MICROCHEM®
by AlphaTec™

# Chemical Permeation Guide

VWR®

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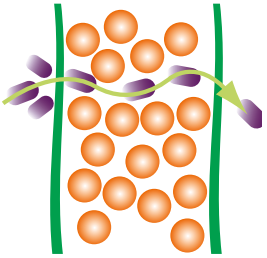
Ansell

MICROCHEM® by AlphaTec™

# Guidance on Chemical Permeation and Penetration

## What is permeation?



**Permeation is the process by which a potentially hazardous chemical moves through a material on a molecular level. Molecules of chemical adsorb onto the outer surface of the material. They then enter and diffuse across the material and are released or desorbed from the inner surface.**

**Measuring permeation**
The resistance of a protective clothing fabric to permeation by a potentially hazardous chemical is determined by measuring the breakthrough time and the permeation rate of the chemical through the fabric.

**Permeation test methods**
There are various permeation test methods in use today. Which one to use depends on a number of factors including the country of use for the protective clothing, and the type of chemical (i.e. gas or liquid).

**Permeation rate (PR)**
This is the rate at which the potentially hazardous chemical permeates through the test fabric and is expressed as a mass of chemical flowing through a given fabric area per unit of time, i.e. 1.0 µg/cm²/min or one millionth of a gram per square centimetre per minute.

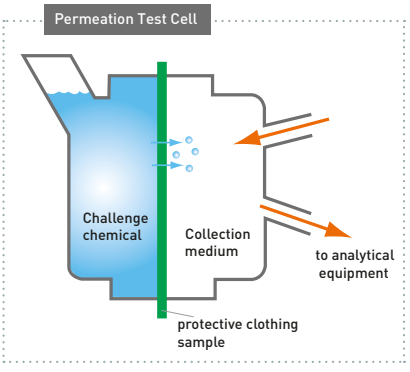
**Breakthrough detection time (BDT)**
The average time elapsed between initial contact of the chemical with the outside surface of the fabric and the detection of the chemical at the inside surface by the analytical device. A breakthrough detection time of >480 min and a permeation rate below the minimum detectable permeation rate (MDPR) does not mean breakthrough has not occurred. It means that permeation was not detected after an observation time of eight hours. Permeation may have occurred, but at a rate less than the minimum detectable permeation rate or MDPR. MDPR can vary depending on the chemical or the analytical device/test method.

| EN Class/CP Class | Normalised breakthrough times |
|---|---|
| 0 | >10 |
| 1 | >10 |
| 2 | >30 |
| 3 | >60 |
| 4 | >120 |
| 5 | >240 |
| 6 | >480 |

**Breakthrough time (BT)**
This is the average time between initial contact of the chemical with the outside surface of the fabric and the time at which the chemical is detected at the inside surface of the fabric at the normalised permeation
rate specified by the appropriate standard.

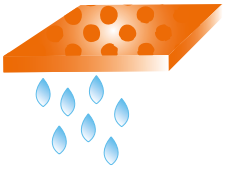
**The key test methods and the normalised permeation rates required are listed below;**

1) EN 374-3 specifies a normalised permeation rate of 1.0 µg/cm²/min, with the lowest BT to be recorded.
2) ISO 6529 specifies BT to be reported at the normalised permeation rate of 1.0 µg/cm²/min(BT 1.0) or 0.1 µg/cm²/min (BT 0.1), with the mean BT to be recorded.
3) ASTM F739 specifies results to be recorded as breakthrough time (BT) at 0.1 µg/cm²/min.




In Europe (as specified in EN 14325:2004) either EN 374-3 or EN ISO 6529:2001 can be used for permeation testing, and the normalised breakthrough time is recorded at the permeation rate of 1.0 µg/cm²/min. The resistance of MICROCHEM® garments to permeation by a hazardous chemical is determined by measuring the breakthrough time and permeation rate of the chemical through the fabric. Permeation tests are performed by independent, accredited laboratories in accordance with EN ISO 6529, EN374-3 or ASTM F739.

