Rubber as material for closures-their merits and demerits

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CLOSURES:

A closure is the part of the package which prevent the contents from escaping and allow no substance to enter the container.

Closures are available in five basic designs:

Crew on, threaded or lug

Crimp on(crowns)

Press on(snap)

Roll on and

Friction

Threaded screw cap:

- When a screw cap is applied, its threads engaged with the corresponding threads molded on the neck of the bottle.
- ➤A liner in the cap, pressed against the opening of the container, seals the product in the container and provide the resistance to chemical and physical reaction with the product.
- ➤ The screw cap is commonly made of metal or plastics. The metal is usually tin plate or aluminum and in plastic is thermoplastic and thermosetting material.





Lug cap:

- > The lug cap is similar to the threaded screw cap and operates on the same principle.
- It is simply an interrupted thread on the glass finish, instead of a continuous thread.
- Unlike the threaded closure, it requires only a quarter turn.
- The lug cap is used for both normal atmosphere pressure and vacuum pressure closing.



Crown caps:

This style cap is commonly used as a crimped closure for beverage bottles.

Roll-on closures :





- The aluminum roll on cap can be seal securely, opened easily and resealed effectively.
- Resalable, non resalable and pilfer proof types of roll on closures are available for use on glass or plastic bottles.



Pilfer proof closures

- > It is similar to roll on closure but has a greater skirt length.
- This additional length extends below the threaded portion and fastened to the basic cap by the series of narrow bridges.
- When the closure is removed the extra portion remains in the space on neck of the container, this indicates that the package has been opened.



Rubber

- Rubber is used mainly for the construction of clouser meant for vials, transfusion fluid bottles, dropping bottles and as washers in many other types of products.
- In the natural rubber which is the latex of Heava brazillensis the following additives are added to change its physical and chemical properties:
- 1. Activators such as zinc oxide, steric acid and zinc stearate.
- 2. Filters such as asbestos, carbon black and calcius carbonate.
- 3. Vulcansing agents such as sulphur.
- 4. Accelerators such as thiazoles
- 5. Lubricants such as talc and zinc stearate.
- 6. Pigments such as oxides and sulphides of antimony, cadmium and iron.
- 7. Softeners such as mineral oil and pine oil.

Rubber, whether natural or synthetic, must process the following properties, in order to be used in pharmaceutical industry

- It should be soft.
- It should be quite elastic.
- It should be not absorb medicaments.
- It should withstand the temperature and pressure of an autoclave
- It should be compatible with the ingredient of pharmaceutical formulation.
- It should fulfill all the standards which are laid down by the pharmacopoeia.
- It should be impermeable to moisture and air.
- It should release only negligible amount of undesirable substances.

THANK YOU