DUPONT™ TYVEK® 500 XPERT BIOCIRCLE™

TECHNICAL DATA SHEET

CAT III

T5

T6

EN 1073-2

EN 1149-5

EN 14126



PRODUCT INFORMATION

DuPont™ Tyvek® 500 Xpert BioCircle™ CHF5. Robust yet lightweight protection providing an excellent barrier against fine particles and low-level sprays in a hooded coverall using white Tyvek® fabric attributed to 100% bio-circular HDPE through an ISCC-certified mass balance approach. Features stitched external seams, a respirator fit three-piece hood, an ergonomic design, elasticated wrists, ankles, face, and waist (glued-in), and a Tyvek® zipper with a pin lock slider zipper pull and a storm flap. Suitable for a variety of applications including pharmaceutical handling, chemical processing, general maintenance and operations, and automatic spray painting.

ATTRIBUTES

Full Part Number	TYCHF5SWHBC
Fabric/Materials	DuPont™ Tyvek®
Design	Hooded coverall with elastics
Seam	Stitched (external)
Color	White
Sizes	SM, MD, LG, XL, 2X, 3X
Quantity/Box	Minimized plastic packaging: 25 per box, individually packed

FEATURES

- Certified according to Regulation (EU) 2016/425.
- Chemical protective clothing, Category III, Type 5-B (EN ISO 13982-1) and 6-B (EN 13034)
- Antistatic treatment (EN 1149-5) - on both sides.
- Barrier to infective agents (EN 14126)
- Protection against radioactive contamination (EN 1073-2)
- Easily distinguishable by its chest label featuring a teal border
- Independent cradle-to-gate life cycle analysis, including biogenic carbon, shows at least 58% lower climate change impact compared to the standard Tyvek® 500 Xpert coverall
- Stitched external seams.
- Very low inward leakage thanks to optimised design.
- Suitable for use in GMP class C/D (ISO Class 6-9) clean rooms
- High liquid and particulate protection
- Exceptional design and comfort
- Good breathability thanks to air and moisture vapour permeability
- Overall ergonomic shape for perfect fit and protection when moving

SIZETABLE

PRODUCT SIZE	ARTICLE NUMBER	ADDITIONAL INFO
SM	D15582584	
MD	D15582585	
LG	D15582586	
XL	D15582587	
2X	D15582588	
3X	D15582589	

PHYSICAL PROPERTIES

DUPONT™ TYVEK® 500 XPERT BIOCIRCLE™

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PROPERTY	TEST METHOD	TYPICAL RESULT	EN
Abrasion Resistance [7]	EN 530 Method 2	>100 cycles	2/6 [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
Flex Cracking Resistance [7]	EN ISO 7854 Method B	>100000 cycles	6/6 [1]
Puncture Resistance	EN 863	>10 N	2/6 [1]
Resistance to water penetration	AATCC 127	>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	>60 N	2/6 [1]
Tensile Strength (XD)	DIN EN ISO 13934-1	>60 N	2/6 [1]
Trapezoidal Tear Resistance (MD)	EN ISO 9073-4	>10 N	1/6 [1]
Trapezoidal Tear Resistance (XD)	EN ISO 9073-4	>10 N	1/6 [1]

1 According to EN 14325 | 2 According to EN 14126 | 3 According to EN 1073-2 | 4 According to EN ISO 14116 | 12 According to EN ISO 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 | <= Smaller than or equal to | N/A Not Applicable | STD DEV Standard Deviation |

GARMENT PERFORMANCE

PROPERTY	TEST METHOD	TYPICAL RESULT	EN
Type 5: Inward Leakage of Airborne Solid Particulates	EN ISO 13982-2	Pass	N/A
Type 5: Inward Leakage [11]	EN ISO 13982-2	1 %	N/A
Type 6: Resistance to Penetration by Liquids (Low Level Spray Test)	EN ISO 17491-4, Method A	Pass	N/A
Nominal protection factor [7]	EN 1073-2	>50	2/3 [3]
Shelf Life [7]	N/A	10 years [6]	N/A
Seam Strength	EN ISO 13935-2	>75 N	3/6 [1]

1 According to EN 14325 | 3 According to EN 1073-2 | 12 According to EN ISO 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 | <= Smaller than or equal to | N/A Not Applicable | * Based on lowest single value |

COMFORT

PROPERTY	TEST METHOD	TYPICAL RESULT	EN
Air Permeability (Gurley method)	TAPPI T460	< 45 s	N/A