## What is penetration?



**Penetration is a process by which a chemical flows through holes (i.e. pores) or essential openings in a material on a non-molecular level.**

**Penetration test methods**
There are various penetration test methods in use today. Which one to use depends on a number of factors, including the country of use for the protective clothing and the task for which the chemical protective clothing will be used.

**ASTM F903**
Specified in NFPA 1992 (Liquid tight protective clothing for emergency responders), this involves the continuous exposure of a material to a liquid chemical with pressure maintained at 0 psi for 5 min followed by 2 psi [13.8 kPa] for 1 min followed by 0 psi for 54 min, totalling 1 hour.

MICROCHEM® by AlphaTec™

# Chemical Permeation Data

## Chemical Permeation Data

| | | 2300 | | 3000 | | 4000 | | 5000 | | 6000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAS Number | Chemical Name | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS |
| 75-07-0 | Acetaldehyde | | - | | - | | - | >480 | 6 | >480 | 6 |
| 64-19-7 | Acetic Acid (Glacial) | | | >480 | 6 | >480 | 6 | | | | |
| 108-24-7 | Acetic Anhydride | | | >480 | 6 | >480 | 6 | | | | |
| 67-64-1 | Acetone | Imm | 0 | 28 | 1 | >480 | 6 | >480 | 6 | >480 | 6 |
| 75-05-8 | Acetonitrile | | | <6 | 0 | >480 | 6 | >480 | 6 | >480 | 6 |
| 75-36-5 | Acetyl Chloride | | - | | - | | - | | - | >431 | 5 |
| 79-06-1 | Acrylamide | | | >480 | 6 | >480 | 6 | | | | |
| 79-10-7 | Acrylic Acid | | | >480 | 6 | >480 | 6 | | | | |
| 107-13-1 | Acrylonitrile | | | | - | >480 | 6 | | | | |
| 107-18-6 | Allyl Alcohol | | - | >480 | 6 | >480 | 6 | | - | | |
| 7664-41-7 | Ammonia (Gas, 1 atmos.) | | | 3 | 0 | >480 | 6 | >480 | 6 | >480 | 6 |
| 7664-41-7 | Ammonia (Liquid, -34 °C) | | | | | >480 | 6 | >480 | 6 | >480 | 6 |
| 1341-49-7 | Ammonium Hydrogen Fluoride | | | >480 | 6 | >480 | 6 | | | | |
| 1336-21-6 | Ammonium Hydroxide (28%) | | | | - | >480 | 6 | | | | |
| 1336-21-6 | Ammonium Hydroxide (35% w/w) | | | | - | 356 | 5 | | - | | |
| 628-63-7 | Amyl Acetate | | | | - | >480 | 6 | | | | |
| 62-53-3 | Aniline | | | >480 | 6 | >480 | 6 | >480 | 6 | | |
| 17804-35-2 | Benlate® | | | >480 | 6 | >480 | 6 | | | | |
| 71-43-2 | Benzene | | | 2 | 0 | >480 | 6 | | | >480 | 6 |
| 98-09-9 | Benzene Sulphonyl Chloride | | | >480 | 6 | | | | | | |
| 100-44-7 | Benzyl Chloride | | | 16 | 1 | >480 | 6 | | | | |
| 7726-95-6 | Bromine | | | 2 | 0 | 10 | 1 | 12 | 1 | 14 | 1 |
| 7726-95-6 | Bromine (Saturated Vapour) | | - | | - | | - | | - | 12 | 1 |
| 106-99-0 | Butadiene 1,3- | | | | - | >480 | 6 | >480 | 6 | >480 | 6 |
| 71-36-3 | Butanol, n- | | | >480 | 6 | >480 | 6 | | | | |
| 141-32-2 | Butyl Acrylate, n- | | | 16 | 1 | >480 | 6 | | | | |
| 75-15-0 | Carbon Disulphide | | | Imm | 0 | 2 | 0 | >480 | 6 | >480 | 6 |
