

General Information on Gloves

1. What is natural rubber latex?

A white milky fluid obtained by tapping the bark of *Hevea brasiliensis* trees. The latex consists about 30% of rubber hydrocarbon finely dispersed in the aqueous medium. Like all living plants, latex from rubber trees also contains growth related substances such as proteins, carbohydrates and other organic and inorganic substances, albeit in small quantities. The latex has to be concentrated to about 60% dry rubber content and stabilized with chemicals to maintain its fluid state. The latex concentrate is then added with vulcanizing ingredients and other chemicals so that the mixed latex compound can be converted into finished goods by either dipping, extruding, or coating process. In the manufacturing of medical gloves, the dipping process is employed.

2. What are the benefits of natural rubber latex gloves?

- Natural Rubber Latex glove provides superior barrier protection against the transmission of viruses such as HIV, hepatitis B and C, and other blood-borne diseases.
- Natural Rubber Latex gloves also provide high strength and elasticity, comfort, fit and feel. All these properties of natural rubber thin film make natural rubber latex gloves, the perfect choice in glove selection.

3. What are the difference in characteristic for the latex, nitrile and vinyl material examination gloves?

CHARACTERISTIC	LATEX	NITRILE	VINYL
MATERIAL	Natural rubber latex from the rubber tree. Heven brazilliensis.	A synthetic copolymer made up from monomers of carboxylic acid, acrylonitrile and butadiene.	Polyvinyl chloride, a synthetic co-polymer.
BARRIER PROTECTION	Natural rubber latex has good film formation properties and the natural rubber latex film provides superior barrier protection.	Nitrile latex film exhibits comparable barrier protection as natural rubber if the film is continuous.	Vinyl gloves contain up to 40% plasticizers in order to provide the soft feel. As such, vinyl gloves are the least elastic among the three materials and provide the worst barrier protection.
STRENGTH	Superior.	Excellent strength and puncture resistance.	Limited.
ELASTICITY	High levels of elasticity, memory and elongation provide excellent fit.	Medium to High conforming to the user's hand with use.	Low to Medium, with moderate flexibility. Lower elongation properties result in a loose-fitting glove.
DURABILITY	High resistant to tear and puncture. Have superior dynamic durability.	High resistant to puncture and tear. Exhibits moderate dynamic durability.	Poor dynamic durability that declines with use, resulting in medium to high in-use failure rates.
CHEMICAL RESISTANCE (incidental exposure)	Depending on the type of chemicals in contact. Generally good.	Depending on the type of chemicals. Generally good to excellent.	Depending on chemicals. Generally poor.



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GLUTARALDEHYDE USE	Fair, AAMI recommended use for short-term, incidental contact only.	Excellent, recommended by AAMI.	Poor, not recommended by AAMI.
COMPATIBILITY WITH LOTIONS	Water-based only.	Water-based and petroleum-based.	Water-based and petroleum-based.
POSSIBLE GLOVE ASSOCIATED HEALTH RELATED REACTIONS	• Immediate Type I hypersensitivity caused by certain natural rubber latex proteins. • Delay Type IV hypersensitivity due to certain types of accelerators used in the vulcanization process.	• Delay Type IV hypersensitivity due to certain types of accelerators used. <i>(Nitrile gloves manufactured without chemical accelerators have been launched by KOSSAN under Chemax 7th Sense to address this issue)</i>	• Plasticizers used in vinyl gloves have shown to be carcinogenic. • Chemical Allergies (Type IV)
FIT AND COMFORT	Excellent, conforms to hand.	Good to Excellent, conforms to hand.	Fair, loose-fitting.
COST	Low to Moderate.	Moderate to High.	Low to Moderate.
RECOMMENDED USE	Optimal choice based on overall performance. Material strength supports use in high-risk situations and potential exposure to blood-borne pathogens.	Latex-like properties make this an ideal synthetic alternative for latex-sensitized individuals. Premier choice for use in high-risk situations, including infectious agents and most chemicals.	Low risk situations where exposure to blood-borne pathogens is limited and for short-term, minimal stress situations.



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4. What are the different classifications for surgical, examination and specialty gloves?

Surgical gloves are categorized as Class II medical devices according to the European Directive MDD 2007/47/CE. The gloves are designed specifically for surgical procedures. Surgical gloves are primarily used to prevent cross contamination between surgeon to patient and vice versa during invasive medical procedures. Examination gloves are categorized as Class I medical device and are designed for use when conducting non-invasive medical examination, diagnostic and therapeutic procedures and for handling contaminated medical materials. Examination gloves are primarily used to prevent cross contamination.

