



MICROFLEX[®] CHEMICAL RESISTANCE GUIDE

PLEASE SEE INSIDE PANEL FOR CHEMICAL RESISTANCE GUIDE FOR MICROFLEX[®] LATEX AND NITRILE GLOVES.

 POWDER-FREE LATEX					
 LIGHTLY POWDERED LATEX					
 POWDER-FREE LATEX FOR HIGH RISK ENVIRONMENTS					
 POWDER-FREE NITRILE					
 POWDER-FREE NITRILE FOR HIGH RISK ENVIRONMENTS					
 POWDER-FREE NITRILE FOR NON-MEDICAL USE					
 LIGHTLY POWDERED NITRILE					

-  **CAUTION (LATEX):** This product contains natural rubber latex (latex) which may cause allergic reactions. Safe use of this glove by or on latex sensitized individuals has not been established.
-  **CAUTION (NITRILE: MEDICAL GRADE):** Components used in making these gloves may cause allergic reactions in some users. Follow your institution's policies for use.
-  **CAUTION (NITRILE: INDUSTRIAL GRADE):** These gloves are for non-medical use only. They may **NOT** be worn for barrier protection in medical or healthcare applications. Please select other gloves for these applications. Components used in making these gloves may cause allergic reactions in some users. Follow your institution's policies for use.

4 U.S. PATENT NO. 35,616
EUROPEAN PATENT NO. 0,456,333

5 U.S. PATENT NO. 6,451,893
U.S. PATENT NO. 7,176,260

MICROFLEX[®]
THE MOST TRUSTED NAME IN GLOVES[®]
A division of BarrierSafe Solutions International[®], Inc.

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MICROFLEX[®] CHEMICAL RESISTANCE GUIDE For NeoPro[®] and NeoPro[®]EC Gloves.


Test Method Description: The test method uses analytical equipment to determine the concentration of and the time at which the challenge chemical permeates through the glove film. The liquid challenge chemical is collected in a liquid miscible chemical (collection media). Data is collected in three separate cells; each cell is compared to a blank cell which uses the same collection media as both the challenge and collection chemical.

Cautionary Information: These glove recommendations are offered as a guide and for reference purposes only. The barrier properties of each glove type may be affected by differences in material thickness, chemical concentration, temperature, and length of exposure to chemicals. Thin-film gloves are designed for transient and single-use only. Gloves should be removed and replaced with a new pair upon exposure to chemicals. Please follow your institution's policies for use.

The data presented in this guide is deemed accurate to the best of Microflex's knowledge.

Test Method: ASTM F739 continuous contact

Chemicals	NeoPro [®] NeoPro [®] EC
Acetaldehyde	0
Acetic acid (50%)	NBT
Aluminum nitrate (10%)	NBT
Ammonium hydroxide (30%)	10
Benzene	0
Butyl acetate	5
Chloroform	0
Chloridine hydrochloride (0.10%)	NBT
Copper(II) ethylenediamine (1 molar)	NBT
Diesel fuel (1%)	10
Dimethylformamide	1
Dimethyl sulfoxide	30

 **CAUTION (SYNTHETIC):** Components used in making these gloves may cause allergic reactions in some users. Follow your institution's policies for use.

Chemicals

NeoPro[®]
NeoPro[®]EC

Ethanol	NBT
Ethanolamine (99%)	NBT
Ether	2
Ethidium bromide (1%)	NBT
Ethyl acetate	1
Formaldehyde (37%)	NBT
Formamide	NBT
Gluteraldehyde (50%)	NBT
Guanidine hydrochloride	NBT
Hydrochloric acid (50%)	0
Isopropanol	NBT
Methanol	NBT
Methyl ethyl ketone	0
Methyl methacrylate (33%)	0
Nitric acid (50%)	NBT
Periodic acid (50%)	NBT
Phenol (0.10%)	NBT
Phenylmethylsulfonyl fluoride (5%)	0
Silver nitrate (10%)	NBT
Sodium dodecyl sulfate (0.10%)	NBT
Sodium hydroxide (50%)	10
Sodium selenate (10%)	NBT
Sulfuric acid (50%)	NBT
Tetrahydrofuran	0
Toluene	0
Trifluoroacetic acid	0
Xylene	0