| 7782-50-5 | Chlorine (Gas, 1 atmos.) | | | 10 | 1 | >480 | 6 | >480 | 6 | >480 | 6 |
| 7782-50-5 | Chlorine (Liquid, -32 °C) | | - | | - | | - | | - | >480 | 6 |
| 7782-50-5 | Chlorine Water (satd.) | | | 2 | 0 | >480 | 6 | | | | |
| 70258-18-3 | Chloro-5-(chloromethyl)pyridine, 2- | | | | - | >480 | 6 | | | | |
| 79-11-8 | Chloroacetic Acid (79% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 105-39-5 | Chloroacetic Acid Ethyl Ester | | | | - | >480 | 6 | | | | |
| 79-04-9 | Chloroacetyl Chloride | | | 36 | 2 | >480 | 6 | | | >480 | 6 |
| 920-37-6 | Chloroacrylonitrile, 2- | | | | - | >480 | 6 | | | | |
| 106-47-8 | Chloroaniline, 4- (75 °C) | | | | - | >480 | 6 | | | | |
| 108-90-7 | Chlorobenzene | | | | - | >480 | 6 | | | | |
| 107-07-3 | Chloroethanol, 2- | | | >480 | 6 | | | | | | |
| 67-66-3 | Chloroform | | | Imm | 0 | 11 | 1 | 101 | 3 | | |
| 74-87-3 | Chloromethane (Gas, 1 atmos.) | | | | - | >480 | 6 | >480 | 6 | >480 | 6 |
| 107-94-8 | Chloropropionic Acid, 3- (Liquid, 50 °C) | | - | >480 | 6 | >480 | 6 | | - | | |
| 7790-94-5 | Chlorosulphonic Acid | | | | - | 69 | 3 | | | | |
| 95-49-8 | Chlorotoluene, o- | | | | - | >480 | 6 | | | | |
| 106-43-4 | Chlorotoluene, p- | | | | - | >480 | 6 | | | | |
| 1333-82-0 | Chromium Trioxide (50% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 108-39-4 | Cresol, m- in water solution (20 g/L) | | | | - | >480 | 6 | | | | |
| 95-48-7 | Cresol, o- in water solution (20 g/L) | | | | - | >480 | 6 | | | | |
| 106-44-5 | Cresol, p- in water solution (20 g/L) | | | | - | >480 | 6 | | | | |
| 1319-77-3 | Cresols, mixed | >480 | 6 | >480 | 6 | | | | | | |
| 65996-89-6 | Crude Coal Tar | | | | - | >480 | 6 | | - | | |
| 98-82-8 | Cumene | | | | - | >480 | 6 | | | | |
| 506-77-4 | Cyanogen Chloride (Gas, 1 atmos.) | | - | | - | | - | | - | >480 | 6 |
| 110-82-7 | Cyclohexane | | - | | - | | - | | - | >480 | 6 |
| 108-91-8 | Cyclohexylamine | | | | - | 82 | 3 | >480 | 6 | | |
| 110-05-4 | Di-tert-butyl peroxide | | | | - | >480 | 6 | | | | |
| 328-84-7 | Dichloro-4-(trifluoromethyl)benzene, 1,2- | | | | - | >480 | 6 | | | | |
| 513-88-2 | Dichloroacetone, 1,1- | | | | - | >480 | 6 | | | | |
| 534-07-6 | Dichloroacetone, 1,3- | | | | - | >480 | 6 | | | | |
| 111-44-4 | Dichlorodiethyl Ether, 2,2'- | | | | - | >480 | 6 | | | | |
| 107-06-2 | Dichloroethane, 1,2- | | | 4 | 0 | >480 | 6 | | | >480 | 6 |
| 156-60-5 | Dichloroethylene, trans-1,2- | | | 2 | 0 | | | | | | |
| 75-09-2 | Dichloromethane (Methylene Chloride) | | | Imm | 0 | 9 | 0 | 59 | 2 | >480 | 6 |
| 75-54-7 | Dichloromethylsilane | | | | - | 20 | 1 | | | | |
| 68334-30-5 | Diesel | | | 15 | 1 | >480 | 6 | | | | |
| 111-42-2 | Diethanolamine | | | | - | >480 | 6 | | | | |
| 60-29-7 | Diethyl Ether | | | Imm | 0 | 2 | 0 | >480 | 6 | | |

