



RECOMMENDED USE DEFINITIONS

IMMERSION SERVICE (Most Severe) – IS

Suitable for continuous contact with chemical exposure up to specified temperature.

CARGO/TEMPORARY IMMERSION – CI

Suitable for 60 day continuous contact with chemical exposure up to specified temperature. Coating will show no effect except slight softening or color change, possibly permanent, after 60 days or less continuous immersion. When used in transport or hauling conditions, the vessel must be completely drained to prevent puddling that would constitute continuous immersion.

SECONDARY CONTAINMENT – SC

Suitable for continuous contact with chemical for up to 72 hours. Softening or discoloration may occur during the exposure.

FREQUENT CONTACT – FC

Suitable for frequent splash or up to 72 hours exposure to concentrated vapors. The coating will show no effects except slight softening or color change, possibly permanent, after eight hours continuous immersion in the liquid chemical or 72 hours exposure to the vapor.

OCCASIONAL CONTACT (Least Severe) – OC

Suitable for occasional splash and spillage or occasional exposure to concentrated vapors. The coating shows no effects, except slight softening or color changes, following short exposure to splash or spillage which evaporates, is hosed off, or dried overnight or, 24 hours exposure to vapor.

NOT TESTED – This chemical has not been tested or evaluated for the listed chemical.

NOT RECOMMENDED – This product is not recommended for the listed exposure. The product's resistance to the listed chemical is often queried, therefore this information is provided as a reference even though the product is not recommended.

IMPORTANT NOTES

The term "chemicals" is used broadly in this guide and can refer to various constituents including, but not limited to, acids, fatty acids, food and beverage materials, finished and unrefined hydrocarbons, as well as individual chemicals and chemical blends.

Temperature can have a significant effect on a coating's chemical resistance. Prior to coating selection, due care should be taken to determine the service temperature of stored chemicals, elevated temperature caused by natural environmental conditions (i.e. radiant heat from sun, weather), and temperature fluctuations during service (i.e. loading of cargo, service cycling).

Chemical mixtures and alternating chemical storage can aggressively degrade a coating or lining system. Prior to coating selection and application, the expected chemical exposures and sequence of chemical storage should be discussed with Tnemec Technical Service to ensure the proper coating is selected.

Proper surface preparation is always important to ensure optimum coating performance but it is even more so for coatings that will undergo chemical exposure. Carefully read product data sheets along with related application guides to determine the required level of surface preparation and surface profile.

Structural designs of tanks, structures, and containment areas can greatly affect coating performance. Sharp angles, channels, edges, corners, pits, voids, defects, rough welds, and other similar conditions present areas that are either difficult to coat or achieve the required film thickness. Avoid skip welds in favor of continuous welds. A stripe coat on these areas, prior to full coating application, can help achieve needed film thickness and prevent premature coating failure. (Reference NACE SP0178-2007 for more information.)

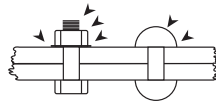
The length of a coating system's service life depends on surface cleanliness and preparation prior to application, proper application procedures, exposure conditions, physical abuse, cleaning techniques, and frequency of inspection, maintenance, and repair. No coating system has an unlimited service life. Regular inspection of the coating system can prolong service life by identifying areas in need of repair. Additionally, regular inspections can determine when the coating system is nearing its end of service and should be completely replaced.

Chemical resistance information is provided for the purpose of establishing a general profile of the coating and was obtained through laboratory testing, field experience, and industry knowledge. Test results were produced in a controlled environment and Tnemec makes no claim that any tests, or published chemical resistance information, accurately represent all environments or correlate to actual field performance. Application, environmental and design factors, chemical temperatures, chemical mixtures, sequence of storage, conditions of service, and cleaning procedures can significantly impact coating performance, so due care must be exercised in the selection and use of the coating. Tnemec disclaims responsibility for product use outside its published information. Contact Tnemec Technical Service to review full project details before the coating or coating system is selected and applied.

