



Personal Safety

## **Factors In Glove Selection: Disposable Protection**

Brought To You By Ansell | Jan 17, 2018

A Disposable Glove Program is an important part of managing safety in your operation. The selection of the right Disposable glove solution for workers depends on their operating environment. The wide range of single use gloves available today are designed for use in a range of applications including General Purpose, Industrial, Medical and Food environments. This guide serves as an overview of factors in the selection of the right glove in various risk environments.

### **What are the differences between the various disposable gloves?**

Disposable gloves are primarily differentiated by their features, polymer science and manufacturing technologies.

**The primary features of disposable gloves are...**

#### **Grade**

- Examination
- Classified as a medical device
- Prevents contamination between caregiver and patient
- Industrial
- Industrial or general purposes
- Not for contact

## Powder

- Powdered – Easier on/off; better moisture absorption
- Powder-Free – No powder to contaminate products

## Texture

- Full – Entire glove has a raised texture to improve grip
- Fingers-only – Texture on fingers only
- Smooth Finish – No texture; good when less resistance is desired

## Glove Length

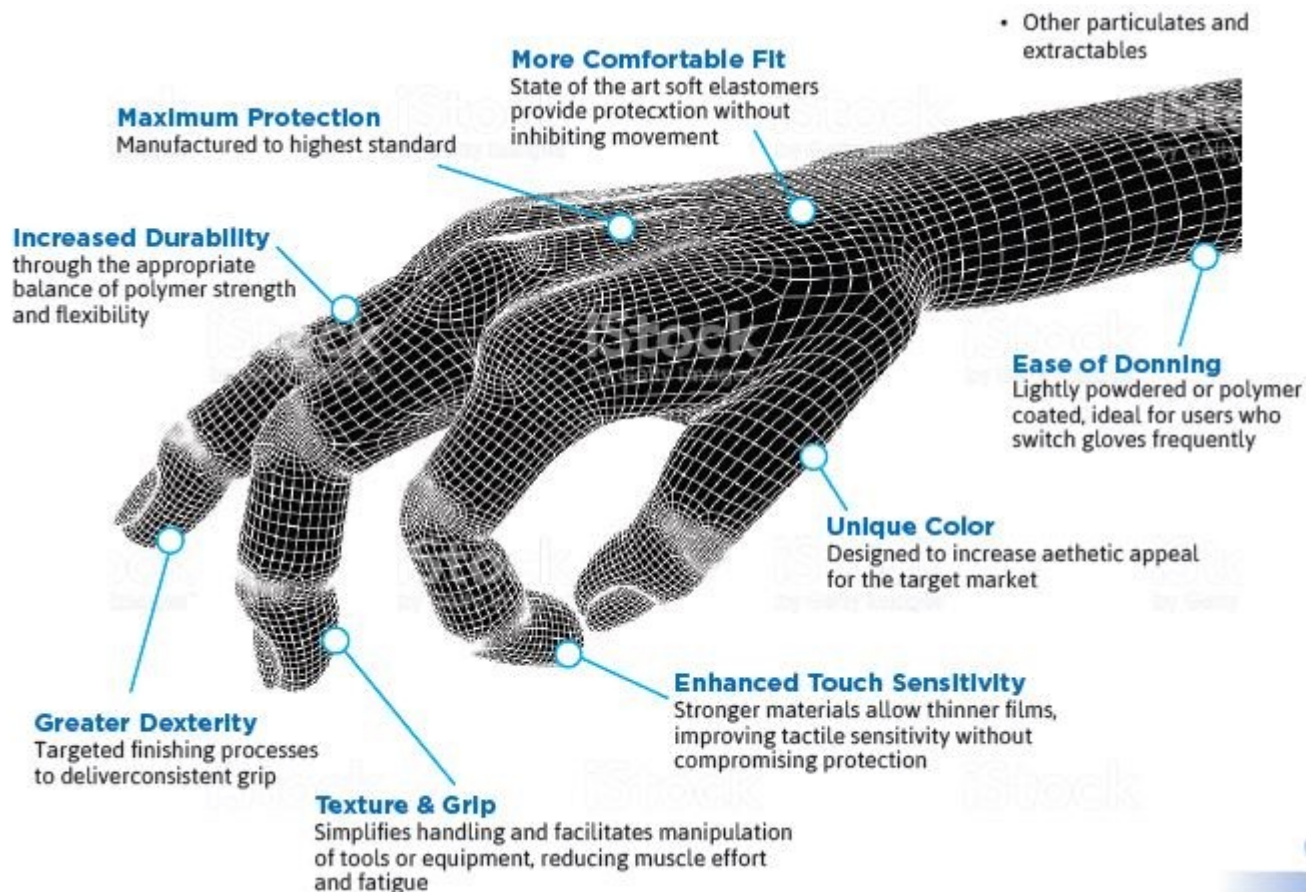
- Standard glove length is 9.5 inches
- Extended cuff provides additional protection to wrists and forearms

