

(NFPA - National Fire Protection Association)

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**NFPA 1991, 2000 edition CHEMICAL BATTERY**  
**Hazmax Material (All tests concluded after 3 hours) (Average of 3 cells)**

# NFPA 1991, 2000 Edition Boot Requirement

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**NFPA 1991, 2000 edition CHEMICAL BATTERY**  
**Hazmax<sup>®</sup> Material (All tests concluded after 3 hours) (Average of 3 cells)**

CHEMICAL	Chemical Class	NORMALIZED BREAKTHROUGH TIME (MIN) Using BT criteria 0.1mg/cm <sup>2</sup> /min				MAXIMUM PERMEATION RATE: ug/cm <sup>2</sup> /min			
		Sample #1	Sample #2	Sample #3	Sample #4	Sample #1	Sample #2	Sample #3	Sample #4
ACETONE	Ketone	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
ACETONITRILE	Nitrile	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
AMMONIA (gas)	Basic Inorganic Compound	>180	>180	>180	>180	<0.03	<0.03	<0.03	<0.03
1, 3-BUTADIENE (gas)	Hydrocarbon Gas	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
CARBON DISULFIDE	Sulfur Organic Compound	>180	>180	>180	>180	<0.02	<0.02	17.4	5.8
CHLORINE (gas)	Acidic Inorganic Gas	>180	>180	>180	>180	<0.002	<0.002	<0.002	<0.002
DICHLOROMETHANE	Chlorinated Hydrocarbon	>180	153	>180	171	<0.03	<0.85	<0.03	0.3
DIETHYLAMINE	Amine	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
DIMETHYLFORMAMIDE	Amide	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
ETHYL ACETATE	Ester	>180	>180	>180	>180	<0.09	<0.09	<0.09	<0.09
ETHYLENE OXIDE (gas)	Heterocyclic Compound	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
HEXANE	Aliphatic Hydrocarbon	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
HYDROGEN CHLORIDE (gas)	Inorganic Gas & Vapor	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
METHANOL	Alcohol	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
METHYL CHLORIDE (gas)	Halogen Compound Gas	>180	>180	>180	>180	<0.02	<0.02	<0.02	<0.02
NITROBENZENE	Nitrogen Organic Compound	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
SODIUM HYDROXIDE	Inorganic Base	>180	>180	>180	>180	<0.1	<0.1	<0.1	<0.1
SULFURIC ACID	Inorganic Acid	>180	>180	>180	>180	<0.1	<0.1	<0.1	<0.1
TETRACHLOROETHYLENE	Chlorinated Hydrocarbon (olefin)	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01
TETRAHYDROFURAN	Heterocyclic Ether	>180	>180	>180	>180	<0.04	<0.04	<0.04	<0.04
TOLUENE	Aromatic Hydrocarbon	>180	>180	>180	>180	<0.01	<0.01	<0.01	<0.01