
APPENDIX E: GLOVE SELECTION CHART

The following guide was developed from information in several sources.² Many factors affect the breakthrough times of glove materials including, but not limited to, the thickness of glove material, concentration of the chemical, amount of chemical the glove comes in contact with, length of time the glove is exposed to the chemical, the temperature and abrasion or puncture.

General Safety Procedures

This information is provided as a guide to proper glove material selection. Glove performance varies between manufacturers, so before working with any highly toxic chemical always consult the manufacturer to make sure that the correct gloves are used for the application. Generally, **Nitrile** is recommended as a good all-purpose glove. When using gloves follow these safety procedures:

- Make sure the glove material is resistant and compatible with the substances in use.
- Inspect gloves for holes and tears before each use.
- Wash gloves appropriately before removing them.
- In order to prevent the unintentional spread of hazardous substances, remove gloves before handling objects such as doorknobs, telephones, pens etc. and before leaving the laboratory.
- Replace gloves periodically, depending on their permeation and degradation characteristics.

²

Sources:
ILC Dover Chemical Compatibility Chart.
Glove Resistance Ratings, James North & Sons, Inc.
Quick Selection Guide to Chemical Protective Clothing,
2nd Edition, Forsberg & Mansdorf.

Selection Key:

4 = Excellent, breakthrough times generally greater than 8 hours.

3 = Good, breakthrough times generally greater than 4 hours.

2 = Fair, breakthrough times generally greater than 1 hour.

1 = Not Recommended, breakthrough times generally less than 1 hour.

? = Not Tested or No Information, check other references.

TABLE VIII Glove Selection Guide

Chemical	Natural Rubber	Neoprene	Butyl	PVC	Nitrile	Viton ®
Alcohols						
Allyl alcohol	1	1	4	1	4	3
Butyl alcohol	1	3	4	2	3	4
Ethyl alcohol	1	2	4	1	3	4
Isopropyl alcohol	1	3	4	2	4	4
Methyl alcohol	1	1	4	1	1	4
Aldehydes						
Acetaldehyde	1	1	4	1	1	1
Acrolein	1	1	4	1	1	1
Benzaldehyde	1	1	4	1	1	3
Butyraldehyde	1	1	4	1	1	1
Formaldehyde	1	2	4	2	4	4
Glutaraldehyde	?	4	4	2	?	4
Aliphatic Hydrocarbons						
Diesel Fuel	1	2	1	2	3	4
Hexanes	1	1	1	1	4	4
Kerosene	1	3	1	3	4	4
Naphtha	1	2	1	3	4	4
Pentane	1	1	1	1	3	4
Petroleum Ether	1	1	1	2	3	4
Turpentine	1	1	1	1	2	4

Chemical	Natural Rubber	Neoprene	Butyl	PVC	Nitrile	Viton ®
----------	----------------	----------	-------	-----	---------	---------

Alkalis

Ammonium Hydroxide up to 70%	1	3	4	2	3	?
Potassium Hydroxide up to 70 %	4	4	4	4	4	4
Sodium Hydroxide 70 + %	4	4	4	4	3	3

Amines

Aniline	1	1	1	1	2	1
Ethanolamine	2	4	4	3	4	4
Ethylamine	1	2	4	1	1	1
Methylamine	1	3	4	2	4	4
Triethanolamine	1	1	4	1	4	4

Aromatic Hydrocarbons

Benzene	1	1	1	1	1	3
Gasoline	1	1	1	1	4	4
Naphthalene	1	1	1	1	4	4
Toluene	1	1	1	1	1	4
Xylene	1	1	1	1	1	4

Elements

Bromine	1	2	1	?	1	4
Chlorine aqueous	?	1	2	?	1	4
Iodine	?	1	3	?	3	4
Mercury	?	4	4	?	4	4

Esters

Ethyl acetate	1	1	3	1	1	1
Butyl acetate	1	1	2	1	1	1
Methyl acetate	1	1	4	1	1	1
Isobutyl acrylate	1	1	4	1	1	1

Chemical	Natural Rubber	Neoprene	Butyl	PVC	Nitrile	Viton ®
----------	----------------	----------	-------	-----	---------	---------

Ethers/Glycols

Diethyl ether	1	2	1	1	2	1
Ethylene glycol	1	2	4	1	2	4
Isopropyl ether	1	2	1	1	3	1
Propylene glycol	?	3	3	2	2	?
Tetrahydrofuran	1	1	2	1	1	1

Halogenated Hydrocarbons

Carbon Tetrachloride	1	1	1	1	1	4
Chloroform	1	1	1	1	1	4
Methylene Chloride	1	1	1	1	2	3
Polychlorinated Biphenyls(PCB's)	1	4	4	?	2	4
Perchloroethylene	1	1	1	1	2	4
Trichloroethylene	1	1	1	1	1	4

Inorganic Acids

Chromic acid up to 70%	1	1	4	3	3	4
Hydrochloric acid up to 37%	3	3	4	3	3	3
Hydrofluoric acid up to 70%	2	2	3	1	1	?
Nitric acid 70+ %	?	1	2	?	1	4
Perchloric acid up to 70%	4	4	3	4	4	4
Phosphoric acid 70+ %	4	4	4	4	4	4
Sulfuric acid 70+ %	1	2	4	2	1	2

Ketones

Acetone	1	1	4	1	1	1
Diisobutyl ketone	1	1	2	1	1	2
Methyl ethyl ketone	1	1	4	1	1	1

Miscellaneous

Acetic anhydride	1	2	4	1	1	1
------------------	---	---	---	---	---	---

Chemical	Natural Rubber	Neoprene	Butyl	PVC	Nitrile	Viton ®
Acetonitrile	1	1	4	1	1	1
Acrylamide	1	1	3	1	2	3
Carbon disulfide	1	1	1	1	1	4
Cresols	1	3	4	?	2	4
Cutting fluid	?	2	?	2	3	?
Dimethyl sulfoxide	1	4	4	1	1	1
Hydraulic oil	?	?	1	2	3	?
Hydrazine	2	4	4	4	4	1
Hydrogen Peroxide	4	2	4	3	4	4
Lubricating oil	3	3	?	?	4	3
Malathion	?	3	1	?	3	?
Nitrobenzene	1	1	4	1	1	4
Phenol	1	3	2	1	1	4
Photo solutions	3	4	?	3	4	?
Picric acid	1	2	3	1	2	4
Pyridine	1	1	4	1	1	1

Organic Acids

Acetic acid	2	3	4	2	1	4
Formic acid	2	3	4	3	2	2
Lactic Acid	4	4	4	3	4	4
Maleic acid	3	3	2	3	3	4
Oxalic Acid	4	4	4	4	4	4

Salt Solutions

Ammonium nitrate	4	4	4	4	4	4
------------------	---	---	---	---	---	---

Chemical	Natural Rubber	Neoprene	Butyl	PVC	Nitrile	Viton ®
Calcium hypochlorite	1	3	4	4	3	4
Ferric chloride	4	4	4	4	4	4
Mercuric chloride	3	3	4	3	3	4
Potassium cyanide	4	4	4	4	4	4
Potassium dichromate	4	4	4	4	4	4
Potassium permanganate	4	4	?	4	4	?
Sodium cyanide	4	4	4	4	4	4
Sodium thiosulfate	4	4	4	4	4	4