

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	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							
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	A	—	—						
Acetamide	—	A	—	A	—	A	—	A	D	A	A	A	D	C	A	A	C	B	A	D	D	D	B	B	A	A	A	A	D	D	—	—	—	A	—	—						
Acetate Solvent	—	—	C	A	—	A	D	A	—	B ¹	A	A	D	C	C	A	C	A	A ¹	C	C	C	D	D	D	D	D	C	C	C	A	C	A	D	A	A	A	—	—			
Acetic Acid	D	D	C	C	—	A ²	A	D	B ¹	B	A	A	D	C	C	A	C	A	A	B	C	C	D	D	B	D	D	C	C	C	A	C	A	D	B	A	A	A	—	—		
Acetic Acid 20%	C	C	A	A ¹	—	A	A	D	A	A	A	A	D	C	B	A	C	A	A	B	C	C	A	B	D	B	D	B	D	C	A	C	A	D	B	A	A	A	—	—		
Acetic Acid 80%	D	D	C	B ¹	—	D	A	D	B ¹	A	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	A	D	B ¹	C	B	C	A	A ²	C	D	B	D	D	C	B	A	B	D	C	C	C	A	D	A	D	B	A	A	A	—	—
Acetic Anhydride	C ¹	D	D	D	C	C	C	C	C	C	A	A	D	B ¹	D	B	A	A	C	C	A	C	D	D	D	C	D	D	D	C	C	C	A	D	B	D	B	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					
Acetyl Bromide	—	—	—	—	—	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	A	B	A	D	B	C	B	D	A	A	A	D	A	C	A	D	—	—	—	A	—	—						
Acrylonitrile	D	—	A	A	—	A	—	A	—	D	A	A ¹	A ¹	D	D	C	—	B ¹	C	C	D	D	D	A ¹	A ¹	B ¹	A	—	A ¹	A ¹	A	B	—	A	—	—						
Adipic Acid	—	—	A ²	A	—	—	—	B ²	—	A	A	A ²	A ²	—	A	A	A	A ²	C	—	D	A ²	A	A	A	B	C	A	D	—	—	—	—	—	—							
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	D	A	A	A	B	A	A	A	B	A	A	A	A	—	—					
Benzyl	D	A	A	C	—	D	D	B ¹	—	A	A	A	A	A	D	B	C	A	D	C	—	D	A	B	B	B	—	A	A	B	A	A	A	A	—	—						
Butyl	A ¹	A	A ²	A	—	A	A	D	A ²	A	A	A	A	A	C	B	A	—	A	C	B	A ²	A	A	B	A	—	A	A	B	A	A	A	A	—	—						
Diacetone	—	A	—	A	—	B ¹	A	A	—	B ²	—	A	B	A ¹	D	A	D	B ¹	D	C	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	—	—						
Hexyl	—	A	—	A	—	A	A	A	—	—	—	A	A ²	—	A	C	B	—	A	A	B	A	C	A	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	A	A	A ¹	A	A	B	B	—	A	A	C	—	—	—	A	—	—						
Isopropyl	—	A	C	A	—	A ²	A ¹	D	A ²	A ²	—	A ²	A ¹	—	B	A	A	—	A	B	A	A ¹	A	A	B	B	—	A	A	A	B	A	A	A	—	—						
Methyl	D	A	A	B ¹	B	A ¹	A	A	B ¹	B ¹	A	A	A ¹	A	A	A	A	A ¹	A	A	A	C	A	A	A	A ¹	A	A	A	B ¹	A	B	A	A	—	—						
Octyl	A ¹	A	B ¹	A	—	A	A	A	—	—	—	—	—	—	B	A	B	—	B	B	B	—	B	A	A	A	—	A	A	A	C	A	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	—	—						
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	B	D	D	D	B ¹	D	B	A	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	—						
Aluminum Fluoride	A	C	A	B ¹	—	A ²	A ¹	A ¹	—	A	A	A	A ²	A	A	A	A	—	B	A	B	A ²	A	D	D	B ¹	—	—	C	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 ²	A	A	C ¹	B ¹	B	C	A	D	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 ²	A ²	A	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	D	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	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 ¹	B	B	D	C	B	A	A	A	—	—						
