Technical Data Sheet

DuPont™ Tyvek® 500 Accessory , *TYPOS0SWH00*

CAT III PB[6] EN 14126

Technical Data Sheet

DuPont Tyvek® 500 Shoe cover model POS0. Stitched internal seams. Elastication. White.

Certifications

- Certified according to Regulation (EU) 2016/425
- Partial body chemical protective clothing, Category III, Type PB [6-B]
- EN 14126 (barrier to infective agents)
- Antistatic treatment (EN 1149-1) - on both sides; see footnotes

Packaging(Quantity/Box)

400 per box, bulk packed.

Product Size	Article Number	Additional info
00	D13395783	One Size

Reference Number: TYPOS0SWH00

PHYSICAL PROPERTIES

Property	Test Method	Result	EN Class
Abrasion Resistance [7]	EN 530 Method 2	>100 cycles	2 of 6 [1]
Basis Weight	DIN EN ISO 536	41.5 g/m^2	N/A
Colour	N/A	White	N/A
Exposure to high Temperature	N/A	Melting point ~135 °C	N/A
Exposure to low Temperature	N/A	Flexibility retained down to -73 °C	N/A
Flex Cracking Resistance [7]	EN ISO 7854 Method B	>100000 cycles	6 of 6 [1]
Flex Cracking Resistance at -30°C	EN ISO 7854 Method B	>4000 cycles	N/A
Puncture Resistance	EN 863	>10 N	2 of 6 [1]
Resistance to Water Penetration	DIN EN 20811	>10 kPa	N/A
Surface Resistance at RH 25%, inside [7]	EN 1149-1	< 2,5 • 10^9 Ohm	N/A
Surface Resistance at RH 25%, outside [7]	EN 1149-1	< 2,5 • 10^9 Ohm	N/A
Tensile Strength (MD)	DIN EN ISO 13934-1	>30 N	1 of 6 [1]
Tensile Strength (XD)	DIN EN ISO 13934-1	>30 N	1 of 6 [1]
Thickness	DIN EN ISO 534	140 µm	N/A
Trapezoidal Tear Resistance (MD)	EN ISO 9073-4	>10 N	1 of 6 [1]
Trapezoidal Tear Resistance (XD)	EN ISO 9073-4	>10 N	1 of 6 [1]

1 According to EN 14325 **2** According to EN 14126 **3** According to EN 1073-2 **4** According to EN 14116 **12** According to EN 11612 **5** Front Tyvek ® / Back **6** Based on test according to ASTM D-572 **7** See Instructions for Use for further information, limitations and warnings **>** Larger than **<** Smaller than **N/A** Not Applicable **STD DEV** Standard Deviation

GARMENT PERFORMANCE

Property	Test Method	Result	EN Class
Seam Strength	EN ISO 13935-2	>50 N	2 of 6 [1]
Shelf Life [7]	N/A	10 years [6]	N/A

1 According to EN 14325 **3** According to EN 1073-2 **12** According to EN 11612 **13** According to EN 11611 **5** Front Tyvek ® / Back **6** Based on test according to ASTM D-572 **7** See Instructions for Use for further information, limitations and warnings **11** Based on the average of 10 suits, 3 activities, 3 probes **>** Larger than **<** Smaller than **N/A** Not Applicable ***** Based on lowest single value

COMFORT

Property	Test Method	Result	EN Class
Air Permeability (Gurley method)	ISO 5636-5	< 45 s	N/A
Air Permeability (Gurley method)	ISO 5636-5	Yes	N/A
Thermal Resistance, Rct	EN 31092/ISO 11092	$16.3*10^{-3}$ m^2 *K/W	N/A
Thermal Resistance, clo value	EN 31092/ISO 11092	0.105 clo	N/A
Water Vapour Resistance, Ret	EN 31092/ISO 11092	11.3 m^2 *Pa/W	N/A

