



Technical Data Sheet

DOWSIL™ 3-6548 RTV Silicone Foam

Two-part silicone rubber foam

Features & Benefits

- A fire rating of up to 4 hours can be achieved
- Approved by Lloyds Register
- Prevents smoke and gas penetration through the seal
- Forms to complex, irregular shapes
- Blank penetrations can be filled for future cable installations
- Long service life
- Resistant to ozone, ultra-violet radiation and temperature extremes

Applications

- For sealing of linear gaps and fire rated penetrations containing pipes, cable or ductwork

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Test	Property	Unit	Result
	As supplied		
	Physical form		Flowable liquid
	Color and consistency		Dark gray elastomeric foam
CTM092A	Snap time ¹	minutes	1.5
CTM0812	Density ²	kg/m ³	300
CTM0826	Cell structure, closed cell ³	%	> 50
	Tensile strength	MPa	0.23
CTM0525	Compression deflection		
	40% compression	MPa	0.07
	60% compression	MPa	0.15
CTM069	Thermal conductivity ⁴	W/(m.K)	7.5x10 ⁻²
	K factor, 270 kg/m ³ foam	W/(m.K)	7.8x10 ⁻²

1. Time to non pour condition. Also, time to begin foam rise.
2. Power mixed for 30 seconds and cured in nonconfined condition.
3. Breathability method.
4. Cenco Fitch Method.

Typical Properties (Cont.)

Test	Property	Unit	Result
CTM 0585	Linear coefficient of thermal expansion (25°C to 150°C/13°F to 302°F)	1/°C	3.2x10 ⁻⁴
		1/°F	1.8x10 ⁻⁴
	Volume coefficient of thermal expansion (25°C to 150°C/13°F to 302°F)	1/°C	9.26x10 ⁻⁴
		1/°F	5.1x10 ⁻⁴
ASTM E84	Flame spread rating		6.7
CTM 0780	Limiting oxygen index	% oxygen	35
CTM 0114	Dielectric strength	kV/mm	6.6
	Dielectric constant at 100 Hz		1.95
	Dissipation factor at 100 Hz		0.00505
	Volume resistivity	ohm.cm	2.24x10 ¹⁵

Description

DOWSIL™ 3-6548 RTV Silicone Foam is a two-part room temperature vulcanizing (RTV) silicone foam that has been specially formulated to have fire resistant properties coupled with good flexibility under the most demanding conditions. It has been developed to withstand high temperatures and to confine such hazards as smoke, fire and gases.

Technical Specifications and Standards

DOWSIL™ 3-6548 RTV Silicone Foam has been tested and classified according to the following standards:

- EN1366-4, linear joints in floors, classified up to EI 180 according to EN13501-2
- EN1366-3, penetration seals in floors, classified up to EI 60 according to EN13501-2
- BS 476 Part 22, penetration seals in walls, up to 4 hours fire rating
- Fire resistance tested according to UL1479 (through penetration Firestop systems); classified up to three hours FT depending on detailing (walls and floors)
- Fire reaction tested, classified E according to EN13501-1
- IMO-A517 (XIII) H0, H60, H120 ratings
- IMO-A517 (XIII) A0, A15, A60 ratings
- 148 kN/m² Blast resistance
- Approved for railway standard EN 45545-2, R22-HL3

Fire Ratings

Fire test data is available showing that DOWSIL™ 3-6548 RTV Silicone Foam can achieve up to a 4 hour fire rating (integrity and insulation) at specified joint and penetration configurations in floors and walls. Table 1 shows the Test Reports held by DOWSIL™ 3-6548 RTV Silicone Foam. Interpolation within the tested range between the maximum and the minimum nominal joint width is permitted provided the overall seal depth including the backing material is equal or higher. Further rules defining the extended application process of the test results are available.

