



4 mil single use nitrile

styles tested: 7005(PF), 6005PF, 7500PF
B6005PF, 6105PF, 6110PF,
7700PFT, 7705PFT

Chemical Permeation and degradation testing of personal protective equipment

PLEASE NOTE: Chemical permeation testing of personal protective equipment is performed under laboratory conditions which cannot emulate every real world application. Showa thin gauge single use/disposable nitrile gloves can offer a variety of protection from single splash protection to total immersion applications depending on the frequency and duration of exposure with any given chemical. As a general rule most workers (worldwide) take work breaks every two hours, therefore a single use/disposable glove need only to be used a maximum of 2 hours before being changed out. Chemical permeation data is meant to be used as a guide and as such offers no warranties or guarantees in real world applications. Doubling gloving is a common practice to increase marginal protection while maintaining maximum dexterity.

Chemical Tested	Degradation				ASTM F 739 Total Immersion	
					Permeation Breakthrough	
	5 min	30 min	60 min	240 min	BDT Min.	ANSI/ISEA rating
Acetaldehyde	NR	NR	NR	NR	NR	0
Acetic Acid 84%	E	P	P	NR	NR	0
Acetone	NR	NR	NR	NR	NR	0
Acetonitrile	P	P	P	P	4	0
Acrylonitrile	NR	NR	NR	NR	NR	0
Ammonium Hydroxide 29%	E	E	E	E	>480	6
Amyl Acetate	NR	NR	NR	NR	NR	0
Amyl Alcohol	E	G	G	G	24	1
Benzaldehyde	NR	NR	NR	NR	NR	0
Benzene	NR	NR	NR	NR	NR	0
Bromoacetophenone,2 (10% in Acetone)	NT	NT	NT	NT	2	0
Butanol	E	E	G	G	13	1
Butyl Acetate	NR	NR	NR	NR	NR	0
P-Tert-Butyl Toluene	NT	NT	NT	NT	11	1
Carbon Tetrachloride	F	NR	NR	NR	NR	0
Cellosolve Acetate	P	NR	NR	NR	NR	0
Chlorobenzene	NR	NR	NR	NR	NR	0
Chloroform	NR	NR	NR	NR	NR	0
Citric Acid	E	E	E	E	>480	6
Cresols	P	NR	NR	NR	NR	0
Cyclohexane	E	E	E	E	10	1
Cyclohexanol	E	E	E	G	80	3
Cyclohexanone	NR	NR	NR	NR	NR	0
n-Dibutyl Phthalate	G	F	P	NR	NR	0
o-Dichlorobenzene	NR	NR	NR	NR	NR	0
1,2-Dichloroethane	NR	NR	NR	NR	NR	0
Diesel Fuel	E	E	G	G	82	3



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	5 min	30 min	60 min	240 min	BDT Min.	ANSI/ISEA rating
Diethanolamine	E	E	E	E	>480	6
Diethylamine	P	P	P	NR	NR	0
Di-Isobutyl Ketone	E	E	E	E	NT	NA
N,N-Dimethylacetamide	NR	NR	NR	NR	NR	0
Ethyl Acetate	NR	NR	NR	NR	NR	0
Ethyl Benzene	NR	NR	NR	NR	NR	0
Ethyl Ether	G	G	G	G	2	0
Ethylene Glycol	E	E	E	E	>480	6
Formaldehyde	E	E	E	E	>480	6
Formic Acid	G	NR	NR	NR	NR	0
Furfural	P	NR	NR	NR	NR	0
Gasoline	E	G	P	NR	NR	0
Glutaraldehyde 50%	E	G	G	G	>480	6
Glyphosate"RoundUp"	E	G	G	G	>480	6
Heptane	E	E	E	E	NT	NA
Hexane	E	E	E	E	11	1
Hydraulic Fluid	E	E	E	E	NT	NA
Hydrochloric Acid 37%	E	E	E	E	>480	6
Iso Octane	E	E	E	G	120	4
Isobutanol	E	F	P	P	32w	0
Kerosene	E	E	E	E	>480	6
Lactic Acid 85%	E	E	E	E	>480	6
Methanol	E	G	G	F	NR	0
Methyl Ethyl Ketone	NR	NR	NR	NR	NR	0
Methyl Isobutyl Ketone	NR	NR	NR	NR	NR	0
Methyl Methacrylate	NR	NR	NR	NR	NR	0
Methylamine 40%	E	E	E	G	NT	NA
Methylene Chloride	NR	NR	NR	NR	NR	0
N-Methylpyrrolidone	NR	NR	NR	NR	NR	0
Methyl-Tert Butyl Ether	G	P	P	P	NR	0
Mineral Spirits	E	E	G	F	>480	6
Monoethanolamine	E	E	E	E	>480	6
Morpholine	NR	NR	NR	NR	NR	0
Nitric Acid 70%	G	P	NR	NR	NR	0
Nitrobenzene	NR	NR	NR	NR	NR	0
Nitromethane	F	P	P	P	NR	0
Nitropropane	NR	NR	NR	NR	NR	0
n-Octanol	E	E	E	G	>480	6
Oleic Acid 98%	E	E	E	G	>480	6
Pentane	E	E	E	E	4	0
Perchloroethylene	F	NR	NR	NR	6	0



