Chemical Handling Guide.

Ansell chemsafe™
www.ansellchemsafe.com

There is no ‘one glove fits all’ chemical handling solution.

Knowing which glove for which chemical is a real ‘acid test’. Fail the acid test and you put yourself and your employees at risk of costly and serious injury – even death.

Did you know that our PVA (Polyvinyl Alcohol) coated glove will protect you from some of the most dangerous chemicals on the market? In fact, the glove can remain submersed in Ethylene Dichloride, a suspected carcinogen, for at least six hours before signs of permeation breakthrough. It can also withstand Methyl Ethyl Ketone (MEK), Methylene Chloride, Toluene and Xylene and a range of other notoriously dangerous chemicals where many other gloves fail.

Yet, this same PVA glove will dissolve in water.

Such is the unpredictable, complex and dangerous nature of chemicals.

Even the best-made, most sophisticated glove offers little protection if it’s the wrong glove.

Ansell Chemsafe™ is an initiative designed to help ensure you and your workers are adequately protected. It contains critical chemical handling advice, support, information and SpecWare™ – the ultimate tool for selecting the right glove for the right chemical.

For more information visit www.ansellchemsafe.com

Select the right glove, not just the best glove.

There is no ideal universal glove that will protect you from each and every possible risk. Each chemical and each application needs to be analysed to ensure critical, unique requirements are met.

The selection process for chemical resistant gloves should follow a simple step-by-step process, to ensure you select the right glove not just the best glove.

Step 1 – Glove compound.

Use the SpecWare™ guide to research which glove compound is required.

The first and most important step is to determine what material composition or compound is required to handle the specific chemical. Our SpecWare™ glove guide contains information on the suitability of various glove compounds, such as nitrile, PVC, neoprene, etc, for over 160 pure chemicals. (For chemical mixes, seek further advice from Ansell).

Step 2 – Glove construction.

Evaluate the physical application characteristics to determine the most suitable glove construction.

You have the option of 3 basic glove types – **disposable**, for very basic protection with frequent changing, a longer lasting **unsupported** glove where flexibility and dexterity are important or a **supported** glove, which contains a cotton liner for more heavy-duty use. Your choice should depend on how much durability is required, whether the glove needs abrasion or cut resistance, the degree of contact with the chemical, etc. The Product section of this brochure contains more details and useful information on glove performance that will assist you with this selection.

Step 3 – Glove options.

Select the specific option or features that various gloves offer.

Having determined which glove compound and glove construction, all you need to do is decide which features or options you required – such as grip style, length, thickness, glove lining, color, etc. As you will see in the Product Specification section, there are many to choose from.

Following these 3 basic steps and using the technical data provided by Ansell will take the guesswork out of knowing which is the **right** glove for your job.

Step 1 – Which Glove Compound?

SpecWare Technical Support online

There’s no point in selecting the best glove if it’s not the right glove.

Our SpecWare™ chemical handling guide will recommend a glove that will safely handle specific chemicals by providing permeation and degradation resistance information.

Permeation/Degradation Resistance Guide for Ansell Chemical Resistant Gloves.

Ansell’s ASTM standard permeation and degradation tests are presented on the following pages as an aid in determining the general suitability of various products for use with specific chemicals. Because the conditions of ultimate use are beyond our control, and because we cannot run permeation tests in all possible work environments and across all combinations of chemicals and solutions, these recommendations are advisory only.

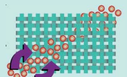
Definition of key terms.

Permeation is a process by which a chemical can pass through a protective film without going through pinholes, pores or other visible openings. Individual molecules of the chemical enter the film, and “squirm” through by passing between the molecules of the glove compound or film. In many cases the permeated material may appear unchanged to the human eye. Chemical permeation can be described in simple terms by comparing it to what happens to the air in a balloon after several hours. Although there are no holes or defects, and the balloon is tightly sealed, the air gradually passes through (permeates) its walls and escapes. This simple example uses gas permeation, but the principle is the same with liquids or chemicals. Permeation data are presented in two values:

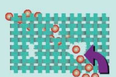
Breakthrough time and **Rate**. Breakthrough times (min.) are the times observed from the start of the test to first detection of the chemical on the other side of the sample (for test methodology, see the outside back cover of this guide). These times represent how long a glove can be expected to provide effective permeation resistance when totally immersed in the test chemical. Permeation rates are the highest flow rates recorded for the permeating chemicals through the glove samples during a six-hour test. These qualitative ratings are comparisons of permeation rates to each other.

Degradation is a reduction in one or more physical properties of a glove material due to contact with a chemical. Certain glove materials become hard, stiff, or brittle, or they grow softer, weaker, and swell to several times their original size. If a chemical has a significant impact on the physical properties of a glove material, its permeation resistance is quickly impaired. For this reason, glove/chemical combinations rated “Poor” or “Not Recommended” in degradation testing were not tested for permeation resistance. Please note, however, that permeation and degradation do not always correlate.

The overall Degradation **Rating** for each chemical is explained in “How To Read The Charts.”



Permeation is a process by which a chemical can pass through a protective film.



Degradation is a reduction in one or more physical properties of a glove material.

THE SUITABILITY OF THE PRODUCT FOR A SPECIFIC JOB MUST BE DETERMINED BY TESTING BY THE PURCHASER.

