

Classification

The special properties of silicone rubber are a result of their particular chemical. They are unique in their kind because they combine the qualities of the silica, mineral filler, with those typical organic materials. In fact while the organic polymers are characterized in their principal structure by bonds carbon-carbon, silicone rubbers replace the carbon atoms with the couple silicon-oxygen. This particular verifiable combination, present also in other materials as quarts, glass or sand, positions these materials among those with very high temperature resistance. The silicone rubbers are insensitive to ozone attack, atmospheric agents and they show good dielectric characteristics. The side organic substituents to the principal polymeric chain also confer an elevated flexibility without the aid of particular additives.

Polymer type

At last, "tailor-made" elastomers are available from the chemical point of view to get specific properties. The presence of methyl groups is essential but their partial substitutions with phenyl groups improve the flexibility at low temperatures and gamma radiation resistance.

Vinyl groups give more adjustable vulcanization speed with an improvement of the compression set. Contrarily the presence of these substituents, characterized by a double bond, can represent potential point of attack from aggressive agents as ozone.

		VMQ	PVMQ	VMQ
Hardness ShA	Pti	60	65	50
Tensile strength	Mpa	7	8	7
Elongation	%	350	400	260
Compression set 24 H @ 175°C	%	25	40	15
Heat Resistance 70 H @ 200°C				
Tensile strength	%	-15	-20	-20
Elongation	%	-20	-18	-10
Hardness ShA	Pti	+6	+4	+3
ASTM N.3 70 H @ 150°C				
Volume	%	+2	+3	+3
ASTM Fluid B 70 H @ 73.4°F				
Volume	15	+40	+75	+50
Brittle Point	°C	-60	-95	-60

Applications

With silicone rubber it is possible to produce compounds with a hardness range between 20 and 80 ShA. The typical cure system is based on peroxides. Recently polymers with vulcanization by poly-addition have been set. Such polymers offer notable advantages in process and the final items do not give the typical peroxide odor.

The process technologies used for silicone compounds are typical of rubber industry and the end users of technical articles involve automotive, electronic industries, medical and food sectors, aerospace and construction. The most common applications concern seals, gaskets, membranes, cables, electric connectors, pipes, cylinders sanitary and surgical articles.