KOSSAN

STRETCHING LIMITS • SINCE 1979

Quality, Standard & Regulations

1. Can 'single use' products be reused?

According to Annex I (13.6h) of the Council Directive 93/42/EEC, as amended by the Council Direction 2007/47/EC, concerning medical devices, we declare under our sole responsibility on the implication of reuse on single medical device. The reuse of single-use devices can affect their safety, performance and effectiveness, exposing patients and staff to unnecessary risk. Potential hazard has been identified as follow:

- Loss of sterility
- User may face allergy reactions
- Loss of glove barrier integrity
- Loss of glove physical properties

Single use medical device is intended to be used in surgical work and to be worn once and then discarded. The reuse of single-use devices has the following legal implications:

- anyone who reprocesses or reuses devices intended by the manufacturer for use on a single occasion bears full responsibility for the safety and effectiveness; and
- anyone who reprocesses a single-use device and passes it to a separate legal entity (for example, the independent healthcare sector) has the same legal obligations under the Medical Devices Regulations as the original manufacturer of the device.

2. What is the purpose of glove testing?

Glove testing is carried out to ensure that the products meet the national and international standards and specifications set for the products. It is also used to define and maintain product specifications, to monitor quality control and quality assurance of product and to measure the capability of the manufacturing process.

3. How do you define AQL?

AQL is the acceptable quality levels used in normal inspection. The AQL is defined in ISO as "When a continuous series of lots is considered, the quality level which for the purposes of sampling inspection is the limit of a satisfactory process average." When a specific value is designated for a certain nonconformity, it indicates that the sampling scheme will accept the great majority of the lots submitted, provided the quality level (percent nonconforming per 100 units) in these lots is no greater than the designated value of AQL. It is the maximum percent defective (or maximum number of defects) per hundred units that are allowed in a product LOT. However, it must be remembered that the AQL is a parameter of the sampling

scheme and should not be confused with the process average which is the operating level of the manufacturing process.

4. How do you quantify the protein and allergen levels in natural rubber (NR) latex products?

In attempts to measure the protein and allergen levels present in natural rubber latex products, several assays have been developed over the years. Quantification of proteins in NR latex gloves is of great interest both to the glove manufacturers and users. The amount present is, however, very much influenced by the manufacturing process.

Measurements of proteins or allergens are generally classified into two main groups; the chemical method and the immunological method involving ELISA. At the moment, measurement of total leachable protein of gloves by the modified Lowry tests appears to be the best available chemical method for manufacturers to monitor closely the extractable protein level of their gloves. Modified Lowry test is considered to be suitable for current production control, though it can be susceptible to chemical interference such as diphenyguadinine (DPG).

5. What is the Modified Lowry assay test?

The ASTM D 5712 described the Modified Lowry assay which is a chemical assay that measures all proteins. It was the first validated method and is available as a kit. The disadvantages of this assay are that it is not sufficiently sensitive to accurately quantitate low protein level and the assay is prone to the interference of chemical additives in natural rubber products. The ASTM D 5712 determines the concentration of total water – soluble protein present in a glove sample. The test results are expressed as micrograms of total protein per gram of product. The lowest limit of the test is considered to be less than or equal to 50 µg/g. This is currently the only test recognized by the FDA for the determination of the protein on latex devices.

6. What is the ELISA test?

ELISA is an abbreviation for "enzyme-linked immunosorbent assay." An ELISA test uses components of the immune system and chemicals to detect immune responses in the body. The tests are widely used to detect substances that have antigenic properties, such as proteins in NR latex. Various forms of ELISA assays are used to measure the level of antigens or allergens present in natural rubber latex gloves.

7. What is the LEAP assay test?

Unlike the chemical test, the LEAP assay is an immunologic method for the measurement of antigenic proteins. The Latex ELISA for Antigenic Protein (LEAP) is an ELISA that uses rabbit anti-natural rubber latex protein antibodies. The test is more sensitive than the Modified Lowry standard test and is also available as a kit. One of the drawbacks is that the assay format is not standardized. The test results are expressed as micrograms of antigenic protein per gram of glove. Currently, there is no regulatory requirement for antigenic protein testing.

8. What is the RAST inhibition test?

RAST stands for Radio-AllergoSorbent Test. The RAST inhibition assay is based on the reaction between the allergenic protein and the antibody (IgE). In the case of LEAP, the antibodies are IgG antibodies raised in rabbit, but in RAST inhibition assay, the IgE antibodies are from latex allergic patients. The RAST inhibition assay is a serological in-vitro test requiring only the blood serum containing the latex specific IgE antibodies. This test measures the allergenic protein level of gloves.