KEY: CHEMICAL PERMEATION RATES

Greater than 60 minutes = **Excellent**; 31-60 minutes = **Very Good**
21-30 minutes = **Good**; 11-20 minutes = **Fair**; 3-10 minutes = **Poor**
Less than 3 minutes = **Not Recommended**

Normalized Breakthrough Time: Identified in minutes

NBT = No Breakthrough Time up to 120 minutes

Example: Dimethyl sulfoxide **30**



The following chemical resistance ratings are based on published research data. Microflex® gloves have not been individually tested against the chemicals contained in this chart.

Chemicals	Latex (NATURAL RUBBER)	Nitrile (BUNA N)	Chemicals	Latex (NATURAL RUBBER)	Nitrile (BUNA N)
Acetaldehyde	Good	Excellent	Hydrogen peroxide (30% concentration)	Good	Excellent
Acetamide	Excellent	Good	Hydrogen peroxide (concentrated)	Not Recommended	Not Recommended
Acetic acid (50% concentration)	Good	Good	Hydroquinone	Good	Fair
Acetone	Not Recommended	Not Recommended	Hydroxylamine hydrochloride	No Data	No Data
Acetonitrile	Good	Good	Imidazole	No Data	No Data
Acetophenone	Not Recommended	Not Recommended	Isobutanol (isobutyl alcohol)	Good	Good
Acetyl chloride	Not Recommended	Not Recommended	Isooctane	Not Recommended	Not Recommended
Acrylamide (same as 2-propenamide)	No Data	No Data	Isopropanol (isopropyl alcohol)	Good	Good
Acrylic acid	Good	Fair	Kerosene	Not Recommended	Not Recommended
Aircraft stripper	Not Recommended	Good	Ketones	Good	Not Recommended
Aluminum nitrate (nonhydrous) (10% concentration)	Good	Good	Lacquers	Not Recommended	Not Recommended
Ammonia (anhydrous)	Not Recommended	Good	Lacquer thinners	Not Recommended	Not Recommended
Ammonium benzoate (same as benzoic acid)	Not Recommended	Not Recommended	Lactic acid (85% concentration)	Good	Good
Ammonium hydroxide (30% concentration)	Good	Good	Laurel alcohol (lauryl alcohol)	Good	Good
Ammonium hydroxide (concentrated)	Not Recommended	Not Recommended	Lauric acid (36% concentration)	Not Recommended	Not Recommended
Ammonium oxalate	No Data	Good	Lead acetate	Good	Good
Ammonium sulfate (aqueous)	Good	Good	Linoleic acid	Not Recommended	Good
Amyl acetate	Not Recommended	Not Recommended	Linseed oil	Not Recommended	Good
Aniline	Not Recommended	Not Recommended	Lubricants (containing mineral spirits as primary component)	Not Recommended	Good
Antifreeze (methanol-based)	Good	Good	Maleic acid	Fair	Fair
Benzaldehyde	Not Recommended	Not Recommended	2-Mercaptoethanol	No Data	No Data
Benzene	Not Recommended	Not Recommended	Mercuric chloride	Good	Good
Benzoic acid	Not Recommended	Not Recommended	Mercury	Good	Good
Boric acid	Good	Good	Methane	Not Recommended	Good
Brake cleaner (containing hexane or ethanol)	Not Recommended	Good	Methyl alcohol (methanol)	Fair	Good
Brake cleaner, non-chlorinated (containing acetone, n-heptane and/or xylene)	Not Recommended	Not Recommended	2-Methoxyethanol (ethylene glycol monomethyl)	Not Recommended	Good
Brake fluid	Good	Good	Methyl amine	Fair	Good
Bromine (anhydrous liquid)	Not Recommended	Not Recommended	Methyl bromide	Fair	Fair
Bromoethane (methyl bromide)	Not Recommended	Not Recommended	Methyl butyl ketone	Not Recommended	Not Recommended
Butyl acetate	Not Recommended	Not Recommended	Methylene chloride	Not Recommended	Not Recommended
n-Butyl alcohol (propyl carbinol)	Good	Good	Methyl chloride	Not Recommended	Not Recommended
n-Butyl chloride	Not Recommended	Not Recommended	Methyl ethyl ketone (MEK)	Not Recommended	Not Recommended
1,3-Butylene glycol (1,3-butanediol)	No Data	Good	Methyl isobutyl ketone (MIBK)	Not Recommended	Not Recommended
Calcium chloride (aqueous)	Good	Good	Methyl methacrylate	Not Recommended	Not Recommended
Calcium hydroxide (dental)	Good	Good	Mineral spirits	Not Recommended	Good
Carbamide peroxide (urea+hydrogen peroxide at 1:1 ratio)	Good	Fair	Monoethanolamine	Good	Good
Carbon dioxide	Good	Good	Morpholine	Not Recommended	Not Recommended
Carbon disulfide	Not Recommended	Not Recommended	Motor oil (includes oils made from petroleum distillates, synthetic oils, diesel oils, 2-stroke oils, and hydraulic oils)	Not Recommended	Good