Typical Foam Linear Joint Installation

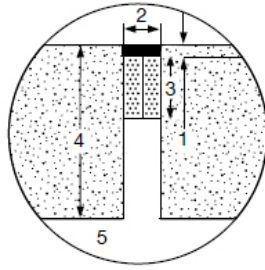


Figure 1

Legend

1. DOWSIL™ 3-6548 RTV Silicone Foam
2. Joint width
3. Backing (mineral wool) thickness
4. Fire rated supporting construction thickness
5. Fire side

Typical Foam Installation in Penetration Seals

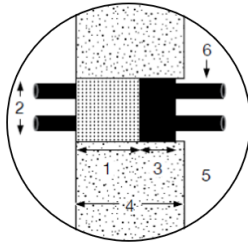


Figure 2

Legend

1. Fire rated backing thickness
2. Penetration size
3. DOWSIL™ 3-6548 RTV Silicone Foam thickness
4. Fire rated supporting construction thickness
5. Fire/non fire side
6. Penetrating items

Penetrants shall be correctly positioned (including spacing between penetrants) to ensure that the DOWSIL™ 3-6548 RTV Silicone Foam will achieve the required fire rating and will be able to accommodate movement of the penetrants.

Typical Foam Installation in Penetration Seals (Cont.)

Table 1: Fire Resistance Test results for linear joints and penetration seals in walls and floors.

Test Standard	Penetrating Items	Fire Rating
EN1366-4	None, linear joints	Up to EI 180
EN1366-3	None, multiple penetrant types	Up to EI 60
BS 476 Part 22	None, multiple penetrant types	4 hours
148 KN/m ² Blast Test	Multiple steel pipes	See below
FRS 14-84	Multiple steel pipes	2 hours following blast test
IMO-A517 (XIII)	Multiple steel pipes	2 hours
IMO-A517 (XIII)	Single steel pipe	2 hours
IMO-A517 (XIII)	Steel pipes	H0, H60, H120
IMO-A517 (XIII)	Cable trays	A0, A15, A60
IMO-A517 (XIII)	Steel pipes	A0, A15, A60
BS 476 Part 22	100 mm Ø, steel pipe, cable tray	3 hours
UL1479	Various designs	Up to 3 hours FT

- Note: To achieve the correct fire rating, the penetration seal must be correctly designed. Full details of the penetration tested to the above standards are included in the individual reports and attention should be paid to the requirements for insulation materials on the penetrating items.
- In addition, a large amount of information is available from Dow, including fire testing to Underwriters Laboratories (UL) standards.
- For further information regarding the fire performance of DOWSIL™ 3-6548 RTV Silicone Foam, including the design of penetration seals, please contact the Technical Services Department.

Substrate Preparation

Adhesion

DOWSIL™ 3-6548 RTV Silicone Foam seals by compression rather than adhesion. However, if adhesion is required in a particular application, primers can be used. In these instances, contact technical support for further advice.

Damming Method

Damming materials are required to contain the liquid foam while it expands and cures. These may be formed from combustible or non-combustible materials. Combustible damming materials should be removed as soon as the foam is completely cured. Non-combustible damming materials may be used as an integral part of the fire seal, but materials used in this way must be as specified in the relevant fire test report.

Substrate Preparation (Cont.)

Damming Procedures

- a) For the purpose of damming a penetration where the damming material is an integral part of the fire seal, aluminum silicate board, or other suitably approved material, can be used.
- b) The damming material should be cut so as to form a tight fit in the opening and around the penetration items. Any gaps should be plugged with, for example, ceramic fiber, to ensure that the foam is contained within the seal cavity.
- c) The damming material may be cut into two or more pieces to ensure ease of application and, if necessary, easy removal.
- d) In a wall or bulkhead situation, damming materials are required on both sides of the opening. In a floor or deck seal, damming material may only be required at the lower face of the seal.
- e) It is important to note DOWSIL™ 3-6548 RTV Silicone Foam exerts considerable pressure as it cures and expands. It may therefore be necessary to use additional supports to prevent deformation and damage of the damming material.