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| | | 2300 | | 3000 | | 4000 | | 5000 | | 6000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAS Number | Chemical Name | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS |
| 109-89-7 | Diethylamine | | | lmm | 0 | lmm | 0 | >480 | 6 | >480 | 6 |
| 111-40-0 | Diethylenetriamine | | | | - | >480 | 6 | | | | |
| 367-25-9 | Difluoroaniline, 2,4- | | | >480 | 6 | >480 | 6 | | | | |
| 4525-33-1 | Dimethyl Dicarbonate | | | | - | >480 | 6 | | | | |
| 77-78-1 | Dimethyl Sulphate | | | >480 | 6 | >480 | 6 | | | | |
| 75-18-3 | Dimethyl Sulphide | | - | | - | 3 | 0 | >480 | 6 | >480 | 6 |
| 67-68-5 | Dimethyl Sulphoxide | | | | - | >480 | 6 | | | | |
| 127-19-5 | Dimethylacetamide, N,N- | | | | - | >480 | 6 | | | | |
| 124-40-3 | Dimethylamine (40% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 5683-33-0 | Dimethylaminopyridine, 2- | | | 57 | 2 | | | | | | |
| 75-78-5 | Dimethyldichlorosilane | | | | - | 234 | 4 | | - | | |
| 598-56-1 | Dimethylethylamine, N,N- | | | | - | | - | >480 | 6 | | |
| 68-12-2 | Dimethylformamide, N,N- | | | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 |
| 123-91-1 | Dioxane, 1,4- | | | | - | >480 | 6 | | - | | |
| 34590-94-8 | Dipropylene Glycol Methyl Ether | | | | - | >480 | 6 | | | | |
| 56-18-8 | Dipropylenetriamine | | | | - | >480 | 6 | | | | |
| 106-89-8 | Epichlorohydrin | | | >480 | 6 | >480 | 6 | | | | |
| 64-17-5 | Ethanol | | | | - | >480 | 6 | | | | |
| 141-43-5 | Ethanolamine | | | >480 | 6 | >480 | 6 | | - | | |
| 563-12-2 | Ethion | | | | - | >480 | 6 | | | | |
| 141-78-6 | Ethyl Acetate | | | 3 | 0 | >480 | 6 | >480 | 6 | >480 | 6 |
| 109-90-0 | Ethyl Isocyanate | | - | | - | | - | | - | >480 | 6 |
| 56-38-2 | Ethyl Parathion | | | | - | >480 | 6 | | | | |
| 100-41-4 | Ethylbenzene | | | | - | >480 | 6 | | | | |
| 106-93-4 | Ethylene Dibromide | | | | - | >480 | 6 | | | | |
| 107-21-1 | Ethylene Glycol | | | >480 | 6 | >480 | 6 | | | | |
| 75-21-8 | Ethylene Oxide (Gas, 1 atmos.) | | | | - | >480 | 6 | >385 | 4 | >480 | 6 |
| 75-21-8 | Ethylene Oxide (Liquid, ≤10 °C) | | - | | - | >480 | 6 | | - | | - |
| 107-15-3 | Ethylenediamine | | | | - | >480 | 6 | >480 | 6 | | |
| 149-57-5 | Ethylhexanoic Acid, 2- | | | >480 | 6 | >480 | 6 | | | | |
| 7705-08-0 | Ferric Chloride (45% w/w) | | | >480 | 6 | | - | | - | | |
| 7705-08-0 | Ferric Chloride (satd.) | >480 | 6 | | - | | - | | - | | |
| 7758-94-3 | Ferrous Chloride (satd.) | >480 | 6 | | - | | - | | - | | |
