



# Peroxide Cured vs Platinum Cured Silicone Tubing

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Navigating tubing and hose selection in the medical and pharmaceutical industry presents selectors with a unique set of challenges. Having the most information relative to the suitability of the individual choices for custom applications is always assistive in the final selection process. With regard to which tubing, peroxide cured, or platinum cured silicone, is the best for each unique use, the technical team at NewAge is pleased to offer guidance on efficiently selecting the best choice.

Silicone Curing: Strength and Stability

As a thermoset material, silicone undergoes a chemical reaction, known as crosslinking (image 1), to be cured or molded. Silicone tubing forms the basis for both peroxide cured and platinum silicone tubing. The crosslinking process forms covalent bonds between the silicone’s polymer chains thus strengthening the material by preventing the polymer chains from freely flowing past one another as they would in a thermoplastic material. This is especially beneficial in applications (table 1) that require dimensional stability at high temperatures and low shrinkage in cold temperatures.

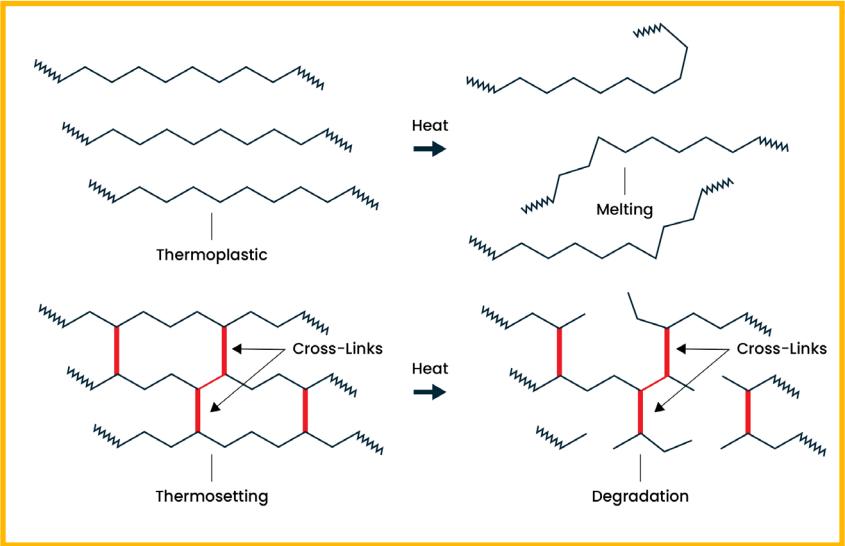


Image 1

High Temperature Applications	Low Temperature Applications	High and Low Temperature Applications
Automotive	Construction	Food and Beverage Processing
Manufacturing Refineries	Medical	Laboratory Material Transfer
Aerospace	Electrical	HVAC and Plumbing

Table 1

There are two types of silicone rubber often used in manufacturing: High Consistency Rubber (HCR) (image 2) and Liquid Silicone Rubber (LSR) (image 3). Depending on the base silicone formulation properties such as, mechanical properties, optimal temperature range, and appropriate catalyst, can vary.

# High Consistency Rubbery (HCR)

HCR could be described as the heavier duty option because of its higher molecular weight and longer polymer chains. Due to the high molecular weight its viscosity is also high. As a result, HCR is portioned out and milled with a catalyst before curing. The curing process can occur at room temperature over time or expedited with heat. HCR's thickness makes it a great material for applications requiring a thick-walled tubing such as industrial hoses and equipment.

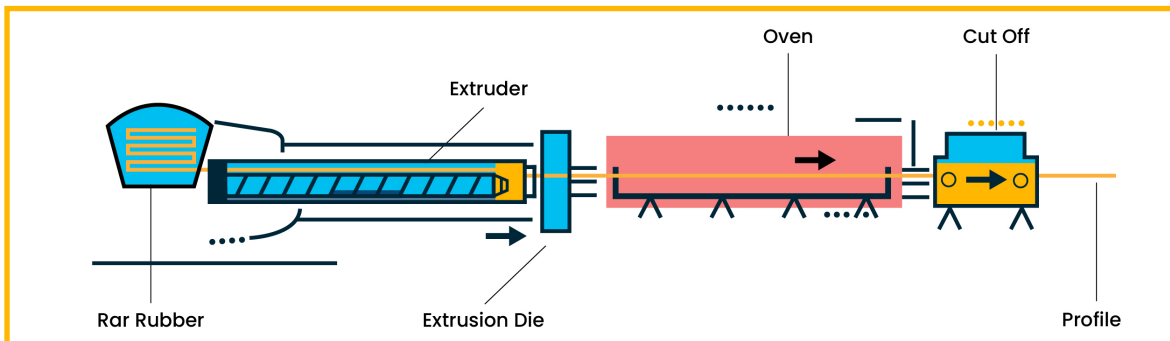


Image 2

# Liquid Silicone Rubber (LSR)

LSR on the other hand, has a lower molecular weight and shorter polymer chains so it's generally thinner and less viscous. As a result, the process, unlike that of HCR, occurs in two parts. First, the catalyst, siloxanes and inhibitors are metered together. The mixture is then injection molded into its final form. This cures much faster compared to HCR and would be ideal for applications requiring thin-walled or intricate tubing such as food grade tubing.