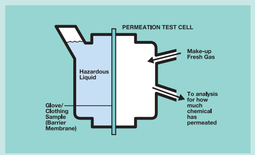
Methodology.

Permeation testing.

Ansell conducts permeation testing in accordance with ASTM Method F 739 standards. A specimen is cut from the glove and clamped into a test cell as a barrier membrane (see illustration below). The “exterior” side of the specimen is exposed to a hazardous chemical. At timed intervals, the unexposed “interior” side of the test cell is checked for the presence of the permeated chemical and the extent to which it may have permeated the glove material. This standard allows a variety of options in analytical technique and collection media. At Ansell, dry nitrogen is the most common medium and gas chromatography with FID detection is the most common analytical technique. Our Research Department also uses liquids such as distilled water and hexane as collecting media, and techniques such as conductivity, colourimetry, and liquid chromatography for analysis of the collecting liquid.

Degradation testing.

Films of the test material are made. These films are weighed and measured, and then completely immersed in the test chemical for 30 minutes. The percentage of change in size is determined, and the films are then dried to calculate the percentage of weight change. Observed physical changes are also reported. Ratings are based on the combined data.



Permeation/Degradation Resistance Guide for Ansell Gloves.

How to read the charts.

Three categories of data are represented for each Ansell product and corresponding chemical:
1) overall degradation resistance rating;
2) permeation breakthrough time, and
3) permeation rate.

Standards for Colour-Coding

A glove-chemical combination receives **GREEN** if either set of the following conditions is met:

- The degradation rating is Excellent or Good
- The permeation breakthrough time is 30 minutes or longer
- The permeation rate is Excellent, Very Good, or Good.

OR

- The permeation rate is not specified
- The permeation breakthrough time is 240 minutes or longer
- The degradation rating is Excellent, Very Good, or Good

A glove-chemical combination receives **RED** if: the degradation rating is Poor or Not Recommended, regardless of the permeation rating.

All other glove-chemical combinations receive **ORANGE**. That means, any glove-chemical combination not meeting either set of conditions required for Green, and not having a Red degradation rating of either Poor or Not Recommended, receives an **ORANGE** rating.

SpecWare
Technical Support online

Key to Permeation Rate

	Simply Stated Drops Per Hour Through A Glove (Eyedropper size drop)
E – Excellent; permeation rate of less than 0.9 µg/cm²/min.	0 to 1/2 drop
VG – Very Good; permeation rate of less than 9 µg/cm²/min.	1 to 5 drops
G – Good; permeation rate of less than 90 µg/cm²/min.	6 to 50 drops
F – Fair; permeation rate of less than 900 µg/cm²/min.	51 to 500 drops
P – Poor; permeation rate of less than 9000 µg/cm²/min.	501 to 5000 drops
NR – Not Recommended; permeation rate greater than 9000 µg/cm²/min.	5001 drops up

Note: The current revision to the ASTM standard permeation test calls for permeation to be reported in micrograms of chemical permeated per square centimetre of material exposed per minute of exposure, "µg/cm²/min."

Key to Permeation Breakthrough

>Greater than (time) <Less than (time)

Key to Permeation Degradation Ratings

E – Excellent; fluid has very little degrading effect.
G – Good; fluid has minor degrading effect.
F – Fair; fluid has moderate degrading effect.
P – Poor; fluid has pronounced degrading effect.
NR – Fluid is not recommended with this material.

NOTE: Any test samples rated P (poor) or NR (not recommended) in degradation testing were not tested for permeation resistance. A dash (–) appears in those cases.

Specific Gloves Used for Testing

	Degradation	Permeation
Nitrile	Sol-Vex® 37-145 (11 mil/0.28 mm)	Sol-Vex® 37-165 (22 mil/0.54 mm)
Neoprene Unsupported	29-865 (15 mil/0.38 mm)	29-865 (15 mil/0.38 mm)
Polyvinyl Alcohol Supported	PVA™	PVA™
Polyvinyl Chloride Supported	Snorkel®	Monkey Grip™
Natural Rubber Latex	Canners 392 (19 mil/0.48 mm)	Canners 392 (19 mil/0.48 mm)
Neoprene/Latex Blend	Chemi-Pro™ 224 (27 mil/0.67 mm)	Chemi-Pro™ 224 (27 mil/0.67 mm)
Laminated LCP™ Film	Barrier™ 2-100 (2.5 mil/0.06 mm)	Barrier™ 2-100 (2.5 mil/0.06 mm)

Single palm thickness is listed in both mil and metric millimetre (mm) for Unsupported Gloves. Supported Gloves are specified by glove weight, not thickness.

Why is a product with a shorter breakthrough time sometimes given a better rating than one with a longer breakthrough time?

One glove has a breakthrough time of just 4 minutes. It is rated "very good," while another with a breakthrough time of 30 minutes is rated only "fair." Why? The reason is simple: in some cases the *rate* is more significant than the *time.*
Imagine connecting two hoses of the same length but different diameters to a faucet using a "Y" connector. When you turn on the water, what happens? Water goes through the smaller hose first because there is less space inside that needs to be filled. But when the water finally gets through the larger hose it really gushes out. In only a few minutes, the larger hose will discharge much more water than the smaller one, even though the smaller one started first.
The situation is similar with gloves. A combination of a short breakthrough time and a low permeation rate may expose a glove wearer to less chemical than a combination of a longer breakthrough time and a much higher breakthrough rate, if the glove is worn long enough.