Mixing

Prior to use, Part A and Part B components must be thoroughly stirred in their original containers to uniformly disperse any fillers or pigments that may have settled. When mixing, use clean containers and mixing equipment. If stirred containers stand for more than four hours, re-stir. At time of installation, material temperature should be between 18 and 27°C (65 and 81°F). (Materials can be warmed by placing them in a room at these temperatures for 12 hours.) Please check material temperature prior to use if there is a possibility it is outside this range. To properly catalyze DOWSIL™ 3-6548 Silicone RTV Foam, add Part A to Part B in a 1:1 ratio (by weight or volume). Mix vigorously and thoroughly for 30 to 60 seconds by hand or with power mixing. The mixed product will begin to foam shortly after mixing; therefore, it should be dispensed in the penetration as soon as mixing is completed.

For large-volume applications, the use of suitable automatic mixing, metering and dispensing equipment is recommended. For small volumes, the cartridges can be used.

Using the 310 ml cartridges, the two components are contained in a single cartridge in which they must be mixed according to the instructions supplied with the packaging as shown on Figure 1. The two components of the 40 kg and 900 lb kits are supplied for use with meter mix equipment as used by Dow approved applicators.

Substrate Preparation (Cont.)

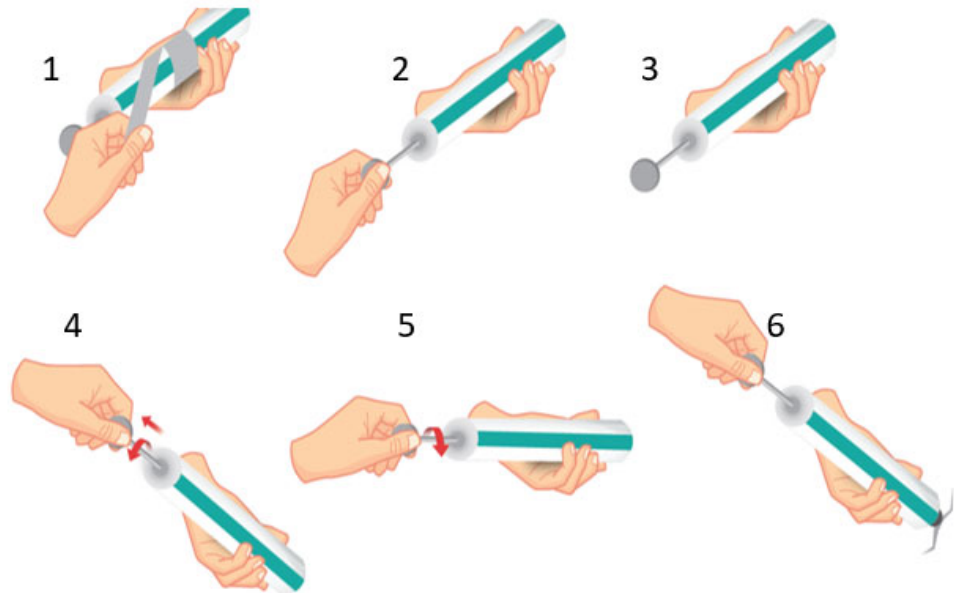


Figure 3: Mixing of cartridges.

Legend

1. Remove clinch band and discard.
2. Pull dasher rod towards the neck of the cartridge. This releases the foil barrier from the mixing head.
3. Press cartridge slightly in the area of the clinch band to deform the foil barrier.
4. Push dasher rod to the bottom of the cartridge. Rotate dasher rod in a clockwise direction while moving it up and down the cartridge. Be sure to move dasher rod all the way to the top and bottom of the cartridge while mixing. Mix material for 25 strokes, but for no longer than 2 minutes. On the last stroke, the dasher rod should be fully extended.
5. Unscrew the dasher rod by gripping the cartridge and turning the dasher rod in an anti-clockwise direction.
6. The foam should be dispensed from the cartridge by placing the dasher rod into the plunger at the base of the cartridge and applying pressure. If using the 600 ml cartridge the foam may also be dispensed by using the cartridge in conjunction with an applicator gun.

