REMCO PRODUCTS

Top Dog Product Chemical Resistance Guide (A Sampling)

Please see the end of this document for more information, or email cs@remcoproducts.com

Note: When in doubt, test a sample of the material in the application/intended use.

These ratings are intended as a general guide only. Since there are variable factors which can affect the chemical resistance of the material, the final determination of the suitability of the material is the responsibility of the user. Upon request, we will provide a sample of the material to aid the user in making this determination.

(E) = Excellent – Little or no effect
(G) = Good – Minor effect
(F) = Fair – Moderate effect
(NR) = Not Recommended – Severe effect

Chemical/Substance	PVC	Neoprene	PU
Acetaldehyde	E	E	F
Acetate	NR	F	NR
Acetic Acid	E	E	G
Acetic Acid (less than 5%)		E	E
Acetic Acid (more than 5%)		E	E
Acetone	F	E	F
Acrylonitrile	E	G	F
Air		E	E
Alcohols		E	E
Aliphatic Hydrocarbons		E	E
Ammonia (gas-liquid)		E	E
Ammonium Hydroxide	E	E	G
Ammonium Sulfate	E	E	G
Amyl Acetate	G	G	G
Amyl Alcohol	E	E	F
Aniline	E	E	F
Antifreeze		E	E
Aromatic Hydrocarbons		E	E
Battery Acid	E	G	F
Benzaldehyde	E	G	F
Benzene (Benzol)	F	F	E
Benzyl Alcohol	E	E	E
Benzyl Chloride	E	G	F
Boric Acid		E	E
Butane	G	G	E
Butanol		E	E

Chemical/Substance	PVC	Neoprene	PU
Butter	E	E	E
Buttermilk	E	E	E
Butyl Acetate	G	G	G
Butyl Alcohol	E	E	E
Butyraldehyde	E	E	F
Butyric Acid		E	E
Calcium Chloride	E	E	G
Calcium Hypochlorite	E	E	F
Carbolic Acid	E	E	F
Carbon Dioxide		E	E
Carbon Disulfide	E	F	F
Carbon Tetrachloride	G	G	G
Carbonic Acid	E	E	E
Castor Oil	E	E	E
Caustic Potash	E	E	F
Chlorine (Wet)		F	F
Chlorine (Water dilution)	E	E	F
Chloroacetone	G	E	F
Chloroform	E	G	G
Chloroxylenol	E	E	F
Citric Acid	E	E	E
Coal Tar Solvents	F	G	E
Coconut Oil	E	E	E
Copper Chloride	E	G	F
Copper Salts		E	E
Copper Sulfate	E	G	G
Cottonseed Oil	E	E	E
Cutting Oil	E	F	E
Cyclohexane	F	G	NR
Dexron II (Auto transmission fluid)		E	E
Diacetone Alcohol	E	E	E
Dibenzyl Ether	E	G	G
Dibutyl Phthalate	E	E	G
Diethanolamine	E	E	F
Diethyl Ether (Ethyl ether)	E	E	E
DOT 3 Brakefluid		NR	NR
Ethers		F	F
Ethyl Acetate	G	G	G
Ethyl Alcohol	E	E	E
Ethyl Formate	G	E	G
Ethylene Glycol	E	E	E
Fatty Acids		E	E
Ferric Chloride	E	E	F
Formaldehyde	E	E	F
Formic Acid	E	E	E

