

## Common Silicone Rubber Products

Liquid silicone rubber is a very unique and special material used in many products. Its environmentally friendly characteristics, durability, sterility and tear resistance make it an ideal for a wide scale of applications. Silicone rubber has some unique properties such as excellent electrical properties, high chemical resistance, and can be used in temperatures ranging from  $-50^{\circ}\text{C}$  to  $+200^{\circ}\text{C}$ . More over it is also translucent and can readily be colored. They are resistant to temperature extremes, sunlight and aging. They are increasingly being used to substitute for organic rubbers, because of their advantageous properties, such as high and low temperature stability, inertness (no smell or taste), low toxicity, numerous options for coloration and transparency, combined with good electrical properties. The hardness range is wide, from 10-80 Shore A (WP, 2006). With its ultimate resistance for mechanical shocks and other unexpected influences, silicone rubber can withstand pressure of many tones, so sealants made of silicone rubber are the best choice sealing, shaping and manufacturing sealed compartments and containers such as aquariums due to the fact that its huge durability and really high performance is the best component for fulfilling crevices, joints and any kind of gaps. Silicone's durability and high resistance for many different (and often dangerous) substances makes it one of the best materials for manufacturing any kind of seals or sealants. Using silicone rubber can prevent the penetration of oils, water, gases or noise. Silicone is also used for waterproofing parchment paper or manufacturing heat-resistant kitchen utensils and dish-ware. Silicone has great affinity for many chemicals, it has great resistance for many other external factors. Because of its sterility it very rarely has an allergic reaction with soft skin, so it's a perfect material for manufacturing medical devices such as implants, hearing aids, rubber gloves, condoms, sanitary napkins and many others.

The development of silicone rubber with improved physical strength and excellent dielectric and moisture resistant properties have resulted in the application of these materials as primary insulation for transformers, large industrial motors and traction equipment (Naegele et al, 2006). These applications have taken advantage of the natural properties of silicone rubber that are superior over other insulating systems. Silicone rubber is used widely in the following products: automotive applications, electrical/electronic applications, components/seals for medical devices in health care, in cooking, baking, and food storage products, in textile industry, in footwear industry and for making gaskets, domestic appliances, fabric coatings (e.g. airbags), baby bottle teats, and medical devices. Silicone rubber is compression-molded to form gaskets, seals, O-rings, flat sheets, fabric reinforced laminates, and many other types of industrial rubber goods, of almost any size desired. Silicone rubbers are frequently used for the extrusion molding of tube, tape, sheet, wire and cable coatings and the like because these rubbers offer an excellent heat resistance, cold resistance, weathering resistance, and electrical characteristics. Silicones have been in use in medical applications for over 30 years because of their long-term stability and biocompatibility. High gas permeability is a positive property in many medical devices; silicones have up to 400 times the permeability of butyl rubber at room temperature. A particular grade of liquid injection molded silicone rubber is ideal for applications where contamination is a problem or where high volumes are required. The Medical Industry prefers this grade because it is a closed system of molding, meaning, the pail or drum kits of uncured liquid silicone are loaded into the pumping system, injected and cured without human contact (KDL, 2007). Liquid Injection Silicone Molding is also ideal because of it is less expensive compared to other products. Silicone rubber is also used in cosmetic applications, where its several options for coloration and sensory properties are important (a soft, skin-like touch and appearance can be achieved) (WP, 2006).