Alums	—	—	A	A	D	A	—	A	—	—	—	A	—	—	A	A ¹	—	—	A	B	A ¹	—	A	A	B	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	A	A	A	D	A	D	C	—	B ¹	D	A	A	A ²	—	D	A ¹	A	—	A	C	A	—	—						
Ammonia Nitrate	—	C	B	A	—	A	A ¹	D	—	A	A	A	B	A	C	A	D	—	—	C	—	B	D	A	A	C	—	D	A	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	A ²	A ¹	D	D	A	D	B	C	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	A	A ²	A	—	D	—	—	—	—	A	—	—						
Ammonium Acetate	—	—	A	—	—	A	—	A	—	—	—	A	—	—	B	A	—	—	—	B	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	—	—	A	A	C	A ²	A	B	B	B	D	D	B	D	B	A	A	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	D	B	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 ¹	D	D	D	D	B	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	B	A	A	A ¹	A ¹	B ²	D	D	D	B	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 ¹	A	B ¹	D	D	D	D	B	A	A	A	—	—						
Ammonium Oxalate	—	B	—	A	—	—	—	—	A ¹																																	

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	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								
Chloroform	D	A	D	C ¹	D	C ¹	D	A	D	C ¹	A	A ¹	D	A	D	D	D	B ¹	D	D	D	A	A	A	A	B ¹	B ¹	B	A	B	A	A ¹	A ²	A	A	A	A							
Chlorosulfonic Acid	—	D	D	C ¹	D	D	D	D	C ¹	D	D	A	D	D	D	D	D	A ²	D	D	D	D	D	D	D	B ²	C	B	B	D	D	D	D	D	D	D	A	A	A					
Chocolate Syrup	—	A	—	A	—	—	A	A	A	A ²	—	A	—	A	—	A	—	—	—	A	—	A	—	—	D	D	D	D	D	D	D	D	D	D	D	—	—	—	—					
Chromic Acid 5%	B	D	A	D	D	D	A ¹	—	B	D	A	A	A ²	A	D	A	B	A	B	D	C	B	A	D	C	C	B	A	B	B	D	D	D	D	D	D	D	A	A	A				
Chromic Acid 10%	B	D	A ²	D	D	D	A ¹	—	B	D	A	A	A ²	A	D	C	C	A	B	D	D	C	C	B	D	C	C	B	A	B	B	D	D	D	D	D	D	D	A	A	A			
Chromic Acid 30%	B	D	A ¹	D	D	D	D	—	C	D	B	A	A ¹	A ²	D	B	C	A	D	D	C	B	A	D	B ²	B ²	D	D	D	D	D	D	D	D	D	D	D	D	A	A	—			
Chromic Acid 50%	D	D	D	D	D	D	D	—	D	D	A ¹	A	D	A ²	D	B	C	A ²	D	D	C	B	A	D	C	B ²	D	D	D	D	D	D	D	D	D	D	D	D	A ²	A	A	—		
Chromium Salts	—	—	—	—	B ¹	B	B	—	B	—	—	—	—	—	—	—	—	—	—	—	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Cider	—	A	—	A	B ¹	B	A	A	A	A	—	—	—	—	A	A	A	C	A ²	A	A	B ¹	—	A	A	B	—	A	A	D	—	—	—	—	—	—	—	—	—	—	—			
Citric Acid	D	B ¹	B ²	A ¹	A ¹	D	A ¹	A ¹	A ¹	A	A	A	B ²	A	A	A	C	A ²	A	A	A	—	A	—	B ¹	A ²	C	D	D	D	D	D	D	D	D	D	D	D	A ²	A	A	A		
Citric Oils	—	B	—	A	—	—	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	D	—	B	—	B	A	A	A	C	—	A	D	D	—	—	—	—	—	—	—	—	—	—	—	
Coffee	—	A	A	A	—	—	A	A	—	A	—	—	—	—	A	A	A	C	—	A	A	A	—	A	—	A	A	—	—	D	—	—	—	—	—	—	—	—	—	—	—	—		
Copper Chloride	A	A	A	A	A ¹	—	A	D	—	A	A	A	A ²	A	A	A	C	A	C	A	A	A	A	A	A	A	A	A	A	D	—	—	—	—	—	—	—	—	—	—	—	—	—	