| 462-06-6 | Fluorobenzene | | | | - | 105 | 3 | | | | |
| 50-00-0 | Formaldehyde (10% w/w) | >480 | 6 | | - | | - | | - | | |
| 50-00-0 | Formaldehyde (37%) | | | >480 | 6 | >480 | 6 | | | | |
| 64-18-6 | Formic Acid (90%) | | | >480 | 6 | >480 | 6 | | | | |
| 64-18-6 | Formic Acid (98% w/w) | | - | >480 | 6 | | - | | - | | |
| 98-01-1 | Furfural | | | >480 | 6 | >480 | 6 | | | | |
| 121-75-5 | Fyfanon | | | | - | >480 | 6 | | | | |
| 1310-58-3 | Gardoclean S 5174 (Analysis of potassium hydroxide component) | | | >480 | 6 | | - | | - | | |
| 68476-33-5 | Gas Oil (SHELL "Heizoel HVS 300 CST") | | | | - | >480 | 6 | | | | |
| 142-82-5 | Heptane, n- | | | lmm | 0 | >480 | 6 | >480 | 6 | >480 | 6 |
| 87-68-3 | Hexachloro-1,3-butadiene | | | | - | >480 | 6 | | | | |
| 999-97-3 | Hexamethyldisilazane | | | | - | >480 | 6 | | | | |
| 124-09-4 | Hexamethylene Diamine, 1,6- | | | >480 | 6 | | | | | | |
| 822-06-0 | Hexamethylene Diisocyanate | >480 | 6 | >480 | 6 | | - | | - | | |
| 110-54-3 | Hexane, n- | | | lmm | 0 | >480 | 6 | >480 | 6 | >480 | 6 |
| 592-41-6 | Hexene, 1- | | | | - | >480 | 6 | | - | | |
| 7803-57-8 | Hydrazine Monohydrate (98%, containing hydrazine, 64-65% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 10035-10-6 | Hydrobromic Acid (48% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 7647-01-0 | Hydrochloric Acid (36-37% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 7664-39-3 | Hydrofluoric Acid (37% w/w) | | | | - | >480 | 6 | | | | |
| 7664-39-3 | Hydrofluoric Acid (48-51% w/w) | >480 | 6 | | - | | - | | - | | |
| 7664-39-3 | Hydrofluoric Acid (49% w/w) | | | >480 | 6 | | - | | - | | |
| 7664-39-3 | Hydrofluoric Acid (62-64% in urea) | | | 41 | 2 | | - | | | | |
| 7664-39-3 | Hydrofluoric Acid (71-75% w/w) | | | 273 | 5 | >480 | 6 | >480 | 6 | >480 | 6 |
| 16961-83-4 | Hydrofluorosilicic Acid (34.5% w/w) | | | | - | >480 | 6 | | - | | |
| 7647-01-0 | Hydrogen Chloride (Gas, 1 atmos.) | | | 8 | 0 | >480 | 6 | >480 | 6 | >480 | 6 |
| 74-90-8 | Hydrogen Cyanide | | - | <3 | 0 | >480 | 6 | | - | >480 | 6 |
| 7664-39-3 | Hydrogen Fluoride (Gas, anhydrous) | | | | - | 42 | 2 | >480 | 6 | >480 | 6 |
| 7664-39-3 | Hydrogen Fluoride (Liquid, 17 °C) | | | | - | 190 | 4 | >480 | 6 | | |
| 7722-84-1 | Hydrogen Peroxide (35% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 7722-84-1 | Hydrogen Peroxide (50% w/w) | | - | >480 | 6 | | - | | - | | |
| 7783-06-4 | Hydrogen Sulphide | | | | - | >480 | 6 | >480 | 6 | | |
| 7553-56-2 | Iodine | | | >480 | 6 | | - | | | | |