DD Ratings:

DD is a new degradation rating that sometimes applies to Viton/Butyl gloves versus certain chemicals. It means "Degrades and Delaminates". If a chemical causes severe swelling of Viton but has little effect on Butyl, the adhesion between these two rubber layers can be overcome under the relatively severe continuous-liquid contact. The end result of this stress is Viton 'blisters' or even complete layer separation. This damage is permanent. Any chemical with a DD rating against Viton/Butyl gloves receives an automatic 'Not Recommended' red colour code.

SpecWare Technical Support online

This information applies only to Ansell glove brands.

No.	CHEMICAL	LAMINATED FILM BARRIER™ Degradation Rating	BARRIER™ Permeation: Breakthrough	BARRIER™ Permeation: Rate	NITRILE SOL-VEX™/ALPHATEC™ Degradation Rating	SOL-VEX™/ALPHATEC™ Permeation: Breakthrough	SOL-VEX™/ALPHATEC™ Permeation: Rate
1.	Acetaldehyde	■	380	E	P	—	—
2.	Acetic Acid	■	150	—	G	270	—
3.	Acetone	▲	>480	E	NR	—	—
4.	Acetonitrile	▲	>480	E	F	30	F
5.	Acrylic Acid	—	—	—	G	120	—
6.	Acrylonitrile	▲	>480	E	—	—	—
7.	Allyl Alcohol	▲	>480	E	F	140	F
8.	Ammonia Gas	■	19	E	▲	>480	—
9.	Ammonium Fluoride, 40%	—	—	—	E	>360	—
10.	Ammonium Hydroxide	E	30	—	E	>360	—
11.	Amyl Acetate	▲	>480	E	E	60	G
12.	Amyl Alcohol	—	—	—	E	30	E
13.	Aniline	▲	>480	E	NR	—	—
14.	Aqua Regia	—	—	—	F	>360	—
15.	Benzaldehyde	▲	>480	E	NR	—	—
16.	Benzene, Benzol	▲	>480	E	P	—	—
17.	Benzotrichloride	—	—	—	E	>480	E
18.	Benzotrifluoride	—	—	—	E	170	G
19.	Bromine Water	—	—	—	E	>480	E
20.	1-Bromopropane	▲	>480	E	■	23	F
21.	Bromopropionic Acid	▲	>480	—	F	120	—
22.	Butyl Acetate	▲	>480	E	F	75	F
23.	Butyl Alcohol	▲	>480	E	E	>360	E
24.	Butyl Carbitol	—	—	—	E	323	E
25.	Butyl Cellosolve	▲	>480	E	E	90	VG
26.	gamma-Butyrolactone	▲	>480	E	NR	—	—
27.	Carbon Disulfide	▲	>480	E	G	30	F
28.	Carbon Tetrachloride	—	—	—	G	150	G
29.	Cellosolve Acetate	▲	>480	E	F	90	G
30.	Cellosolve Solvent	—	—	—	G	210	G
31.	Chlorine Gas	▲	>480	E	—	—	—
32.	Chlorobenzene	▲	>480	E	NR	—	—
33.	2-Chlorobenzyl Chloride	—	—	—	E	120	E
34.	Chloroform	E	20	G	NR	—	—
35.	Chloronaphthalene	▲	>480	E	P	—	—
36.	2-chlorotoluene	—	—	—	G	120	G
37.	Chromic Acid, 50%	—	—	—	F	240	—
38.	Citric Acid, 10%	—	—	—	E	>360	—
39.	Cyclohexanol	▲	>480	E	E	>360	E
40.	Cyclohexanone	▲	>480	E	F	103	G
41.	1,5-Cyclooctadiene	—	—	—	E	>480	E
42.	Diacetone Alcohol	▲	>480	E	G	240	E
43.	Dibutyl Phthalate	—	—	—	G	>360	E
44.	Diethylamine	▲	>480	E	F	45	F
45.	Di-Isobutyl Ketone, DIBK	▲	>480	E	E	120	F
46.	Dimethyl Acetamide, DMAC	▲	>480	E	NR	—	—
47.	Dimethyl Formamide, DMF	▲	>480	E	NR	—	—
48.	Dimethyl Sulfoxide, DMSO	▲	>480	E	E	>240	VG
49.	Dioctyl Phthalate, DOP	▲	>480	E	G	>360	E
50.	Dioxane	▲	>480	E	NR	—	—
51.	Electroless Copper	—	—	—	E	>360	—
52.	Electroless Nickel	—	—	—	E	>360	—
53.	Epichlorohydrin	▲	>480	E	NR	—	—
54.	Ethidium Bromide, 10%	▲	>480	E	▲	>480	E
55.	Ethyl Acetate	▲	>480	E	NR	—	—
56.	Ethyl Alcohol	▲	>480	E	E	240	VG
57.	Ethylene Dichloride	▲	>480	—	NR	—	—
58.	Ethylene Glycol	▲	>480	E	E	>360	E
59.	Ethylene Oxide Gas	▲	234	E	—	—	—
60.	Ethyl Ether	▲	>480	E	E	120	G
61.	Ethyl Glycol Ether	▲	>480	E	G	210	G
62.	Formaldehyde	▲	>480	E	E	>360	E
63.	Formic Acid, 90%	▲	>480	—	F	240	—
64.	Furfural	▲	>480	E	NR	—	—
65.	Glutaraldehyde, 25%	—	—	—	—	>360	—
66.	Gasoline (hi-test)	■	170	E	E	>360	E
67.	HCFC-141b	▲	>480	E	E	92	F
68.	Hexamethyldisilazane	▲	>480	E	E	>360	—
69.	Hexane	▲	>480	E	E	>360	E
70.	HFE 7100	▲	>480	E	E	>480	E
71.	HFE 71DE	▲	164	E	F	10	F
72.	Hydrazine, 65%	—	—	—	E	>360	—
73.	Hydrobromic Acid	▲	>480	—	E	>360	E