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Chemical/Substance	PVC	Neoprene	PU
Fuels:			
Diesel		E	E
Gasohol		E	E
JP4		E	E
Leaded Regular		E	E
Super Unleaded		E	E
Furfural	E	G	G
Gasoline (Cracked)	F	E	E
Gasoline (SR)	F	E	E
Glucose		E	E
Glycerine		E	E
Grease (All kinds)	E	E	E
Hexane	G	E	E
Hydrobromic Acid	E	E	F
Hydrochloric Acid (1%)		E	E
Hydrochloric Acid (10%)		E	E
Hydrochloric Acid (Concentrated)	E	F	F
Hydrofluoric Acid	E	NR	NR
Hydrogen Peroxide	E	E	G
Hydrogen Sulfide	E	G	G
Hylene	F	G	F
Kerosene		E	E
Kerosene (C-T)	G	F	E
Kerosene (PET)	G	E	E
Lactic Acid	E	E	E
Lard Oil	E	E	E
Linseed Oil	E	E	E
Malic Acid	E	E	F
Methyl Acetate	G	E	G
Methyl Alcohol	E	E	E
Methyl Cellosolve	E	E	G
Methyl Chloride	E	E	F
Methyl Ethyl Ketone	G	E	F
Milk	E	E	E
Mineral Oil	E	E	E
Monoethanolamine	E	E	F
Morpholine	E	E	G
Naphtha	F	E	E
Nitric Acid	E	G	F
Nitric Acid (Diluted)		NR	NR
Nitrobenzene	E	F	G
Nitrous Acid		E	NR
Octyl Alcohol	E	E	E
Oils, Animal	F	E	E
Oils, Fish	F	E	E

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Chemical/Substance	PVC	Neoprene	PU
Oils, Vegetable		E	E
Oleic Acid	E	E	G
Olive Oil	E	E	E
Oxalic Acid		E	E
Oxygen (Gas)	E	E	E
Paint Remover	G	G	F
Perchlorethylene	F	G	G
Perchloric Acid	E	G	NR
Petroleum Oils	E	E	E
Petroleum Solvent	E	E	E
Phosphoric Acid	E	E	G
Pine Oil	E	E	E
Potassium Dichromate	E	G	F
Potassium Hydroxide	E	E	F
Propane	E	G	E
Propyl Acetate	G	E	G
Propyl Alcohol	E	E	E
Pyridine		NR	NR
Soaps	E	E	E
Sodium Hydroxide	E	E	G
Sodium Hydroxide (Diluted 1%)		E	E
Sodium Hydroxide (Medium concentrate)		E	E
Sodium Hydroxide (10%)		E	E
Stearic Acid	E	E	G
Sulfuric Acid (Concentrated)	E	G	F
Sulfuric Acid (Diluted 1%)		G	E
Sulfuric Acid (10%)		G	E
Tannic Acid	E	E	G
Tin Chloride	E	E	G
Toluene (Tuluol)	F	G	G
Toluol	F	G	G
Trichlorethylene	G	G	G
Tricresyl Phosphate	E	E	F
Triethanolamine	E	G	G
Trinitrotolune	E	F	F
Turpentine	G	E	E
Water		E	E
Water Brine		E	E
Xylol		F	F

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Why Choose Polyurethane Over Other Materials?

The secret to TOP DOG's success when dealing with the challenge of chemical resistance is the refusal to use anything but polyurethane (PU) in its premium line of protective garments. When compared to other materials, fabrics, or films used in similar applications, PU delivers much better protection against a wider range of chemicals than products made from vinyl, polyolefin, or polyethylene. This is because of the chemistry make-up of the products. All of these cost less than PU, which is why so many try these products first. Polyolefin is more resistant to some of the alcohols and some solvents that can sometimes damage PU. But they have very little strength and are stiffer and heavier compared to PU. Products made from vinyl, polyolefin, or polyethylene do very poorly with sodium hydroxide, which is the most common cleaning chemical in the food processing business, whereas PU is outstanding when used with it. This is why PU is our top recommendation for use in food processing facilities.

Balance Between Thickness and Hardness

Another TOP DOG secret to chemical resistance is getting the right balance between thickness, hardness, and softness. TOP DOG PU garments are manufactured using the highest quality PU film with a durometer hardness rating of 82A. This delivers the soft suppleness required for human comfort, but delivers great strength along with outstanding abrasion and chemical resistance that can be counted on to keep people safe.

Temperature and Concentration

Independent laboratory comparative tests typically involve a 30-day, total 100% immersion test in the chemical to establish a consistent baseline for comparison between all materials, fabrics, and PU film being tested. Each product will react differently to each chemical. This reaction is dependent upon several items, such as what the product is made from, product thickness, the temperature of the chemical, the level of concentration, and the interaction of other chemicals if there is more than one being exposed to the product at the same time. Independent laboratory tests are typically conducted with the chemical at 20°C to establish a consistent baseline for comparison. Higher or lower temperatures of the chemicals will cause reactions to sometimes be different.