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	5 min	30 min	60 min	240 min	BDT Min.	ANSI/ISEA rating
Petroleum Ether	E	E	E	E	6	0
o-Phosphoric Acid 85%	E	E	E	E	>480	6
Potassium Hydroxide 45%	E	E	E	E	>480	6
2-Propanol	E	E	E	E	15	1
n-Propanol	G	F	P	P	7	0
Propylene Oxide	NR	NR	NR	NR	NR	0
Rotella Multigrade 15W40 Motor Oil	E	E	E	E	>480	6
Shell Diala Oil AX Base Oil	E	E	E	E	>480	6
Shell HVI 100 Neutral MQ Base Oil	E	E	E	E	>480	6
Shell Turbo T 68 Hydraulic Oil	E	E	E	E	>480	6
Shellwax 100	E	E	E	E	>480	6
Sodium Hydroxide 50%	E	E	E	E	>480	6
Stoddard Solvent	E	E	E	E	126	4
Sulfuric Acid 97%	G	P	NR	NR	NR	0
Tannic Acid	E	E	E	E	>480	6
Tetrahydrofuran	NR	NR	NR	NR	NR	0
Toluene	NR	NR	NR	NR	NR	0
1,2,4-Trichlorobenzene	NR	NR	NR	NR	NR	0
1,1,1-Trichloroethane	NR	NR	NR	NR	NR	0
Trichloroethylene	NR	NR	NR	NR	NR	0
Tricresyl Phosphate	E	E	G	P	>480	6
Triethanolamine	E	E	E	E	>480	6
Turpentine	E	E	E	G	>480	6
Xylene	NR	NR	NR	NR	NR	0

Permeation and Degradation Legend & Explanantion

Permeation is the act of a chemical passing through a solid material like personal protective clothing on a molecular level, and is measured by test standards designed by the ASTM.

ASTM - American Society of Testing and Materials

ASTM F739 - An eight hour test to measure the length of time for a chemical to permeate personal protective equipment / clothing in total immersion contact. ASTM F1383 - A four hour test to measure the length of time for a chemical to permeate personal protective equipment / clothing in intermittent contact. Intermittent exposure is one minute of immersion followed by nine minutes of no immersion, and then repeated continously.

Degradation is a physical change in a glove material that occurs after exposure to chemicals. The effects of degradation may include (but not limited to) swelling, wrinkling, deterioration, discoloration or delamination. There are no single accepted test standard for measuring degradation. Showa gloves were tested for degradation using a protocol considered by the American Society for Testing and Materials (ASTM) F23 Protective Clothing Committee. The percent weight change was measured gravimetrically after 60 minutes. The ratings were assigned as follows: Percent weight change: 0-10 = Excellent, 11-20 = Good, 21-30 = Fair, 31-50 = Poor, >50 = NR/not recommended

NT= not tested, BDT= breakthrough detection time

BDT, or breakthrough detection time is the amount of time it takes a chemical to pass through a article of protective clothing on a molecular level.