74.	Hydrochloric Acid, conc.	▲	>480	—	E	>360	—
75.	Hydrochloric Acid, 10%	—	—	—	E	>360	—
76.	Hydrofluoric Acid, 48%	▲	>480	—	E	120	—
77.	Hydrogen Fluoride Gas	▲	>480	E	■	<15	P
78.	Hydrogen Peroxide, 30%	—	—	—	E	>360	—
79.	Hypophosphorus Acid	—	—	—	E	>480	—
80.	Hydroquinone, saturated	—	—	—	E	>360	E
81.	Isobutyl Alcohol	▲	>480	E	E	>360	E
82.	Iso-Octane	▲	>480	E	E	360	E
83.	Isopropyl Alcohol	▲	>480	E	E	>360	E
84.	Kerosene	▲	>480	E	E	>360	E
85.	Lactic Acid, 85%	▲	>480	—	E	>360	E
86.	Lauric Acid, 36%/EtOH	—	—	—	E	>360	—
87.	d-Limonene	▲	>480	E	E	>480	E
88.	Maleic Acid, saturated	—	—	—	E	>360	—
89.	Mercury	—	—	—	▲	>480	—
90.	1-methoxy-2-acetoxypropane	▲	>480	E	E	200	F
91.	Methyl Alcohol	E	>480	E	E	11	F
92.	Methylamine	▲	>480	E	E	>360	E
93.	Methyl Amyl Ketone	E	>480	E	F	53	F
94.	Methyl Cellosolve	E	440	E	F	11	G
95.	Methylene bis (4-phenylisocyanate), MDI	—	—	—	—	—	—
96.	Methylene Bromide	▲	>480	E	NR	—	—
97.	Methylene Chloride	E	20	VG	NR	—	—
98.	Methyl Ethyl Ketone, MEK	E	>480	E	NR	—	—
99.	Methyl Glycol Ether	▲	>480	E	F	11	G
100.	Methyl Iodide	▲	>480	E	NR	—	—
101.	Methyl Isobutyl Ketone	▲	>480	E	P	—	—
102.	Methyl Methacrylate	▲	>480	E	P	—	—
103.	N-Methyl-2-Pyrrolidone	▲	>480	E	NR	—	—
104.	Propane Gas	—	—	—	▲	>480	E
105.	Methyl t-Butyl Ether	E	>480	E	E	>360	E
106.	Mineral Spirits, rule 66	▲	>480	E	E	>360	E
107.	Monoethanolamine	—	—	—	E	>360	E
108.	Morpholine	▲	>480	E	NR	—	—
109.	Muriatic Acid	—	—	—	E	>360	—
110.	Naphtha VM&P	▲	>480	E	E	>360	E
111.	Nitric Acid, 10%	▲	>480	—	E	>360	—
112.	Nitric Acid, 70%	E	>480	—	NR	—	—
113.	Nitric Acid, Red Fuming	—	—	—	NR	—	—
114.	Nitrobenzene	▲	>480	E	NR	—	—
115.	Nitromethane, 95.5%	▲	>480	E	F	30	F
116.	Nitropropane, 95.5%	▲	>480	E	NR	—	—
117.	Octyl Alcohol	—	—	—	E	>360	E
118.	Oleic Acid	—	—	—	E	>360	E
119.	ortho-Chlorotoluene	—	—	—	G	120	G
120.	Oxalic Acid, saturated	—	—	—	E	>360	—
121.	Pad Etch 1(Ashland Chem.)	—	—	—	F	>360	—
122.	Palmitic Acid, saturated	—	—	—	G	30	—
123.	Pentane	—	—	—	E	>360	E
124.	Pentachlorophenol, 5%	—	—	—	E	>360	E
125.	Perchloric Acid, 60%	—	—	—	E	>360	—
126.	Perchloroethylene	▲	>480	E	G	300	VG
127.	Phenol	▲	>480	E	NR	—	—
128.	Phosphoric Acid, conc.	▲	>480	—	E	>360	—
129.	PMA Glycol Ether Acetate	▲	>480	E	E	200	F
130.	Potassium Hydroxide, 50%	—	—	—	E	>360	—
131.	Propane Gas	—	—	—	▲	>480	E
132.	Propyl Acetate	—	—	—	F	20	G
133.	Propyl Alcohol	▲	>480	—	E	>360	E
134.	Propylene Oxide	▲	>480	—	NR	—	—
135.	Pyridine	▲	>480	E	NR	—	—
136.	Rubber Solvent	—	—	—	E	>360	E
137.	Silicon Etch	—	—	—	NR	—	—
138.	Skydrol hydraulic fluid	E	>480	E	NR	—	—
139.	Sodium Hydroxide, 50%	E	>480	—	E	>360	—
140.	Stoddard Solvent	▲	>480	E	E	>360	E
141.	Styrene	▲	>480	E	NR	—	—
142.	Sulfur Dichloride	—	—	—	E	>480	—
143.	Sulfuric Acid, 95%	E	>480	—	NR	—	—
144.	Sulfuric 47% battery acid	—	—	—	E	>360	—
145.	Sulfuric Acid 120%, Oleum	▲	>480	E	—	—	—
146.	Tannic Acid, 65%	—	—	—	E	>360	E
147.	Tetrachloroethene	▲	>480	—	G	300	VG
148.	Tetrahydrofuran, THF	▲	>480	E	NR	—	—
149.	Toluene, toluol	▲	>480	E	F	10	F
150.	Toluene Di-Isocyanate	▲	>480	E	NR	—	—
151.	Triallylamine	▲	>480	E	—	>480	E
152.	Trichloroethylene, TCE	▲	>480	E	NR	—	—
153.	Trichlorotrifluoroethane	—	—	—	E	>360	E
154.	Tricresyl Phosphate, TCP	—	—	—	E	>360	E
155.	Triethanolamine, 85%	—	—	—	E	>360	E
156.	Turpentine	▲	>480	E	E	30	E
157.	Vertrel MCA	▲	>480	E	E	110	G
158.	Vertrel SMT	E	<10	G	P	—	—
159.	Vertrel XE	E	105	E	E	>480	E
160.	Vertrel XF	E	>480	E	E	>480	E
161.	Vertrel XM	E	120	E	E	>480	E
162.	Vinyl Acetate	▲	>480	E	F	18	F
163.	Vinyl Chloride Gas	▲	>480	E	—	—	—
164.	Xylene, Xylol	▲	>480	E	G	75	F

