



College of Biological Sciences  
**THE OHIO STATE UNIVERSITY COLLEGE OF BIOLOGICAL SCIENCES**  
**CHEMICAL HYGIENE PLAN**  
**APPENDIX F SAMPLE GLOVE SELECTION CHART**

	BUTYL	CPE	NATURAL RUBBER	NEOPRENE	NITRILE	NITRILE/PVC	PE	PU	PVA	PVC	SBR	VITON
<b>Acids, Carboxylic</b>												
Aliphatic & Alicyclic Unsubstituted	R	r	**	RR	RR	R	NN	R	nr	r	R	r
<b>Aldehydes</b>												
Aliphatic	RR	rr	**	nn	nn	r		r	NN	rr	r	NN
Aromatic & Heterocyclic	rr	**	nn	nn	nn	n		n	rr	N	n	**
<b>Amides, Carboxylic</b>												
Aliphatic	**		**	nn	nn						nn	
<b>Amines</b>												
Aliphatic & Alicyclic Primary	**	nn	**	rr	rr	r		**	rr	rr	**	
Secondary	rr		nn	**	nn	**		n	**	**	**	**
Tertiary	r	rr	rr	R	r	r			r	r		
<b>Esters, Carboxylic</b>												
Aliphatic Acetates	**	r	NN	NN	NN	N	nn	**	rr	N	N	N
Higher Monobasic	r	nn			n					n		
Aromatic Phthalates	**		nn	rr	rr				**			r
<b>Ethers, Aliphatic</b>	nn	rr	nn	nn		**		n		**	**	

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	BUTYL	CPE	NATURAL RUBBER	NEOPRENE	NITRILE	NITRILE/PVC	PE	PU	PVA	PVC	SBR	VTN
<b>Halogen Compounds</b>												
Aliphatic												
Unsubstituted	NN	NN	NN	NN	NN	n	NN	nn	**	NN	N	RR
Substituted	rr	**	NN	NN	nn		nn	n	**	NN		RR
<b>Aromatic</b>												
Unsubstituted	N	nn	N	N	NN				**	N	n	RR
Polynuclear	nn		nn	nn	**				**	nn		rr
<b>Heterocyclic Compounds</b>												
Epoxy Compounds	rr	**	NN	n	**				NN	n		nn
Furan Derivatives	**	**	nn	nn	NN	n			**	nn		**
<b>Hydrazines</b>												
	**	nn	n	nn	**					**		**
<b>Hydrocarbons</b>												
Aliphatic & Alicyclic	N	R	NN	**	RR	**	NN	R	**	NN	N	RR
Aromatic	NN	**	NN	**	**	**	nn	**	RR	NN	N	RR
<b>Hydroxyl Compounds</b>												
Aliphatic & Alicyclic												
Primary	RR	R	**	**	**	R	**	R	**	**	**	R
Secondary	**	r	**	RR	RR	r	r	r	rr	RR		R
Polyols			r	rr						R		
Aromatic	rr	r	**	RR	**		**	**	nn	**		rr
<b>Inorganic Acids</b>												
	**	RR	rr	RR	RR	**	**	N	NN	**	**	rr
<b>Inorganic Bases</b>												
	R	r	RR	RR	RR	R	**		n	RR	R	**
<b>Inorganic Gas</b>												
	**	RR	n	R	n		nn			**		**
<b>Inorganic Salts</b>												
	R	rr	R	R	r	R		R		R	**	
<b>Ketones, Aliphatic</b>												
	RR	N	NN	NN	NN	N	nn	**	**	NN	**	NN

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	BUTYL	CPE	NATURAL RUBBER	NEOPRENE	NITRILE	NITRILE-PVC	PE	PU	PVA	PVC	SBR	VITON
Nitriles, Aliphatic	rr		NN	**	**				RR	n		rr
Nitro Compounds Unsubstituted	**	rr	NN	**	NN	**	**	nn	rr	**	**	nn
Organo-Phosphorus Compounds	**			**	**		nn	n				**
Peroxides	r		r	**	**			r		rr		rr
Vinyl Halides		**										