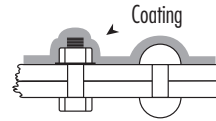
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COMMON PROBLEM AREAS FOR COATINGS AND SOLUTIONS

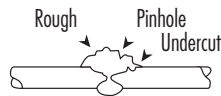
Problem:
Points of failure due to thin spots in coating



Solution:
Carefully and fully coat



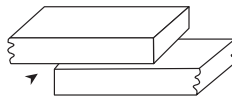
Problem:
Uneven welds



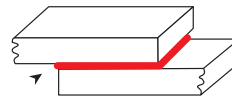
Solution:
Grind smooth



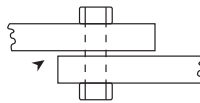
Problem:
Gaps between plates, coating can not cover



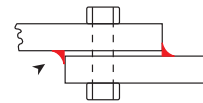
Solution:
Continuous welds



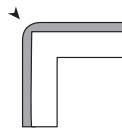
Problem:
Gaps between plates, coating can not cover



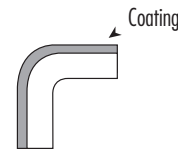
Solution:
Continuous welds



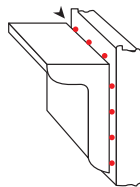
Problem:
Sharp surface contours create thin spots in coating



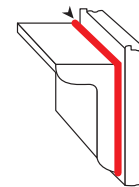
Solution:
Round the contours



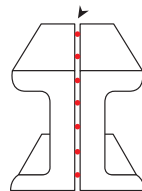
Problem:
Skip welding creates gaps that coating can not cover



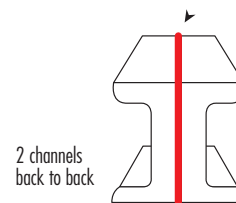
Solution:
Continuous welds



Problem:
Skip welding creates gaps that coating can not cover



Solution:
Continuous welds



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Chemical	Intended Use (Maximum Temperature Listed)				
	Occasional Contact	Frequent Contact	Secondary Containment	Cargo Immersion	Immersion Service
1, 1, 1-Trichloroethane (Trichloroethane)	NR	NR	NR	NR	NR
Acetic Acid					
10%	100°F (38°C)				
30%	NR	NR	NR	NR	NR
Acetic Acid, Glacial	NR	NR	NR	NR	NR
Acetic Anhydride					
100%	NR	NR	NR	NR	NR
Acetone	100°F (38°C)				
Acrylic Acid					
25%	NR	NR	NR	NR	NR
Acrylic Latex Solution	NR	NR	NR	NR	NR
Activated Carbon	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Adipic Acid (Dry)	NT	NT	NT	NT	NT
Aluminum Chloride					
25%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Aluminum Hydroxide	NT	NT	NT	NT	NT
Aluminum Sulfate (Alum)					
49%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Ammonium Chloride	100°F (38°C)	100°F (38°C)			
Ammonium Hydroxide					
10%	100°F (38°C)	100°F (38°C)			
30%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Ammonium Nitrate					
38%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Ammonium Nitrite					
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)

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Ammonium Perchlorate (Dry)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Ammonium Phosphate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Ammonium Sulfate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Amyl Acetate	NR	NR	NR	NR	NR
Aniline	NR	NR	NR	NR	NR
Aqua Regia	NR	NR	NR	NR	NR
Aviation Gas	NR	NR	NR	NR	NR
Barium Chloride					
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Barium Hydroxide					
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Barium Nitrate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Barium Sulfate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Benzene	100°F (38°C)				
Borax	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Boric Acid					
5%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Butyric Acid	NR	NR	NR	NR	NR
Calcium Carbonate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Calcium Chloride					
50%	100°F (38°C)	100°F (38°C)			
Calcium Hydroxide (Lime Slurry)					
30%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Calcium Hypochlorite					
5%	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Calcium Nitrate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Calcium Oxide	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)

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	Occasional Contact	Frequent Contact	Secondary Containment	Cargo Immersion	Immersion Service
Calcium Sulfate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Chromic Acid					
10%	100°F (38°C)	100°F (38°C)			
Citric Acid					
50%	100°F (38°C)	100°F (38°C)			
Copper Chloride	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Copper Sulfate					
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Corn Mash Solution (non-food contact) ¹	100°F (38°C)	100°F (38°C)			
Crude Oil (Sour)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Crude Oil (Sweet)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Cyclohexane	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Cyclohexanol	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Dibutyl Phthalate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Diesel Fuel (Fuel Oil, Diesel Oil)	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Diethanolamine	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Diethylene Glycol	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Dioctyl Phthalate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Dipropylene Glycol	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Ethanol (Ethyl Alcohol, Denatured Alcohol)	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Ethyl Benzene	NR	NR	NR	NR	NR
Ethylene Glycol	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Fatty Acids (Greater than C6)	100°F (38°C)				
Ferric Chloride	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Ferric Sulfate					
20%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Formaldehyde					