The first square in each column for each glove type is colour coded. This is an easy-to-read indication of how we rate this type of glove in relation to its applicability for each chemical listed. The colour represents an overall rating for both degradation and permeation. The letter in each square is for Degradation alone...

GREEN: Well suited. ORANGE: Suitable under careful control. RED: Avoid use.

Note: All numeric designations within the product classifications are denoted in minutes.

▲ A degradation test against this chemical was not run. However, since its breakthrough time is greater than 480 minutes, the Degradation Rating is expected to be **Good** to **Excellent**.

■ A degradation test against this chemical was not run. However, in view of degradation tests performed with similar compounds, the Degradation Rating is expected to be **Good** to **Excellent**.

*CAUTION: This product contains natural rubber latex which may cause allergic reactions in some individuals.

SPECIAL NOTE: The chemicals in this guide highlighted in LIGHT BLUE are experimental carcinogens, according to the ninth edition of Sax' Dangerous Properties of Industrial Materials.

Chemicals highlighted in GREY are listed as suspected carcinogens, experimental carcinogens at extremely high dosages, and other materials which pose a lesser risk of cancer.

SpecWare Technical Support online

NEOPRENE/ NATURAL RUBBER BLEND
CHEMI-PRO™*

This information applies only to Ansell glove brands.

CHEMICAL	NITRILE TOUCH N TUFF™ / VIRTEX™ 0.12mm			VINYL FRESH TOUCH™ 0.12mm			NATURAL RUBBER CONFORM™* 0.12mm		
	Degradation Rating	Permeation Breakthrough	Permeation Rating	Degradation Rating	Permeation Breakthrough	Permeation Rating	Degradation Rating	Permeation Breakthrough	Permeation Rating
1. Acetaldehyde	P	—	—	NR	—	—	E	<10	F
2. Acetic Acid	E	10	—	G	45	—	E	10	—
3. Acetone	NR	—	—	NR	—	—	P	—	—
4. Acetonitrile	F	<10	G	NR	—	—	G	<10	G
5. Ammonium Fluoride	E	—	—	E	240	—	E	360	—
6. Ammonium Hydroxide	G	20	—	E	240	—	E	11	—
7. Aniline	NR	—	—	G	20	VG	E	<10	G
8. Butyl Acetate	NR	—	—	NR	—	—	NR	—	—
9. Butyl Alcohol	G	475	G	VG	<10	F	E	<10	G
10. Butyl Cellosolve	NR	—	—	P	—	—	E	<10	F
11. Citric Acid, 10%	E	>480	—	E	>360	—	E	>480	—
12. Cyclohexanol	E	—	—	E	60	E	E	<10	G
13. Dimethyl Formamide	NR	—	—	NR	—	—	E	<10	G
14. Dimethyl Sulfoxide	F	10	E	NR	—	—	NR	—	—
15. Ethanolamine	E	>480	—	E	120	—	E	120	—
16. Ethyl Acetate	NR	—	—	NR	—	—	G	<10	F
17. Ethyl Alcohol	F	10	VG	VG	<10	F	E	<10	VG
18. Ethylene Dichloride	NR	—	—	NR	—	—	NR	—	—
19. Ethylene Glycol	E	38	G	E	45	VG	—	—	—
20. Ethyl Ether	G	<10	G	P	—	—	F	<10	P
21. Formaldehyde	E	>480	E	E	20	VG	E	<10	E
22. Gasoline (Shell 92 oct.)	F	<10	G	P	—	—	NR	—	—
23. Hexane	E	>480	E	NR	—	—	NR	<10	F
24. Hydrazine	E	<10	F	E	>360	E	G	25	F
25. Hydrochloric Acid, conc.	E	78	—	G	>360	—	E	55	—
26. Hydrogen Peroxide, 30%	E	200	—	E	>360	E	E	>480	E
27. Isobutyl Alcohol	G	61	VG	G	10	VG	E	<10	F
28. Isopropyl Alcohol	E	10	VG	VG	<10	F	E	<10	VG
29. Kerosene	E	>480	—	G	30	G	NR	—	—
30. Maleic Acid, saturated	E	>480	—	VG	>360	—	—	—	—
31. Methyl Alcohol	E	<10	G	VG	10	G	E	<10	VG
32. Methyl Ethyl Ketone	NR	—	—	NR	—	—	F	<10	F
33. Methylene Chloride	NR	—	—	NR	—	—	NR	—	—
34. Nitric Acid, 10%	E	>480	E	VG	>360	E	G	>480	E
35. Octyl Alcohol	E	350	E	G	9	E	—	—	—
36. Perchloroethylene	G	10	G	P	—	—	NR	—	—
37. Phenol	NR	—	—	G	30	VG	—	—	—
38. Phosphoric Acid, 85%	—	—	—	G	>360	—	F	>480	—
39. Propyl Alcohol	E	125	VG	G	<10	F	E	<10	G
40. Sodium Hydroxide, 50%	E	>480	—	E	>360	—	E	>480	—
41. Stoddard Solvent	E	>480	—	G	40	E	NR	—	—
42. Sulfuric Acid, 47%	E	>480	—	G	>480	—	E	>480	—
43. Tricresyl Phosphate	G	10	F	G	>360	E	—	—	—
44. Triethanolamine, 85%	P	—	—	E	>360	E	E	>480	—
