

SprayGuard®

Protective Garments Made with **Puntiform®**

SprayGuard garments are engineered with over taped seams or welded seams (Technology) cat. 3 type 4-B, 5 and 6 for NBC (nuclear, biological and chemical) protection with antistatic properties



Puntiform®



NUCLEAR PROTECTION
(EN 1073-2)
non ventilated suits
(EN 1073-1)
ventilated suits



BIOLOGICAL PROTECTION
(EN 14126)



CHEMICAL PROTECTION
(EN 14605 type 4-B)
(EN ISO 13982-1 type 5)
(EN 13034 type 6)



ANTISTATIC PROPERTIES
(EN 1149)

Puntiform®

Property		Norm/Method	U.M.	Value	Class
Weight		ISO 4591	gr/m ²	65	n.a.*
Abrasion resistance		EN 530/96	cycles	2000	5
Flex cracking resistance		EN-ISO 7854/99 (B)	cycles	>100.000	6
Trapezoidal tear resistance	MD	EN-ISO 9073-4/99	N	39,9	2
	XD	EN-ISO 9073-4/99	N	20,1	2
Traction resistance	MD	EN-ISO 13934-1/00	N	100	3
	XD	EN-ISO 13934-1/00	N	54	1
Puncture resistance		EN 863/95	N	16,9	2
Burst resistance		EN-ISO 13938-2/01	KPa	201	3
Stability of heat	ext/ext	ISO 5978/90	-	No adhesion	n.a.
	ext/int.	ISO 5978/90	-		
	int./int.	ISO 5978/90	-		
Surface resistivity		EN 1149-1/97	Ω	4,1 . 10 ¹⁰	n.a.*
Hydrostatic head		EN ISO 20811/93	Cm H ₂ O	324	n.a.*
			Pa	31800	n.a.*
Air permeability	Mean coeff. of variation	ISO 9237/97	mm/s	1,17±0,05	n.a.*
			%	5,75	n.a.*
Water vapour transmission rate			gr/m ² /24h	9500	n.a.*
Ignition resistance		prEN 13274-4/98 (3)	-	Self extinguishing**	n.a.*
Seam strength resistance		EN ISO 13935-2/01	N	140	4
Over taped seam strength resistance		EN ISO 13935-2/01	N	130	4



evolve
emergency
PREPAREDNESS

7 Industrial Way, Salem, NH 03079-2817, evolvetechcorp.com
1-888-315-9007



Protective Garments Made with *Puniform*[®]



PROTECTIVE PROPERTIES
Particle release (Helmke Drum Test– IFTH Lyon)

Micron dimension (µm)							
0,3	0,5	0,7	1	3	5	7	10
543	354	348	307	12	2	1	0

Particle penetration (% Filtration - IOM Edinburg)

Micron dimension (µm)					
0,35 – 0,5	0,5 – 0,6	0,6 – 1,5	1,5 – 2,0	2,0 – 2,5	> 2,5
99,9%	99,9%	99,9%	99,9%	99,9%	99,9%



Biological Protection (EN 14126:2003)

Test	Value	Class
Synthetic blood under hydrostatic pressure	20 KPa	6 of 6
Blood born infective agents (Phi-X 174 bacteriophage)	20 KPa	6 of 6
Penetration of infecting agents by contact	> 75 min.	6 of 6
Biologically contaminated aerosols	∞ Log R	3 of 3
Biologically contaminated powders	0 Log u.f.c	3 of 3

NB To guarantee the biological protection all garments must be made with over taped seams or welded seams.



Nuclear Protection (EN 1073-2)

Garments made with raw material *Puniform*[®] passed all the tests included in EN 1073-2 norm for the protection against nuclear contaminated particles.



Protective Garments Made with *Puntiform*[®]



Puntiform[®]

Chemical Protection

Permeation resistance EN ISO 6529 (ex. EN 369)

Chemical n° CAS		Permeation EN 369		Permeation at 480 minutes (µg/min/cm ²)	Accuracy (µg/min/cm ²)
		min	Class		
Acetic acid 30%	64-19-7	> 480	6	0,076	0,001
Ammonium hydroxide 30%	1336-21-6	> 480	6	0,018	0,001
Formic acid 30%	64-18-6	> 480	6	0,172	0,001
Glycerol	56-81-5	74	3	9,4	0,08
Hydrochloric acid 30%	7647-01-0	> 480	6	0,41	0,001
Hydrogen peroxide (30%)	7722-84-1	400	5	47,2	0,64
Isophorone Diamine	2855-13-2	>480	6	0,2	0,001
Mercuric chloride (sat'd)	7487-94-7	>480	6	0,08	0,03
Nitric acid 30%	7697-37-2	> 480	6	0,20	0,001
Phosphoric acid 50%	7664-38-2	> 480	6	< 0,001	0,001
Potassium chromate (sat'd)	7789-00-6	>480	6	0,56	0,0,15
Potassium cyanide (sat'd)	151-50-8	>480	6	<0,001	0,001
Potassium hydroxide 40%	1310-58-3	> 480	6	0,27	0,001
Sodium acetate (sat'd)	127-09-3	> 480	6	0,025	0,001
Sodium fluoride (sat'd)	7681-49-4	>480	6	<0,001	0,001
Sodium hydroxide 40%	1310-73-2	> 480	6	0,004	0,001
Sodium hypochlorite (12% chlorine)	7681-52-9	>480	6	<0,001	0,001
Sulphuric acid 16%	7664-93-9	> 480	6	0,05	0,001
Sulphuric acid 30%	7664-93-9	> 480	6	0,08	0,001
Sulphuric acid 50%	7664-93-9	> 480	6	0,19	0,001

