## 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.

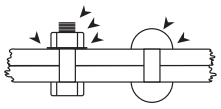
Structural designs of tanks, structures, and containment areas can greatly affect coating performance. Sharp angles, channels, edges, corners, pits, voids, defects, rough welds, and other similar conditions present areas that are either difficult to coat or achieve the required film thickness. Avoid 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.

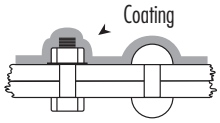
Chemical resistance information is provided for the purpose of establishing a general profile of the coating and was obtained through laboratory testing, field experience, and industry knowledge. Test results were produced in a controlled environment and Tnemec makes no claim that any tests, or published 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.

## COMMON PROBLEM AREAS FOR COATINGS AND SOLUTIONS

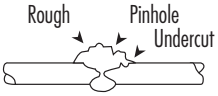
**Problem:** Points of failure due to thin spots in coating



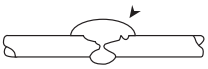
**Solution:** Carefully and fully coat



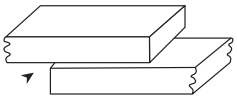

**Problem:** Uneven welds



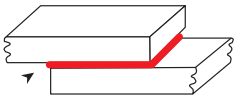

**Solution:** Grind smooth



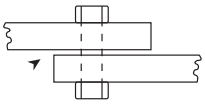
**Problem:** Gaps between plates, coating can not cover



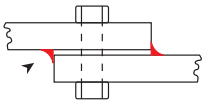
**Solution:** Continuous welds



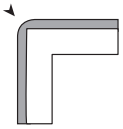
**Problem:** Gaps between plates, coating can not cover



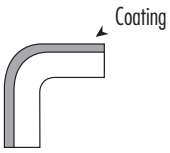
**Solution:** Continuous welds



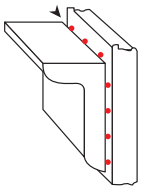
**Problem:** Sharp surface contours create thin spots in coating



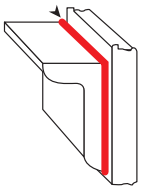
**Solution:** Round the contours



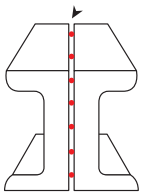

**Problem:** Skip welding creates gaps that coating can not cover



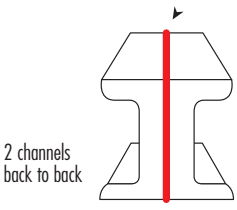
**Solution:** Continuous welds



**Problem:** Skip welding creates gaps that coating can not cover



**Solution:** Continuous welds

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| Acetaldehyde | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Acetic Acid | | | | | |
| 5% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 30% | 100°F (38°C) | 100°F (38°C) | | | |
| Acetic Acid, Glacial | 100°F (38°C) | | | | |
| Acetic Anhydride | | | | | |
| 100% | 100°F (38°C) | | | | |
| Acetone | 100°F (38°C) | | | | |
| Acetyl Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Acrylic Acid | | | | | |
| 100% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Acrylonitrile | | | | | |
| 100% | 100°F (38°C) | 100°F (38°C) | | | |
| Adipic Acid | | | | | |
| 25% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Allyl Alcohol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Allyl Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Aluminum Bromide | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Aluminum Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Aluminum Nitrate | | | | | |
| 50% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) |
| Aluminum Sulfate (Alum) | | | | | |
| 49% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Bisulfite | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Fluoride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| Ammonium Hydroxide | | | | | |
| 20% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 30% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Lauryl Sulfate | | | | | |
| 30% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Nitrate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Persulfate | 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) | | |
| Ammonium Sulfide | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Sulfite | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ammonium Xylene Sulfonate | | | | | |
| 40% | 100°F (38°C) | 100°F (38°C) | | | |
| Amyl Acetate | 100°F (38°C) | 100°F (38°C) | | | |
| Amyl Alcohol | NT | NT | NT | NT | NT |
| Aniline | 100°F (38°C) | 100°F (38°C) | | | |
| Aniline Hydrochloride | 100°F (38°C) | 100°F (38°C) | | | |
| Antimony Chloride (tri) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Aqua Ammonia | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Aqua Regia | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Arsenous Acid | 100°F (38°C) | 100°F (38°C) | | | |
| Barium Sulfide | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Beer (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Benzal Chloride | NR | NR | NR | NR | NR |
| Benzaldehyde | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Benzene Sulfonic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Benzene Thiol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Bromine | | | | | |
| 5% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |

