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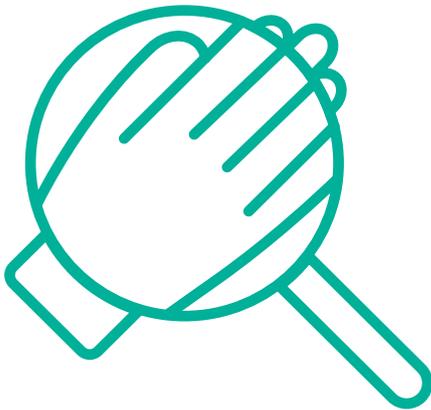
MATERIAL MATTERS

EXPLAINING THE DIFFERENCES BETWEEN SINGLE-USE GLOVE MATERIAL TYPES

As the name suggests, single-use hand protection solutions have a relatively short life span requirement. Though disposable in nature, they perform an important role in providing barrier protection against a range of workplace hazards.

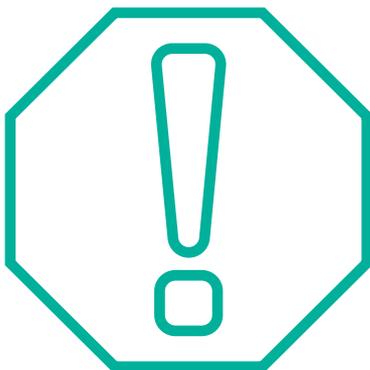
Single-use glove options are often used because they tend to be thinner than other styles of hand protection. This construction delivers increased dexterity and tactility, making it easier to handle small components or tools and lessening the likelihood of hand fatigue.

IDENTIFY THE OPTIONS...



Materials — or polymers — used in the construction of single-use gloves include; latex, nitrile, neoprene, polyisoprene and vinyl. Each demonstrates different physical properties that make them more- or less-suited to specific tasks and environmental conditions.

...AND THE APPLICATION HAZARDS



When looking for the most appropriate alternative, safety and operations managers should conduct a thorough risk analysis, which should also identify the presence of multiple hazards. Once all hazards are identified, the strengths and weaknesses of each available base material can be assessed and the polymer type that delivers the greatest harm minimisation selected.

COMMON POLYMERS



Each of the common polymer materials has a different set of characteristics that makes them a more- or less-suited option specific to the hazards posed. Understanding the material properties of each can — and matching them to the application — will significantly simplify the selection process.

LATEX

When it comes to fit and comfort, latex — a naturally occurring material — is often regarded as having the edge over other polymers. It offers a high degree of dexterity and elasticity, delivers good grip in both wet and dry conditions and features effective insulating properties.

Latex can offer splash protection against some chemical families but performs poorly against oils and greases, which degrade the material and make it porous. It is also unsuitable for use with undiluted ketones and aldehydes.

Latex withstands tear reasonably well, although this depends on both the thickness of the material and how the glove is manufactured.

Once the go-to solution for disposable glove wearers, an increasing prevalence of latex protein allergy has led to the development of non-latex alternatives that offer similar levels of wearer comfort, without allergy risk.

NITRILE

Nitrile is a synthetic polymer that provides excellent resistance to puncture and abrasion. It is free of latex proteins and plasticizers, meaning that allergy risk is limited. New generation nitrile gloves are thinner and stronger than their predecessors, providing high levels of tactility, durability and sensitivity — particularly at the fingertip.

Nitrile is a suitable alternative across a range of applications and environments, particularly when multiple hazards are present. It is increasingly used because it offers a high degree of chemical resistance, although is not recommended for use with ketones or organic solvents. Nitrile is slightly stiffer than latex, which can compromise wet or oily grip capability.

NEOPRENE

Neoprene — or Polychloroprene — is another synthetic polymer. It's soft, yet strong, properties make it suitable for a range of demanding applications including clean, sterile and wet environments. It offers similar elasticity and comfort to latex alternatives, without the associated allergy risks, and is more elastic and dense than nitrile.

Neoprene offers excellent protection against acids and base chemicals but is not recommended for use with organic or hydrocarbon solvents. Its medium mechanical properties offer less resistance to puncture and abrasion than either nitrile or latex options.



POLYISOPRENE

Polyisoprene mimics all the positive attributes of latex without the associated protein allergy risks. It has good insulating properties, offers excellent elasticity and delivers superior sensitivity, dexterity and wet grip. It does not perform well in protection against oils and greases.

The material cost is higher than some other alternatives, making it prohibitive for some applications. It is generally reserved for use in surgical or industrial clean/sterile environments.

VINYL

The weaknesses associated with vinyl gloves generally outweigh the benefits. A low cost, low allergy-risk alternative, vinyl gloves offer good abrasion resistance, but are susceptible to rips and tears.

Vinyl contains plasticizers which may irritate the skin and makes it a less environmentally friendly option. It also features poor elasticity, does not hold its shape and degrades when in contact with fatty foods. Vinyl is not recommended for use with ketones and organic solvents.

SIDE-BY-SIDE COMPARISON

The following table summarises the performance of each polymer against specific criteria.

	LATEX	NITRILE	NEOPRENE	POLYISOPRENE	VINYL
Elasticity					
Puncture Resistance					
Strength (rip-tear)					
Wet Grip					
Dry Grip					
Chemical Splash Protection*					



* Chemical resistance is dependent on the specific chemical or chemical family. Always consult the glove material data sheet for information or request an Ansell Chemical Guardian assessment to determine the most appropriate choice for your application.

OTHER PHYSICAL PROPERTIES AND CONSIDERATIONS



“ The general properties of each polymer type serve as a useful guide in the selection of single-use gloves, but other characteristics should also influence the decision. ”

Whenever chemical resistance is a consideration, consult the material safety data sheet for the chosen glove option to ensure there is adequate protection against the substances in your specific application. The Ansell Chemical Guardian™ service matches glove materials to specific chemicals via a personalised assessment of workplace conditions and present hazards.

If the wearer is required to handle tools or equipment, opt for a glove that features a textured grip which will make it easier to carry out tasks, particularly where liquids are present.

A variety of glove lengths are available, and the optimum length

will vary from application to application and the hazards present. Acceptable Quality Level (AQL) is also a determining factor. In high-volume product categories such as disposable gloves, the manufacturing process delivers a certain number of defective items in every production batch and the AQL is a statistical value that indicates the acceptable amount of defective gloves in a batch. In the case of single-use hand protection, gloves with a low AQL will exhibit fewer defects per lot and higher levels of barrier quality and consistency overall. The lower the AQL, the more robust the glove, offering a higher resistance to rips and tears.

Despite the disposable nature of single-use gloves, the same decision criteria used for any personal protective equipment selection needs to be applied and understanding the basic construction material differences will certainly help guide the process.

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