

# DuPont™ Tyvek® Classic Xpert , Model CHF5a



## Product Description

DuPont™ Tyvek® Classic Xpert, model CHF5a. Hooded coverall. Ergonomic-protective design. Stitched external seams. Elasticated wrists, ankles and face. Elasticated waist (glued-in). Tyvek® zipper and flap. Eco Pack available. White.

## Certifications

- Chemical protective clothing, Category III, Type 5-B and 6-B
- EN 14126 (barrier to infective agents), EN 1073-2 (protection against radioactive contamination)
- Antistatic treatment (EN 1149-5) - on both sides

## Packaging

Quantity/Box: 100 per box, individually packed/100 per box, 4 units of 25 (Eco Pack)

| Size | Article Number                 | Chest Grid(cm) | Body Height(cm) | Chest Grid(in) | Body Height(ft/in) | Additional info |
|------|--------------------------------|----------------|-----------------|----------------|--------------------|-----------------|
| SM   | D14663953/D15359234 (Eco Pack) | 84-92          | 162-170         | 33-36          | 5'4"-5'7"          |                 |
| MD   | D14663967/D15359243 (Eco Pack) | 92-100         | 168-176         | 36-39          | 5'6"-5'9"          |                 |
| LG   | D14663977/D15359254 (Eco Pack) | 100-108        | 174-182         | 39-43          | 5'8"-6'0"          |                 |
| XL   | D14663986/D15359261 (Eco Pack) | 108-116        | 180-188         | 43-46          | 5'11"-5'2"         |                 |
| 2X   | D14663997/D15359276 (Eco Pack) | 116-124        | 186-194         | 46-49          | 6'1"-6'4"          |                 |
| 3X   | D14664003/D15359284 (Eco Pack) | 124-132        | 192-200         | 49-52          | 6'3"-6'7"          |                 |

Reference Number: TY CHF5 S WH XP / TY CHF5 S WH XB (Eco Pack)

| Physical Properties                                |                      |                                     |                     |
|----------------------------------------------------|----------------------|-------------------------------------|---------------------|
| Property                                           | Test Method          | Result                              | EN Class            |
| Colour                                             | N/A                  | White                               | N/A                 |
| Basis Weight                                       | DIN EN ISO 536       | 41.5 g/m <sup>2</sup>               | N/A                 |
| Thickness                                          | DIN EN ISO 534       | 140 µm                              | N/A                 |
| Abrasion Resistance <sup>7</sup>                   | EN 530 Method 2      | >100 cycles                         | 2 of 6 <sup>1</sup> |
| Flex Cracking Resistance <sup>7</sup>              | EN ISO 7854 Method B | >100000 cycles                      | 6 of 6 <sup>1</sup> |
| Flex Cracking Resistance at -30 °C                 | EN ISO 7854 Method B | >4000 cycles                        | N/A                 |
| Trapezoidal Tear Resistance (MD)                   | EN ISO 9073-4        | 27 N                                | 1 of 6 <sup>1</sup> |
| Trapezoidal Tear Resistance (XD)                   | EN ISO 9073-4        | 20 N                                | 1 of 6 <sup>1</sup> |
| Tensile Strength (XD)                              | DIN EN ISO 13934-1   | 82 N                                | 2 of 6 <sup>1</sup> |
| Tensile Strength (XD)                              | DIN EN ISO 13934-1   | 68 N                                | 2 of 6 <sup>1</sup> |
| Puncture Resistance                                | EN 863               | 12.5 N                              | 2 of 6 <sup>1</sup> |
| Resistance to Water Penetration                    | DIN EN 20811         | 12 kPa                              | N/A                 |
| Surface Resistance at RH 25%, inside <sup>7</sup>  | EN 1149-1            | 2,510 Ohm                           | N/A                 |
| Surface Resistance at RH 25%, outside <sup>7</sup> | EN 1149-1            | 2,510 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                 |
| Resistance to Ignition <sup>7</sup>                | EN 13274-4 Method 3  | Pass                                | N/A                 |