2 According to EN 14126 **5** Front Tyvek ® / Back **>** Larger than **<** Smaller than **N/A** Not Applicable

PENETRATION AND REPELLENCY

Property	Test Method	Result	EN Class
Repellency to Liquids, Sodium Hydroxide (10%)	EN ISO 6530	>95 %	3 of 3 [1]
Repellency to Liquids, Sulphuric Acid (30%)	EN ISO 6530	>95 %	3 of 3 [1]
Resistance to Penetration by Liquids, Sodium Hydroxide (10%)	EN ISO 6530	<1 %	3 of 3 [1]
Resistance to Penetration by Liquids, Sulphuric Acid (30%)	EN ISO 6530	<1 %	3 of 3 [1]

1 According to EN 14325 **>** Larger than **<** Smaller than

BIOLOGICAL BARRIER

Property	Test Method	Result	EN Class
Resistance to Penetration by Biologically Contaminated Aerosols	ISO/DIS 22611	Pass	1 of 3 [2]
Resistance to Penetration by Blood and Body Fluids using Synthetic Blood	ISO 16603	Pass	3 of 6 [2]
Resistance to Penetration by Blood-borne Pathogens using Bacteriophage Phi-X174	ISO 16604 Procedure C	No classification	No classification [2]
Resistance to Penetration by Contaminated Liquids	EN ISO 22610	Pass	1 of 6 [2]
Resistance to Penetration by Contaminated Solid Particles	ISO 22612	Pass	1 of 3 [2]

2 According to EN 14126 **>** Larger than **<** Smaller than

CLEANILESS

Property	Test Method	Result	EN Class
Dry Linting Propensity, inside	BS 6909	128 Average particle count/17 liters of air	N/A
Dry Linting Propensity, outside	BS 6909	56 Average particle count/17 liters of air	N/A

5 Front Tyvek ® / Back **>** Larger than **<** Smaller than **N/A** Not Applicable **STD DEV** Standard Deviation

Permeation Data for Tyvek® 500 Accessory

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum Time ISO 480 150
Acetic acid (30%)	Liquid	64-19-7	imm	imm	imm		13.5	0.001	
Ammonium hydroxide (16%)	Liquid	1336-21-6	imm	imm	imm		20.3	0.005	
Ammonium hydroxide (28%)	Liquid	1336-21-6	imm	imm	imm		16.7	0.014	
Carboplatin (10 mg/ml)	Liquid	441575-94-4	>240	>240	>240	5	<0.001	0.001	
Carmustine (3.3 mg/ml, 10 % Ethanol)	Liquid	154-93-8	imm	imm	>240	5	<0.3	0.001	