The Ohio State University Office of Environmental Health & Safety - Chemical Hygiene Plan  
 - Appendix B - Sample Glove Selection Chart - Revision 4-98 -

Note: Single and double, upper and lower case “r’s” and “n’s” are used to convey the recommendations. Briefly, RR, R, rr, and r indicate various degrees of good resistance and NN, N, nn, and n indicate various degrees of poor chemical resistance. Double characters indicate that there are test data to support the recommendations and single characters indicate that only qualitative information was available. Upper case characters indicate consensus and a relatively large amount of information, whereas lower case indicates a relatively small amount of information or inconsistencies. Double asterisks (\*\*) indicate a wide variation in ratings within the class for the given material. In these cases refer to Matrix A.

Source: Guidelines for Selecting of Chemical Protective Clothing Second Edition  
 American Conference of Governmental Industrial Hygienists, Inc.  
 Matrix B - CPC Recommendations By Chemical Class

## GLOSSARY

**Acetate** - Polymer of cellulose acetate; a clear, relatively inexpensive material used for face and eye protection.

**Acrylic** - Polymer of methyl methacrylate; clear plastic used for face and eye protection.

**Breakthrough Time** - The time elapsed between initial contact of a chemical with the outside surface of a protective clothing materials and the time at which the chemical can be detected at the inside surface of the material. Measured breakthrough times are dependent on the sensitivity of the analytical methods used to detect the chemical.

**Baypren** - See Neoprene.

**Butyl Rubber** - Copolymer of isobutylene and a small amount of isoprene. Material has good resistance to weathering and a wide variety of chemicals. Both supported and unsupported forms of butyl rubber are used as protective clothing.

**Cellulose Propionate** - Polymer; clear plastic use for face and eye protection.

**Chlorobutyl Rubber** - A chlorinated form of butyl rubber. Generally has better wear than butyl rubber.

**Chloroprene Rubber** - See Neoprene.

**Chlorinated Polyethylene** - CPE, Chloropelä. A polyethylene elastomer with a chlorine content of 36 to 45%. The material generally has better chemical resistance and physical properties than polyethylene.

**Chlorosulphonated Polyethylene** - See Hypalon.

**Contamination** - The presence of potentially harmful chemicals on the surface of or within the polymer of CPC.

**Copolymer** - A long chain molecule synthesized by reaction of more than one monomer species with each other. Copolymers often have cost and/or performance advantages over polymers produced from a single monomer species.

**CPE** - See Chlorinated Polyethylene.

**CF-39** - Polymer of allyl diglycol carbonate. A clear, impact resistant plastic used for face and eye protection.

**Decontamination** - The removal of potentially harmful chemicals from the surface of and from within the polymer of CPC. Noted surface decontamination does not necessarily remove absorbed chemical.

**Degradation** - The loss in physical properties of an item of protective clothing due to exposure to chemical, use, or ambient conditions (e.g., sunlight).

**FEP** - Polymer of fluorinated ethylene propylene. Polymer with exceptionally good chemical resistance with protective clothing applications in both film and clothing form.

**Flock-lined or Flocked** - A layer of fibers, typically cotton, adhered to the inside of rubber gloves. The lining absorbs perspiration and provides some insulating effect.

**Gore-Tex® Fabric** - A proprietary fabric in which microporous PTFE is laminated on one or both sides with a fabric. The fabric allows the transmittance of moisture vapor which reduces heat stress. It prevents penetration by many liquids and solids but does not provide vapor protection.

**Hypalon®** - Polymer produced by the post chlorination and sulfonation of polyethylene thereby producing a rubbery material suitable for CPC.

