

Ref: NFPA 1991, 2000 Ed Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies

Tingley Hazproof Boot (82330) Permeation Resistance as per ASTM F-739-91,

ASTM Standard Method: Resistance of Protective Clothing Materials to Permeation by Liquids and Gases

Chemical or Agent	Actual Breakthrough Time (min)	Normalized Breakthrough Time (min)	Maximum Permeation Rate ($\mu\text{g}/\text{cm}^2\cdot\text{min}$)	Minimum Detectable Rate for Test Application ($\mu\text{g}/\text{cm}^2\cdot\text{min}$)
Acetone	>180	>180	< 0.01	0.01
Acetonitrile	>180	>180	< 0.1	0.1
Ammonia	>60	>60	< 0.01	0.01
1,3, Butadiene	>180	>180	< 0.02	0.01
Carbon Disulfide	86	114	0.18	0.01
Chlorine	>180	>180	< 0.01	0.01
Dichloromethane	>60	>60	< 0.01	0.01
Diethylamine	>180	>180	< 0.1	0.01
Dimethylformamide	>180	>180	< 0.02	0.02
Ethyl Acetate	>180	>180	< 0.09	0.01
Ethylene Oxide	>60	>60	< 0.01	0.01
Hexane	>60	>60	< 0.01	0.01
Hydrogen Chloride	>180	>180	< 0.1	0.1
Methanol	>180	>180	< 0.1	0.01
Methyl Chloride	>180	>180	< 0.01	0.01
Nitrobenzene	>60	>60	< 0.01	0.01
Sodium Hydroxide (50%)	>180	>180	< 0.1	0.1
Sulfuric Acid	>180	>180	< 0.1	0.1
Tetrachloroethylene	>180	>180	< 0.01	0.01
Tetrahydrofuran	33	119	20.8	0.01
Toluene	>180	>180	< 0.01	0.01

All chemical concentrations 98% or greater, unless otherwise noted

Tests performed for durations of either 1 or 3 hours (60 or 180 min) unless otherwise noted

Ref: report#: 564554, J9720050-001, J9817311-001

Testing with Chemical Agents under Military Standard 282 has demonstrated permeation resistance to standard static diffusion tests (duration: 24 hrs) as follows:

Blister Agents:

Mustard: HD > 14 hours (Method 204 1.2; Static Diffusion method)

Nerve Agents:

Sarin: GB > 24 hours (Method 206 1.3; Static Diffusion method)

Nerve: VX > 24 hours (Method 204 1.2; " " modified for use with VX)

Soman: GD > 24 hours (Method 206 1.3; " " modified for use with GD)

Tabun: GA > 24 hours (Method 206 1.3; " " modified for use with GA)

Ref. report: # 1364-001

All testing performed and reported by
Geomet Technologies, Inc, Gaithersburg, MD 20877