Chemical Permeation Test Results

TO FIND PERMEATION TEST RESULTS

1. Locate the desired chemical in the Chemical Index.

The Chemical Index is presented in 2 ways:

- Alphabetical Index
- Index by Chemical Abstract System (CAS) Number

For each chemical, the following information is listed.

- Chemical name
- Chemical subclass number(s)
- CAS number
- Chemical name used in data table if name listed is a synonym
- Whether the chemical has been tested (T) or not tested (NT) on Tychem® Limited-Use and/or Tychem® Reusable Fabrics

2. Locate the subclass(es) of the chemical in the permeation data table(s). There are 2 separate data tables, 1 for limited use fabrics, and 1 for reusable fabrics.

3. If the chemical has been tested, find the chemical name under its sub-class(es) and read across to find the permeation test results for the chemical.

Example: If an application has contact with chlorine and depending on exposure time, the minimum garment coverage could be a Tychem® SL.

Note: For a complete chemical permeation guide for DuPont™ garments, see www.personalprotection.dupont.com.


Tychem® QC


Tychem® SL


Tychem® F


Tychem® ThermoPro


Tychem® CPF 3


Tychem® BR


Tychem® CPF 4


Tychem® Responder®


Tychem® TK

ASTM	CAS	Physical	BREAKTHROUGH TIME IN MINUTES Mid Level Suits Tychem® QC	Tychem® SL	Tychem® F	Tychem® ThermoPro	Tychem® CPF 3	High Level Suits Tychem® BR	Tychem® CPF 4	Tychem® Responder®	Tychem® TK
Industrial Chemicals											
Acetone	67-64-1	Liquid	Imm	12	>480	>480	>480	>480	>480	>480	>480
Acetonitrile	75-05-8	Liquid	Imm	12	157	>480	Imm	>480	>480	>480	>480
Ammonia	7664-41-7	Gas	Imm	32	79	>480	12	46	>480	>480	>480
1, 3-Butadiene	106-99-0	Gas	Imm	>480	>480	>480	>480	>480	>480	>480	>480
Carbon Disulfide	75-15-0	Liquid	Imm	Imm	>480	>480	16	>480	>480	>480	>480
Chlorine	7782-50-5	Gas	Imm	>480	>480**	>480	>480	>480	>480	>480	>480
Dichloromethane	75-09-2	Liquid	Imm	Imm	Imm	Imm	Imm	432	114	>480	>480
Diethylamine	109-89-7	Liquid	Imm	12	>480	>480	>480	>480	>480	>480	>480
N, N-Dimethylformamide	68-12-2	Liquid	Imm	78	>480	>480	>480	>480	>480	>480	>480
Ethyl Acetate	141-78-6	Liquid	Imm	14	>480	>480	>480	>480	>480	>480	>480
Ethylene Oxide	75-21-8	Gas	Imm	Imm	65	>480	>480	>480	305	>480	>480
n-Hexane	110-54-3	Liquid	Imm	10	>480	>480	>480	>480	>480	>480	>480
Hydrogen Chloride	7647-01-0	Gas	Imm	>480	>480	>480	>480	>480	>480	>480	>480
Methanol	67-56-1	Liquid	Imm	>480	77	>480	Imm	157	>480	>480	>480
Methyl Chloride	74-87-3	Gas	Imm	>480	>480	>480	>480	>480	>480	>480	>480
Nitrobenzene	98-95-3	Liquid	Imm	102	>480	>480	>480	>480	>480	>480	>480
Sodium Hydroxide, 50%	1310-73-2	Liquid	>480	>480	>480	>480	>480	>480	>480	>480	>480
Sulfuric Acid, 98%	7664-93-9	Liquid	>480	>480	>480	>480	>480	>480	>480	>480	>480
1, 1, 2, 2-Tetrachloroethylene	127-18-4	Liquid	Imm	Imm	>480	>480	>480	>480	>480	>480	>480
Tetrahydrofuran	109-99-9	Liquid	Imm	Imm	464	>480	>480	>480	>480	>480	>480
Toluene	108-88-3	Liquid	Imm	Imm	>480	>480	>480	>480	>480	>480	>480
WMD Chemicals**											
Lewisite (L)	—	—	NT	>360*	360†	360	120*	>720*	>360*	>720*	>720†
Mustard (HD)	—	—	NT	180*	>720†	>720	120*	>720†	180*	>720†	>720†
Tabun (GA)	—	—	NT	NT	>720#	>720#	NT	>720‡	NT	>720‡	>720#
Sarin (GB)	—	—	NT	360‡	>720#	>720#	120‡	>720#	360‡	>720#	>720#
Soman (GD)	—	—	NT	NT	>720#	>720#	>480‡	>720‡	NT	>720‡	>720#
VX Nerve Agent	—	—	NT	>720‡	>720#	>720#	>480‡	>720#	>720‡	>720#	>720#

Index of Codes:

> = Greater Than, Imm = Immediate (<10 Minutes), NT = Not Tested

Chemical warfare agents are tested according to the following protocols:

(*) Protocol DN3-MIL-STD-282, Method T-209 (HD) or modified for Lewisite, for 12 hours at 10 g/m^2

(†) Protocol DN4-MIL-STD-282, Method T-209 (HD) or modified for Lewisite, for 12 hours at 100 g/m^2 (total coverage)

(‡) Protocol DN5-MIL-STD-282, Method T-208 (GB) or modified for GA,GD and VX, for 12 hours at 10 g/m^2

(#) Protocol DN6-MIL-STD-282, Method T-208 (GB) or modified for GA, GD and VX, for 12 hours at 100 g/m^2 (total coverage)

All tests are performed at 22°C and 50% R.H. Actual breakthrough times, in minutes, are reported.

Normalized Breakthrough Time (NBT) shown in minutes. (**) Actual Breakthrough time in minutes; standardized breakthrough time not available.

NOTE: Numbers reported are averages of samples tested. Sample results vary. All DuPont™ testing is performed by a third party.

Permeation testing on industrial chemicals is in accordance with ASTM F739, "Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Continuous Contact." All tests are conducted at a room temperature unless otherwise noted. Reported results are normalized breakthrough times defined by ASTM F739 as the time (in minutes) when the permeation rate reaches 0.1 ug/cm^2/min.

For a complete chemical permeation guide for DuPont™ garments see www. personalprotection.dupont.com