

CHEMICAL RESISTANCE GUIDE

METHODOLOGY

PERMEATION

Permeation is a process by which a chemical can pass through a protective film without going through pinholes, pores or other visible openings. Individual molecules of the chemical enter the film, and “squirm” through by passing between the molecules of the glove compound or film. In many cases the permeated material may appear unchanged to the human eye.

Chemical permeation can best be described by comparing it to what happens to the air in a balloon after several hours. Although there are no holes or defects, and the balloon is tightly sealed, the air gradually passes through (permeates) its walls and escapes. This simple example uses gas permeation, but the principle is the same with liquids or chemicals.

DEGRADATION

Degradation is a reduction in one or more physical properties of a glove material due to contact with a chemical. Certain glove materials may become hard, stiff, or brittle, or they may grow softer, weaker, and swell to several times their original size. If a chemical has a significant impact on the physical properties of a glove material, its permeation resistance is quickly impaired. For this reason, glove/chemical combinations rated “Poor” or “Not Recommended” in degradation testing were not tested for permeation resistance. Please note, however, that permeation and degradation do not always correlate.

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LATEX

NITRILE

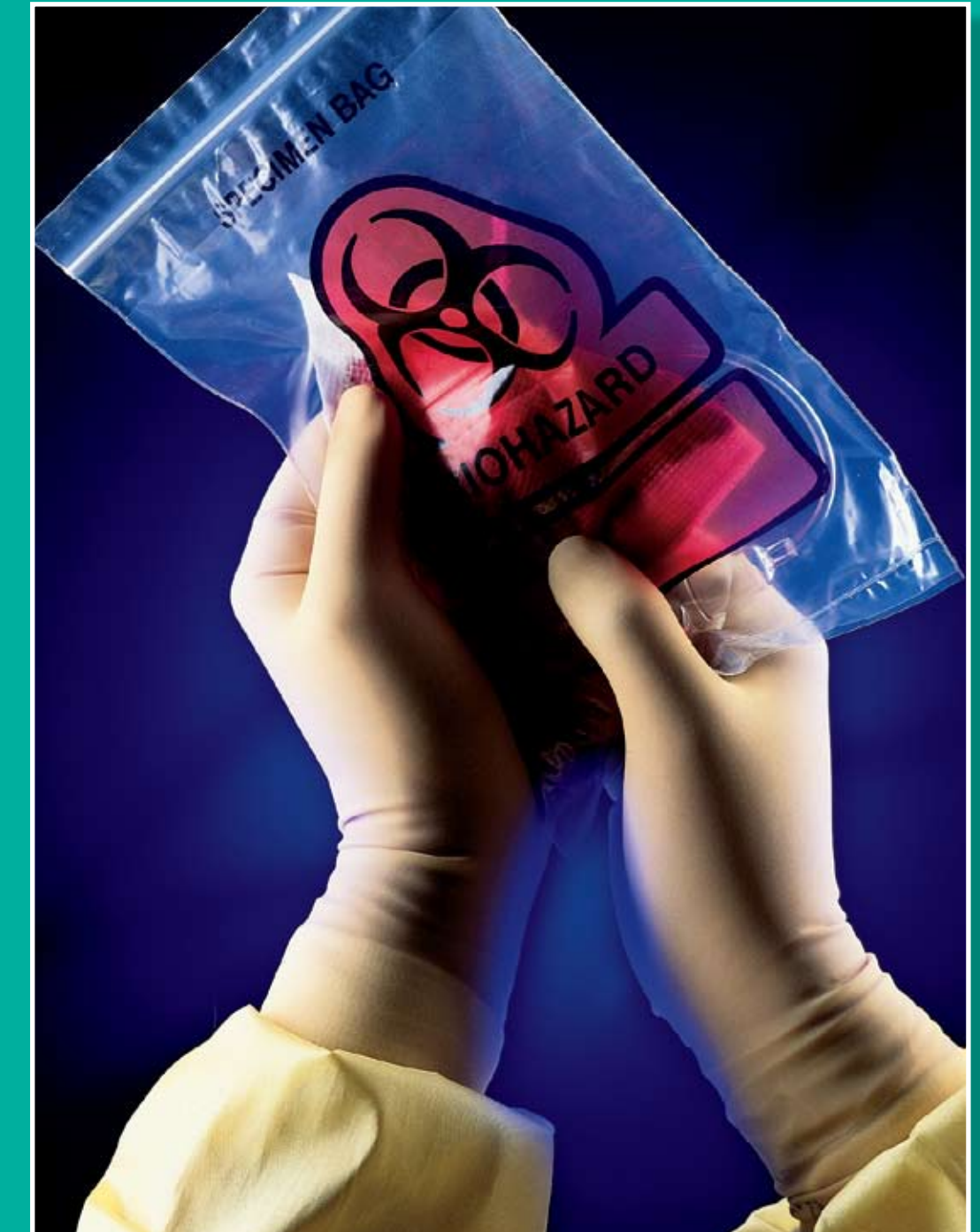
NEOPRENE

POLYISOPRENE

GENERAL PURPOSE



A Guide to Safe Handling of Hazardous Materials



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CHEMICAL RESISTANCE GUIDE

	LATEX 1	NITRILE 2	NEOPRENE 3	POLYISOPRENE 4	GENERAL PURPOSE GLOVES 5
CLEANING AGENTS - 'QUAT' (QUATERNARY) COMPOUNDS					
Acetone	Limited	Not Recommended	Limited	Limited	Use Perry™ General Purpose Glove
Ammonium Hydroxide, Conc.	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Detergents	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Diguanide	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
N, N Didecyl Dimethyl Ammonium Chloride	Good	Preferred	Good	Good	Use Any Of 3 General Purpose Styles
Phenol, 90%	Limited	Not Recommended	Good	Limited	Use Perry™ General Purpose Glove
Phenolic Disinfectant (Typical)	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Sodium Hypochlorite, (< 15%) (Bleach - Saturated Aqueous Solution)	Fair	Fair	Good	Fair	Sol-Vex® Preferred. Minimize Contact
HAND SANITIZERS/CLEANERS					
CHG, 4% (Chlorhexidine Gluconate)	Limited	Preferred	Fair	Limited	Use Any Of 3 General Purpose Styles
Iodine In (Betadine) Alcohol Solution	Good	Good	Good	Good	Sol-Vex® Preferred
Iodine In (Betadine) Antiseptic Solution	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Iodine In (Betadine) Surgical Scrub	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Povidone Iodine (PVPI)	Preferred	Good	Good	Good	Use Any Of 3 General Purpose Styles
Triclosan (Irgasan DP 300)	Fair	Fair	Fair	Fair	Use Any Of 3 General Purpose Styles