Specialty gloves are custom designed for protection against extreme conditions such as high-risk situations and dealing with chemotherapy materials. This will be further elaborated in section on PPE.

5. What are the differences between examination and surgical gloves?

Examination gloves are ambidextrous in design while surgical gloves are designed hand specific. Surgical procedures are extremely critical and require precision movements and hand specific design enables better fit and movement.

Examination Gloves are usually non-sterile while surgical gloves must be sterilized. The sterility of surgical gloves is essential to avoid bacteria or virus contamination to the patient wound during surgical procedures.

Examination gloves are normally thinner and shorter length compared to surgical gloves due to the nature of procedure which is less critical (non-invasive) as compared to the more critical surgical procedure.

6. Why do gloves come in different colors?

Generally, natural rubber latex gloves come in pale white colour. In an attempt to distinguish the synthetic gloves from the natural rubber gloves, pigment was added to the synthetic gloves. This will facilitate in glove selection, especially for people who have been sensitized by latex proteins and should not use natural rubber latex gloves. Nowadays, glove colors can often be used to help identify contamination or designated critical work areas. Some gloves are colored to differentiate the type of primary material used, as well as to clearly distinguish the subject of examination or surgery.

7. How do we determine the right glove size?

Use a tape measure to find the circumference of your hand around the palm.

This measurement (in inches) is the closest to your glove size. For example, if your hand measures 8 inches, you probably wear a size 8 glove.

8. When should medical-grade gloves be worn?

Due to the AIDS epidemic, the US recommended a strategy in 1985, known as universal precautions. The purpose of these precautions is to protect healthcare workers from exposure to blood and other body fluids from patients infected with bloodborne pathogens. Hence, medical-grade gloves should be worn whenever there is a probability of hand contact with skin, blood, mucous membranes, body fluids as well as cleaning and disposal of infectious materials and equipment. Healthcare workers are advised to change gloves after contact with each patient and do not reuse gloves.

9. What can you do to make sure the gloves will be an effective barrier?

- Select high quality gloves including the right glove size
- Adopt proper donning technique
- Consider the duration of glove wearing and removal
- Double gloving if needed
- Appropriate glove storage/usage
- Wearers of natural rubber gloves should avoid contact with oil-based lotion/hand sensitizers
- When wearing medical gloves, one should have well trimmed fingernails and remove all hand jewelry

10. How often should you change gloves?

- Between patients
- Between procedures
- If gloves become contaminated/prolonged contact with blood/body fluids
- Going to a clean site after working on a contaminated site
- If gloves are torn, cut or punctured
- Sterile gloves are contaminated by touching something non – sterile
- If gloves have been in contact with oils
- Gloves should be changed often during lengthy procedures

11. What are the Dos and Don'ts of glove use?

- Ensure hands are properly washed before and after donning gloves.
- Medical gloves are recommended for single use and should be immediately disposed after use.
- Do not leave gloves on along hallways or outside the examined area, as the gloves might contaminate or contract infectious agents along the way.
- Proper glove size and fitting is important. Tight fitted gloves will restrain movements resulting to hand fatigue while overlarge size gloves will affect dexterity causing spillage and error in precision.
- Gloves should not be stored under high temperatures as this will evidently cause product degradation.
- Always remember to remove gloves when handling office equipment and stationary to avoid contamination.
- During prolonged procedures, gloves should be changed periodically.
- Select proper glove characteristics for intended application such as grip, length, thickness, primary material, dexterity, cuff type, physical properties, surface treatment or coating, resistance to biological and mechanical hazards.
- Avoid direct immersion and prolonged exposure of gloves during handling of biological hazards.
- Double gloving provides a secondary line of defense against contracting infectious agents.

12. Why should we double-glove?

Double-gloving (wearing 2 sets of surgical gloves) minimizes the surgeons from potential exposure to bodily fluid during surgery. It provides a reassurance, especially in surgery where instruments with sharp edges are encountered and may cut or tear gloves.

13. What factors should be considered when selecting gloves?

TO REDUCE THE DEVELOPMENT OF :	CHOOSE GLOVES THAT ARE :
Irritation	• Low in endotoxin • Powder-free • Low in residual chemicals
Type IV – hypersensitivity	• Low in residual accelerators used in vulcanization process • Not using sulfur and accelerators vulcanizing system
Type I – hypersensitivity including occupational asthma	• If natural rubber gloves are used, select those with low extractable latex protein level and powder-free. • Select gloves made from synthetic latex such as nitrile latex.