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| Bromine Gas (Dry) | 100°F (38°C) | 100°F (38°C) | | | |
| Bromine Gas (Wet) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Butyl Acid Levulinic | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Butyl Acrylate | NT | NT | NT | NT | NT |
| Butyl Amine | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Butyl Ether | 100°F (38°C) | 100°F (38°C) | | | |
| Butyric Acid | 100°F (38°C) | | | | |
| Cadmium Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Cadmium Plating (Cyanide) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Calcium Bisulfite | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Calcium Carbonate | 100°F (38°C) | 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) | | |
| Calcium Hypochlorite | | | | | |
| 5% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Calcium Nitrite | NT | NT | NT | NT | NT |
| Calcium Oxide | | | | | |
| 1% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Calcium Sulfite | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Caprylic Acid (Octanoic Acid) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Carbon Bisulfide (Di) Fumes (wet) | NT | NT | NT | NT | NT |
| Carbon Dioxide | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Carbon Tetrachloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Castor Oil | 100°F (38°C) | 100°F (38°C) | | | |
| Chloracetic Acid | | | | | |
| 20% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Chlorine Dioxide | NR | NR | NR | NR | NR |

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| Chloroacetic Acid | | | | | |
| 50% | 100°F (38°C) | 100°F (38°C) | | | |
| 100% | 100°F (38°C) | 100°F (38°C) | | | |
| Chlorobenzene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Chlorobutane | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Chloroform | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Chlorophenol | 100°F (38°C) | 100°F (38°C) | | | |
| Chlorosulfonic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Chlorotoluene | 100°F (38°C) | 100°F (38°C) | | | |
| Chromic Acid | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Chromic Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Citric Acid | | | | | |
| 50% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Copper Nitrate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Copper Plating (Acid) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Copper Plating (Cyanide) | NT | NT | NT | NT | NT |
| Copper Sulfate | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 20% | 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) | | |
| Copper Sulfate (dry) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Corn Oil (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Cottonseed Oil (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Cresol | 100°F (38°C) | 100°F (38°C) | | | |
| Cresylic Acid | 100°F (38°C) | 100°F (38°C) | | | |
| Cumene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Cyclohexanone | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |

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| Cymene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Dextrose | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Dibromopropane Phosphate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Dichloracetic Acid | | | | | |
| 20% | 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) | | |
| Diethylene Chloroformate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Diethylketone | 100°F (38°C) | 100°F (38°C) | | | |
| Dimethyl Carbonyl Chloride | 100°F (38°C) | 100°F (38°C) | | | |
| Dimethyl Formamide | 100°F (38°C) | 100°F (38°C) | | | |
| Dimethyl Sulfoxide | 100°F (38°C) | 100°F (38°C) | | | |
| Dimethylaminopropylamine | 100°F (38°C) | 100°F (38°C) | | | |
| Dimethylaniline | 100°F (38°C) | 100°F (38°C) | | | |
| Dinitro Toluene | 100°F (38°C) | 100°F (38°C) | | | |
| Dinitrobenzene | 100°F (38°C) | 100°F (38°C) | | | |
| Dodecyl Alcohol (Lauryl Alcohol) | 100°F (38°C) | 100°F (38°C) | | | |
| Ethoxy Ethanol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethoxylated Nonyl Phenol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethyl Acetate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethyl Acrylate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethyl Bromide | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethyl Chloride | 100°F (38°C) | 100°F (38°C) | | | |
| Ethyl Chloroformate | 100°F (38°C) | 100°F (38°C) | | | |
| Ethyl Ether | 100°F (38°C) | 100°F (38°C) | | | |
| Ethyl Hexyl Acrylate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethyl Sulfate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethylamine | 100°F (38°C) | 100°F (38°C) | | | |