Carbon tetrachloride	Not Recommended	Good	Naphtha	Not Recommended	Not Recommended
Carburetor cleaner (typically xylene, toluene and/or acetone)	Not Recommended	Not Recommended	Naphthalene	Not Recommended	Not Recommended
Castor Oil	Good	Good	Nitric acid (50% concentration)	Not Recommended	Not Recommended
Chlorine (wet)	Not Recommended	Not Recommended	Nitromethane (95.5% concentration)	Fair	Not Recommended
Chlorobenzene	Not Recommended	Not Recommended	Nitropropane (95.5% concentration)	Not Recommended	Not Recommended
Chloroform	Not Recommended	Not Recommended	Nitrophenols	No Data	No Data
o-Chloronaphthalene	Not Recommended	Not Recommended	Octyl alcohol (octanol)	Good	Good
Chromic acid (50% concentration)	Not Recommended	Fair	Oleic acid	Fair	Good
Citric acid (10% concentration)	Good	Good	Oxalic acid	Good	Good
Clonidine hydrochloride (0.1% concentration)	No Data	No Data	Paint (latex-based)	Not Recommended	Fair
Cresols	Not Recommended	Not Recommended	Paint (oil-based)	Not Recommended	Good
Cupric sulfate (copper sulfate)	Good	Good	Paint, automotive (paint containing V.M.&P. naphtha, mineral spirits; with small amounts of toluene, xylene or n-butyl acetate)	Not Recommended	Good
Cyanic compounds	No Data	Fair	Paint, automotive (paints containing large amounts of toluene, xylene or n-butyl acetate)	Not Recommended	Not Recommended
Cyclohexane	Not Recommended	Good	Paint activator, automotive (containing MEK, polyisocyanate resin, and/or butyl acetate)	Not Recommended	Fair
Cyclohexanol	Fair	Good	Paint reducers/thinners, automotive (aliphatic hydrocarbons, eg. V.M.&P. naphtha or mineral spirits)	Not Recommended	Good
Cyclohexanone	Not Recommended	Not Recommended	Paint reducers/thinners, automotive (aromatic hydrocarbons, eg. toluene or xylene)	Not Recommended	Not Recommended
Decahydronaphthalene (decalin)	Not Recommended	Not Recommended	Paint thinner (Ducco)	Not Recommended	Not Recommended
Denatured alcohol	Good	Good	Palmitic acid	Good	Good
Dental etching material	Good	Good	Paraformaldehyde	Not Recommended	Good
Dental resin cement	Fair	No Data	Parts wash, automotive (containing naphtha, n-hexane, cyclohexane and/or MEK)+A64	Not Recommended	Good
Dental waxes	Not Recommended	Good	Pentane	Not Recommended	Good
Denture polishing material	Not Recommended	Good	Pentyl ether (same as pentane)	Not Recommended	Good
Detergent solutions	Good	Good	Perchloric acid (60% concentration)	Fair	Not Recommended
Developing fluids	Good	Good	Perchloroethylene	Not Recommended	Good
Diamond polishing paste	Good	Good	Periodic acid (50% concentration)	No Data	No Data
Dibutyl phthalate	Not Recommended	Not Recommended	Petroleum distillates (naphthas)	Not Recommended	Good
o-dichlorobenzene	Not Recommended	Not Recommended	Phenol (0.1% concentration)	Good	Good
p-dichlorobenzene	Not Recommended	Not Recommended	Phenol (approx. 100% concentration)	Not Recommended	Not Recommended
Dichloromethane	Not Recommended	Not Recommended	Phenolphthalein (aromatic phenols)	Not Recommended	Not Recommended
Diesel fuel	Not Recommended	Good	Phosphoric acid (0 to 50% concentration)	Good	Good
Diesel fuel additive	Not Recommended	Good	Phosphoric acid (50-85% concentration)	Not Recommended	Not Recommended
Diethylamine	Fair	Fair	Phosphoric acid (100% concentration)	Not Recommended	Not Recommended
Diethylene glycol	Good	Good	Polysorbates	No Data	No Data
Diisobutyl ketone (DIBK)	Not Recommended	Not Recommended	Potassium bromate	Good	Good
N, N-dimethyl acetamide (same as dimethyl acetamide (DMAC), same as acetic acid)	Good	Good	Potassium chloride	Good	Good
Dimethylformamide	Not Recommended	Good	Potassium cyanide	Good	Good
Dimethyl sulfoxide (DMSO)	Not Recommended	Not Recommended	Potassium dichromate (aqueous)	Good	Good
Dioctyl phthalate (DOP)	Not Recommended	Not Recommended	Potassium hydroxide	Good	Good
Dioxane	Not Recommended	Not Recommended	Potassium iodide	Good	Good