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# Chemical Permeation Data

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| | | 2300 | | 3000 | | 4000 | | 5000 | | 6000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAS Number | Chemical Name | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS |
| 67-63-0 | Isopropyl Alcohol | >480 | 6 | >480 | 6 | >480 | 6 | | | | |
| 108-31-6 | Maleic Anhydride | | | | - | >480 | 6 | | | | |
| 7439-97-6 | Mercury | >480 | 6 | >480 | 6 | >480 | 6 | | | | |
| 124-63-0 | Methanesulphonyl Chloride | | | | - | >480 | 6 | | - | | |
| 67-56-1 | Methanol | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 |
| 625-45-6 | Methoxyacetic Acid, 2- | | | >480 | 6 | | | | | | |
| 79-22-1 | Methyl Chloroformate | | | | - | >480 | 6 | | | | |
| 78-93-3 | Methyl Ethyl Ketone | | | | - | >480 | 6 | | | | |
| 74-88-4 | Methyl Iodide | | | >480 | 6 | | | | | | |
| 80-62-6 | Methyl Methacrylate | | | | - | >480 | 6 | | | | |
| 298-00-0 | Methyl Parathion | | | | - | >480 | 6 | | | | |
| 872-50-4 | Methyl-2-pyrrolidone, N- | | | >480 | 6 | >480 | 6 | | | | |
| 75-79-6 | Methyltrichlorosilane | | | | - | >480 | 6 | | - | | |
| 54-11-5 | Nicotine | | | | - | >480 | 6 | | | | |
| 7697-37-2 | Nitric Acid ( 99.5%, white fuming) | | | | - | >480 | 6 | | | | |
| 7697-37-2 | Nitric Acid (70% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 10102-43-9 | Nitric Oxide | | - | | - | >480 | 6 | >480 | 6 | | |
| 98-95-3 | Nitrobenzene | | | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 |
| 100-00-5 | Nitrochlorobenzene, p- (88 °C) | | | | - | >480 | 6 | | | | |
| 75747-77-2 | Octave® | | | >480 | 6 | | | | | | |
| 5283-66-9 | Octyltrichlorosilane | | | | - | 198 | 4 | | - | | |
| 144-62-7 | Oxalic Acid (10%) | | | >480 | 6 | | - | | - | | |
| 79-37-8 | Oxalyl Chloride | | - | | - | >480 | 6 | | - | | - |
| 64-17-5 | Oxsilan 9810 (Analysis of ethanol component) | | | >480 | 6 | | - | | - | | |
| N/A | Oxsilan Additive 9905 (Mixture) | | | >480 | 6 | | - | | - | | |
| 92062-35-6 | Paraffin | | | 25 | 1 | >480 | 6 | | | | |
| 7601-90-3 | Perchloric Acid (30% w/w) | | | >480 | 6 | | | | | | |
| 8006-61-9 | Petrol (Unleaded) | | | 2 | 0 | >480 | 6 | | | | |
| 108-95-2 | Phenol (Liquid, 45 °C) | | | 4 | 0 | >480 | 6 | | | | |
| 108-95-2 | Phenol (Liquid, 60 °C) | | - | | - | 36 | 2 | 131 | 4 | 70 | 3 |
| 108-95-2 | Phenol (liquified, approx. 90% w/w with water) | | | >480 | 6 | >480 | 6 | | | | |