## What Makes a Good Disposable Glove?

Polymer science and manufacturing technologies combined to deliver increased comfort, protection and productivity.

A common practice is to focus primarily on glove thickness. Glove thickness alone doesn't translate to user requirements. There are a number of product differentiators that are important to review with your customers:

- **Barrier Integrity** – people wear gloves for a reason; better barrier integrity = more consistent reliable protection
- **Durability** – there are a lot of cheap gloves on the market; if a user has to continue to replace gloves due to breakage, they end up spending more in the long run
- **Grip** – plays an important role in productivity; it is important to understand a users grip requirements, wet or dry; some users prefer gloves that are less grippy or tacky
- **Touch Sensitivity** – how important is tactile sensitivity to your customer? Having poor tactile sensitivity can affect productivity and have potential implications with safety
- **Glove Color** – may not seem like a big deal, but color can be used to differentiate departments and compliance; sometime there is just a "cool" factor with wearing a unique color, such as black nitrile.



## DISPOSABLE GLOVE POLYMERS

### Performance Overview



	Comfort	Performance	Protection	Elasticity	Latex Allergy	Puncture Resistance	Strength (Rip/Tear)	Wet Grip	Dry Grip	Chemical Splash Protection	Cost per Glove	
Natural Latex Rubber	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 48%, #008000 48% 52%, #008000 52%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 36%, #008000 36% 64%, #008000 64%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	\$\$	<ul style="list-style-type: none"> <li>• Highest comfort with elasticity &amp; dexterity</li> <li>• Good rip and tear resistance</li> <li>• Great wet and dry grip</li> <li>• Allergenic; type I &amp; type IV</li> </ul>
Nitrile	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	\$\$\$	<ul style="list-style-type: none"> <li>• Strong and durable material</li> <li>• Excellent puncture and abrasion resistance</li> <li>• Good chemical splash resistance</li> </ul>
Neoprene	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	\$\$\$\$	<ul style="list-style-type: none"> <li>• Broad chemical splash resistance</li> <li>• Maintains flexibility across a wide range of temperatures</li> <li>• Consistent performance even in wet environments</li> </ul>
Polyisoprene	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 48%, #008000 48% 52%, #008000 52%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	\$\$\$\$	<ul style="list-style-type: none"> <li>• As comfortable as natural rubber latex</li> <li>• Second skin fit and feel</li> <li>• Reduces the risk of type I and type IV allergies</li> </ul>
Vinyl	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 36%, #008000 36% 64%, #008000 64%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 36%, #008000 36% 64%, #008000 64%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%;"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 44%, #008000 44% 56%, #008000 56%);"></span>	<span style="display: inline-block; width: 10px; height: 10px; background-color: #008000; border-radius: 50%; background: radial-gradient(circle, transparent 40%, #008000 40% 60%, #008000 60%);"></span>	\$	<ul style="list-style-type: none"> <li>• Most economical</li> <li>• Provides lowest level of protection and performance</li> </ul>

Disposable Glove Polymers- Performance Overview

## How Do I Select The Proper Disposable Glove?

What manufacturing applications are the gloves to be used in?