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| | Intended Use (Maximum Temperature Listed) | | | | |
|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| Ethylene Dichloride | 100°F (38°C) | 100°F (38°C) | | | |
| Ethylene Glycol Monobutyl Ether (Butyl "Cellosolve") | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethylene Glycol Monobutyl Ether Acetate (Butyl "Cellosolve" Acetate) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ethylene Oxide | 100°F (38°C) | 100°F (38°C) | | | |
| Ferric Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Ferric Nitrate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Fluorosilicic Acid (Hydrofluorosilicic Acid) | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 25% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Formaldehyde | | | | | |
| 37% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Formic Acid | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | | | |
| Furfuryl Alcohol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Gasoline (Unleaded) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Glucose (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Glycol Acid | NT | NT | NT | NT | NT |
| Gold Plating (Cyanide) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Grape Juice | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Hydrazine | | | | | |
| 35% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Hydrazine Hydrate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Hydriodic Acid | | | | | |
| 20% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Hydrobromic Acid | | | | | |
| 20% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| 48% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Hydrochloric Acid | | | | | |
| 5% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 15% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 20% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 28% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 37% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Hydrofluoric Acid | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 20% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Hydrogen Peroxide | | | | | |
| 30% | 100°F (38°C) | | | | |
| Hypochlorous Acid | NR | NR | NR | NR | NR |
| Iodine (Crystals and vapor) | 100°F (38°C) | 100°F (38°C) | | | |
| Isooctylthioglycolcolate | 100°F (38°C) | 100°F (38°C) | | | |
| Isophorone | NR | NR | NR | NR | NR |
| Isopropyl Acetate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Isopropyl Alcohol | NT | NT | NT | NT | NT |
| Isopropyl Ether | 100°F (38°C) | 100°F (38°C) | | | |
| Lactic Acid | | | | | |
| 85% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Lard (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Lauric Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Lauryl Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Lecithin | NT | NT | NT | NT | NT |
| Levulinic Acid | 100°F (38°C) | 100°F (38°C) | | | |
| Lithium Hydroxide | | | | | |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Lithium Hydroxide (saturated) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Maleic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Malic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Mercury and Salts | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Methanol (Methyl Alcohol) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Methyl Acetate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Methyl Amyl Alcohol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Methyl Chloride | 100°F (38°C) | 100°F (38°C) | | | |
| Methyl Ethyl Ketone | 100°F (38°C) | | | | |
| Methyl Isobutyl Ketone | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Methyl Oleate | 100°F (38°C) | 100°F (38°C) | | | |
| Methylene Chloride | NR | NR | NR | NR | NR |
| Milk (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | | | |
| Molasses (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | | | |
| Naphtha | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Naphthalene | NT | NT | NT | NT | NT |
| Naphthenic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| n-Butyl Acetate (Butyl Acetate) | 100°F (38°C) | 100°F (38°C) | | | |
| Nickel Plating (bright) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Nitric Acid | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 25% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 70% | NR | NR | NR | NR | NR |
| Nitrilotriethanol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Nitrobenzene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Nitromethane | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| n-Octyl Alcohol (Octanol) | NT | NT | NT | NT | NT |
| 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) | 100°F (38°C) | | |
| Pelargonic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Pentachloroethane | NT | NT | NT | NT | NT |
| Perchloric Acid | | | | | |
| 30% | NT | NT | NT | NT | NT |
| Phenol (Carbolic Acid) | NT | NT | NT | NT | NT |
| Phenolsulfonic Acid | | | | | |
| 65% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Phosphoric Acid | | | | | |
| 5% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 25% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 43% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 85% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Phosphorous Oxychloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Phosphorous Trichloride | 100°F (38°C) | 100°F (38°C) | | | |
| Picric Acid | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | | | |
| Polyacrylic Acid | | | | | |
| 50% | 100°F (38°C) | 100°F (38°C) | | | |
| Polymer Emulsion | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Polymer Mannich | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Acetate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Bicarbonate | 100°F (38°C) | 100°F (38°C) | | | |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| Potassium Bromide | 100°F (38°C) | 100°F (38°C) | | | |
| Potassium Carbonate | | | | | |
| 25% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Chlorate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Cyanide | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Hydroxide | | | | | |
| 50% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) |
| Potassium Permanganate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Persulfate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Potassium Sulfate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Propanediol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Propylene Glycol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) |
| Pulpmill (Green Liquor) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Pulpmill (White Liquor) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Pyridine | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Rayon Spin Liquor | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Salicyaldehyde | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Salicylic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Silicon Tetrachloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Silver Nitrate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Skydrol | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) |
| Sodium Acetate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Aluminate | NR | NR | NR | NR | NR |
| Sodium Bicarbonate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Bisulfate | | | | | |
| 30% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Bisulfite | | | | | |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| 38% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Bromate | | | | | |
| 5% | NT | NT | NT | NT | NT |
| Sodium Carbonate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Chlorite (>6 pH) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Chromate | | | | | |
| 50% | NT | NT | NT | NT | NT |
| Sodium Cyanide | | | | | |
| 18% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Fluoride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Hydrosulfide | | | | | |
| 72% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | 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) | | |
| 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) | | |
| 15% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Oxalate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Peroxide | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Phosphate | | | | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Polymethacrylate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Silicate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Silicofluoride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Sulfide (all) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Sulfite | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| Sodium Tartrate | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sodium Thiosulfate | | | | | |
| 30% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Stannic Chloride (all) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Stannous Chloride (all) | 100°F (38°C) | 100°F (38°C) | | | |
| Stearic Acid (conc) | 100°F (38°C) | 100°F (38°C) | | | |
| Styrene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sugars (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sulfamic Acid | | | | | |
| 25% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sulfite Liquor (paper industry) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sulfur Dioxide (dry) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sulfur Dioxide (wet) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sulfur Trioxide (wet) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Sulfuric Acid (Sulphuric Acid) | | | | | |
| 5% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 10% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 30% | 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) | | |
| 70% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| 98% | 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) | 100°F (38°C) | 100°F (38°C) |
| Tetrachloroethane | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Tetrachloroethylene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Tetrahydrofuran | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Tetrahydrofurfuryl Alcohol | NT | NT | NT | NT | NT |
| Tetrasodium Pyrophosphate | NR | NR | NR | NR | NR |