Caustic ammonia (16%)	Liquid	1336-21-6	imm	imm	imm		20.3	0.005	
Caustic ammonia (28%)	Liquid	1336-21-6	imm	imm	imm		16.7	0.014	
Caustic soda (10%)	Liquid	1310-73-2	>240	>480	>480	6	<0.005	0.005	
Caustic soda (40%)	Liquid	1310-73-2	imm	>30	>240	5	<0.005	0.005	
Caustic soda (50%)	Liquid	1310-73-2	imm	>30	>480	6	0.85	0.01	
Caustic soda (>95%, solid)	Solid	1310-73-2	>480	>480	>480	6	<0.01	0.01	
Cisplatin (1 mg/ml)	Liquid	15663-27-1	>240	>240	>240	5	<0.0002	0.0002	
Cyclo phosphamide (20 mg/ml)	Liquid	50-18-0	>240	>240	>240	5	<0.002	0.002	
Dimethyl sulfate	Liquid	77-78-1	imm	imm	imm		>160	0.02	
Doxorubicin HCl (2 mg/ml)	Liquid	25136-40-9	>240	>240	>240	5	<0.003	0.003	
Ethane 1,2-diol	Liquid	107-21-1	imm	imm	imm		6.6	0.002	
Ethylene glycol	Liquid	107-21-1	imm	imm	imm		6.6	0.002	
Etoposide (Toposar®, Teva) (20 mg/ml, 33.2 % (v/v) Ethanol)	Liquid	33419-42-0	>240	>240	>240	5	<0.01	<0.01	
Fluorouracil, 5- (50 mg/ml)	Liquid	51-21-8	imm	imm	>30	2	na	0.001	
Formic acid (30%)	Liquid	64-18-6	imm	imm	imm		nm	0.001	
Ganciclovir (3 mg/ml)	Liquid	82410-32-0	>240	>240	>240	5	<0.005	0.005	
Gemcitabine (38 mg/ml)	Liquid	95058-81-4	imm	>60	>240	5	<0.4	0.005	
Glycerine	Liquid	56-81-5	>240	>480	>480	6	0.03	0.01	
Glycerol	Liquid	56-81-5	>240	>480	>480	6	0.03	0.01	
Glycol alcohol	Liquid	107-21-1	imm	imm	imm		6.6	0.002	
Hydrochloric acid (16%)	Liquid	7647-01-0	imm	imm	imm		na	0.05	
Hydrochloric acid (32%)	Liquid	7647-01-0	imm	imm	imm		na	0.05	
Hydrogen peroxide (10%)	Liquid	7722-84-1	>10	>10	>480	6	<0.01	0.01	
Hydrogen peroxide (30%)	Liquid	7722-84-1	imm	imm	imm		>0.11	0.04	
Ifosfamide (50 mg/ml)	Liquid	3778-73-2	>240	>240	>240	5	<0.009	0.009	
Irinotecan (20 mg/ml)	Liquid	100286-90-6	imm	>240	>240	5	<0.1	0.0028	
Mercuric II chloride (sat)	Liquid	7487-94-7	>480	>480	>480	6	<0.01	0.01	
Methotrexate (25 mg/ml, 0.1 N NaOH)	Liquid	59-05-2	>240	>240	>240	5	<0.001	0.001	
Mitomycin (0.5 mg/ml)	Liquid	50-07-7	>240	>240	>240	5	<0.0009	0.0009	
Nicotine (9 mg/ml)	Liquid	54-11-5	>480	>480	>480	6	<0.08	0.08	