Copper Cyanide	—	A	A	B ¹	—	B ²	A ¹	D	D	A	A	A	A ²	A	A	A	C	—	A	A	A	—	A	—	A	B	B	D	D	D	D	D	D	D	D	D	D	D	D	D	A	A	A	
Copper Fluoroborate	—	B	A ¹	A	—	—	—	—	—	—	—	—	—	—	B	—	—	—	—	A	—	A	A	A	D	D	—	—	—	D	D	—	—	—	—	—	—	—	—	—	—	—	—	
Copper Nitrate	—	A	A	A ¹	—	B ²	A ¹	D	D	A	A	A	A ²	A	A	—	—	A	C	A	C	A	—	A	B	A	A	A ²	D	D	D	D	D	D	D	D	D	D	D	D	B	B	A	A
Copper Sulfate 5%	—	D	A	A	A ¹	A ²	A ¹	D	A ¹	A	A	A	A ²	A	A	A	C	A	C	A	A	A	A	A	B	B	D	D	D	D	D	D	D	D	D	D	D	D	D	D	A	A	A	
Copper Sulfate >5% Cream	—	A	A	A	—	A ²	A	A	—	A	A	A ²	A	—	A	—	—	—	—	A	—	A	—	A	A	A	A	A	A	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cresols	D	D	D	A ¹	D	C ¹	D	D	D	D	A	—	D	A ²	D	D	D	A ¹	D	D	D	D	A	A ²	A	A	A	—	A	A	A	—	—	—	—	—	—	—	—	—	—	—	—	
Cresylic Acid	—	D	D	D	—	B ¹	—	D	D	A ¹	—	A	D	B ²	D	D	D	—	D	D	D	—	A	—	A	A	B ²	—	D	A ²	C	B	B	B	B	B	B	B	B	B	B	A ¹	A	—
Cupric Acid	—	—	—	A ²	—	B ¹	A ²	D	A ¹	A ²	—	A	A	A ²	—	A	A	A ²	B ²	A ²	A ²	B ²	A ²	A ¹	A ²	A	A	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Cyanic Acid	—	D	—	A ¹	—	—	—	—	—	—	—	—	—	—	C	—	—	—	—	C	—	—	—	A	A	A	—	—	D	D	—	—	—	—	—	—	—	—	—	—	—	—	—	
Cyclohexane	—	A ¹	D	A ²	A ¹	B ¹	D	A	B	D	A	A	D	A	B	D	D	A	D	D	D	D	A	—	A ¹	A	A	A	B	A ²	B	B	B	B	B	B	B	B	B	B	B	A	A	—
Cyclohexanone	D	A	D	C	—	D	D	A	D	D	A	A	D	D	D	B	A	—	A ¹	D	D	D	D	B	D	D	D	A	—	B	B	A ¹	—	—	—	—	—	—	—	—	—	—	—	—
Detergents	B	A ¹	A	A ¹	—	D	A ¹	A ¹	A ¹	A	A	A	A	A	A	B	A	B	B	A	A	A	B	D	A	A	A	A	A	A	—	—	—	—	—	—	—	—	—	—	—	—	—	
Diacetone Alcohol	—	—	D	A	—	A	—	A ¹	D	A	—	A	D	D	D	A	A	B ¹	—	D	D	D	—	D	D	—	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dichlorobenzene	D	—	D	A	—	—	D	D	C ¹	—	A	D	D	A	D	D	D	—	D	D	—	C	—	D	D	—	C	—	B ¹	B ¹	—	B ¹	—	—	—	—	—	—	—	—	—	—	—	
Dichloroethane	D	A ¹	D	D	—	C ¹	A ¹	A ¹	D	D	—	A ¹	D	A	D	—	C	A ²	D	D	—	D	C	D	D	D	D	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
Diesel Fuel	—	A	A ¹	A	—	C ¹	A	A	A ²	A ¹	A	A	A ¹	A	A	D	B	A ¹	D	D	D	D	D	D	D	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	—
Diethyl Ether	D	—	D	D	C	—	—	A ¹	D	A ¹	A	A	D	A ¹	D	D	D	C	D	D	D	D	D	D	D	D	D	D	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diethylamine	D	B	D	A	—	D	—	A	D	A ¹	D	D	D	D	C	B	C	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	—	—
Diethylene Glycol	B	A ¹	A ¹	C	—	B ²	A ¹	A ¹	B ¹	A ²	—	A ²	C ¹	A	A	C	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	—	
Dimethyl Aniline	D	D	D	A ¹	—	—	D	A	D	D	A	A	D	A ¹	D	D	B ²	—	A ²	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	A ²	—
Dimethyl Formamide	D	D	D	D	—	A	D	A	D	A	A	A	D	D	D	B	D	B	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	—
Diphenyl	—	—	—	—	—	—	—	—	D	—	—	A	—	—	D	D	D	B	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	—
