

Expanded Silicone Rubber Sponge - Grades SIL10, SIL16, SIL24 & SIL33

Introduction

Silicone rubbers are substances whose chemical skeleton is made up of extremely stable silicon - oxygen linkages. Silicone rubbers are chemically related to quartz and glass and many of their excellent properties are similar to those of the latter materials. The molecular structure of silicone avoids the rigidity of the organic groups on every atom and during vulcanisation they are cross linked to form a three dimensional, flexible, rubber like substance. Inorganic fillers are embedded in the latticework structure and have a decisive effect on the general properties due to the reciprocal action between the filler and high siloxanes. As with other kinds of rubber, the physical and chemical properties of silicone may be varied by the appropriate selection of filler and catalyst.

Description And Product Characteristics

After vulcanisation the general appearance of expanded silicone is a fine non-interconnecting cell structure encapsulated by a soft smooth outer skin. Density of structure is varied to suit the required application. Skin tear resistance varies with density. Due to the severe blowing action during vulcanisation there can be an element of curve along the length and cross sectional surface of the extrusion and is particularly evident on thin wide strip. Every effort is made to minimise this effect.

General Properties

- 1 Resistance to ultra-violet light, corona, arcing and ozone is good.
- 2 Oxidation, which quickly destroys organic elastomers is virtually non existent with silicone rubber.
- 3 With a low degree of moisture absorption the mechanical properties show little change, even after long periods of immersion. However, superheated water will cause the silicone to break down after continuous immersion.
- 4 Expanded silicone possesses valuable non-stick properties.
- 5 Silicone rubber is little affected by moisture in the form of free steam. However, with increased pressure, effects upon the structure of the rubber become greater. Expanded silicone is not recommended for long term service where steam pressure exceeds 50 psi.
- 6 Expanded silicone is excellent for Vibration damping, protecting and cushioning components, seals and gasketry.

Chemical Resistance

Generally, silicone is resistant to moderate or oxidizing chemicals, but is attacked by many solvents, oils and concentrated acids when in direct contact.

Temperature Limitations

SAMCO expanded silicone offers designers a versatile product capable of withstanding temperatures from -60°C up to +200°C continuous use. Exposure at elevated temperatures will have a limiting effect on the life of this material.

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Colours

Normally expanded silicone is off-white in colour on all standard grades. Colours are readily available to customers' requirements, but some depth of colour can be lost during the process.

Compression Recovery At Temperature

We do not generally recommend a compression loading greater than 25% when used in working temperatures between 100°C to 200°C. Structure collapse will occur on loading above 25% and an increase in compression set is more evident on thinner sections.

Tolerances And Random Sampling

Tolerances on dimensions vary according to the size and engineering complexity of the extruded form. Unless specified SAMCO manufacture generally in accordance with DIN7715 (German) guidelines. Random sampling procedures are generally based on BS6001 Inspection Level 1.

Expanded Silicone And The Environment

Expanded silicone does not contain any CFC's and is manufactured under contained conditions.

Handling And Health And Safety Information

- 1 Fully post cured to "burn off" the volatiles in the rubber to leave a near toxic free product. Additional additives only constitute 7% of the total mix, which is primarily silicone gum (Methyl Vinyl Polysiloxane).
- 2 The occupational life of the product is difficult to evaluate on an individual basis and depends largely on the working environment. Shelf life at least 10 years.
- 3 We recommend no special precautions for handling or storage, but do stress that the product be bagged or boxed to protect it from accidental damage.
- 4 **Fire situation:** In a fire situation the product will decompose to a fine dust/ash. We recommend that care be taken to avoid inhalation of fumes or dust during such circumstances and advise adequate protection must be worn (dust masks, eye protection and clothing) when cleaning away all fire damaged material as a precaution.
Test reports to the following are available upon request: Burning Rate Test to BS 4735: 1974 Fire Hazard Test to NES 713 (Issue 03).
- 5 For the safe disposal of expanded silicone, after use, we recommend you follow National or Local Authority Regulation guidelines.
- 6 The product is of a low order of toxicity. It is non-flammable, but will burn for a short duration if ignited by high temperature naked flame.
- 7 **Food Contact:** Although we do not generally recommend direct contact with food, expanded silicone is used in the food processing and the pharmaceutical industry. Raw materials used within the process have **FDA** approval. Company personnel have been directly involved in the handling and processing of the product at all stages of production for over 15 years and have not experienced any health problems.

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Technical Data				
Property	SPEC	SIL16	SIL24	SIL33
Temperature Resistance (°C)				
Continuous		-60/+200	-60/+200	-60/+200
Intermittent		+250	+250	+250
Thermal Conductivity (W/(M.K))		0.069		
Compression Set (%)	BS4443	15%	15%	10%
Compression Deflection (Kpa)				
25% Compression				
On Thick	ASTM1056	13	N/A	N/A
Tensile Strength (Mpa)	BS4443			
10mm Thick	DIN53504	0.64	1.10	1.60
Elongation At Break (%)	BS4443			
10mm Thick	DIN53504	145	175	205
Compression Loading (N/Mm2)				
1mm Thick	BS4443	0.049	0.093	0.233
Chemical Resistance				
Oil		Not Good	Not Good	Not Good
Uv		V Good	V Good	V Good
Ozone		V Good	V Good	V Good
Electrical Charge		V Good	V Good	V Good
Water		V Good	V Good	V Good
Acid		Not Good	Not Good	Not Good

Physical Data				
Property	SPEC	SIL16	SIL24	SIL33
DENSITY (kg/m3)	BS4443 DIN53520	250	400	550
DIMENSIONS (mm)				
FORMAT	DIN7715	1000X600	1000X600	3mm-10mm
THICKNESS		1.5-20mm	1.5-20mm	Sheet Size Subject To Thickness

Note: The test methods alone do not assess the fire hazard of the material or products made from the expanded silicone under actual fire conditions. The results above should only be used for guidance in product development, quality control and material specification.