

## Appendix A – Chemical Resistance Guide

Reference: Forsberg and Keith (1997), *Chemical Protective Clothing Performance Index Book*. John Wiley and Sons. This information has been provided by Best Manufacturing Company and is applicable only to Best gloves.

### ASTM Breakthrough Times and CPC Rating Page I ASTM F739-91 Normalized Breakthrough in Minutes and CPC Rating for Best Gloves

Breakthrough detection times (BDT) are given in minutes. CPC Index ratings are based on the system of Forsberg that relies on both breakthrough times and permeation rates to establish a rating system for chemical protective clothing. The ratings range from 0 to 5 with 0 being the best and 5 the best:

#### Chemical Protective Clothing Performance Index Rating Summary (CPC)

0	Best safest selection for unlimited exposure (no breakthrough)
1	Next best selection for unlimited exposure.
2	Sometimes satisfactory (good for limited exposure).
3	Poor choice (not for heavy exposure).
4	Very poor (for splashes only).
5	Not recommended

#### Chemicals by Class

<b>Neoprene</b>		<b>Nitrile</b>		<b>Rubber</b>		<b>PVC</b>		<b>Butyl</b>		<b>Viton</b>	
BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC
<b><i>Aliphatic Solvents</i></b>											
Cyclohexane											
21	2	9	0	55	5	13	3	ND	4	NR	0
Gasoline(Unleaded)											
46	3	46	0	NR	5	22	3	NR	5	ND	0
Heptane											
ND	0	ND	0	24	3	39	4	23	4	ND	0
Hexane											
173	2	234	0	21	4	29	3	13	5	ND	0
Isooctane											
ND	0	ND	0	57	3	114	3	56	4	ND	0
Kerosene											
ND	0	ND	0	NR	5	ND	0	94	4	ND	0
Petroleum Ethers											
99	2	ND	0	5	5	19	4	15	4	ND	0
<b><i>Acids, Organic</i></b>											
Acetic 84%											
ND	0	240	5	ND	0	300	2	ND	0	ND	0
Formic 90%											
ND	0	75	0	ND	0	ND	0	ND	0	120	0
<b><i>Acids, Mineral</i></b>											
Battery 47%											
ND	0	ND	0	ND	0	ND	0	ND	0	ND	0
Hydrochloric 37%											
ND	0	ND	0	ND	0	ND	0	ND	0	ND	0
Hydrofluoric 48%											
ND	0	60	3	45	3	110	2	ND	0	185	1
Muriatic 10%											
ND	0	ND	0	ND	0	ND	4	ND	0	ND	0
Nitric 70%											
ND	0	NR	5	ND	0	240	5	ND	0	ND	0
Sulfuric 97%											
ND	0	180	3	ND	0	210	5	ND	0	ND	0

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 ASTM F739-91 Normalized Breakthrough in Minutes and CPC Rating for Best Gloves