Diphenyl Oxide	—	D	—	A	—	—	—	—	D	—	A	A ¹	D	B ²	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	—
Dyes	—	C	—	A	—	—	A	A	—	—	—	—	B	—	—	—	—	—	—	C	—	C	A	A	A	A	B	A	—	C	—	A	—	—	—	—	—	—	—	—	—	—	—	—
Epsom Salts (Magnesium Sulfate)	B ²	B	A ¹	A	—	A ²	A ¹	A ¹	A ¹	A	A	A	A ¹	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	A	A	A	A	—
Ethane	—	A ¹	A ¹	A ¹	—	—	D	—	D	—	—	A	A ¹	A	A	D	B	—	D	B	D	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	—
Ethanol	B ¹	A ¹	B	A ²	—	B	A ¹	A ¹	B ²	A	—	A	C	—	C	A	A	D	A	A	B	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	—
Ethanolamine	—	D	—	A ¹	—	—	A	A	—	D	—	A	A ¹	D	C ¹	B	B	C	D	B	B	C	D	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	—
Ether	D	A ¹	D	A ¹	—	D	D	A	—																																			

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
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%)	D	D	B ¹	D	D	B ¹	B ²	D	B	D	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	C	C	C	D	A	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	B	—	A	C	C	C	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 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	A	—	—	—	—	—	—
Bone	—	D	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	D	—	—	A	—	—	—	—	—	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	D	A	—	—	—	—	—	C	—	—	A	A	A	—	—	—	A	—	—	—	—	—	—	—
Citric	D	A	—	A	—	A	A	A	A	A	—	A	B	A	D	B	—	—	—	D	—	D	A	A	A	A	B	—	D	D	—	A	—	—	—	—
Clove	—	—	—	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	B	A	A	A	—	—	A	A	A	A	—	A	A	—
Creosote	—	D	—	A	D	C	D	D	—	C ¹	—	A	C	—	D	D	D	A ¹	D	C	D	—	A	B	B	B	—	A	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	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	D	A	—	D	A	B	A	A	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	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	A	A	A	A	A	A	B	B	A	A	D	B	A	D	B	C	B	A	A	A	A	A	A	A	—	B	A	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
Orange	—	D	—	A	—	C ¹	—	—	C ¹	A	—	C ¹	A	—	A	—	—	—	—	C	D	—	A	A	A	—	—	—	A	—	—	—	—	—	—	—
Palm	A	A	A	A	—	A	—	—	—	A	—	A	A	A	A	A	—	—	—	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	—	—	—
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	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	—	—	—	—	—	—
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
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
Sperm (whale)	A	D	A	A	—	—	—	—	—	—	—	A	—	A	—	—	—	—	—	D	—	—	A	A	A	—	—	—	A	A	—	—	—	—	—	—
Tanning	—	D	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	D	—	—	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	—	—
