NFPA 1991, 2005 Edition Boot Requirements

NFPA – National Fire Protection Association

To pass the applicable boot requirements for NFPA 1991, 2005 edition, boots are independently tested to verify compliance. Boots must resist permeation for 1 hour or more against chemicals in the NFPA 1991, 2005 edition battery. The battery consists of 15 chemical liquids and 6 chemical gases. The boots must also pass a flammability resistance test. Hazmax kneeboots have successfully passed all of these tests

NFPA 1991, 2005 edition CHEMICAL BATTERY

Hazmax™ Material (All tests concluded after 3 hours) [Average of 3 cells]

			NORMALIZED BREAKTHROUGH TIME (MIN) using BT criteria 0.1mg/cm²/min				MAXIMUM PERMEATION RATE: ug/cm²/min			
CHEMICAL	CHEMICAL CLASS	2005 Ed. Compliant	CELL #1	CELL #2	CELL #3	AVERAGE	CELL #1	CELL #2	CELL #3	AVERAGE
ACETONE	Ketone	Y	92	112	90	98	0.51	0.47	0.80	0.62
ACETONITRILE	Nitrile	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
AMMONIA (gas)	Basic Inorganic Compound	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	< 0.01
1,3-BUTADIENE (gas)	Hydrocarbon Gas	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
CARBON DISULFIDE	Sulfur Organic Compound	Y	>180	>180	>180	>180	< 0.03	< 0.03	<0.03	<0.03
CHLORINE (gas)	Acidic Inorganic Gas	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	< 0.01
DICHLOROMETHANE	Chlorinated Hydrocarbon	Y	>180	>180	>180	>180	< 0.07	< 0.07	< 0.07	< 0.07
DIETHYLAMINE	Amine	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
DIMETHYLFORMAMIDE	Amide	Y	>180	>180	>180	>180	< 0.01	< 0.01	0.618	<0.01
ETHYL ACETATE	Ester	Y	122	124	150	132	13.5	13.2	< 0.09	9.11
ETHYLENE OXIDE (gas)	Heterocyclic Compound	Y	>180	>180	>180	>180	< 0.01	< 0.01	<0.01	<0.01
HEXANE	Aliphatic Hydrocarbon	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
HYDROGEN CHLORIDE (gas)	Inorganic Gas & Vapor	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
METHANOL	Alcohol	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
METHYL CHLORIDE (gas)	Halogen Compound Gas	Y	>180	>180	>180	>180	< 0.04	< 0.04	< 0.04	<0.04
NITROBENZENE	Nitrogen Organic Compound	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
SODIUM HYDROXIDE	Inorganic Base	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
SULFURIC ACID	Inorganic Acid	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
TETRACHLOROETHYLENE	Chlorinated Hydrocarbon (olefin)	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	<0.01
TETRAHYDROFURAN	Heterocyclic Ether	Y	>180	>180	>180	>180	< 0.01	< 0.01	< 0.01	v0.01
TOLUENE	Aromatic Hydrocarbon	Y	>180	>180	>180	>180	< 0.02	< 0.02	< 0.02	<0.02

Additional permeation data not part of NFPA 1991, 2005 ed.

		NORMALIZED BREAKTHROUGH TIME (MIN) using BT criteria 0.1mg/cm²/min				MAXIMUM PERMEATION RATE: ug/cm²/min			
CHEMICAL	CHEMICAL CLASS	CELL #1	CELL #2	CELL #3	AVERAGE	CELL #1	CELL #2	CELL #3	AVERAGE
ACETIC ACID (GLACIAL)	Carboxylic Acid	>480	>480	>480	>480	N/A	N/A	N/A	N/A
ACRYLIC ACID	Carboxylic Acid	>480	>480	>480	>480	N/A	N/A	N/A	N/A
ACRYLONITRILE	Nitrile	160	136	136	144	34	34	36	35
ARSENIC ACID	Inorganic Acid	>480	>480	>480	>480	N/A	N/A	N/A	N/A
BROMINE(LIQUID)	Elements	444	400	420	421	1.3	99	30	43
CHROMIC ACID	Inorganic Acid	>480	>480	>480	>480	N/A	N/A	N/A	N/A
DIMETHYL HYDRAZINE	Hydrazines	240	232	288	253	2.1	2.6	1.8	2.2
EPICHLOROHYDRIN	Halogen Compound	216	196	216	209	38	37	32	74
ETHYLENE DICHLORIDE	Aliphatic Halogen Compound	188	120	144	151	48	48	45	47
HYDRAZINE	Hydrazines	>480	>480	>480	>4800	.03	N/A	0.002	0.01
HYDROFLUORIC ACID (48%)	Inorganic Acid	>480	>480	>480	>480	N/A	N/A	N/A	N/A
HYDROGEN FLUORIDE (99%)	Inorganic Acid	45	30	30	35	500	500	500	500
NITRIC ACID (70%)	Inorganic Acid	>480	>480	>480	>480	N/A	N/A	N/A	N/A
NITROGEN DIOXIDE	Inorganic Gases & Vapors	450	>480	390	440	0.16	0.01	0.19	0.12
NITROGEN TETROXIDE	Inorganic Gases & Vapors	>480	270	330	360	N/A	0.1	0.12	0.07
OLEUM (30%)	Inorganic Acid	>480	>480	>480	>480	N/A	N/A	N/A	N/A
TOLUENE DIISOCYANATE (TDI)	Aromatic Isocyanate	>480	>480	>480	>480	N/A	N/A	N/A	N/A

Caution: Do not use this footwear for fire protection.

Use in accordance with NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, and 29 CFR 1910.132.