Chemical Protective Gloves

Selection Considerations
Why protect the skin?

1. Some chemicals can damage the skin; and/or

2. Many chemicals can be absorbed into the body through the skin. Exposures received in this way can be very significant and, in extreme cases, can even lead to death.

Glove use is needed if the chemical is corrosive to the skin and/or can penetrate the skin, and contact with your hands cannot be avoided.
Any glove will protect me, right?

No, the ability of a glove to prevent skin exposure depends on several factors including:

1. The chemical and its concentration
2. The glove material
3. Thickness of the glove material
4. Duration of use
5. Temperatures involved
6. Pressure
7. Holes or other damage to the glove material
# Common Glove Materials

<table>
<thead>
<tr>
<th>Glove Material</th>
<th>Protect Against</th>
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</thead>
<tbody>
<tr>
<td>Natural Rubber (latex)</td>
<td>Bases, alcohols, &amp; dilute aqueous solutions</td>
</tr>
<tr>
<td>Polyvinyl Chloride (PVC)</td>
<td>Acids, bases, &amp; water solutions</td>
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<tr>
<td>Butyl Rubber</td>
<td>Glycol ethers, ketones, &amp; esters</td>
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<tr>
<td>Nitrile</td>
<td>Oils, greases &amp; aliphatic chemicals</td>
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<tr>
<td>Neoprene</td>
<td>Oxidizing acids &amp; glycol ethers</td>
</tr>
<tr>
<td>Polyvinyl Alcohol (PVA)</td>
<td>Aliphatics, aromatics, chlorinated solvents, esters, ethers, and ketones (other than acetone)</td>
</tr>
<tr>
<td>Laminate Film (e.g. Silver Shield)</td>
<td>Almost any chemical</td>
</tr>
<tr>
<td>Fluoro-elastomer (Viton)</td>
<td>Aromatics, chlorinated solvents, aliphatics, &amp; alcohols</td>
</tr>
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Selection Criteria

One needs to know:

1. The chemical(s) to which the glove may be exposed;
2. Whether chemical exposure will occur by immersion or splash;
3. Anticipated duration of glove contact with the chemical;
4. How much coverage is needed (see next slide).

Size, how much dexterity is needed, and comfort are also important.
Coverage

Gloves should be long enough to protect the skin from contacting the chemical(s).

If gloves of sufficient length can’t be found and additional skin coverage is needed, then other protective equipment such as aprons, arm sleeves, etc. can be worn.
A chemical will permeate any chemical protective glove material over time. Once the chemical reaches the other side “breakthrough” has occurred. Manufacturers provide breakthrough times for their gloves.

If contact with a chemical during your work process is known to occur (e.g. immersion) then the safest practice is to replace the gloves before breakthrough occurs. Not doing so may lead to significant exposure.

Never use a damaged glove.
Gloves used for splash protection need to be replaced once the glove is splashed by the chemical(s).

Never use a damaged glove.
Thin Walled Gloves

Thin walled gloves are used for splash protection, and (in general) for protection from contact with dry solids.

Common thin-walled glove materials include latex and nitrile.

Notice: some proteins in natural latex can cause mild to severe allergic reactions, therefore nitrile is preferred over latex.

Replace thin-walled gloves once they have been splashed by a chemical. These types of gloves are disposable and should not be reused.
What Glove to Use?

The first step is to determine your use parameters. Example:

Use Parameters:
Chemical = Acetaldehyde
Exposure Duration = 28 minutes
Exposure type = Immersion
NTP

Next, reference your preferred manufacturer literature (e.g. glove chart) to determine what glove to use, and for how long.
Many manufacturers have information available for the gloves they produce. Links to access manufacturer information can be found on Risk Management’s website.

http://risk.byu.edu/safety/Gloves.php
There will be times when gloves are needed to protect against chemical mixtures and there isn’t one type of glove that is suitable for all the chemicals. When this is the case consider wearing multiple types of gloves at the same time - one over the other.
Always check chemically protective gloves for holes before use.

1. Fill the glove with air, manually or with an inflator;
2. Once inflated, check the glove for leakage by holding the glove closed and squeezing; and
3. Listen for escaping air or feel the glove for any air releasing.
Warning

Any of the following poor practices can lead to chemical exposure:

1. Using the wrong glove;
2. Using a damaged glove; and/or
3. Using a glove that contains contamination

Using the wrong gloves can be worse than not wearing gloves if the chemical is held against the skin once the chemical has permeated the glove material.
Please contact the college Health & Safety Officer (422-6589) or Risk Management (422-4468) if you have any questions.