<sup>1</sup> According to EN 14325    <sup>2</sup> According to EN 14126    <sup>3</sup> According to EN 1073-2    <sup>4</sup> According to EN 14116    <sup>12</sup> According to EN 11612    <sup>5</sup> Front Tyvek ® / Back    <sup>6</sup> Based on test according to ASTM D-572    <sup>7</sup> 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            |
| Type 5: Inward Leakage of Airborne Solid Particulates               | EN ISO 13982-2           | Pass                           | N/A                 |
| Type 5: Inward Leakage <sup>11</sup>                                | 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 <sup>7</sup>                              | EN 1073-2                | Nominal protection factor: >50 | 2 of 3 <sup>3</sup> |
| Seam Strength                                                       | EN ISO 13935-2           | >75 N                          | 3 of 6 <sup>1</sup> |
| Shelf Life <sup>7</sup>                                             | N/A                      | 10 years <sup>6</sup>          | N/A                 |

<sup>1</sup> According to EN 14325    <sup>3</sup> According to EN 1073-2    <sup>12</sup> According to EN 11612    <sup>13</sup> According to EN 11611    <sup>5</sup> Front Tyvek ® / Back    <sup>6</sup> Based on test according to ASTM D-572    <sup>7</sup> See Instructions for Use for further information, limitations and warnings    <sup>11</sup> 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         | 27 s                                      | N/A      |
| Water Vapour Resistance, Ret     | EN 31092/ISO 11092 | 11.3 m <sup>2</sup> *Pa/W                 | N/A      |
| Thermal Resistance, Rct          | EN 31092/ISO 11092 | 16.3*10 <sup>-3</sup> m <sup>2</sup> *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 <sup>1</sup> |
| Resistance to Penetration by Liquids, Sodium Hydroxide (10%) | EN ISO 6530 | <1 %   | 3 of 3 <sup>1</sup> |
| Repellency to Liquids, Sulphuric Acid (30%)                  | EN ISO 6530 | >95 %  | 3 of 3 <sup>1</sup> |
| Repellency to Liquids, Sodium Hydroxide (10%)                | EN ISO 6530 | >95 %  | 3 of 3 <sup>1</sup> |

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 <sup>2</sup>            |
| Resistance to Penetration by Blood-borne Pathogens using Bacteriophage Phi-X174 | ISO 16604 Procedure D | 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 Biologically Contaminated Aerosols                 | ISO/DIS 22611         | Pass              | 1 of 3 <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

# Permeation Data

| Hazard Name                                                 | Physical State | CAS         | BT Act mins | BT 0.1 mins | BT 1.0 mins | EN | SSPR g/cm²/min | MDPR g/cm²/min | Cum 480 g/cm² | Time 150 mins | 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    **BT 0.1** Normalized breakthrough time at 0.1 µg/cm²/min    **BT 1.0** Normalized breakthrough time at 1.0 µg/cm²/min    **EN** Classification according to EN 14325    **SSPR** Steady state permeation rate    **MDPR** Minimum detectable permeation rate    **CUM 480** Cumulative permeation mass after 480 mins    **Time 150** Time to reach cumulative permeation mass of 150 µg/cm²    **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    **8** Actual breakthrough time; normalized breakthrough time is not available    **na** Not attained

Permeation Data

| Hazard Name                    | Physical State | CAS       | BT Act<br>mins | BT 0.1<br>mins | BT 1.0<br>mins | EN | SSPR<br>g/cm²/min | MDPR<br>g/cm²/min | Cum 480<br>g/cm² | Time 150<br>mins | 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    **BT 0.1** Normalized breakthrough time at 0.1 µg/cm²/min    **BT 1.0** Normalized breakthrough time at 1.0 µg/cm²/min    **EN** Classification according to EN 14325    **SSPR** Steady state permeation rate    **MDPR** Minimum detectable permeation rate    **CUM 480** Cumulative permeation mass after 480 mins    **Time 150** Time to reach cumulative permeation mass of 150 µg/cm²    **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    **8** Actual breakthrough time; normalized breakthrough time is not available    **na** Not attained

## 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® L1431N 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: 19/07/2017

- The garment does not protect against ionizing radiation.
- Although the fabric passes the resistance to ignition-test, the garment is not flame-retardant. Keep away from heat and flame. For application which requires heat and flame protection please consider garments meeting EN ISO 14116 e.g. Nomex® and/or ProShield® FR.

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.

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

[www.safespec.dupont.co.uk](http://www.safespec.dupont.co.uk)

### DuPont Personal Protection

DuPont de Nemours (Luxembourg) S.à.r.l.

L-2984 Luxembourg

Tel.: +800 3666 6666 (international toll-free)

Fax: +352 3666 5071

E-mail: [personal.protection@lux.dupont.com](mailto:personal.protection@lux.dupont.com)

The footnotes can be found on the SafeSPEC™ website.

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