KAPPLER TECHNICAL DATA
ASTM F1001 Chemical Test Battery

CHEMICAL	Zytron®						ChemTape®
	100	100XP	200	300	400	500	
Acetone	NT	NT	17	>480	>480	>480	>480
Acetonitrile	NT	NT	52	50	>480	>480	>480
Carbon Disulfide	NT	NT	2	>480	>480	>480	>480
Dichloromethane	NT	NT	2	24	88	>480	>480
Diethylamine	NT	NT	21	>480	>480	>480	160
Dimethylformamide	NT	NT	77	151	>480	>480	>480
Ethyl Acetate	NT	NT	14	>480	>480	>480	>480
n-Hexane	NT	NT	7	>480	>480	>480	>480
Methyl Alcohol	NT	NT	>480	43	>480	>480	>480
Nitrobenzene	NT	NT	97	>480	>480	>480	>480
Sodium Hydroxide	>480	>480	>480	>480	>480	>480	>480
Sulfuric Acid	>480	>480	>480	>480	>480	>480	>480
Tetrachloroethylene	NT	NT	21	>480	>480	>480	>480
Tetrahydrofuran	NT	NT	3	>480	>480	>480	>480
Toluene	NT	NT	6	>480	>480	>480	>480
GASES							
Ammonia Gas	NT	NT	NT	39	NT	>480	NT
1,3 Butadiene	NT	NT	NT	>480	NT	>480	NT
Chlorine Gas	NT	NT	NT	>480	NT	>480	NT
Ethylene Oxide Gas	NT	NT	NT	81	NT	>480	NT
Hydrogen Chloride Gas	NT	NT	NT	>480	NT	>480	NT
Methyl Chloride Gas	NT	NT	NT	>480	NT	>480	NT

Typical Physical Properties for ZYTRON (measured per ASTM D751)

TEST METHOD	100	100XP	200	300	400	500
Grab Tensile Strength MD*	32 / 142	49 / 217	52 / 231	70 / 311	94 / 418	80 / 359
Grab Tensile Strength CD*	24 / 106	38 / 169	39 / 173	54 / 240	98 / 435	73 / 325
Tear Resistance MD*	11.5 / 51	17.4 / 77	22.9 / 101.8	16.4 / 71	28.2 / 125.4	27 / 120
Trapezoid Method CD*	7.4 / 32	10.3 / 45	9.6 / 42.7	25.2 / 111	33.3 / 148.1	15 / 67
Ball Burst	28 / 124	46 / 204	43 / 191	53 / 236	121 / 538	79 / 351

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If you need to document a Kappler fabric against a specific chemical hazard, we offer a custom testing program that makes it easy. When you order a standard minimum number of garments (varies by product), we will conduct custom third-party testing of your specific chemical at no charge. For details contact Customer Service at 1-800-600-4019 or *usa@kappler.com*.

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Sources for all test data are independent laboratories. All tests were performed under laboratory conditions and not under actual use conditions.

NOTE: These tests were performed in accordance with ASTM standards by independent laboratories. This data is derived from tests performed on material samples only, not finished garments.

WARNING: There are uses, environments and chemicals for which these garments and/or fabrics are unsuitable. It is the responsibility of the user to review available data and verify that the garment and/or fabric is appropriate for the intended use and meets all specified government industry standards.

CAUTION: Do not use for fire protection. Avoid open flame or intense heat.

*MD - Machine Direction, CD - Cross Direction

Chemical Warfare Agent Data

	ZYTRON 300		ZYTRON 500		CHEMTAPE	
CHEMICAL AGENT	Breakthrough Time	Breakthrough Criteria	Breakthrough Time	Breakthrough Criteria	Breakthrough Time	Breakthrough Criteria
Bis (2-chloroethyl) sulfide (Mustard:HD)	>480 MINUTES	4.0 ug/cm^2	>480 MINUTES	4.0 ug/cm^2	>480 MINUTES	0.5 ug/cm^2
Isopropyl methylfluorophosphonate (Sarin:GB)	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	0.5 ug/cm^2
Chlorovinyl arsinedichloride (Lewisite:L)	>240 MINUTES	4.0 ug/cm^2	>480 MINUTES	4.0 ug/cm^2	NT	
O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (Nerve:VX)	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	1.25 ug/cm^2	>480 MINUTES	0.5 ug/cm^2
Pinacolyl methylfluorophosphonate (Soman:GD)	NT		NT		>480 MINUTES	0.5 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.