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	Occasional Contact	Frequent Contact	Secondary Containment	Cargo Immersion	Immersion Service
37%	100°F (38°C)	100°F (38°C)			
Formic Acid					
10%	NR	NR	NR	NR	NR
Furan	NR	NR	NR	NR	NR
Furfuryl Alcohol	NR	NR	NR	NR	NR
Gasohol E10 (10% Ethanol)	NR	NR	NR	NR	NR
Gasohol E15 (15% Ethanol)	NR	NR	NR	NR	NR
Gasohol E30 (30% Ethanol)	NR	NR	NR	NR	NR
Gasohol E50 (50% Ethanol)	NR	NR	NR	NR	NR
Gasohol E85 (85% Ethanol)	NR	NR	NR	NR	NR
Gasoline (Reformulated)	NR	NR	NR	NR	NR
Gasoline (Unleaded)	NR	NR	NR	NR	NR
Gasoline (w/ETBE, 15% max)	NR	NR	NR	NR	NR
Gasoline (w/TAME, 15% max)	NR	NR	NR	NR	NR
Gasoline (w/TBA, 15% max)	NR	NR	NR	NR	NR
Gasoline (w/WTBE, 15% max)	NR	NR	NR	NR	NR
Glycerin	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Heptane	100°F (38°C)	100°F (38°C)			
Hexane	100°F (38°C)	100°F (38°C)			
Hexanol	100°F (38°C)				
Hydraulic Fluid (Hydraulic Oil)	NT	NT	NT	NT	NT
Hydrochloric Acid					
5%	100°F (38°C)	100°F (38°C)			
10%	100°F (38°C)	100°F (38°C)			
15%	100°F (38°C)	100°F (38°C)			
28%	100°F (38°C)	100°F (38°C)			
37%	100°F (38°C)	100°F (38°C)			

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	Occasional Contact	Frequent Contact	Secondary Containment	Cargo Immersion	Immersion Service
Hydrofluoric Acid					
10%	NR	NR	NR	NR	NR
Hydrogen Peroxide					
30%	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Hydrogen Sulfide	100°F (38°C)	100°F (38°C)			
Iodine					
5%	100°F (38°C)				
Isobutyl Acetate	100°F (38°C)	100°F (38°C)			
Isobutyl Alcohol	100°F (38°C)	100°F (38°C)			
Isopropyl Acetate	100°F (38°C)	100°F (38°C)			
Isopropyl Alcohol	100°F (38°C)	100°F (38°C)			
Jet A Fuel	NR	NR	NR	NR	NR
JP-4 Aviation Fuel	NR	NR	NR	NR	NR
JP-5 Aviation Fuel	NR	NR	NR	NR	NR
Kerosene	NR	NR	NR	NR	NR
Lactic Acid					
2%	NR	NR	NR	NR	NR
10%	NR	NR	NR	NR	NR
85%	NR	NR	NR	NR	NR
Lead Acetate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Linseed Oil	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Lithium Chloride	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Lubricating Oil (SAE 5W-40, et al) (Motor Oil)	100°F (38°C)	100°F (38°C)			
Magnesium Chloride					
50%	100°F (38°C)	100°F (38°C)			
Magnesium Hydroxide					
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)

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Methanol (Methyl Alcohol)	NR	NR	NR	NR	NR
Methyl Ethyl Ketone	NR	NR	NR	NR	NR
Methyl Propyl Ketone	NR	NR	NR	NR	NR
Methylene Chloride	NR	NR	NR	NR	NR
Mineral Oil	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Mineral Spirits	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Naphtha	100°F (38°C)	100°F (38°C)	100°F (38°C)		
n-Butyl Acetate (Butyl Acetate)	NR	NR	NR	NR	NR
n-Butyl Alcohol (1-Butanol) (Butanol (Normal))	100°F (38°C)				
n-Decyl Alcohol (Decyl Alcohol (1-Decanol))	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Nitric Acid					
10%	100°F (38°C)				
25%	NR	NR	NR	NR	NR
70%	NR	NR	NR	NR	NR
n-Methyl-2-Pyrolidone	NR	NR	NR	NR	NR
n-Octyl Alcohol (Octanol)	100°F (38°C)	100°F (38°C)	100°F (38°C)		
n-Propyl Alcohol (Propyl Alcohol)	100°F (38°C)	100°F (38°C)			
Oleic Acid	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Oxalic Acid					
10%	100°F (38°C)	100°F (38°C)			
Paraffin Wax	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Perchloroethylene	100°F (38°C)	100°F (38°C)			
Petroleum Ether	100°F (38°C)	100°F (38°C)			
Phenol (Carbolic Acid)	NR	NR	NR	NR	NR