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|---|---|---|---|---|---|
| **Chemical** | **Occasional Contact** | **Frequent Contact** | **Secondary Containment** | **Cargo Immersion** | **Immersion Service** |
| Thionyl Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Thionyl Chloride (water solution) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Toluene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Toluenesulfonic Acid | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Toluidine | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Trichloroacetic Acid | | | | | |
| 20% | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Trichlorobenzene | 100°F (38°C) | 100°F (38°C) | | | |
| Trichloroethylene | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Tricresyl Phosphate | 100°F (38°C) | 100°F (38°C) | | | |
| Triethyl Phosphite | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Triethylenetetramine | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Vinegar (non-food contact) [1] | NR | NR | NR | NR | NR |
| Vinyl Chloride | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Wine (non-food contact) [1] | 100°F (38°C) | 100°F (38°C) | | | |
| Xylene | 100°F (38°C) | 100°F (38°C) | | | |
| Zinc Plating (Acid Fluoborate) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |
| Zinc Plating (Acid Sulfate) | 100°F (38°C) | 100°F (38°C) | | | |
| Zinc Plating (Cyanide) | 100°F (38°C) | 100°F (38°C) | 100°F (38°C) | | |

IMPORTANT: Definitions for the terms and acronyms used in this guide to describe the recommended exposures, along with other important information, can be found on the cover page of this guide or by contacting Tnemec Technical Service. Coatings should not be applied in a chemical exposure environment until the user has thoroughly read and understood the product information and full project details have been discussed with Tnemec Technical Service.