Antiblastic and chemotherapeutic drugs resistance

Chemotherapeutic and antiblastic chemicals	EN ISO 6529 (ex. EN 369)
Cyclofosfamide monohydrate	60 min.
Doxorubicina HCL (Adriamicina)	45 min.
Fluorouracil	30 min.
Methotrexate	45 min.
Vincristina Sulfato	90 min.
Daumorubicina HCL	60 min.

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Liquid chemical penetration resistance (EN 368)

<i>Chemical</i>	<i>Penetration %</i>	<i>Class</i>	<i>Repellence %</i>	<i>Class</i>
Acetone	0,00	3 of 3	99,5	3 of 3
Butan-1-ol	0,00	3 of 3	97,1	3 of 3
Sodium hydroxide 10%	0,00	3 of 3	99,3	3 of 3
Sulphuric acid 30%	0,00	3 of 3	88,3	1 of 3
p-xylene	0,00	3 of 3	95,1	3 of 3
Toluene	0,00	3 of 3	96,2	3 of 3

Garments made with over taped seams or welded seams (**TOPGUARD**[®] Technology) with NBC (nuclear, biological and chemical) protection made with raw material *Puntiform*[®] in white colour (available in light blue colour)



NUCLEAR PROTECTION
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(EN 1073-1) ventilated suits



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(EN 13034 type 6)



ANTISTATIC PROPERTIES
(EN 1149)

Garments have antistatic properties following these norms:

- Surface resistance and volume resistance – EN 1149-1 Par. 5-4-2 e 5-4-3 – EN 1149-2 Rv Par. 7
- Triboelectric compatibility – EN 1149-1 Par. 4.1-4.2 App. 1-2-3 – EN 1149.3 Par. 4.2-4.2.1 – EIA IS 5 A
- Time decay of charge – EN 1149-3 Par. 3.5-3.6 –pr EN 1149-5 – EIA IS 541 A STD Fed. TM N° 101 C Method 4046/1
- Electric safety ground resistance of model of the human body – CEI 64-8/4 Par. 6.12.5
- Time decay of the charge on a model of the human body – IEC 61340-4-1 TR/2

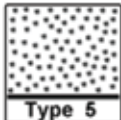
Sprayguard[®] garments have good electrical characteristics and does not generate electrostatic charges. The time taken to decline for the potential residue is neither too fast or too slow.



Protective Garments Made with *Puntiform*[®]

AVAILABLE MODELS

CATEGORY 3 TYPE 4-B (also 5 and 6) – All the garments are in conformity with the following norms:



- EN 340 Protection Garments: General requirements
- EN 14605 Liquid aerosols tight chemical protective garments (Type 4)
- EN ISO 13982 Particle tight chemical protective garments (Type 5)
- EN 13034 Liquid limited splash tight chemical protective garments (Type 6)

- OVERALL with hood
- OVERALL with hood and incorporated boots
- VENTILATED SUITS A.M. and A.R.
Certified also for breathing way protection
- SPECIAL GARMENTS on customer need



CATEGORY 3 TYPE PB[4]-B - ACCESSORIES

- GOWN with short collar with buttons o with zip
- GOWN with mao collar with buttons o with zip
- GOWN rear entry
- JACKET + TROUSER
- HOOD
- APRON
- SLEEVES
- BOOTS with pvc and antislid sole
- OTHER ACCESSORIES on customer need

CATEGORY 1 – All the garments are in conformity to Directive 89/696/CEE art. 8 paragraph 3

- OVERSHOES with pvc or antislid sole
- BUFFANT CAPS



MOST COMMON WORK AREAS

- Medical applications, biomedical research, coroners
- Terrain decontamination
- Pest control
- Lead elimination processes
- Mineral fibres (asbestos) and glass fibres
- Emergency interventions after accidents with loss of chemicals
- Pharmaceutical and petrochemical companies
- Maintenance work
- Mining
- Production, treatment and shipment of chemicals
- Industrial cleaning
- Wood powder, etc..
- Surface refinishing, etc...
- Army, scientific police, crime lab
- Waste treatment
- Water treatment
- Painting and refinishing operation
- Transformation, preparation and store of food products
- Nuclear power plant
- Veterinary services