	-	A	B	A	-	-	A	A	A	-	-	A	A	A ¹	-	-	-	A	B	-	
Trisodium Phosphate	B ¹	A	A	A	A	A	A	A	-	A	A	A	A	A	A	A	A	-	A	A	A	-	-	B	B	D	-	A	C	-	B ¹	A	-	-	A	-	-	
Turpentine	D	A ²	A	B	-	D	D	B	D	D	A	A	D	A	-	D	D	A	D	D	D	A	-	A	A	A	D	A	A	C	-	B	B	B	A	A	-	
Urea	B	A	-	A	-	A	A	A	D	A	A	A	D	A	B	A	-	-	-	B	B	A	-	B	B	B	-	B	-	-	-	-	-	-	A	B	-	
Uric Acid	-	-	-	-	-	B	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B	B	D	-	B	-	D	A	B	A	-	A	D	-	
Urine	-	A	A	A	-	A ²	A ²	B	-	A	-	A ¹	A	A	A ¹	A ¹	-	-	D	D	-	-	-	A	A	B	-	A	C	A	-	-	-	-	A	-	-	
Varnish	-	A	-	A	-	A	D	A	-	A	-	A	D	-	B	D	D	A	D	D	D	A	-	A	A	A	-	-	A	C	B	A	-	-	A	-	-	
Vegetable Juice	B	A	-	A	-	-	A	-	-	-	-	-	-	-	A ²	A	-	-	-	-	-	-	-	A	A	D	A	A	A	C	D	-	-	-	A	-	-	
Vinegar	A	B	A	-	A	A	A ¹	A	A ²	A	A	A	B	B	B	A	A	B	A	B	A	A	-</															