- What are their performance requirements?
- What tasks are they doing?

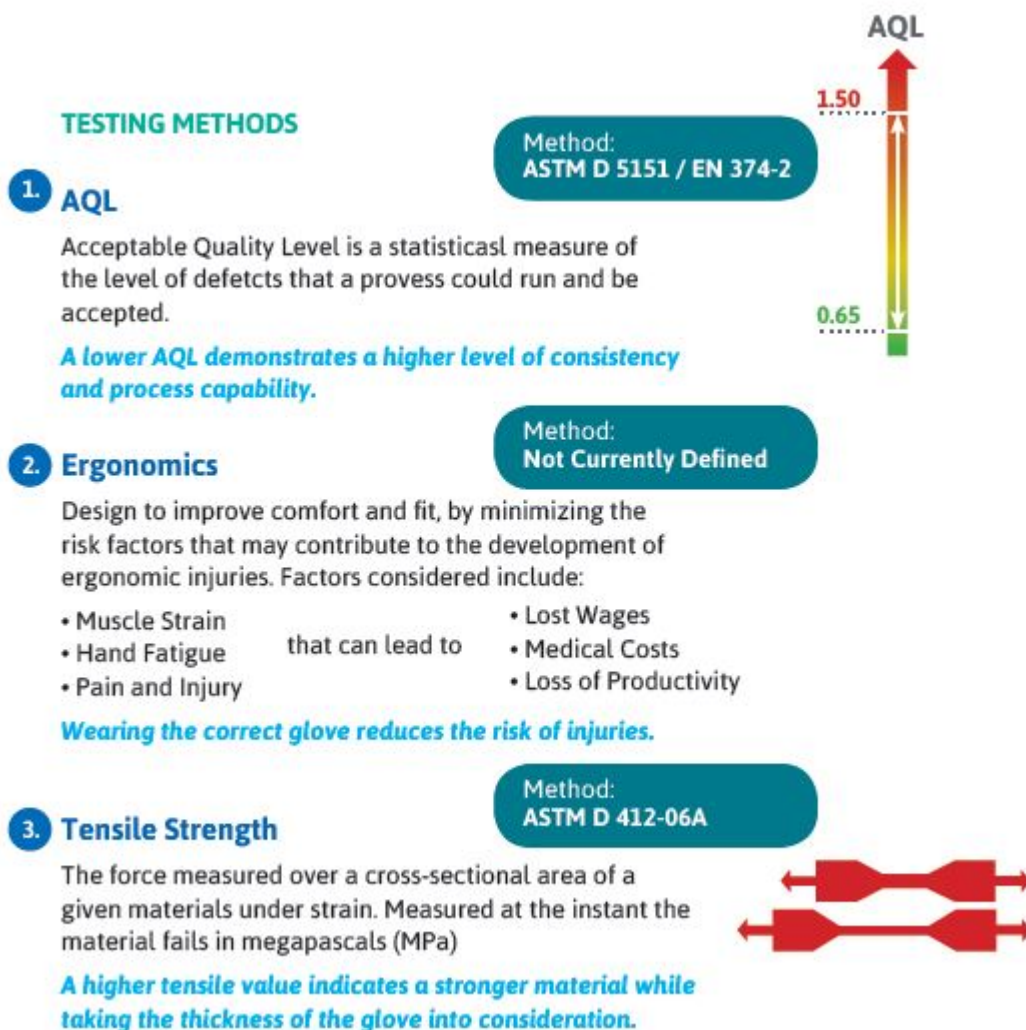
- What do they like or dislike about their current glove?

Confirm their requirements for the following factors:

- Wet/ Dry Grip
- Comfort/Ergonomics
- Tactile Sensitivity
- Durability
- Residue Free
- Chemical Splash Protection
- Expanded Protection
- Cost

## How Do Glove Manufacturers Test For Chemical Resistance?

Multiple test methods are commonly used to determine chemical permeation, tensile strength, AQL and ergonomics.