Splash Protection or Immersion

From a practical standpoint, humans are not exposed to a total immersion of chemicals in the workplace. What is more relevant and important to an employee is the need for continuous good splash protection. The volume of chemicals and the frequency of the splashing are very important factors that must be considered. Therefore, it is important to recognize that if a TOP DOG product rates as "Fair" or "Not Recommended" with a particular chemical, the test was done with 100% immersion for 30 days. In the workplace, garment application won't be in a total-immersion scenario. The product will very likely still provide satisfactory splash protection for a reasonable amount of time. One such example is acetic acid over 5% concentration, where some discoloration and swelling of the PU film is likely but the film will not fail to provide protection. Another example is nitric acid, which is NOT recommended with PU. If the PU is exposed to nitric acid, there is severe swelling of the PU film and discoloration, but no other failure in the PU film. The longer the chemical stays on the PU, the more discoloration and swelling will occur. However, the employee is well protected against splashes. Some discoloration and swelling of the PU film is not proof of its failure to provide good splash protection.

Rating Scale

If a TOP DOG product is rated as "E – Excellent" with a particular chemical, then the user can expect to have no swelling of the PU film, no discoloration, and no cracking from continuous 100% immersion in the chemical. This is true for a very wide range of concentration levels of the chemicals TOP DOG rates as "E – Excellent". A rating of "F – Fair" indicates that there will be some swelling and some loss of PU properties (but not failure). A rating of "NR – Not Recommended" indicates that there will be significant loss of properties and significant swelling (but not immediate failure).

Failure of PU with Some Chemicals

PU is very good against a vast number of chemicals as compared to other materials, fabrics, and films, however, PU will fail (meaning the film will dissolve and fall apart) with some chemicals even in very low levels of concentration. Some chemicals are simply more dangerous than others, even in small levels of concentration. There will only be a small number of situations where PU will fail like this. The reality is, however, that it is very uncommon to find dangerous chemicals in the workplace with more than a 5% or 10% level of concentration. Pure muriatic acid is an example of a chemical that will tear apart PU. In TOP DOG tests using total 100% immersion, the PU film took 15 days to fall apart. However, it gave good splash protection for several months.

The "When in Doubt" Recommendation

Even if the TOP DOG chemical resistance chart states "F" or "NR", it will be important to ask the end user of the TOP DOG garments to try an immersion test and a splash test by using the TOP DOG mini aprons with the chemical. Given all of the variables involved, this is the only way to 100% prove what will happen.

For Special Circumstances

TOP DOG's manufacturer's independent laboratory testing center will conduct tests if resistance data is not presently available for a specific chemical. Distributors are asked to provide TOP DOG with the chemical manufacturer's MSDS (Material Safety Data Sheet) which will correctly identify the active ingredients in the chemical and the exact dilution level. With this accurate data, tests can be then arranged with TOP DOG's manufacturer's independent laboratory testing center.

Save Big with Durability and Get Superior Protection

TOP DOG's PU garments can be counted on to provide superior protection against most common chemicals found in the workplace! This claim cannot be made by other manufacturers of protective garments that still manage to maintain strength and longevity with softness and a lightweight feel.

REMCO PRODUCTS

ABOUT REMCO

Remco provides specialized color-coded tools for cleaning and material handling where hygiene and safety are critical. The introduction of a food-safe poly shovel more than 30 years ago established Remco as an industry pioneer of hygienic design. In addition to our hygienic shovels, scoops, and scrapers, Remco features Vikan's advanced line of brushes, brooms, and squeegees. Together with Vikan, Remco supports color-coding plans by offering more tools in more colors than any other supplier. Remco also provides training and support to end users, helping ensure regulatory compliance. Regardless of an operation's size or complexity, Remco has the tools and expertise to help execute HACCP color-coding plans.

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