45. Xylene, Xylol	G	<10	F	NR	—	—	NR	—	—

NOTE.

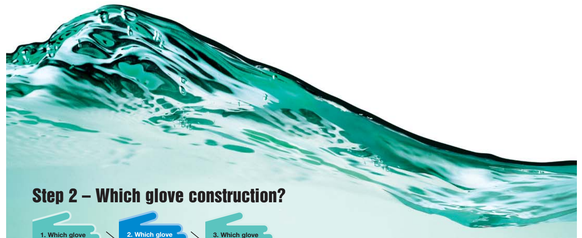
These recommendations are based on laboratory tests, and reflect the best judgement of Ansell in the light of data available at the time of preparation and in accordance with the current revision of ASTM F 739. They are intended to guide and inform qualified professionals engaged in assuring safety in the workplace. Because the conditions of ultimate use are beyond our control, and because we cannot run permeation tests in all possible work environments and across all combinations of chemicals and solutions, these recommendations are advisory only. The suitability of a product for a specific application must be determined by testing by the purchaser. The data in this guide are subject to revision as additional knowledge and experience are gained. Test data herein reflect laboratory performance of partial gloves and not necessarily the complete unit. Anyone intending to use these recommendations should first verify that the glove selected is suitable for the intended use and meets all appropriate health standards. Upon written request, Ansell will provide a sample of material to aid you in making your own selection under your own individual safety requirements.

NEITHER THIS GUIDE NOR ANY OTHER STATEMENT MADE HEREIN BY OR ON BEHALF OF ANSELL SHOULD BE CONSTRUED AS A WARRANTY OF MERCHANTABILITY OR THAT ANY ANSELL GLOVE IS FIT FOR A PARTICULAR PURPOSE. ANSELL ASSUMES NO RESPONSIBILITY FOR THE SUITABILITY OR ADEQUACY OF AN END-USER'S SELECTION OF A PRODUCT FOR A SPECIFIC APPLICATION.

Note: All numeric designations within the product classifications are denoted in minutes.

*CAUTION: This product contains natural rubber latex which may cause allergic reactions in some individuals.

SPECIAL NOTE: The chemicals in this guide highlighted in LIGHT BLUE are experimental carcinogens, according to the ninth edition of Sax' *Dangerous Properties of Industrial Materials.* Chemicals highlighted in GREY are listed as suspected carcinogens, experimental carcinogens at extremely high dosages, and other materials which pose a lesser risk of cancer.



Step 2 – Which glove construction?

1. Which glove compound? > **2. Which glove construction?** > 3. Which glove option?

A glove's chemical resistance performance will be influenced by the nature of the job. If a glove tears or cuts easily, it will not provide adequate chemical protection.

The next step in the selection process is to evaluate the job to be performed and consider whether you will need a **disposable**, an **unsupported** or a **supported** glove.

The more commonly used gloves in chemical handling applications are **unsupported** and **supported** gloves. Both types will provide similar chemical protection, as the thickness of the compound, the critical element in chemical protection, is often similar. Abrasion and cut resistance, two other important considerations, can also be similar. The main difference is that **supported** gloves have a cotton liner that makes the overall glove thicker and gives it more structural strength and resistance to tearing. **Disposable** gloves are designed for extremely lightweight applications. More information on each glove type is below:

Disposable gloves are very thin, and, as the name suggests, are not designed for long-term use. Should only be used for basic chemical protection and are designed for very light duty work where frequent changes will occur. Splash protection (for suitable chemicals) is a good example of where a disposable glove may be used. Refer to the separate table in SpecWare™, which contains chemical resistance specifically for disposables.