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

PENETRATION AND REPELLENCY

PROPERTY	TEST METHOD	TYPICAL RESULT	EN
Repellency to Liquids, Sodium Hydroxide (10%)	EN ISO 6530	>95 %	3/3 [1]
Repellency to Liquids, Sulphuric Acid (30%)	EN ISO 6530	>95 %	3/3 [1]
Resistance to Penetration by Liquids, Sodium Hydroxide (10%)	EN ISO 6530	<1 %	3/3 [1]
Resistance to Penetration by Liquids, Sulphuric Acid (30%)	EN ISO 6530	<1 %	3/3 [1]

1 According to EN 14325 | > Larger than | < Smaller than | <= Smaller than or equal to |

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BIOLOGICAL BARRIER

PROPERTY	TEST METHOD	TYPICAL RESULT	EN
Resistance to Penetration by Biologically Contaminated Aerosols	ISO/DIS 22611	1 < log ratio < 3	1/3 [2]
Resistance to Penetration by Blood and Body Fluids using Synthetic Blood	ISO 16603	3,5 kPa	3/6 [2]
Resistance to Penetration by Blood-borne Pathogens using Bacteriophage Phi-X174	ISO 16604 Procedure C	1,75 kPa	2/6 [2]
Resistance to Penetration by Contaminated Liquids	EN ISO 22610	≤ 15 min	1/6 [2]
Resistance to Penetration by Contaminated Solid Particles	ISO 22612	2 < log cfu < 3	1/3 [2]

1 According to EN 14325 | > Larger than | < Smaller than | <= Smaller than or equal to |

PERMEATION DATA DUPONT™ TYVEK® 500 XPERT BIOCIRCLE™

HAZARD / CHEMICAL 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 hydroxide (16%)	Liquid	1336-21-6	imm	imm	imm		20.3	0.005			
Ammonium hydroxide (28% - 30%)	Liquid	1336-21-6	imm	imm	imm		16.7	0.014			
Carboplatin (10 mg/ml)	Liquid	41575-94-4	>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% - 30%)	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	>240	5	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	imm	imm	>240	5	<0.5	0.003		>480	6
Irinotecan (20 mg/ml)	Liquid	100286-90-6	imm	>240	>240	5	<0.1	0.0028			

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HAZARD / CHEMICAL NAME	PHYSICAL STATE	CAS	BT ACT	BT 0.1	BT 1.0	EN	SSPR	MDPR	CUM 480	TIME 150	ISO
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			
Nitric acid (10%)	Liquid	7697-37-2	>60	>120	>480	6	na	0.05		>477	5
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	imm	>480	>480	6	<0.1	0.05		>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	>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	>240	5	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	5	<0.001	0.001			
Vinorelbine (0.1 mg/ml)	Liquid	71486-22-1	>240	>240	>240	5	<0.0209	0.00209			

BTAct (Actual) Breakthrough time at MDPR [mins] | BT0.1 Normalized breakthrough time at 0.1 µg/cm²/min [mins] |

BT1.0 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] | CUM480 Cumulative permeation mass after 480 mins [µg/cm²] |

Time150 Time to reach cumulative permeation mass of 150 µg/cm² [mins] | ISO Classification according to ISO 16602 |

CAS Chemical abstracts service registry number | min Minute | > Larger than | < Smaller than | imm Immediate (< 10 min) | nm Not tested |

sat Saturated solution | N/A Not Applicable | na Not attained | GPR grade General purpose reagent grade | * Based on lowest single value |

8 Actual breakthrough time; normalized breakthrough time is not available | DOT5 Degradation after 5 min | DOT30 Degradation after 30 min |

DOT60 Degradation after 60 min | DOT240 Degradation after 240 min | BT1383 Normalized breakthrough time at 0.1 µg/cm²/min [mins] acc. ASTM F1383 |

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 (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 orshorter 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: 10/24/2022

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..

WARNING

The garment does not protect against ionizing radiation.

This garment and/or fabric are not flame resistant and should not be used around heat, open flame, sparks or in potentially flammable environments.

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DuPont™ SafeSPEC™ - We're here to help

Our powerful web-based tool can assist you with finding the appropriate DuPont garments for chemical and controlled environment hazards.



DuPont Personal Protection SafeSPEC™

DuPont Personal Protection

DuPont Personal Protection

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