EDTA (17% solution)	Good	Good	Potassium permanganate	Good	Good
Engine cleaner and degreaser (containing kerosene, petroleum distillates or propane-isobutane-n-butane as main components)	Not Recommended	Good	Potassium sulfate (potassium sulphate)	Good	Good
Epoxy primer (containing toluene, acetone, MEK and/or n-butyl acetate)	Not Recommended	Not Recommended	Propyl acetate	Not Recommended	Not Recommended
Ethanol (ethyl alcohol) (95% concentration)	Good	Good	Propyl alcohol	Good	Good
Ethanolamine	Good	Good	Propylene (1-propene, methylethylene)	Not Recommended	Not Recommended
Ether	Not Recommended	Not Recommended	Propylene glycol	Good	Good
Ethidium bromide (0.5% concentration)	No Data	No Data	Pyridine	Not Recommended	Not Recommended
2-ethoxyethanol (ethoxyethanol)	Good	Good	Rust inhibitors, automotive	Good	Good
Ethyl acetate	Not Recommended	Not Recommended	Rust remover, automotive (containing <50% phosphoric acid)	Good	Good
Ethyl ether	Not Recommended	Not Recommended	Silver nitrate (0.17N)	Good	Good
Ethylene dichloride	Not Recommended	Not Recommended	Sodium acetate (aqueous)	Good	Good
Ethylene glycol	Good	Good	Sodium azide (sodium salt)	Good	Good
Ethylene oxide	Not Recommended	Not Recommended	Sodium bicarbonate (aqueous) (baking soda)	Good	Good
Ferric chloride (aqueous)	Good	Good	Sodium chloride (aqueous)	Good	Good
Formaldehyde	Good	Good	Sodium cyanide (aqueous)	Good	Good
Formalin (40% concentration of formaldehyde)	Good	Good	Sodium hydroxide (50% concentration)	Not Recommended	Not Recommended
Formamide	No Data	Good	Sodium hypochlorite (bleach)	Good	Fair
Formic acid (90% concentration)	Good	Good	Sodium selenate (10% concentration)	No Data	No Data
Freon 11	Not Recommended	Good	Sodium thiosulfate (developing fluids)	Good	Good
Freon 12	Not Recommended	Good	Staining rating (all stains)	Good	Fair
Freon 21	Not Recommended	Not Recommended	Styrene	Not Recommended	Not Recommended
Freon 22	Not Recommended	Not Recommended	Sulfuric acid (50% concentration)	Not Recommended	Not Recommended
Fuel injector cleaner (primarily kerosene)	Not Recommended	Good	Sulfuric acid (93-98% concentration)	Not Recommended	Not Recommended
Furfural	Not Recommended	Not Recommended	Tannic acid (65% concentration)	Not Recommended	Not Recommended
Gasoline, leaded	Not Recommended	Not Recommended	Tetrachloroethylene	Not Recommended	Fair
Gasoline, unleaded	Not Recommended	Not Recommended	Tetrahydrofuran	Not Recommended	Not Recommended
Glass ionomer dental cements	Good	Good	Tetramethylurea	No Data	No Data
Glucose	Good	Good	Toluene	Not Recommended	Not Recommended
Gluteraldehyde (50% concentration)	No Data	No Data	Toluene diisocyanate	Fair	Not Recommended
Glycerin	Good	Good	Transmission fluid, Type A	Not Recommended	Good
Glycerol	Good	Good	Transmission fluid, synthetic	Not Recommended	Good
Grease, automotive (petroleum-based)	Not Recommended	Good	Trichloroethylene	Not Recommended	Not Recommended
Grease, automotive (silicon-based)	Good	Good	Triethanolamine	Good	Good
Grease, automotive (synthetic)	Not Recommended	Good	Triton X-100, Igepal CA, Polytergent G (octoxynol with varying ethylene oxide units)	Good	Good
Heptane (n-heptane)	Not Recommended	Good	Tung oil	Not Recommended	Good
Hexane	Not Recommended	Good	Turpentine	Not Recommended	Good
Hydraulic fluid (petroleum-based)	Not Recommended	Good	Undercoater, rubberized (automotive)	Not Recommended	Good
Hydrochloric acid (20% concentration)	Good	Good	Urea	Good	Good
Hydrochloric acid (50% concentration)	Good	Fair	Varnish	Not Recommended	Not Recommended
Hydrochloric acid (concentrated)	Good	Not Recommended	Vinyl chloride	Not Recommended	Not Recommended
Hydrofluoric acid (48% concentration)	Fair	Good	Water	Good	Good
Hydrofluoric acid (concentrated)	Not Recommended	Not Recommended	Wax remover, automotive (containing V.M.&P. naphtha, xylene and/or ethylbenzene)	Not Recommended	Not Recommended
Hydrogen peroxide (3% concentration)	Good	Good	Xylene (Xylol)	Not Recommended	Not Recommended

