

# DuPont™ Tyvek® IsoClean® CS , Model IC 458 B WH MS



## Technical Data Sheet

DuPont Tyvek® IsoClean® boot cover model IC 458 B WH MS. Tunnelled elastication at shin. Ties. Elasticated ankle. Gripper sole. Bound internal seams. Clean-processed and gamma-sterilized. Aseptically folded. 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)



## Packaging(Quantity/Box)

100 per box, individually packed in pairs. Subgrouped by 20 in an outer bag. 2 polyethylene liners. Cardboard box.

Product Size	Article Number	Mens Shoe US	Womens Shoe US	Mens Shoe EU	Mens Shoe UK
SM	D15466072	5	6.5	37	4.5
MD	D15466083	7	8.5	39.5	6.5
LG	D15466090	14	15.5	48.5	13.5
XL	D15466105	19	21	53	18.5

Reference Number: IC0458BWHMS

## PHYSICAL PROPERTIES

Property	Test Method	Result	EN
Abrasion Resistance <sup>7</sup>	EN 530 Method 2	>10 cycles	1 of 6 <sup>1</sup>
Basis Weight	DIN EN ISO 536	45 g/m <sup>2</sup>	N/A
Colour	N/A	White	N/A
Exposure to high Temperature	N/A	Melting point ~135 °C	N/A
Flex Cracking Resistance <sup>7</sup>	EN ISO 7854 Method B	>100000 cycles	6 of 6 <sup>1</sup>
Puncture Resistance	EN 863	>5 N	1 of 6 <sup>1</sup>
Resistance to Water Penetration	DIN EN 20811	7 kPa	N/A
Surface Resistance at RH 25%, inside <sup>7</sup>	EN 1149-1	2 <sup>10</sup> Ohm	N/A
Tensile Strength (MD)	DIN EN ISO 13934-1	>30 N	1 of 6 <sup>1</sup>
Tensile Strength (XD)	DIN EN ISO 13934-1	>30 N	1 of 6 <sup>1</sup>
Thickness	DIN EN ISO 534	185 µm	N/A
Trapezoidal Tear Resistance (MD)	EN ISO 9073-4	>10 N	1 of 6 <sup>1</sup>
Trapezoidal Tear Resistance (XD)	EN ISO 9073-4	>10 N	1 of 6 <sup>1</sup>

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  
 Instructions for Use for further information, limitations and warnings    > Larger than    < Smaller than    N/A Not Applicable    STD DEV Standard Deviation    6 Based on test according to ASTM D-572    7 See

## GARMENT PERFORMANCE

Property	Test Method	Result	EN
Seam Strength	EN ISO 13935-2	>30 N	1 of 6 <sup>1</sup>

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  
 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    6 Based on test according to ASTM D-572    7 See Instructions for Use for

## COMFORT

Property	Test Method	Result	EN
Air Permeability (Gurley method)	ISO 5636-5	Yes	N/A
Air Permeability (Gurley method)	ISO 5636-5	4 s	N/A
Thermal Resistance, Rct	EN 31092/ISO 11092	$10 \cdot 10^{-3} \text{ m}^2 \cdot \text{K/W}$	N/A
Thermal Resistance, clo value	EN 31092/ISO 11092	0.065 clo	N/A
Water Vapour Resistance, Ret	EN 31092/ISO 11092	$6.8 \text{ m}^2 \cdot \text{Pa/W}$	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
Repellency to Liquids, Sodium Hydroxide (10%)	EN ISO 6530	>90 %	2 of 3 <sup>1</sup>
Repellency to Liquids, Sulphuric Acid (30%)	EN ISO 6530	>95 %	3 of 3 <sup>1</sup>
Resistance to Penetration by Liquids, Sodium Hydroxide (10%)	EN ISO 6530	<5 %	2 of 3 <sup>1</sup>
Resistance to Penetration by Liquids, Sulphuric Acid (30%)	EN ISO 6530	<1 %	3 of 3 <sup>1</sup>

1 According to EN 14325 > Larger than < Smaller than

## BIOLOGICAL BARRIER

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

2 According to EN 14126 > Larger than < Smaller than

## CLEANILESS

Property	Test Method	Result	EN
Bacterial Filtration Efficiency (3 µm)	ASTM F2101	$98.4 \% \pm 0.9 \% \text{ STD DEV}$	N/A
Particle Shedding (Helmke Drum)	IEST-RP-CC003.4.	Category I	N/A

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

Permeation Data for Tyvek® IsoClean® CS

Hazard / Chemical Name	Physical State	CAS	BT Act	BT 0.1	BT 1.0	EN	SSPR	MDPR	Cum Time ISO 480 150
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	
Cisplatin (1 mg/ml)	Liquid	15663-27-1	>240	>240	>240	5	<0.001	0.001	
Cyclo phosphamide (20 mg/ml)	Liquid	50-18-0	>240	>240	>240	5	<0.008	0.008	
Doxorubicin HCl (2 mg/ml)	Liquid	25136-40-9	>240	>240	>240	5	<0.001	0.001	
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	imm		na	0.001	
Gemcitabine (38 mg/ml)	Liquid	95058-81-4	imm	>60	>240	5	<0.4	0.005	
Ifosfamide (50 mg/ml)	Liquid	3778-73-2	>240	>240	>240	5	<0.009	0.009	
Oxaliplatin (5 mg/ml)	Liquid	63121-00-6	imm	imm	imm		na	0.001	
Paclitaxel (Hospira) (6 mg/ml, 49.7 % (v/v) Ethanol)	Liquid	33069-62-4	>240	>240	>240	5	<0.01	<0.01	
Thiotepa (10 mg/ml)	Liquid	52-24-4	imm	imm	imm		na	0.001	

BTAct (Actual) Breakthrough time at MDPR [mins]    BT0.1 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/min [mins]    BT1.0 Normalized breakthrough time at 1.0 µg/cm<sup>2</sup>/min [mins]    EN Classification according to EN 14325  
 SSPR Steady state permeation rate [µg/cm<sup>2</sup>/min]    MDPR Minimum detectable permeation rate [µg/cm<sup>2</sup>/min]    CUM480 Cumulative permeation mass after 480 mins [µg/cm<sup>2</sup>]    Time150 Time to reach cumulative permeation mass of 150 µg/cm<sup>2</sup> [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    BT\_1383 Normalized breakthrough time at 0.1 µg/cm<sup>2</sup>/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/cm<sup>2</sup>/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

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