ALCOHOL(S)					
Ethyl Alcohol (Ethanol)	Limited	Preferred	Fair	Limited	Sol-Vex® Preferred
Isopropyl Alcohol (Isopropanol) (Isopropanol, 70% - Rubbing Alcohol)	Limited	Good	Good	Limited	Sol-Vex® Preferred
Methanol (Alcohol Solvent)	Limited	Preferred	Good	Limited	Sol-Vex® Preferred
BODY/BLOOD FLUIDS/TEST VIRUS					
Blood / Body Fluid	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Virus (Pass/Fail Rating to Virus Test F1671)	Pass	Pass	Pass	Pass	Pass
COLD STERILANTS - INSTRUMENTS					
Cidex OPA (Ortho-Phthalaldehyde) Solution	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Glutaraldehyde, 2% - 25%	Good	Good	Not Rated	Good	Use Any Of 3 General Purpose Styles
Hydrogen Peroxide, 30%	Good	Good	Preferred	Good	Use Any Of 3 General Purpose Styles
Peracetic Acid, 35% (Organic Peroxide Type E Liquid)	Limited	Limited	Preferred	Limited	Perry™ General Purpose Glove Preferred

A Pure methyl methacrylate (bone cement) rapidly degrades and permeates all types of disposable gloves. If hospital workers must handle cement ingredients that contain high concentrations of methyl methacrylate, Ansell recommends that double gloves are worn and that the outer gloves be replaced very promptly in case of accidental contact. When a bone cement is prepared for use, it is generally prepared in a container using a spatula to mix and avoiding contact with the gloved hand. When mixed the methyl methacrylate begins to polymerize rapidly, thereby increasing in molecular weight and losing the

ability to permeate through gloves. When this polymerization has progressed far enough, orthopedic-grade latex gloves, or double gloved latex, neoprene or polyisoprene gloves can be used safely. The time to "progressed far enough" will vary with the temperature, the details of the cement formulation, and other factors. There is no practical way to test for this property. Operating room personnel should therefore be alert for possible skin symptoms. Any medical-grade utility glove may be used for clean-up afterwards. The methyl methacrylate in any unused bone cement will be fully converted to a safe, solid high polymer by then.

LATEX

1 Surgical - Encore® Family, No Powder™, Neutralon®, Micro-Touch®, Perry™ Orthopaedic, Sensi-Touch®, The Original Perry® Style 42®
Exam - Micro-Touch® Plus, Micro-Touch® NextStep®, Micro-Touch® E.P.® Gloves, Micro-Touch® Plus Sterile Singles, Micro-Touch® Powder

NITRILE

2 Surgical - None
Exam - Micro-Touch® NitraFree™, Micro-Touch® Nitrile, Micro-Touch® Smooth Nitrile, Micro-Touch® Nitrile E.P.®, Micro-Touch® NitraTex® Sterile Pairs and Singles

NEOPRENE

3 Surgical - Derma Prene® Ultra
Exam - Micro-Touch® Affinity®

POLYISOPRENE

4 Surgical - Derma Prene® IsoTouch®, Derma Prene® IsoTouch® Micro
Exam - None

GENERAL PURPOSE GLOVES

5 Other - Perry™ General Purpose Gloves, Housekeeping Gloves, Sol-Vex®

Vinyl is not represented in the above chart because Ansell does not recommend for use with chemicals or bodily fluids.