Unsupported gloves are more suitable for a wide range of applications. 'Unsupported' simply means they don't have an internal material lining. They are designed this way to allow for good dexterity, tactility and flexibility. They are more suited, for example, to applications that require the handling of small components. The external compound of a glove determines chemical resistance, so the absence of a cotton lining will have no impact on its chemical permeation performance.

Supported gloves will contain a liner, usually made from knitted cotton, to give the glove a stronger construction for more heavy-duty work. This internal liner makes the glove thicker overall and is designed to provide more strength, not necessarily more chemical resistance. While Supported gloves are less dexterous and flexible than Unsupported gloves, they are generally stronger and with the cotton liner can provide more comfort and sweat absorption.

As part of European Std EN388, each of our products is tested for 'mechanical hazards' performance, which is a useful tool for glove selection. This measures performance in critical areas such as abrasion, cut, tear and puncture resistance. The results for each product are shown below a 'mechanical hazards' icon in the product section. The four numbers relate to the gloves resistance to abrasion, cut, tear and puncture. All ratings have a maximum score of 4, except cut resistance, which is based on a maximum of 5. The higher the score, the more resistance the glove will offer in that area.

Use the Mechanical Hazards ratings to ensure the construction of the glove will support its chemical resistance performance. If any of the gloves you are currently using don't have this, it means they are not Standards approved and could be dangerous.

Step 3 – Which glove option?

1. Which glove compound? > 2. Which glove construction? > **3. Which glove option?**

Ansell's range of chemical resistant gloves offers a variety of options. These include variations in length, thickness, grip pattern, lining, color and size. You can choose from these options to ensure optimal suitability of the glove to the application.

The data in the Product section contains all the information you'll need to ensure you select the right glove and the best glove.

Product specifications.

The chemical resistant product information section is designed to follow the 3 basic steps for glove selection. The product is grouped by glove compound, the critical selection criteria identified in **Step1**. The glove construction, as discussed in **Step 2**, is identified by headings within the table (where certain types are not listed indicates that these are not available in that compound). Individual product specifications are listed which clarify the options available to you as part of **Step 3**.

Flat Film.

Barrier™ is a state of the art 5 layer flat film glove, offering extremely broad range chemical protection. **Barrier™** features a non-woven polyethylene liner for increased wearer comfort and superior perspiration absorption.

Product Code	Product Name	Thickness	Length	Grip Pattern	Lining	Sizes
Unsupported						
2-100	Barrier™	5 Layer	38-40 cm	Smooth	n/a	7-11

1010 Barrier™

All Products

Nitrile.

Ansell high performance nitrile gloves provide an outstanding combination of strength and chemical resistance and are available in a range of disposable, unsupported and supported variants. **Sol-Knit™** is a reinforced, cotton-lined glove with a specially designed rough surface for superior grip and abrasion resistance. **Sol-Vex™**, an unsupported glove range, is ideal for a wide range of applications and has long been regarded as an industry standard. While, **Touch N Tuff™** is a disposable option featuring comfort, dexterity and cleanliness.

Product code	Product	Thickness	Length	Grip Pattern	Lining	Sizes
Disposable						
92-500	TNT™ Powdered	0.12 mm	24 cm	Smooth	Powder	S-XL
92-600	TNT™ P/Free	0.12 mm	24 cm	Smooth	Pwd/Free	S-XL
92-670A	TNT™ Blue P/Free	0.12 mm	24 cm	Smooth	Pwd/Free	S-XL
79-700	Virtex	0.225mm	310mm	Raised	Unlined	7-11
Unsupported						
37-145	Sol-Vex™ 145	0.28 mm	33 cm	Textured	Unlined	6-11
37-175	Sol-Vex™ 175	0.38 mm	33 cm	Textured	Flock	6-11
37-176	Sol-Vex™ 176 Asia	0.38 mm	33 cm	Raised	Flock	7-11
37-676	Sol-Vex™ 676	0.38 mm	33 cm	Raised	Flock	7-11
37-500	Sol-Vex™ 500	0.38 mm	33 cm	Raised	Flock	7-10
37-165	Sol-Vex™ 165	0.56 mm	38 cm	Textured	Unlined	7-11
37-185	Sol-Vex™ 185	0.56 mm	46 cm	Textured	Unlined	7-11
Supported - Cotton Lining						
39-122	Sol-Knit™	n/a	31 cm	Textured	Cotton	7-10
39-124	Sol-Knit™ 36	n/a	36 cm	Textured	Cotton	8-10
58-530	AlphaTEC 530	0.6mm	305mm/12"	Textured	Acrylic	8-11
58-535	AlphaTEC 535	0.6mm	356mm/14"	Textured	Acrylic	8-11

1000 TNT™ · 2000 Virtex™ · 4102 Sol-Vex™ · 4111 Sol-Knit™ · 3121 AlphaTEC™

All Products

Neoprene.

