Technical Data Chemical And Physical

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ASTM F1001 Chemical Test Battery*

CHEMICAL	Zytron®						Frontline®		ChemTape®
	100	100XP	200	300	400	500	300	500	
Acetone	NT	NT	17	>480	>480	>480	>480	>480	>480
Acetonitrile	NT	NT	52	87	>480	>480	>480	>480	>480
Carbon Disulfide	NT	NT	2	>480	>480	>480	>480	>480	>480
Dichloromethane	NT	NT	2	70	88	>480	10	253	>480
Diethylamine	NT	NT	21	>480	>480	>480	>480	>480	160
Dimethylformamide	NT	NT	77	>480	>480	>480	>480	>480	>480
Ethyl Acetate	NT	NT	14	>480	>480	>480	>480	>480	>480
n-Hexane	NT	NT	7	>480	>480	>480	>480	>480	>480
Methyl Alcohol	NT	NT	>480	55	>480	>480	>480	>480	>480
Nitrobenzene	NT	NT	97	>480	>480	>480	>480	>480	>480
Sodium Hydroxide	>480	>480	>480	>480	>480	>480	>480	>480	>480
Sulfuric Acid	>480	>480	>480	>480	>480	>480	>480	>480	>480
Tetrachloroethylene	NT	NT	21	>480	>480	>480	>480	>480	>480
Tetrahydrofuran	NT	NT	3	>480	>480	>480	>480	>480	>480
Toluene	NT	NT	6	>480	>480	>480	>480	>480	>480
GASES									
Ammonia Gas	NT	NT	NT	39	NT	>480	>480	>480	NT
1,3 Butadiene	NT	NT	NT	>480	NT	>480	>480	>480	NT
Chlorine Gas	NT	NT	NT	>480	NT	>480	>480	>480	NT
Ethylene Oxide Gas	NT	NT	NT	81	305	>480	>480	>480	NT
Hydrogen Chloride Gas	NT	NT	NT	>480	NT	>480	NT	>480	NT
Methyl Chloride Gas	NT	NT	NT	>480	NT	>480	NT	>480	NT

** Normalized breakthrough times in minutes in accordance with ASTM F 739.*

Note: Sources for all chemical test data are independent laboratories. All tests were performed under laboratory conditions and not under actual use conditions. Tests were performed on material samples, not actual garments. All chemicals tested at 95% and 75° F except Sodium Hydroxide, tested at 50%.

Chemical Warfare Agent Data

CHEMICAL AGENT	Zytron®300 Breakthrough		Zytron®500 Breakthrough		Frontline®500 Breakthrough		ChemTape® Breakthrough	
	Time	Criteria	Time	Criteria	Time	Criteria	Time	Criteria
Bis (2-chloroethyl) sulfide (Mustard:HD)	>480 MINUTES	4.0 ug/cm^2	>480 MINUTES	4.0 ug/cm^2	>480 MINUTES	4.0 ug/cm^2	>480 MINUTES	4.0 ug/cm^2
Isopropyl methylfluorophosphonate (Sarin:GB)	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2
Chlorovinyl arsinedichloride (Lewisite:L)	>240 MINUTES	4.0 ug/cm^2	>480 MINUTES	4.0 ug/cm^2	>240 MINUTES	4.0 ug/cm^2	NT	NT
O-ethyl S-(2-diisopropylaminoethyl) methyl-phosphonothiolate (Nerve:VX)	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2

Agent testing was conducted at Battelle Labs in accordance with MIL-STD-282 and/or NFPA 1994-2001 Edition Standard on Protective Ensembles for Chemical / Biological Terrorism Incidents.

Typical Physical Properties

TEST METHOD	Zytron® 100	100XP	200	300	400	500	Frontline® 300	500
Grab Tensile Strength MD* ASTM D751(lbs/N)	32 / 142	49 / 217	52 / 231	78 / 347	155 / 689	120 / 534	134 / 595	137 / 608
Grab Tensile Strength CD* ASTM D751(lbs/N)	24 / 106	38 / 169	39 / 173	69 / 307	152 / 676	121 / 538	125 / 555	166 / 737
Tear Resistance Trapezoid Method MD* ASTM D751(lbs/N)	11.5 / 51	17.4 / 77	22.9 / 101.8	16.6 / 74	42.2 / 188	35 / 156	13.7 / 61	13.5 / 60
Tear Resistance Trapezoid Method CD* ASTM D751(lbs/N)	7.4 / 32	10.3 / 45	9.6 / 42.7	22.1 / 98	50.6 / 225	37 / 168	10.7 / 48	14 / 62
Ball Burst ASTM D3787 (lbs/N)	28 / 124	46 / 204	43 / 191	58 / 258	153 / 681	128 / 569	123 / 546	134 / 595
Flammability Resistance ASTM F1358	N/A	N/A	N/A	N/A	N/A	N/A	PASS	PASS

**MD - Machine Direction, CD - Cross Direction*

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