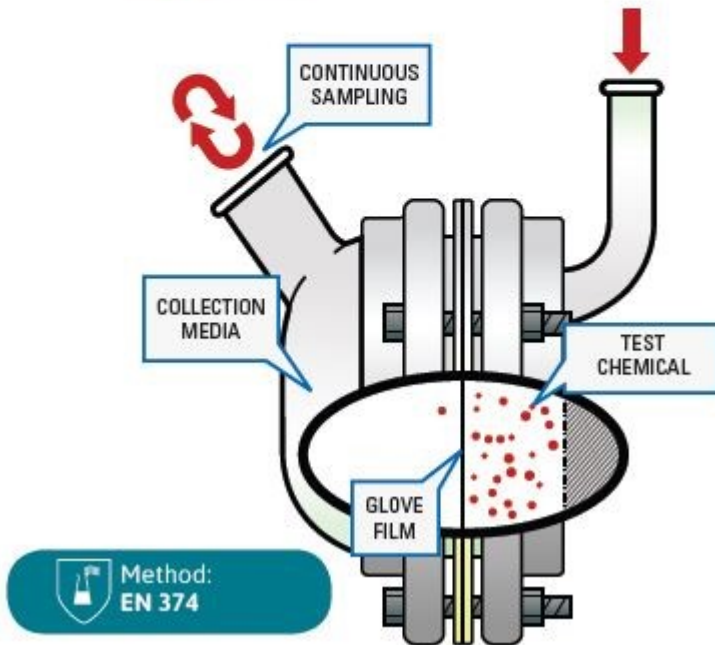




#### 4. Permeation

The process by which a chemical moves through a protective glove material on a molecular or microscopic level.

*Resistance to permeation by a chemical is determined by measuring the permeation breakthrough time ( $1\mu\text{g}/\text{min cm}^2$ )*



Testing Continued

Chemical permeation tests are based on any 3 of the 12 chemicals from the list below. If the permeation time is 30 minutes for those 3 chemicals, the glove can receive the Erlenmeyer “chemical resistant” pictogram with at least 3 code letters.

This does not mean this glove only works with the selected chemicals, but that the selection reflects the glove material’s primary application.

Code Letter	Chemical	CAS No.	Class
A	Methanol	67-56-1	Primary alcohol
B	Acetone	67-64-1	Ketone
C	Acetonitrile	75-05-8	Nitrile Compound
D	Dichloromethane	75-09-2	Chlorinated paraffin
E	Carbon disulfide	75-15-0	Sulphur containing organic compound
F	Toluene	108-88-3	Aromatic hydrocarbon
G	Diethylamine	109-89-7	Amine
H	Tetrahydrofuran	109-99-9	Heterocyclic and ether compound
I	Ethyl acetate	141-78-6	Ester
J	N-Heptane	142-82-5	Saturated hydrocarbon
K	Sodium hydroxide 40%	1310-73-2	Inorganic base
L	Sulphuric acid 96%	7664-93-9	Inorganic mineral acid

The EN374 standards also determine:

- Gloves achieving a breakthrough time less than 30 minutes but pass penetration test requirements (Acceptable Quality Level [AQL]  $\leq 4.0$ ) shall carry the “waterproof” pictogram (commonly seen with disposables);
- Gloves that pass penetration test requirements and achieve an acceptable quality level (AQL  $\leq 1.5$ ) shall carry the “microorganism” pictogram.

Penetration time is used to determine the material’s performance level or rating. Levels range from “0” (under 10 minutes) to “6” (up to 480 minutes, the maximum time that can be claimed under the current EN374 standards).

Penetration test requirements are met when no evidence of air or water leak occurs, based on an acceptable quality level (the percentage of allowable rejects from a known number of inspected samples).

Gloves not complying with the permeation test but meeting penetration requirements must use the pictogram marking with a question mark.