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OTHER COMMON HOSPITAL/OR PRODUCTS					
Chloroform (Anesthetic)	Not Recommended	Not Recommended	Not Recommended	Not Recommended	No General Purpose Gloves Can Be Recommended Alone. Use 2-100 Barrier Gloves For Handling Chloroform.
Ethyl Ether	Not Recommended	Fair	Limited	Not Recommended	Sol-Vex® Preferred
Methyl Methacrylate Bone Cement - (Mixed & Not Mixed)	See Below ^A	See Below ^A	See Below ^A	See Below ^A	See Below ^A
Methylene Blue	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Mineral Oil	Not Recommended	Preferred	Good	Not Recommended	Sol-Vex® Preferred
Plaster of Paris	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
LAB PRODUCTS					
Acetic Acid (Glacial)	Good	Good	Preferred	Good	Use Any Of 3 General Purpose Styles
Cationic Detergent	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Caustic Soda	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Citric Acid, 10%	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Dimethyl Sulfoxide (DMSO)	Good	Good	Preferred	Good	Use Any Of 3 General Purpose Styles
Formaldehyde (Formalin)	Limited	Preferred	Fair	Limited	Sol-Vex® Preferred
Formol, 10%	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Hydrochloric Acid, 10%	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Lactic Acid	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Mercury	Not Rated	Preferred	Not Rated	Not Rated	Use Any Of 3 General Purpose Styles
Methylated Spirits	Limited	Preferred	Fair	Limited	Sol-Vex® Preferred
Nitric Acid, 10%	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Oleic Acid	Fair	Preferred	Fair	Fair	Sol-Vex® Preferred
Phosphoric Acid, 35%	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Picric Acid (Water Solution)	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Potassium Hydroxide	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Sodium Chloride (Saline Solution)	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Sodium Hydroxide, 50%	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Sodium Hypochlorite (Javex)	Fair	Fair	Good	Fair	Sol-Vex® Preferred. Minimize Contact.
Sodium Nitrate Solutions	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Sulfuric Acid, <30%	Good	Good	Preferred	Good	Use Any Of 3 General Purpose Styles
Toluene	Not Recommended	Limited	Not Recommended	Not Recommended	Sol-Vex® Preferred
Triethanolamine, 85%	Fair	Good	Good	Fair	Use Any Of 3 General Purpose Styles
Urea	Good	Good	Good	Good	Use Any Of 3 General Purpose Styles
Xylene	Not Recommended	Limited	Not Recommended	Not Recommended	Sol-Vex® Preferred

KEY TO DEGRADATION RATING

	Preferred Protection Little or no degradation or permeation.
	Good Protection Minimal degradation; permeation should not occur in less than 30 minutes.
	Fair Protection Degradation may occur, and/or some chemical is likely to permeate the glove in less than 30 minutes.
	Limited Protection Degradation is likely to occur; some chemical will probably permeate or penetrate the glove in less than 5 minutes.
	Not Recommended Severe degradation and permeation is likely.
	Not Rated Insufficient data is available to make a recommendation.

When reviewing this guide remember that barrier ratings are based upon Ansell's knowledge and expertise of materials and their performance in a controlled setting. Actual workplace conditions usually dictate a combination of performance capabilities; these variables cannot be duplicated in a controlled environment. A product's resistance to cuts, punctures, and abrasion must also be taken into account as a critical usage factor. A glove with excellent permeation resistance may not be adequate if it tears or punctures easily. Always factor in the physical performance requirements of the job or application when selecting a glove barrier.

Barrier ratings indicated are intended to guide and inform healthcare personnel, safety specialists and other qualified professionals involved in ensuring safety in the healthcare environment. Because the conditions of ultimate use are beyond our control, and because we cannot run permeation tests in all possible work environments and across all combinations or chemical solutions, this guide is solely advisory. The suitability of the product for a specific job must be determined based upon testing by the purchaser. Ansell believes this information is the best currently available; it is subject to revision as additional knowledge and experience are gained. Anyone intending to use the suggestions contained in this publication should first verify that the glove selected is suitable for the intended use and meets all appropriate health standards.

The suggestions in this guide are not comprehensive and Ansell disclaims any implied warranties, including merchantability and fitness for particular purpose for use of its gloves with any particular chemical or fluid.

Upon written request, Ansell will be happy to provide a sample to aid you in making your own selection to meet your own individual safety requirements.

Ansell

Everything you touch...we touch.

For more information about our complete Medical Glove line, call toll-free: (800) 952-9916