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	A	C ²	A ¹	A	—	B ¹	A	A	C ²	A	B	B	C	B	D	C	D	D	B	B ²	B	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	A	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	B	—	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	B	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																							

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	Hyrel®	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	B	A	—	A	—	A	B	—		
Potassium Cyanide Solutions	A	C	A	A	C	A	A ¹	A ¹	—	A	A	A	A	A	A ¹	A ¹	A	A	A	B	A	A	A	B	B	B	D	D	B	B	A	—	A	—	A	B	—		
Potassium Dichromate	B ¹	A	A	C	B	A	A ¹	B ¹	A ¹	A	A	A	A	A	A ¹	A ¹	A	A	B	A	A	A	A	B	B	B	D	D	B	B	A	—	A	—	A	B	A		
Potassium Ferricyanide	B	B ¹	A	A ¹	—	A ²	A ²	B ¹	—	A ²	—	A ²	A	A ²	D	A	A ¹	A ¹	B	A ¹	—	B	A	B	B	B	B ²	B ²	B	C	B	B ²	A ²	A	B	A			
Potassium Ferrocyanide	—	—	B	A	—	A ¹	A	B ¹	—	A	—	A	A	A	D	A	—	A	A	A	—	B	A	B	B	B	B ¹	B ¹	B	C	B	B	A	—	A	B	A		
Potassium Hydroxide (Caustic Potash)	A	A	A	A	D	A	A ¹	C ¹	D	—	A	A	A ¹	A	B ¹	A ²	A	B	B	B	C	B	B	B	B	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	B	—		
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	B	B	B	B	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	B	B	B	B	B	B	A	A	B ¹	A	A	B	A			
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	D	A ²	A ¹	A	A	A ¹	A	C	A	—	—	A ¹	A	—	B	A	B ¹	B	C ¹	D	D	B	A	A	A ¹	A	B ¹	A	—			
Potassium Sulfate	B	B	A	A	B	A ²	A	A	A	A	A	A	A ²	A	A ²	A ¹	A	A ¹	A	A	A	A ²	A	A	B	C ¹	D	A	A	B	B ¹	A	A	B	A				
Potassium Sulfide	B	—	A ²	—	—	A ²	A	A	—	A	A	A	A	A	A	A	B	A	B	C	D	—	—	A	A	A	A	A	A	A	A	—	—	—	A	A	A		
Propane (liquefied)	—	A	A ¹	A	A	—	—	A ¹	C ¹	A	—	A	A ¹	A	A	D	—	A	D	C	D	—	—	A	A	A	A	A ²	A	A	A	—	—	—	A	A	—		
Propylene	B	—	—	—	—	—	—	—	—	—	A ²	B ¹	—	—	D	D	D	—	D	D	D	A	A ¹	B ¹	A ¹	A	—	A	A	A	—	—	—	A ²	—	—			
Propylene Glycol	B	B	C ¹	B	—	B ²	—	C ¹	D	A ²	—	A	C ¹	—	A	A	A	—	A	C	A	A	A	B	B	—	A	A	A	A	B	A	—	A	A	—	A	A	—
Pyridine	—	B	D	A	C	B ¹	B	C ¹	D	A ²	A	A	D	D	D	B	D	A ¹	D	D	D	D	D	B	B	B	B	A	A	B	B	B	A	B	B	B	A	A	—
Pyrogallol Acid	—	D	A	A	—	—	—	—	—	A	—	A	A	A	—	B	—	A	—	A	—	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	—	A	—	—	—	—	—	—	—	—	—			
Rust Inhibitors	—	A	A	A	—	—	—	—	—	A	—	—	—	—	A	A	—	—	—	C	—	—	—	A	A	—	A	—	B	C	—	—	—	—	—	—			
Salad Dressings	—	A	A	A	—	—	A	A	—	A	—	—	—	—	A	—	—	—	—	—	—	—	—	A	B	—	—	A	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	—	—	—	—	—	B	A	A	A ²	A ¹	A ²	—	—			
Salt Brine (NaCl saturated)	—	—	A ²	A	A ¹	A	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	A ²	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	A	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	D	A	D	—	—	—	—	—	—	—		