**Laminated** - Joining two or more sheets of fabrics together by means of heat or adhesive.

**Latex** - A stable dispersion of polymer or rubber particles in water. Latex gloves and coated fabrics are prepared by coagulating and crosslinking the particles on a form or cloth substrate. Most natural rubber, neoprene, and nitrile gloves are prepared from latices.

**Latex Dipped** - A glove prepared by dipping a glove form or a fabric glove into a rubber latex bath. In one dip, the entire amount of rubber that will form the glove is deposited.

**Natural Rubber** - Polyisoprene obtained from rubber plants. A highly flexible and conforming material used principally for gloves. High elasticity.

**NBR (Nitrile-butadiene rubber)** - see Nitrile Rubber.

**Neoprene** - Polychloroprene. A synthetic rubber having chemical and wear resistance properties that are generally superior to those of natural rubber.

**Nitrile Rubber** - Copolymer of acrylonitrile and butadiene. Also known as acrylonitrile rubber, acrylonitrile-butadiene rubber, Buna-N, and nitrile-butadiene rubber (NBR). Trademarked names include Hycarä, Kyrnacä, and Paracrilä. Used for supported and unsupported gloves, and coated fabric. Nitrile rubbers are available in a wide range of acrylonitrile concentrations. In general, the higher the acrylonitrile concentration the better the chemical resistance. However, stiffness also increases at high acrylonitrile concentrations.

**PE** - See Polyethylene.

**Penetration** - The movement of chemical through zippers, stitched seams or imperfections (i.e., pinholes) in a protective clothing material.

**Permeation** - The process by which a chemical dissolves in and moves through a protective clothing material on a molecular level.

**Permeation Rate** - The rate at which the chemical moves through the clothing material. This is expressed in terms of amount per unit area per unit time.

**Polyethylene** - A fairly chemically resistant material that is used as a freestanding film (e.g., apron) or a fabric coating. Low density polyethylene is the most common form used in protective clothing.

**Polycarbonate** - A hard, transparent plastic used for face and eye protection. It has exceptional impact resistance and good chemical resistance, and is commonly used as the lens of safety glasses.

**Polyester** - A family of polymers that finds application in fiber form as clothing and in film form as a clear material for face and eye protection.

**Polyurethane** - An extensive and multi-branched family of polymers based on isocyanates. As used in protective clothing, polyurethanes are rubbery polymers that are either coated onto fabrics or formed into boots.

**Polyvinyl Alcohol** - A water-soluble polymer that, as long as it is dry, exhibits exceptional resistance to many organic solvents that rapidly permeate most rubbers. The material is somewhat stiff, thus limiting dexterity.

**PU** - See Polyurethane.

**PVU** - See Polyvinyl Alcohol.

**PVC** - See Polyvinyl Chloride.

**Polyvinyl Chloride** - A stiff polymer that is made suitable for protective clothing applications by the addition of plasticizers. Used as a freestanding material for gloves, aprons, etc., as well as coating for fabrics. Clear forms are also available as flexible face shields.

**Safeguard CPF** - A proprietary nonwoven fabric for limited-use (i.e., disposable) clothing.

**Saranex** - Multilayer laminate of polyethylene and Saranä.

**Sontara** - A proprietary spun-laced, limited use fabric.

**SBR** (Styrene-butadiene Rubber) - Also known as Buna-S. Trade-mark names include Solpreneä, Plioflexä, and Stereonä. Used for fabric coatings and boots.

**Solvent Dipped** - A glove prepared by repeatedly dipping a glove form or glove substrate into a solution of the rubber in a solvent. The rubber is subsequently cured.

**Supported** - Materials containing a substrate such as cotton, polyester or nylon fabric or scrim which is coated, laminated or impregnated with a polymer or rubber.

**TFE (PRFE)** - Polytetrafluoroethylene. An example is Teflonä.

**Tyvek** - A proprietary, nonwoven fabric for limited use (e.g., disposable) clothing.

**Viton** - A proprietary fluoroelastomer. Highly chemically resistant, but expensive synthetic elastomer.