Chemicals by Class

<b>Neoprene</b>		<b>Nitrile</b>		<b>Rubber</b>		<b>PVC</b>		<b>Butyl</b>		<b>Viton</b>	
BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC
<b>Alcohols</b>											
Amyl											
ND	0	ND	0	ND	0	116	2	ND	0	ND	0
Butyl											
ND	0	ND	0	ND	0	155	2	ND	0	ND	0
Cresols											
ND	0	NR	5	371	2	ND	0	ND	0	ND	0
Ethyl											
ND	0	225	4	ND	0	66	2	ND	0	ND	0
Methyl											
226	1	28	3	82	2	39	4	ND	0	ND	0
Isobutyl											
ND	0	ND	0	ND	0	ND	2	ND	0	ND	0
<b>Aldehydes</b>											
Acetaldehyde											
21	3	NR	5	55	3	13	5	ND	0	NR	5
Benzaldehyde											
93	3	NR	5	81	3	NR	5	ND	0	ND	0
Formaldehyde											
ND	0	ND	0	ND	0	ND	0	ND	0	ND	0
Furfural											
165	2	NR	5	ND	0	85	3	ND	0	298	3
<b>Alkalis</b>											
Ammonium Hydroxide											
ND	0	240	3	120	3	60	4	ND	0	ND	0
Potassium Hydroxide											
ND	0	ND	0	ND	0	ND	0	ND	0	ND	0
Sodium Hydroxide											
ND	0	ND	0	ND	0	ND	0	ND	0	ND	0
<b>Amides</b>											
Dimethylacetamide											
84	3	NR	5	29	4	51	4	ND	0	NR	5
Dimethylformamide											
100	3	NR	5	ND	0	NR	5	ND	0	NR	5
N-MethylPyrrolidone											
ND	0	34	3	ND	0	140	4	ND	0	NR	5
<b>Amines</b>											
Aniline											
32	3	NR	5	1	4	71	3	ND	0	ND	0
Butylamine											
NR	5	NR	5	45	3	15	3	45	3	NR	5
Diethylamine											
23	5	60	5	60	5	107	4	30	3	9	5
<b>Aromatic Solvents</b>											
Benzene											
15	5	16	4	NR	5	13	5	34	4	ND	0
Toluene											
25	4	26	4	NR	5	19	4	22	4	ND	0
Xylene											
37	4	41	4	NR	5	23	3	NR	5	ND	0

ASTM Breakthrough Times and CPC Rating Page III  
ASTM F739-91 Normalized Breakthrough in Minutes and CPC Rating for Best Gloves

Chemicals by Class											
Neoprene		Nitrile		Rubber		PVC		Butyl		Viton	
BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC	BDT	CPC
<b>Chlorinated Solvents</b>											
Carbon Tetrachloride											
73	4	ND	0	NR	5	46	4	53	4	ND	0
Chloroform											
23	4	6	5	NR	5	10	5	21	4	ND	0
Methylene Chloride											
NR	5	4	5	NR	5	NR	5	20	4	113	3
Perchloroethylene											
40	4	ND	0	NR	5	NR	5	28	4	ND	0
Trichloroethylene											
12	5	9	5	NR	5	NR	5	13	5	ND	0
1,1,1-Trichloroethane											
51	4	49	4	NR	5	52	3	72	4	ND	0
<b>Esters</b>											
Amyl Acetate											
110	3	77	4	NR	5	NR	5	158	3	NR	5
Ethyl Acetate											
24	4	30	4	72	4	5	5	212	2	NR	5
Methyl Methacrylate											
27	3	NR	5	77	3	NR	5	63	3	NR	5
<b>Ethers</b>											
Cellosolve Acetate											
228	3	47	4	107	3	64	4	ND	0	NR	5
Ethyl Ether											
12	5	33	4	11	5	14	5	19	5	29	5
Tetrahydrofuran											
13	5	5	5	NR	5	NR	5	24	4	NR	5
<b>Gases</b>											
Ammonia, Anhydrous											
29	2	336	1	4	4	19	3	ND	0	ND	0
1,3-Butadiene											
33	3	ND	0	25	3	24	3	473	2	ND	0
Chlorine											
ND	0	ND	0	ND	0	360	2	ND	0	ND	0
Ethylene Oxide											
21	4	17	5	1	5	1	5	189	2	48	4
Hydrogen Fluoride											
210	2	1	5	142	1	1	5	ND	0	6	3
Methyl Chloride											
84	1	ND	0	52	2	ND	0	ND	0	ND	0
Vinyl Chloride											
7	4	ND	0	2	4	19	3	268	1	ND	0
<b>Ketones</b>											
Acetone											
35	3	3	5	9	5	7	5	ND	0	NR	5
Methyl Ethyl Ketone											
30	3	NR	5	12	5	NR	5	202	2	NR	5
MIBK											
41	3	5	5	38	4	NR	5	292	2	NR	5
<b>Nitriles</b>											
Acetonitrile											
65	3	6	5	16	3	24	4	ND	0	NR	5
Acrylonitrile											
27	3	NR	5	48	3	14	5	ND	0	55	4