| 108-95-2 (In 100 | Phenol/Benzyl Alcohol 25/5 | | | >480 | 6 | >480 | 6 | | | | |
| 98-13-5 | Phenyltrichlorosilane | | | | - | >480 | 6 | | - | | |
| 75-44-5 | Phosgene (CG) | | | | | 387 | 5 | | | | |
| 7664-38-2 | Phosphoric Acid (≥85% w/w) | | | >480 | 6 | >480 | 6 | | | | |
| 10025-87-3 | Phosphorus Oxychloride | | | 9 | 0 | >480 | 6 | >480 | 6 | | |
| 10026-13-8 | Phosphorus Pentachloride | | | >480 | 6 | >480 | 6 | | | | |
| 7719-12-2 | Phosphorus Trichloride | | | | - | >480 | 6 | >480 | 6 | | |
| 85-44-9 | Phthalic Anhydride (Liquid, 135 °C) | | | >480 | 6 | | | | | | |
| 28324-52-9 | Pinane Hydroperoxide | | - | | - | >480 | 6 | | - | | |
| 7722-86-3 | Piranha solution (sulphuric acid 96% w/w:hydrogen peroxide 30% w/w, 20:1 ratio) | | | >480 | 6 | | - | | - | | |
| 75-98-9 | Pivalic Acid | | | >480 | 6 | >480 | 6 | | | | |
| 25322-68-3 | Polyethylene Glycol 200 | | | >480 | 6 | >480 | 6 | | | | |
| 1310-58-3 | Potassium Hydroxide (30%) | | | >480 | 6 | | - | | - | | |
| 1310-58-3 | Potassium Hydroxide (80-86% w/v) | | | >480 | 6 | | - | | - | | |
| 7722-64-7 | Potassium Permanganate (satd.) | >480 | 6 | | - | | - | | - | | |
| 74-98-6 | Propane (Liquid, -32 °C) | | - | | - | | - | | - | >480 | 6 |
| 74-98-6 | Propane (Liquid, -50 °C) | | - | | - | | - | | - | >480 | 6 |
| 115-07-1 | Propene | | | | - | >480 | 6 | | - | | |
| 123-38-6 | Propionaldehyde | | | 2 | 0 | >480 | 6 | | | | |
| 79-09-4 | Propionic Acid | | | | - | >480 | 6 | | | | |
| 107-12-0 | Propionitrile | | | | - | >480 | 6 | | | | |
| 106-94-5 | Propyl Bromide, n- | | | | - | 89 | 3 | >480 | 6 | | |
| 107-10-8 | Propylamine, n- | | | | - | | - | >480 | 6 | | |
| 75-56-9 | Propylene Oxide | | | | - | 17 | 1 | 114 | 3 | | |
| 123-75-1 | Pyrrolidine | | - | | - | | - | >480 | 6 | 234 | 4 |
| 91-22-5 | Quinoline | | | | - | >480 | 6 | | - | | |
| 85-00-7 | Reglone® | | | >480 | 6 | >480 | 6 | | | | |
| 52315-07-8 | Ripcord® | | | >480 | 6 | >480 | 6 | | | | |
| 38641-94-0 | Roundup® | | | >480 | 6 | >480 | 6 | | | | |
| 10026-04-7 | Silicon Tetrachloride | | - | | - | | - | >480 | 6 | | - |
| 7681-38-1 | Sodium Bisulphate (40%) | | | >480 | 6 | | | | | | |
| 7647-14-5 | Sodium Chloride | | | >480 | 6 | >480 | 6 | | | | |
| 143-33-9 | Sodium Cyanide (satd.) | | | >480 | 6 | >480 | 6 | | | | |
| 7681-49-4 | Sodium Fluoride (satd.) | | | >480 | 6 | >480 | 6 | | | | |
| 1310-73-2 | Sodium Hydroxide (30% w/w) | | | | - | | - | >480 | 6 | | |