The type and degree of mixing can significantly affect the cell structure and density of the final foam product. Mixing with a 198 g (7 oz) Semco cartridge will generally result in a slightly higher density than mixing by hand. Hand mixing, in turn, will result in a higher density than power mixing by automatic mixing, metering and dispensing equipment. Likewise, the expansion ratios of foam volume to liquid volume can vary from 2:1 to 4:1, depending on the type and degree of mixing and degree of confinement. If foam rise is restricted or confined during foam cure, densities as high as 0.48 g/cm³ (30 lb/ft³) can result.

Substrate Preparation (Cont.)

Dispensing

As supplied and properly mixed, DOWSIL™ 3-6548 Silicone RTV Foam has a snap time (working time) of one to two minutes at 25°C (77°F). The snap time is dependent upon the temperature of the A and B components just before and after they are mixed. DOWSIL™ 3-6548 RTV silicone foam should be applied at a steady state.

DOWSIL™ 3-6548 Silicone RTV Foam typically expands from two to four times its liquid volume during cure. DOWSIL™ 3-6548 Silicone RTV Foam should not be dispensed in liquid layers thicker than 2.54 cm (1 inch) at any given spot and several applications may be required to completely fill a void. Allow at least 15 minutes between applications of each foam layer. If the opening is not filled to the desirable level when the cured foam has completed its expansion, repeat the injection and cure procedure until the desired fill rate is attained. To permit a clear view when filling a wall cavity, damming materials are built up gradually. The top of the opening is dammed for the final shot of foam. This foam exerts some pressure as it expands and may damage the damming material if too great a quantity is applied in one application. After the foam is installed, damming materials are left in place 24 for hours to allow the penetration seal to cure fully. After 24 hours, the penetration seal must be completely inspected by removing the damming materials. Curing foam should completely fill the penetration, providing a tight, compressive fit. The seal should then be reinspected after an additional 24 hours. Damming materials that are part of a specific system design must be replaced and properly secured in their appropriate positions.

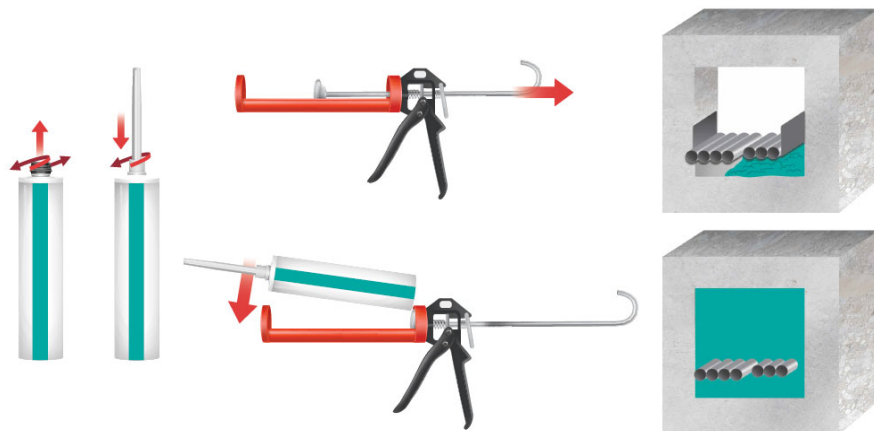


Figure 4: Dispensing of mixed foam cartridge in the case of cavity tray in wall.

Quality Control

There is a two-step quality control check that can be performed on the site quickly and easily. It should be performed at least once daily and upon changing to a new lot of material to ensure the performance of both dispensing equipment and foam product prior to installing penetration seals. The quality control check is shown in Table 2.

Table 2: Two step quality control requirements for checking DOWSIL™ 3-6548 RTV Silicone Foam and dispensing equipment.

1.	Snap time	min	1–3
2.	Free foam density	kg/m ³	220–320

Approved applicators have quality control systems that follow these recommendations.

Clean-up

Excess foam should be cleaned off tools and non-porous surfaces while in an uncured state and using a suitable solvent. Excess cured foam around the penetration seal can be removed with a sharp knife or blade.