Silver Nitrate	B	A	A ¹	A	—	A	A	A ¹	A ²	A ¹	A	A	A ¹	A	B	A	A	A	A	A	A	B	A	B	B	D	—	B	C	C	—	A	A	A	—	—			
Soap Solutions	A	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	B	C	A	A	A	A	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	B	D	—	A	A	B	D	A	D	A	B	B	B	A	B	A	A	A	A	A	A				
Sodium Aluminate	—	B	—	A	—	—	A	A ¹	—	—	—	A	A ¹	—	A	A	A	—	B	A	—	—	—	A	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 ¹	—	A	—	—	—	A ¹	A ¹	A ²	—				
Sodium Bicarbonate	A	A	A ²	A	—	A ²	A	A	A ²	A	A	A	B ¹	A ²	A ¹	A ²	A	A	A	A	A	B	A	A	A	B	A	A	A	D	D	A	A	A	A				
Sodium Bisulfate	A	B	A ²	A	C	A ²	A ¹	A ¹	A ¹	A	A	A	A ²	A	B ²	A ²	A	A ²	A	A	A	B	A	A	A	B	A	D	C	D	D	A ²	A	C	B	B ²	A		
Sodium Bisulfite	A	C	A ²	A	C	A ²	A ¹	C ¹	A ¹	A	A	A	A ²	A	A ²	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	A	A	—	A	B ²	B	C	—	A	A	—	B	A	A	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	—	—	A	—	A	B	C	D	—	A ¹	A ²	—	—			
Sodium Carbonate	B	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 ¹	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 ²	A	A	A	A	A	A	A	A	B	A	B	B	C	D	B	B	D	B								

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	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							
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 ²	A	B	A	—	—	A ²	A	A	D	A ²	—	—	D	C	D	D	A	—	—	A	—	—				
Sorghum	—	A	—	A	—	—	—	—	—	—	—	—	—	—	A	—	—	—	A	—	—	—	A	—	—	—	—	—	—	D	C	D	D	A	—	—	A	—	—				
Soy Sauce	—	A	—	A	—	—	—	—	—	—	—	—	—	—	A	—	—	—	A	—	—	—	A	—	—	—	—	—	—	D	C	D	D	A	—	—	A	—	—				
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	—	—	—	A	—	—	—	—	—	—	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	A	A	A	C	A ¹	A	A	A	—	—	A	—	—	—	—	—	—	D	D	—	—	—	—	—	—	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 ¹	B	D	A ¹	B	A	B	D	B	C	C	D	B	A	A	—	—	A	—	—		
Stoddard Solvent	B	A	A ²	A	—	C ²	D	A	A ²	A ²	A	A	A ²	A	A	D	—	A	D	—	—	—	C ¹	D	C	A	A	A	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	D	D	—	B	A	A	A	A	A	A	A	B	D	—	A	—	—	A	—	—	
Sugar (Liquids)	B	A	—	A	—	—	A ²	A ¹	—	A	—	A	—	—	A	A	A	—	A	A	B	A	A	—	—	—	A	A	A	A	—	A	—	—	—	A	—	—	A	—	—		
Sulfate (Liquors)	—	D	B	A	—	A ²	—	B ¹	—	A	—	A	B	A	A ²	A	B	—	B	B	—	A ¹	A	—	—	—	A	B	D	—	B	D	C	D	B	—	A	—	—	A	—	—	
Sulfur Chloride	—	D	C ¹	C	—	C ¹	A	A ¹	—	C ¹	—	A	C ¹	A ¹	D	D	—	A	D	—	—	D	D	—	A	D	D	D	D	B	D	D	B	A	D	D	—	—	A	—	—		
Sulfur Dioxide	D	B	A ²	A ¹	C	B ¹	A	A ¹	—	C ¹	A	A	A ¹	A	D	A ²	C	A	—	—	—	D	B	C	A	D	D	A ¹	B	D	D	A ¹	B	D	B	B	—	—	A	—	—		
Sulfur Dioxide (dry)	—	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	B	—	A	D	A	B	D	B	A	—	—	—	A	—	—	A	—	—			