# MICROCHEM® by AlphaTec™ Chemical Permeation Data

## Chemical Permeation Data

| | | 2300 | | 3000 | | 4000 | | 5000 | | 6000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAS Number | Chemical Name | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS | BT 1.0 | EN CLASS |
| 1310-73-2 | Sodium Hydroxide (40% w/w) | >480 | 6 | >480 | 6 | >480 | 6 | | | >480 | 6 |
| 1310-73-2 | Sodium Hydroxide (50% w/w, 80 °C) | | | >480 | 6 | >480 | 6 | | | | |
| 1310-73-2 | Sodium Hydroxide (50% w/w) | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 |
| 7681-52-9 | Sodium Hypochlorite Solution (14.5% available chlorine) | >480 | 6 | >480 | 6 | >480 | 6 | | | | |
| 7681-52-9 | Sodium Hypochlorite Solution (5% available chlorine) | | | >480 | 6 | >480 | 6 | | | | |
| 124-41-4 | Sodium Methylate (30%) | | | >480 | 6 | | | | | | |
| 16893-85-9 | Sodium Silicofluoride (satd.) | | | >480 | 6 | >480 | 6 | | | | |
| 100-42-5 | Styrene | | | Imm | 0 | 299 | 5 | | | | |
| 7446-09-5 | Sulphur Dioxide | | | | - | >480 | 6 | | | | |
| 7446-11-9 | Sulphur Trioxide | | - | | - | 18 | 1 | | - | | |
| 7664-93-9 | Sulphuric Acid (≥98% w/w) | >480 | 6 | >480 | 6 | >480 | 6 | | | | |
| 7664-93-9 | Sulphuric Acid (50% w/w, 80 °C) | | | >480 | 6 | >480 | 6 | | | | |
| 7664-93-9 | Sulphuric Acid (50% w/w) | | | | - | >480 | 6 | | | | |
| 7664-93-9 | Sulphuric Acid (93.1% w/w) | | - | | - | | - | | - | >480 | 6 |
| 7664-93-9 | Sulphuric Acid (95-96% w/w) | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 | >480 | 6 |
| 306-83-2 | SUVA HCFC-123 (1,1-Dichloro-2,2,2-trifluoroethane) | | | 251 | 5 | 380 | 5 | | | | |
| 1634-04-4 | t-Butyl Methyl Ether | | | 1 | 0 | >480 | 6 | | | | |
| 25103-58-6 | tert-Dodecyl Mercaptan | | - | | - | >480 | 6 | | - | | |
| 127-18-4 | Tetrachloroethylene | | | | - | >480 | 6 | >480 | 6 | >480 | 6 |
| 78-00-2 | Tetraethyl Lead | | - | | - | >480 | 6 | | - | | |
| 109-99-9 | Tetrahydrofuran | | | Imm | 0 | 3 | 0 | >480 | 6 | >480 | 6 |
| 75-59-2 | Tetramethylammonium Hydroxide (20% w/w) | | - | >480 | 6 | | - | | - | | |
| 75-59-2 | Tetramethylammonium Hydroxide (satd.) | | | | - | >480 | 6 | | | | |
| 110-18-9 | Tetramethylethylenediamine, N,N,N',N'- | | | | - | | - | >480 | 6 | | |
| 7719-09-7 | Thionyl Chloride | | | Imm | 0 | 2 | 0 | 17 | 1 | 18 | 1 |
| 1758-73-2 | Thiourea Dioxide (satd.) | | | >480 | 6 | >480 | 6 | | | | |
| 7550-45-0 | Titanium Tetrachloride | | | 7 | 0 | >480 | 6 | >473 | 5 | | |
| 108-88-3 | Toluene | | | Imm | 0 | >480 | 6 | >480 | 6 | >480 | 6 |
| 584-84-9 | Toluene-2,4-diisocyanate | | | >480 | 6 | >480 | 6 | | | | |
| 95-53-4 | Toluidine, o- | | | >480 | 6 | >480 | 6 | | | | |
| 36768-62-4 | Triacetonediamine | | | | - | >480 | 6 | | | | |
| 76-03-9 | Trichloroacetic Acid | | | >480 | 6 | >480 | 6 | | | | |
| 79-01-6 | Trichloroethylene | | | 2 | 0 | 7 | 0 | >480 | 6 | | |
| 121-44-8 | Triethylamine | | | Imm | 0 | 5 | 0 | >480 | 6 | | |
| 76-05-1 | Trifluoroacetic Acid | | | >480 | 6 | | | | | | |
| 1493-13-6 | Trifluoromethanesulphonic Acid | | - | | - | >480 | 6 | >480 | 6 | | |
| 108-05-4 | Vinyl Acetate | | | | | >480 | 6 | | | | |
| 2177-18-6 | Vinyl Acrylate | | | 3 | 0 | >480 | 6 | | | | |
| 1592-20-7 | Vinylbenzyl Chloride 4- | | | | - | >480 | 6 | | | | |
| 100-43-6 | Vinylpyridine, 4- | | - | | - | | - | >480 | 6 | >480 | 6 |
| 108-38-3 | Xylene, m- | | | 2 | 0 | >480 | 6 | | | | |
| 106-42-3 | Xylene, p- | | | Imm | 0 | | - | | - | | |
| 1477-55-0 | Xylylenediamine, m- | | | | - | >480 | 6 | | | | |
| 7699-45-8 | Zinc Bromide (satd.) | | | >480 | 6 | | | | | | |