Caution: Consult solvent material data sheet for safe handling information.

Repair Procedures

Repair and modifications can easily be performed by using DOWSIL™ 3-6548 RTV Silicone Foam or any suitable fire stopping material. If necessary, the foam can be cut with a sharp knife to enable modification of the seal. Because this product develops good adhesion to itself, the repaired region will become an integral part of the original foam. Maximum adhesion is obtained when foaming against a freshly exposed foam surface, free of dust, dirt, moisture and other contaminants.

Protection of Penetration Seal

If the damming material is to be resistant to water, contact us for a recommendation of an appropriate water resistant material. SYLGARD™ 170 Silicone Elastomer may be used to give additional protection against mechanical abrasion. If protection against oil or solvents is required, DOWSIL™ 730 FS Solvent Resistant Sealant may be used.

Handling Precautions

Immediately upon mixing the A and B components of DOWSIL™ 3-6548 Silicone RTV Foam, a chemical reaction takes place that results in the generation of hydrogen gas. Appropriate caution should be exercised. Keep away from sparks and open flame. When using DOWSIL™ 3-6548 Silicone RTV Foam to seal large penetration openings, exercise care to avoid gas entrapment. Provide adequate ventilation to prevent hydrogen gas build-up. Forced air ventilation is necessary if the work area has less than two cubic feet of free air space for each pound of liquid mixture being foamed. Adequate ventilation must be provided to prevent build-up of hydrogen at explosive levels. While the gas generation is essentially completed during the first three minutes after the A and B components are mixed, hydrogen gas will continue to be released from the foam for at least 24 hours. Most of the evolved gas is initially retained in each foam cell and is not immediately released to the surrounding atmosphere, because the foam is 50 percent closed cell. The gas is released over time by diffusion. The rate of release is dependent on penetration sizes, sealing designs and ambient temperatures. The amount of gas generated is dependent on the amount of foam used. Waste materials must be considered with regard to these precautionary measures during disposal and storage. Waste materials should not be sealed in such things as plastic bags or similar containers that could trap hydrogen gas.

**Handling
Precautions
(Cont.)**

The liquid Part B components of DOWSIL™ 3-6548 Silicone RTV Foam in contact with bases or catalytic oxidizing materials could generate hydrogen gas. A bulged Part B component container may indicate hydrogen gas pressurization, and appropriate caution should be exercised. If this occurs, contact your representative.

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

**Usable Life and
Storage**

When stored at or below 32°C (90°F) in the original unopened containers, DOWSIL™ 3-6548 RTV Silicone Foam has a usable life of 24 months from the date of production for the 40 kg and 900 lb packaging sizes and 12 months for the 310 ml and 600 ml cartridges.

Optimum temperature for application of the foam is 13°C (55°F) to 27°C (81°F) and if possible the foam should be stored at this temperature. On storage, some settling of the contents may occur and the individual components will need to be thoroughly stirred so that an even consistency is obtained before use.

Note: A separate stirring device should be used for each component to avoid cross-contamination.

**Packaging
Information**

DOWSIL™ 3-6548 RTV Silicone Foam is available in 310 ml and 600 ml easy to use cartridges for smaller applications, 40 kg and 900 lb kits for larger applications, in black and gray.

Limitations

Inhibition of Cure

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of DOWSIL™ 3-6548 RTV Silicone Foam. Most notable of those are:

- Organo-tin and other organo-metallic compounds
- Silicone rubber containing organotin catalyst
- Sulfur, polysulfides, polysulfones and other sulfur-containing materials
- Amines, urethanes and amine containing materials
- Unsaturated hydrocarbon plasticizers, moisture

If in doubt, run a small-scale compatibility test.

The presence of liquid or uncured product at the interface between the questionable substrate and the cured DOWSIL™ 3-6548 RTV Silicone Foam would normally indicate incompatibility and inhibition of cure.

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

Health and Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, dow.com or consult your local Dow representative.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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