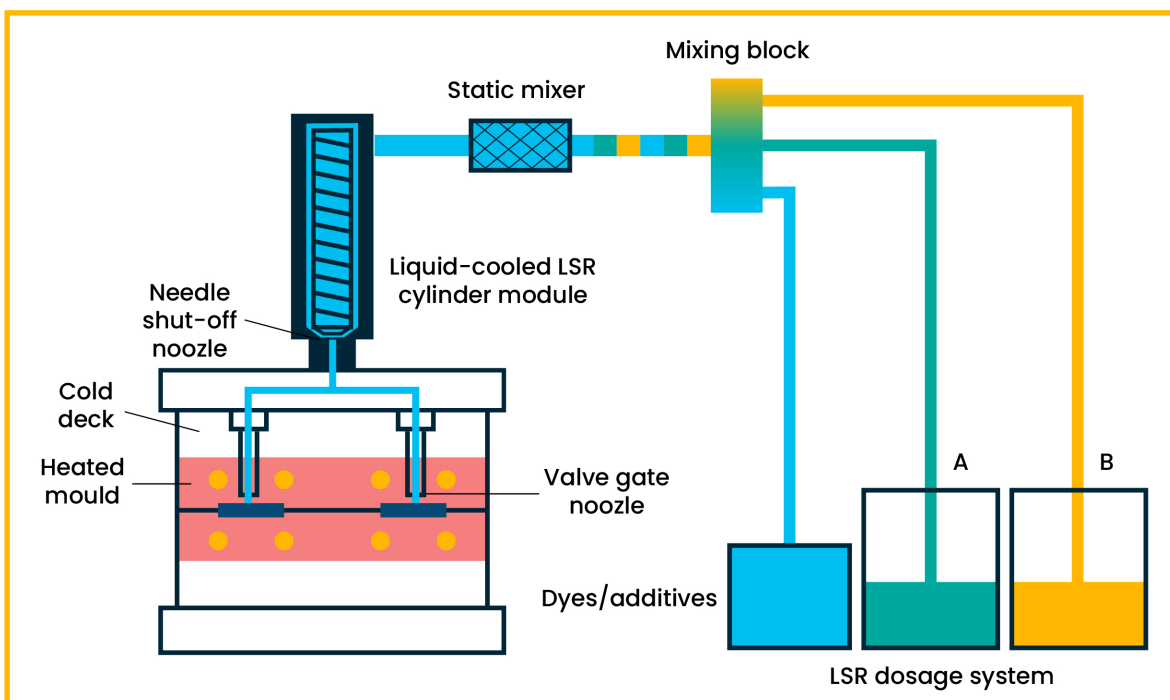


Image 3

# Choosing the Right Catalysts

Two of the most prevalent catalyst options are peroxide and platinum.

## Peroxide Catalyst

Peroxide catalyst uses compounds that are generally easier to procure. This ease allows for a reduced raw materials and subsequently final product cost. The process does tend to leave byproduct of unreacted peroxide which may affect color and cause blooming. To account for this, many manufacturers include a post-cure bake and cleaning of the products to reduce the amount of blooming that will occur over the life of the product.



Peroxide Treated Silicone



Platinum Treated Silicone

## Platinum Catalyst

Platinum, unlike the compounds in peroxide catalyst, is more difficult to procure. As such, the raw materials and final parts may be more expensive. The process using platinum as a catalyst involves no byproducts and may be preferable for applications requiring high purity like medical devices requiring biocompatibility or food contact surfaces. In addition, platinum cured silicones will have more transparency than a peroxide counterpart.

## Choosing the Right Cure

When deciding on which is best suited for your application it is important to consider budget, compliance, sterilization, and mechanical properties related to the application. As always, our experts are here to help make your journey as easy as possible.

## More About NewAge Industries

In business since 1954, NewAge Industries manufactures plastic and rubber tubing in reinforced and unreinforced styles. The company maintains a large inventory of tubing and fittings for its core product lines, provides custom extrusion and fabrication capabilities, and services customers worldwide.

Additionally, NewAge Industries is proud to be ISO 9001 certified, demonstrating our commitment to quality and continuous improvement.





# Bibliography

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