BT Act (Actual) Breakthrough time at MDPR [mins] **BT 0.1** Normalized breakthrough time at 0.1 µg/cm²/min [mins] **BT 1.0** Normalized breakthrough time at 1.0 µg/cm²/min [mins] **EN** Classification according to EN 14325 **SSPR** Steady state permeation rate [µg/cm²/min] **MDPR** Minimum detectable permeation rate [µg/cm²/min] **CUM 480** Cumulative permeation mass after 480 mins [µg/cm²] **Time 150** Time to reach cumulative permeation mass of 150 µg/cm² [mins] **ISO** Classification according to ISO 16602 **CAS** Chemical abstracts service registry number **mins** Minutes **>** Larger than **<** Smaller than **imm** Immediate (< 4 min) **nm** Not tested **sat** Saturated solution **N/A** Not Applicable ***** Based on lowest single value **na** Not attained **8** Actual breakthrough time; normalized breakthrough time is not available

Permeation Data for Tyvek® 500 Accessory

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Nitric acid (10%)	Liquid	7697-37-2	>120	>240	>480	6	<0.005	0.005			
Nitric acid (30%)	Liquid	7697-37-2	imm	imm	imm		4.6	0.001			
Oxaliplatin (5 mg/ml)	Liquid	63121-00-6	imm	imm	imm		na	0.006			
Paclitaxel (Hospira) (6 mg/ml, 49.7 % (v/v) Ethanol)	Liquid	33069-62-4	>240	>240	>240	5	<0.01	<0.01			
Phosphoric acid (50%)	Liquid	7664-38-2	>480	>480	>480	6	<0.05	0.05			
Potassium chromate (sat)	Liquid	7789-00-6	>480	>480	>480	6	<0.005	0.005			
Potassium hydroxide (40%)	Liquid	1310-58-3	imm	imm	>30	2	0.7	0.001			
Propane -1,2,3-triol	Liquid	56-81-5	>240	>480	>480	6	0.03	0.01			
Sodium acetate (sat)	Liquid	127-09-3	>480	>480	>480	6	<0.005	0.005			
Sodium chloride (9 g/l)	Liquid	7647-14-5	>240	>240	>240	5	<0.02	0.02			
Sodium hydroxide (10%)	Liquid	1310-73-2	>240	>480	>480	6	<0.005	0.005			
Sodium hydroxide (40%)	Liquid	1310-73-2	imm	>30	>240	5	<0.005	0.005			
Sodium hydroxide (50%)	Liquid	1310-73-2	imm	>30	>480	6	0.85	0.01			
Sodium hydroxide (>95%, solid)	Solid	1310-73-2	>480	>480	>480	6	<0.01	0.01			
Sodium hypochlorite (10-15 % active chlorine)	Liquid	7681-52-9	>240	>240	>480	6	<0.6	0.05			
Sodium hypochlorite (5.25-6%)	Liquid	7681-52-9	>480	>480	>480	6	<0.025	0.025			
Sulfuric acid (18%)	Liquid	7664-93-9	>240	>240	>480	6	<0.05	0.05			
Sulfuric acid (30%)	Liquid	7664-93-9	>10	>240	>240	5	<0.05	0.05			
Sulfuric acid (50%)	Liquid	7664-93-9	imm	>30	>60	3	38	0.01			
Sulfuric acid dimethyl ester	Liquid	77-78-1	imm	imm	imm		>160	0.02			
Thiotepa (10 mg/ml)	Liquid	52-24-4	imm	imm	imm		na	0.001			
Vincristine sulfate (1 mg/ml)	Liquid	2068-78-2	>240	>240	>240	6	<0.001	0.001			
Vinorelbine (0.1 mg/ml)	Liquid	71486-22-1	>240	>240	>240	6	<0.0209	0.00209			

BT Act (Actual) Breakthrough time at MDPR [mins] **BT 0.1** Normalized breakthrough time at 0.1 µg/cm²/min [mins] **BT 1.0** Normalized breakthrough time at 1.0 µg/cm²/min [mins] **EN** Classification according to EN 14325 **SSPR** Steady state permeation rate [µg/cm²/min] **MDPR** Minimum detectable permeation rate [µg/cm²/min] **CUM 480** Cumulative permeation mass after 480 mins [µg/cm²] **Time 150** Time to reach cumulative permeation mass of 150 µg/cm² [mins] **ISO** Classification according to ISO 16602 **CAS** Chemical abstracts service registry number **mins** Minutes **>** Larger than **<** Smaller than **imm** Immediate (< 4 min) **nm** Not tested **sat** Saturated solution **N/A** Not Applicable ***** Based on lowest single value **na** Not attained **8** Actual breakthrough time; normalized breakthrough time is not available

Important Note

The permeation data published have been generated for DuPont by independent accredited testing laboratories according to the test method applicable at that time (EN369, ASTM F739, EN 374-3, EN ISO 6529 (method A and B) or ASTM D6978)
The data is typically the average of three fabrics samples tested.
All chemicals have been tested at an assay of greater than 95 (w/w) % unless otherwise stated.
The tests were performed at room temperature and environmental pressure unless otherwise stated.
A different temperature may have significant influence on the breakthrough time.
Permeation typically increases with temperature.

Cumulative permeation data have been measured or have been calculated based on steady state permeation rate.
Cytostatic drugs testing has been performed at a test temperature of 27°C according to ASTM D6978 or ISO 6529 with the additional requirement of reporting a normalized breakthrough time at 0.01 µg/cm²/min.
Chemical warfare agents (Lewisite, Sarin, Soman, Mustard, Tabun and VX Nerve Agent) have been tested according to MIL-STD-282 at 22°C or according to FINABEL 0.7 at 37°C.
Permeation data for Tyvek® is applicable to white Tyvek® 500/ Tyvek® 600 only and is not applicable for other Tyvek® styles or colours.
Permeation data are usually measured for single chemicals. The permeation characteristics of mixtures can often deviate considerably from the behaviour of the individual chemicals.

