Technical data sheet

DuPont™ Tyvek® 500 Accessory , *TYPH30SWHL0*

CAT III PB[6]



Product Description

DuPont™ Tyvek® 500 Hood model PH30L0. Wide flange and elastic around neck and face. Stitched internal seams. White.

Certifications

- Certified according to Regulation (EU) 2016/425
- Partial body chemical protective clothing, Category III, Type PB [6]

Packaging (Quantity/Box)

100 per box, bulk packed.

Size	Article Number
00	D13395804

Reference Number: TYPH30SWHL0

Physical Properties

Property	Test Method	Result	EN Class
Colour	N/A	White	N/A
Basis Weight	DIN EN ISO 536	41.5 g/m^2	N/A
Thickness	DIN EN ISO 534	140 µm	N/A
Abrasion Resistance [7]	EN 530 Method 2	>100 cycles	2 of 6 [1]
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
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]
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]
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
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

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	Yes	N/A
Air Permeability (Gurley method)	ISO 5636-5	< 45 s	N/A
Water Vapour Resistance, Ret	EN 31092/ISO 11092	11.3 m^2*Pa/W	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

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
Resistance to Penetration by Liquids, Sulphuric Acid (30%)	EN ISO 6530	<1 %	3 of 3 [1]
Resistance to Penetration by Liquids, Sodium Hydroxide (10%)	EN ISO 6530	<1 %	3 of 3 [1]
Repellency to Liquids, Sulphuric Acid (30%)	EN ISO 6530	>95 %	3 of 3 [1]
Repellency to Liquids, Sodium Hydroxide (10%)	EN ISO 6530	>95 %	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 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 Biologically Contaminated Aerosols	ISO/DIS 22611	Pass	1 of 3 [2]
Resistance to Penetration by Contaminated Solid Particles	ISO 22612	Pass	1 of 3 [2]

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

Cleanliness

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

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Acetic acid (30%)	Liquid	64-19-7	imm	imm	imm		13.5	0.001			
Ammonium aqueous (16%)	Liquid	1336-21-6	imm	imm	imm		20.3	0.005			
Ammonium aqueous (30%)	Liquid	1336-21-6	imm	imm	imm		16.7	0.014			
Ammonium hydroxide (16%)	Liquid	1336-21-6	imm	imm	imm		20.3	0.005			
Ammonium hydroxide (30%)	Liquid	1336-21-6	imm	imm	imm		16.7	0.014			
Carboplatin (10mg/ml)	Liquid	441575-94-4	>240	>240	>240	5	<0.001	0.001			
Carmustine (3.3 mg/ml, 10 % Ethanol)	Liquid	154-93-8	<10	<10	>240	5	<0.3	0.001			
Caustic ammonia (16%)	Liquid	1336-21-6	imm	imm	imm		20.3	0.005			
Caustic ammonia (30%)	Liquid	1336-21-6	imm	imm	imm		16.7	0.014			
Caustic soda (10%)	Liquid	1310-73-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Caustic soda (40%)	Liquid	1310-73-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Caustic soda (50%)	Liquid	1310-73-2	10*	220*	>480	6	0.85	0.01			
Caustic soda (>95%, solid)	Solid	1310-73-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Cisplatin (1 mg/ml)	Liquid	15663-27-1	>240	>240	>240	5	<0.0002	0.0002			
Cyclophosphamide (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	<10	<10	47*	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	<10	<60	>240	5	<0.4	0.005			
Glycerine	Liquid	56-81-5	450	>480	>480	6	0.03	0.01			
Glycerol	Liquid	56-81-5	450	>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	30*	60*	65*	3	11.1	0.005			
Hydrochloric acid (30%)	Liquid	7647-01-0	imm	imm	imm		10.1	0.01			
Hydrogen peroxide (10%)	Liquid	7722-84-1	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Hydrogen peroxide (30%)	Liquid	7722-84-1	imm*	imm*	nm		>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	<4.8	>480	6
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			
Nitric acid (10%)	Liquid	7697-37-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Nitric acid (30%)	Liquid	7697-37-2	55	60*	60*	2	4.6	0.001			
Oxaliplatin (5 mg/ml)	Liquid	63121-00-6	<10	<10	<10		<0.1	0.006			

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

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO
Phosphoric acid (50%)	Liquid	7664-38-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Potassium chromate (sat)	Liquid	7789-00-6	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Potassium hydroxide (40%)	Liquid	1310-58-3	60*	60*	>480	6	0.7	0.001			
Propane-1,2,3-triol	Liquid	56-81-5	450	>480	>480	6	0.03	0.01			
Sodium acetate (sat)	Liquid	127-09-3	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Sodium chloride (9 g/l)	Liquid	7647-14-5	>240	>240	>240	5	<0.02	0.02			
Sodium hydroxide (10%)	Liquid	1310-73-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Sodium hydroxide (40%)	Liquid	1310-73-2	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Sodium hydroxide (50%)	Liquid	1310-73-2	10*	220*	>480	6	0.85	0.01			
Sodium hydroxide (>95%, solid)	Solid	1310-73-2	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Sodium hypochlorite (13%)	Liquid	7681-52-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Sodium hypochlorite (sat)	Liquid	7681-52-9	>480	>480	>480	6	<0.01	0.01	<4.8	>480	6
Sulfuric acid (18%)	Liquid	7664-93-9	>480	>480	>480	6	<0.005	0.005	<2.4	>480	6
Sulfuric acid (30%)	Liquid	7664-93-9	>240	>240	>240	5	<0.005	0.005			
Sulfuric acid (50%)	Liquid	7664-93-9	10*	50*	75*	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	<10	<10	<10		na	0.001			
Vincristine sulfate (1 mg/ml)	Liquid	2068-78-2	>240	>240	>240	5	<0.001	0.001			

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

< test="%{productPermData16.size() > 0}">

Permeation Data for Tyvek® 500

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO

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

< test="%{productPermData17.size() > 0}">

Permeation Data for Tyvek® 500

Hazard Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum 480	Time 150	ISO

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

< test="%{productPermData1.size() > 0}">

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

- Working in Ex-Zones: Please take this into account for your risk-assessment that accessories may not necessarily be grounded via the wearer/shoes and other measures for grounding the accessories and wearer may be required. Special consideration is required for overshoes, overboots which may isolate the wearer.
- This garment and/or fabric are not flame resistant and should not be used around heat, open flame, sparks or in potentially flammable environments.

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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