General Information and Cautions

Your understanding of how to use thin-film gloves is extremely important to your safety.

Microflex gloves are intended for use as protection against incidental exposure to chemicals and other harmful substances. These gloves do not offer protection against all chemicals under all conditions, and are not designed to provide protection against prolonged or continuous exposure to harmful substances.

As a precaution, glove users are advised to change gloves immediately upon exposure to harmful substances. It is the responsibility of the user to choose the appropriate glove type, thickness and to change gloves as they become contaminated.

This Chemical Resistance Chart is offered as a guide and for reference purposes only. The chemical resistance ratings are based on published research data. Microflex cannot certify the accuracy of the data and therefore does not represent nor warrant that the information in the chemical resistance chart is accurate or complete. Microflex gloves have **NOT** been individually tested against the chemicals contained in this chart. The barrier properties of each glove type may be affected by differences in material thickness, chemical concentration, temperature, and length of exposure to chemicals.

References

Chemical Resistance Guide to Elastomers III; A Guide to Chemical Resistance of Rubber and Elastomeric Compounds, Compass Publications, La Jolla, CA, 2005. Plastics Design Library-Chemical Resistance of Plastics and Elastomers, 3rd edition, William Andrew Publishing, 2003. Dupont Dow Elastomers Chemical Resistance Guide; The Los Angeles Rubber Group; www.dupont-dow.com

- CHEMICAL RATINGS KEY -

Blue	EXCELLENT
Green	GOOD
Yellow	FAIR
Red	NOT RECOMMENDED
Grey	NO DATA