Ansell's range of **Neoprene™** gloves provide protection against a broad range of chemicals. **Neotop™** is an unsupported glove that offers good comfort and flexibility. **Scorpio™** offers heavy-duty protection and the specially designed construction provides excellent grip on wet and slippery materials. **Neox™** gloves deliver great all round resistance to abrasion, cuts and chemicals and are available in extended lengths. While **Thermaprene™**, also available in longer versions, offers great heat resistance with its specially designed thermal liner.

Product code	Product	Thickness	Length	Grip Pattern	Lining	Sizes
Unsupported						
29-500	Neotop™	0.75 mm	30 cm	Raised	Flock	8-10
29-865	Neoprene™	0.46 mm	33 cm	Raised	Flock	7-10
Supported - Cotton Lining						
8-352	Scorpio™ 30	n/a	30 cm	Textured	Cotton	8-10
8-354	Scorpio™ 36	n/a	35 cm	Textured	Cotton	8-10
9-922	Neox™ 30	n/a	30 cm	Smooth	Cotton	10
9-924	Neox™ 36	n/a	36 cm	Smooth	Cotton	10
9-928	Neox™ 46	n/a	46 cm	Smooth	Cotton	10
9-430	Neox™ 78	n/a	78 cm	Smooth	Cotton	10
19-024	Thermaprene™ 46	n/a	46 cm	Textured	Thermal	8 &10
19-026	Thermaprene™ 66	n/a	66 cm	Textured	Thermal	8 &10

3121 Neotop™ · 2101 Neoprene™ · 2121 Scorpio™ · 3221 Neox™ · 2223 Thermaprene™

All Products

Note: Products listed represent those sold throughout the Asia Pacific region. Availability of certain products may vary from country to country.

ChemTek.

Product Code	Product Name	Thickness	Length	Grip Pattern	Lining	Sizes
Unsupported						
38-514	ChemTek Butyl™	0.35mm	356 mm	Textured	Unlined	7-11
38-612	ChemTek Viton/Butyl™	0.30mm	305 mm	Smooth	Unlined	8-10

2000 Chemtek™ Butyl™ & Viton/Butyl™

All Products

Polyvinyl Alcohol.

PVA™ gloves are lightweight and comfortable, offering superior protection against dangerous organic solvents. The polyvinyl alcohol coating out-performs host other types of chemical resistant gloves and is virtually inert in aromatic and chlorinated solvents.

Product Code	Product Name	Thickness	Length	Grip Pattern	Lining	Sizes
Supported - Cotton Lining						
15-552	PVA™	n/a	31 cm	Smooth	Cotton	9,10
15-554	PVA™ 36	n/a	36 cm	Smooth	Cotton	9,10

(CAUTION: PVA™ coating is water-soluble. DO NOT use in water based solutions).

4121 PVA™

All Products

PVC.

Superflex Blue™ is a premium grade blue PVC glove which delivers superior chemical and abrasion resistance together with high levels of comfort and workability. An intermediate grade brown PVC glove, **Superflex Brown™** offers flexibility and comfort with a rough surface finish for better grip. **Superflex Brown™** also delivers broad spectrum chemical and abrasion resistance. A PVC/Nitrile blend is also available in the **Snorkel™** product for greater durability.

Product code	Product	Thickness	Length	Grip Pattern	Lining	Sizes
Supported - Cotton Lining						
12-214	Petroflex™	n/a	36 cm	Textured	Jersey	10
4-644	Superflex Blue™	1.6 mm	30 cm	Textured	Cotton	9-11
4-662	Superflex Brown™	1.0 mm	30 cm	Textured	Jersey	9 &10

3121 Petroflex™ · 4121 Superflex Blue™ · 3121 SuperflexBrown™

All Products

PVC/Nitrile.

Supported - Cotton Lining						
4-414	Snorkel™	n/a	36 cm	Raised	Jersey	9 &10

3121 Snorkel™

All Products

Natural rubber latex.

Disposable natural rubber latex gloves are ideal for very basic chemical protect. **Canners™** gloves are a more heavy-duty product and come in various options. **HyCare™** is a premium grade, cotton lined, preformed rubber glove which offers excellent durability and wearability in a range of hot and cold situations. **Chemi-Pro™** features a Neoprene coating over the natural rubber latex compound for additional protection and performance.

Product code	Product	Thickness	Length	Grip Pattern	Lining	Sizes
Disposable						
69-318	Conform™ XT PF*	0.08 mm	22 cm	Textured	Pwd/Free	XS-XL
844	Conform™*	0.05 mm	24 cm	Smooth	Powder	S-XL
Unsupported						
343	Canners™ Gloves*	0.5 mm	30 cm	Raised	Unlined	7-10
352/354	Premium Pink/Blue*	0.5 mm	30 cm	Textured	Silverlined	6.5-11
Supported - Cotton Lining						
739	Hycare™*	n/a	30 cm	Textured	Cotton	S-XL

4121 Hycare™

Hycare™

Natural rubber latex (with Neoprene).

Unsupported						
224	Chemi-Pro™*	0.7 mm	30-32 cm	Raised	Flocklined	8-10

0120 Chem-Pro™

All Products

* Caution: These products contain natural rubber latex which may cause allergic reactions in some people.

Note: Products listed represent those sold throughout the Asia Pacific region. Availability of certain products may vary from country to country.

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