Please use the permeation data provided as a part of the risk assessment to assist with the selection of a protective fabric, garment or accessory suitable for your application. Breakthrough time is not the same as safe wear time. Breakthrough times are indicative of the barrier performance, but results can vary between the test methods and laboratories. Breakthrough time alone is insufficient to determine how long a garment may be worn once the garment has been contaminated. Safe user wear time may be longer or shorter than the breakthrough time depending on the permeation behaviour of the substance, the toxicity of the substance, working conditions and the exposure conditions (e.g. temperature, pressure, concentration, physical state).

Latest Update Permeation Data: 30/05/2018

- The garment does not protect against ionizing radiation.
- This garment is not fire resistant and should not be used around heat, open flame, sparks or in potentially flammable environments.

The permeation data published have been generated for DuPont by independent accredited testing laboratories according to the test method applicable at that time (EN ISO 6529 (method A and B), ASTM F739, ASTM F1383, ASTM D6978, EN369, EN 374-3)
The data is typically the average of three fabrics samples tested.
All chemicals have been tested at an assay of greater than 95 (w/w) % unless otherwise stated.
The tests were performed between 20 °C and 27 °C and at environmental pressure unless otherwise stated.
A different temperature may have significant influence on the breakthrough time.
Permeation typically increases with temperature.
Cumulative permeation data have been measured or have been calculated based on minimum detectable permeation rate.
Cytostatic drugs testing has been performed at a test temperature of 27°C according to ASTM D6978 or ISO 6529 with the additional requirement of reporting a normalized breakthrough time at 0.01 µg/cm²/min.
Chemical warfare agents (Lewisite, Sarin, Soman, Mustard, Tabun and VX Nerve Agent) have been tested according to MIL-STD-282 at 22°C or according to FINABEL 0.7 at 37°C.
Permeation data for Tyvek® is applicable to white Tyvek® 500 and Tyvek® 600 only and is not applicable for other Tyvek® styles or colours.
Permeation data are usually measured for single chemicals. The permeation characteristics of mixtures can often deviate considerably from the behaviour of the individual chemicals.

The permeation data for gloves published have been generated according to ASTM F739 and to ASTM F1383.
The degradation data for gloves published have been generated based on a gravimetric method.
This degradation testing exposes one side of the glove material to the test chemical for four hours. The percent weight change after exposure is measured at four time intervals: 5, 30, 60 and 240 minutes.

Degradation Ratings:
• E: EXCELLENT (0-10% Weight Change)
• G: GOOD (11-20% Weight Change)
• F: FAIR (21-30% Weight Change)
• P: POOR (31-50% Weight Change)
• NR: NOT RECOMMENDED (Above 50% Weight Change)
• NT: NOT TESTED

Degradation is the physical change in a material after chemical exposure. Typical observable effects may be swelling, wrinkling, deterioration, or delamination. Strength loss may also occur.

Please use the permeation data provided as a part of the risk assessment to assist with the selection of a protective fabric, garment, glove or accessory suitable for your application. Breakthrough time is not the same as safe wear time. Breakthrough times are indicative of the barrier performance, but results can vary between the test methods and laboratories. Breakthrough time alone is insufficient to determine how long a garment may be worn once the garment has been contaminated. Safe user wear time may be longer or shorter than the breakthrough time depending on the permeation behaviour of the substance, the toxicity of the substance, working conditions and the exposure conditions (e.g. temperature, pressure, concentration, physical state).

Latest Update Permeation Data: 15/03/2019

,The information provided herein corresponds to our knowledge on the subject at the date of its publication. This information may be subject to revision as new knowledge and experience becomes available. The data provided fall within the normal range of product properties and relate only to the specific material designated; these data may not be valid for such material used in combination with any other materials or additives or in any process, unless expressly indicated otherwise. The data provided should not be used to establish specification limits or used alone as the basis of design; they are not intended to substitute for any testing you may need to conduct to determine for yourself the suitability of a specific material for your particular purposes. Since DuPont cannot anticipate all variations in actual end-use conditions DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent rights.

For further product information, literature and as well as assistance in locating a local supplier, please visit:

www.safespec.dupont.co.uk

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The footnotes can be found on the SafeSPEC™ website.