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Phosphoric Acid					
10%	100°F (38°C)				
25%	100°F (38°C)				
85%	NR	NR	NR	NR	NR
Phthalic Acid (all)	100°F (38°C)	100°F (38°C)			
Pine Oil	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Polyethylene Glycol	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Potassium Fluoride	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Potassium Hydroxide					
50%	100°F (38°C)	100°F (38°C)			
Potassium Nitrate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Potassium Permanganate	NT	NT	NT	NT	NT
Propylene Glycol	100°F (38°C)	100°F (38°C)			
Pulpmill (Black Liquor)	NR	NR	NR	NR	NR
Pulpmill (Green Liquor)	NR	NR	NR	NR	NR
Pulpmill (White Liquor)	NR	NR	NR	NR	NR
Silicone Fluids	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Bicarbonate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Bisulfate					
30%	100°F (38°C)	100°F (38°C)			
Sodium Bisulfite					
38%	100°F (38°C)	100°F (38°C)			
Sodium Borate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Carbonate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Carbonate (slurry)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Chloride (sat'd) (Brine, Water (Sea), Salt Brine)	100°F (38°C)	100°F (38°C)			
Sodium Chromate					

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HI-BUILD TNEME-TAR® | SERIES 46H-413

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² Product is suitable for direct or indirect food contact. Reference the product data sheet for more information.

Chemical	Intended Use (Maximum Temperature Listed)				
	Occasional Contact	Frequent Contact	Secondary Containment	Cargo Immersion	Immersion Service
50%	NT	NT	NT	NT	NT
Sodium Dichromate (all)	NT	NT	NT	NT	NT
Sodium Fluoride	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Sodium Formate					
50%	NT	NT	NT	NT	NT
Sodium Hydrosulfide					
72%	100°F (38°C)	100°F (38°C)			
Sodium Hydrosulfite					
10%	100°F (38°C)	100°F (38°C)			
Sodium Hydroxide (Caustic Soda)					
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Hypochlorite (Bleach)					
5%	100°F (38°C)	100°F (38°C)	100°F (38°C)		
13%	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Sodium Lauryl Sulfate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Nitrate (dry)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Silicate	NT	NT	NT	NT	NT
Sodium Sulfate					
6%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Sodium Thiosulfate					
30%	NT	NT	NT	NT	NT
Sodium Tripolyphosphate					
1%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Soybean Oil (non-food contact) ¹	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Styrene	NR	NR	NR	NR	NR
Sulfuric Acid (Sulphuric Acid)					

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Chemical	Intended Use (Maximum Temperature Listed)				
	Occasional Contact	Frequent Contact	Secondary Containment	Cargo Immersion	Immersion Service
10%	100°F (38°C)	100°F (38°C)			
30%	100°F (38°C)	100°F (38°C)			
50%	100°F (38°C)	100°F (38°C)			
70%	NT	NT	NT	NT	NT
98%	NT	NT	NT	NT	NT
Tall Oil	NR	NR	NR	NR	NR
Tannic Acid	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Tartaric Acid	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Tetrahydrofuran	NR	NR	NR	NR	NR
Toluene	100°F (38°C)	100°F (38°C)			
Transmission Fluid	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Triethanolamine	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Triethylamine	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Trisodium Phosphate (Sodium Phosphate (Tribasic))					
20%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Turpentine	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Urea					
50%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Urea Ammonium Nitrate	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Vegetable Oil (non-food contact) ¹	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Water (fresh, non-potable)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Xylene	100°F (38°C)	100°F (38°C)			
Zinc Bromide	100°F (38°C)	100°F (38°C)	100°F (38°C)		
Zinc Chloride					
40%	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Zinc Phosphate (dry)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)	100°F (38°C)
Zinc Sulfate	100°F (38°C)	100°F (38°C)	100°F (38°C)		

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