For the detection of glove allergens, RAST-inhibition and IgE-ELISA inhibition are being used. However, until now, it has not been possible to standardise these assays because of lack of availability of standardised human antibodies and standardised allergens.

9. What is skin prick test?

The skin prick test is a clinical text which has more specificity for latex allergens than those of the extractable protein measurements. The skin prick test evaluates the allergic reactions in-vivo whereby an aqueous protein extract introduced to an individual with an epidermal puncture. Reactions are gathered by measuring the typical wheal and flare reaction compared to a positive and negative control. A positive test result is an infraction of a latex sensitivity. It has been shown that the total extractable protein correlate relatively well with the skin prick test (SPT). One drawback of this test, however, is the availability of latex hypersensitive individuals, and their willingness to be tested.

Even though skin-prick testing is safe, it is essential that antihistamine medication and adrenaline should be readily available when performing allergen skin-prick testing. Although the technique looks quite simple, its interpretation requires a thorough clinical allergy history and an experienced practitioner.

10. What is patch test?

The test is carried out to test for rubber chemicals identified as specific chemical contact antigens often utilized in the manufacture of latex products. These suspected chemicals are mixed in a petroleum base which is applied to the patient's skin. Results are ready 38 to 72 hours later. The presence of a rash, vesicles or papules indicates positive response. A positive result is an indication of sensitivity to that specific chemical.

11. What is Modified Human Draize test?

The test is a dermal sensitization test performed to demonstrate the potential of the device for eliciting a delayed hypersensitivity (Type IV) immunological response through its contact with skin. The test is conducted by repeatedly applying latex glove patches to human skin over a 6 – week period time. The results are determined based on the degree of skin reaction that is observed during the period tested.

12. What are the glove standards for MDD Directives?

Medical Device Directive (MDD) – 93/42/EEC

- EN 455 Part 1, 2, 3 and 4: Medical Gloves for single use

EN 455-1: Specification for free of holes (barrier properties)

EN 455-2: Specification for physical properties

EN 455-3: Standard for the requirements and testing for biological evaluation (biological properties/labelling)

EN 455-4: Standard for the requirements and testing for shelf life determination of medical gloves for single use

13. How is the EN 455 1, 2, 3 & 4 divided?

EN 455-1: Specification for free of holes (barrier properties)

EN 455-2: Specification for physical properties

EN 455-3: Standard for the requirements and testing for biological evaluation (biological properties/labelling)

EN 455-4: Standard for the requirements and testing for shelf life determination of medical gloves for single use

14. Who is the Notified Body of KOSSAN?

- British Standard institution (BSi)
- Notified Body number 2797
- Symbol CE 2797

15. What does ASTM stand for and what are their responsibilities?

ASTM - American Society for Testing and Materials. It is a not-for-profit organization that provides a forum for consumers, manufacturers, citizens, organizations, government representatives, and academia, to meet and write standards for variety of products, services, and materials. The FDA recognizes the ASTM standards and they are listed in the US Federal Register. Glove manufacturers must conform to these consensus standards in order to meet the requirements set forth by the FDA for the particular type(s) of medical gloves that they market.

16. What are the current available ASTM Standards that are applicable for gloves?

ASTM STANDARD	STANDARD APPLICATION
D 3577	Standard specification for rubber surgical gloves
D 3578	Standard specification for rubber examination gloves
D 5250	Standard specification for polyvinyl chloride gloves for medical application
D 6319	Standard specification for nitrile examination gloves for medical application
D 5151	Standard test method for detection of holes in medical gloves
D 6355	Standard test method for human repeat insult patch testing of medical gloves
D 6124	Standard test method for residual powder on medical Gloves
D 6499	Standard test methods for the immunological measurement of antigenic protein in natural rubber and its product

17. What is ISO? Are there relevant medical glove standards in ISO?

ISO means International Organization for Standardizations. ISO regularly publish standards which are audited for compliances by sanctioning organizations called "Notified bodies".

The relevant rubber medical glove standards are developed by the ISO Technical Committee TC 45, Sub Committee SC 4. These are:

- ISO 11193 Single-use medical examination gloves -- Part 1: Specification for gloves made from rubber latex or rubber solution
- ISO 11193-2 Single-use medical examination gloves - Part 2: Specification for gloves made from poly(vinyl chloride)
- ISO 10282 Single-use sterile rubber surgical gloves -- Specification

Other standards developed by ISO which are relevant to the glove industry are those related to Quality Systems, ISO 9001: Quality systems for design, development, production, installation and servicing and ISO 13485 Medical devices -- Quality management systems -- Requirements for regulatory purposes

KOSSAN's ISO Quality System Certification includes : BS EN ISO9001, & BSEN ISO13485.