

## Bringing Color and Performance to Life

From tubing to tires and cake pans to keypads, silicone rubber is integral to many manufacturing and production processes.

A unique synthetic elastomer, silicone offers professionals the options they need for creative and innovative design and engineering. It is easy to formulate, easy to manufacture, applicable to most trades and available in varying colors and hardness.

### Efficiency ●●●

Silicone rubber is extraordinarily versatile and convenient and offers processors a wealth of design opportunities. Silicone rubber flows easily and can be molded, pressed or extruded using relatively low amounts of energy, simplifying production. Rubber formulations resist temperatures and chemicals, and the fast curing properties maximize productivity in industrial packaging and assembly. Professionals can use a ready-to-process compound to make an end-product or they can combine the compound with others for a particular product with complicated technical requirements.

Silicone rubbers are indispensable in sophisticated, high-tech applications and have an increasing number of applications for new markets. Used with the right technologies, silicone rubber provides innovative manufacturing solutions, particularly when it comes to streamlining automated production, for example, in industrial mold making. Industries that benefit from silicone rubbers include:

- Automotive and transportation (including aerospace and aviation)
- Mechanical engineering and chemical engineering
- Electrical equipment
- Cable
- Household goods
- Medical devices

### Reliability ●●●

Silicone rubber is reliable and cost-effective. It is the preferred choice in many high-end processing and manufacturing applications that require quality, cost-effective production. Because it comes in a variety of formulations for curing, molding and manufacturing, it helps businesses streamline their processing while ensuring consistent quality production. Silicone rubber products do not produce unwanted odor or byproduct and are hypoallergenic. Since these products are easy to clean, they do not require harsh, damaging solvents that can pollute the air or water.



## Performance ●●●

Processors, manufacturers and craftspeople have sophisticated needs that require rubber that is easy to cure, easy to manufacture, cost-effective and of a consistent quality. Silicone rubber outperforms many other organic elastomers and is distinguished by its wide range of complementary physical, mechanical and chemical properties:

- High- and low-temperature stability and compression resistance
- Flexibility
- Tear strength
- Long-term tensile strength and elongation properties
- Inertness – no taste, smell or unwanted byproduct released in production
- Translucent and easy to color
- Varying degrees of softness and hardness
- Chemical resistant
- Weathering and aging resistance
- Ozone and oxidation resistance
- Exceptional sealing and bonding properties
- Excellent insulation properties
- Flame resistance
- Fungus resistance – poor growth medium for mold and fungus in warm, damp environments
- Resilience and damping factor
- Can modify coefficient of friction (friction between two materials) as needed

## Typical Applications

Many industries have embraced silicone rubber and its technology and continue to discover new applications to meet their market demands. Some applications are discussed below.

## Automotive Industry ●●●

Silicone rubber is used in virtually every aspect of the automotive industry. Excellent electrical insulation properties, heat and chemical resistance, weatherability, adhesive properties and tear strength are but a few of the key properties that make silicone rubber particularly useful for automotive manufacturers and component suppliers.

## Examples of Applications:

- **Sealants** – Self-lubricating silicone rubbers create strong, durable, airtight seals for everything from headlamps to oil filters.
- **Gaskets** – Silicone rubber forms a leak-proof and durable seal that will not crack or split under extreme pressures and temperatures.
- **Connectors** – Silicones protect electrical connections, including electrical plug-and-socket connections, against moisture and corrosion.
- **Spark Plugs** – Crucial to optimum ignition, silicone rubber provides reliable protection against water spray, moisture and dirt. It also has good electrical insulation properties and high heat resistance.

- **Tires** – Silicone enhanced low rolling resistance tires have an equal wear life compared to conventional, carbon black-rubber filled tires but have reduced fuel consumption and superior traction.
- **Radiators, heat exchangers and water-pump gaskets** – These products benefit from rubber that transports anti freeze rubbers without a corroding effect.
- **Cylinder head gaskets, engine covers, valve covers, oil pumps or oil pans** – These products benefit from oil-resistant and heat-conductive silicone rubbers that help with heat dissipation.

## Aviation and Aerospace ●●●

Extreme temperature resistance, stability with extreme environmental and chemical stress and durability are some of the many reasons silicone rubber benefits aviation and aerospace. Silicone rubber sealants fasten interior and exterior doors, windows and paneling. Fluid resistance makes rubber ideal for fuel control diaphragms, hydraulic lines and cable clamp blocks. Silicone rubber keypads are even used in computers on earth and in space.



## Bakeware and Cookware ●●●

Bakeware is sturdier, convenient, easy to use and long-lasting when made with silicone rubber. The flexible, non-stick surface is easy to clean and does not impart any flavor or odor. Materials can go from the freezer to the oven, microwave or dish-washer without affecting the quality of the product or the food. Products enhanced with silicone rubber include:

- Baking mats
- Baking molds
- Cake pans
- Flexible bakeware
- Garlic peelers
- Ice cube molds
- Pan and gadgets holders
- Spatulas
- Utensils

## Cable Accessories ●●●

The cable sector uses silicone rubber for cable terminations, connectors, insulators and surge arrestors used indoors and outdoors. High voltage liquid silicone rubber is ideal for energy transmission and distribution.

## Electronics Industry

Silicone rubber is essential to the electronics sector, where highly specialized applications make extreme demands on sealing materials. Silicone rubber is used to insulate, seal and protect circuits, engine gaskets, control unit gaskets, electronic encapsulation and special elements for decoupling noise.

## Engines ●●●

Silicones are important in industrial manufacturing where engines place extreme demands on the heater hoses and coolant hoses. Due to their stability with temperature fluctuations and burst strength properties, silicone rubber hoses remain resistant to kinks and vacuum collapse.

## Medical Devices and Veterinary Applications ●●●

Health care professionals can use silicone rubber products with confidence. Silicone rubber retains its performance qualities and does not contain plasticizers, animal-derived ingredients or natural rubber latex that could generate unwelcome by-products that could affect people or animals.

## Molding ●●●

Silicones are ideal for making all kinds of sturdy, yet flexible molds for industrial manufacturers, artists or craftspeople. Silicone rubber compounds are easy to process, require no expensive equipment and have adjustable working times and cure rates. Flexibility and outstanding release properties mean silicone rubbers separate easily from a model and can be used over and over again. Silicone rubber prototypes are used for design and working models, wax models or small production runs. Silicone molds are helpful in all types of reproduction material including wax, plaster, concrete, casting resin and low-melting alloy.

Silicone rubber is used in industrial mass production of:

- Artistic replications (collectibles, sculptures, figurines, statues, artifacts)
- Costume jewelry and ornamental buttons

- Electroformed parts
- Food moldings (ice, chocolate, sweets)
- Imitation leather
- Plaster working molds for the manufacture of porcelain and sanitary ceramics
- Ornamental door, window, mirror and picture frames
- Ornamental fronts for furniture

Silicone rubber is used in reproduction and copies of:

- Archeological findings
- Architectural fabrication
- Furniture parts
- Hobbyist applications
- Museum pieces
- Reconstituted stone items

## Semi-Conductors ●●●

Silicone rubber-encapsulated semi-conductors are used in industrial motors, locomotives and power supplies requiring high voltage switches; high frequency communications such as cell phone base stations, satellites and radar; and high temperature applications for aircraft engines, oil drilling and automotive electronics.



## Toy Manufacturing ●●●

Toys and play equipment made with silicone rubber are durable, tear-resistant, chew-resistant, weather resistant, water resistant, pleasing to touch, easy to color and can be sterilized at high temperatures.

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