MICROFLEX CHEMICAL RESISTANCE GUIDE

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

[1] 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.

[2] CAUTION (**NITRILE: MEDICAL GRADE**): Components used in making these gloves may cause allergic reactions in some users. Follow your institution's policies for use.

[3] CAUTION (**NITRILE: NON-MEDICAL 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. For single use only.

[4] U.S. PATENT NO. 35.616

[5] PATENT NO. 6,451,893
PATENT NO. 7,176,260

MICROFLEX®
THE MOST TRUSTED NAME IN GLOVES®

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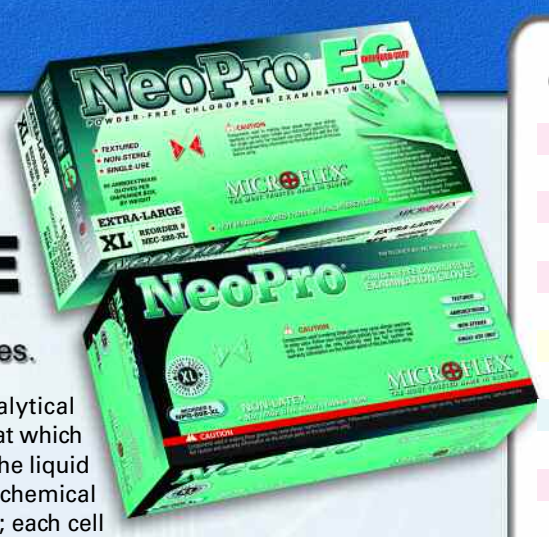

MICROFLEX CHEMICAL RESISTANCE GUIDE

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
Chlonidine hydrochloride (0.10%)	NBT
Copper(II) ethylenediamine (1 molar)	NBT
Diesel fuel (1%)	10
Dimethylformamide	1
Dimethyl sulfoxide	30
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

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

MICROFLEX®
THE MOST TRUSTED NAME IN GLOVES®
REGISTERED ISO13485

CHEMICAL RESISTANCE GUIDE

FOR MICROFLEX LATEX AND NITRILE GLOVES.

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

Custom Chemical Testing

For chemicals not listed, or for applications that use a specific concentration or combination of chemicals, Microflex offers a custom chemical testing program specifically for its glove products. Please contact your distributor representative or Microflex directly at 800-876-6866 to learn more about this program.

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.

– CHEMICAL RATINGS KEY –

- EXCELLENT
- GOOD
- FAIR
- NOT RECOMMENDED
- NO DATA

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