Sulfur Hexafluoride	—	—	—	—	—	B	—	B	—	—	—	B	—	—	B	B	B	—	D	—	—	A	B	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Sulfur Trioxide	—	—	A	A	—	—	D	D	—	C	—	A	A	—	D	C ²	D	—	C	—	—	D	B	A	A	A	C	A	D	C	B	A	B	—	—	—	—	—	B	—	—		
Sulfur Trioxide (dry)	—	D	A	A	—	C ¹	D	A ¹	—	D	—	A	A ¹	C ¹	D	C ¹	—	—	—	—	—	D	B	B	A	D	A	A	B	D	B	A	B	B	D	B	—	—	A	—	—		
Sulfuric Acid (<10%)	B	D	A	A ¹	A	A ¹	A	A 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	—	D	A	B	D	B	D	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	B ¹	D	C	A ²	D	D	D	—	B	A ²	D	—	B ¹	D	C ¹	A	—	A	—	—			
Sulfuric Acid (75-100%)	—	—	C	C ¹	C	C	D	A ¹	D	C ¹	A ¹	A	D	A	C	B ¹	C	A	D	A	D	D	D	D	A ¹	C	D	D	—	B	A ²	D	D	B ¹	D	C ¹	A	A	A	—	—		
Sulfuric Acid (cold concentrated)	—	—	D	D	B	D	A	D	—	A ²	A ¹	A	D	A	D	C	C	A	D	D	D	B ¹	D	C	B	C	B	—	B	A ²	D	—	A ¹	D	D	—	—	D	—	—			
Sulfuric Acid (hot concentrated)	—	—	D	D	—	D	D	D	D	D	D	A	D	C	D	D	A	D	A	D	D	D	D	D	A ²	D	C	D	—	B	D	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	A	B ¹	B	B ¹	—	B	D	D	D	B	A	A	—	—	A	—	—			
Sulfuryl Chloride	—	A	—	A	—	—	—	—	—	—	—	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Tallow	—	A	—	A	—	C	A	A ¹	—	A ²	—	A	—	—	A	A	C	—	—	—	—	B	—	—	A	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	A	B	B	A	B ¹	A	C	B	B	A	C	A	B ¹	A	A	A	A	A	A	A
Tanning Liquors	—	B	A ¹	A	—	A ¹	A ²	A ¹	—	A ¹	—	A	A ¹	—	B ¹	B	A	—	C	—	—	A	B	B	A	A	A ²	A ²	A	—	A ²	A	C	—	B	A	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	A	A	A				
Tetrachloroethane	—	A	C	A	—	—	D	C ¹	—	C	—	A	C	A	D	D	D	A	D	D	—	A	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	—	A	D	D	—	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	—	A	D	D	—	A	—	—	D	—	—	—	A	B	—	—	—	—	—	A	—	—	
Tin Salts	—	—	—	—	—	—	—	—	—	—	—	A	A	—	A	B	A	—	A	—	—	—	B	A	A	—	—	D	—	—	—	—	—	C	A	—	—	—	—	—	—		
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	A	A	A	A	A		
Tomato Juice	B	B	—	A	—	A ¹	A	A ²	A ¹	A	A	A	B	A	A	A	—	A	—	—	—	A	—	—	A	A	A	A	—	A	C	—	—	—	—	—	—	A	—	—			
Trichloroacetic Acid	—	—	—	D	—	A	—	C	D	A	A	A	B	B	—	B	—	A	C	—	—	D	D	A	C	D	C	D	—	—	—	D	D	B	D	A	—	—	A	—	—		
Trichloroethane	—	A	—	A	—	—	D	C ¹	D	C	—	A	C	A	D	D	D	A	D	D	—	A	D	D	—	A	B	B	D	—	A	A	B	—	—	—	—	—	A	—	—		
Trichloroethylene	D	D	D	C ¹	C	D	D	C ¹	—	C ¹	A ¹	A	D	B	D	D	D	A	D	D	—	A	D	D	—	B	B	B	D	—	B	A	C	A	A ¹	A	A	A	A	A			
Trichloropropane	D	A	—	A	—	—	D	—	—	—	—	A ¹	—	—	D	—	—	A	D	—	—	D	—	—	A	A	A	D	—	A	A	A	A	A	A	A	A	—	—	—			
Tricresylphosphate	B	C	D	A	—	B ¹	A	A ²	—	A ¹	—	A	D	D	D	C	D	A ²	C	C	D	A ²	B	A	D	—	A ²	A	B	B	A	B	A	B	A	A	B	A	D	—	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	—	—												