

DOW CORNING®

3140 RTV COATING

101-713/4

11 JAN 1999

FEATURES

- * EXCELLENT DIELECTRIC PROPERTIES OVER A WIDE TEMPERATURE RANGE
- * GOOD ADHESION TO GLASS, CERAMICS, METAL AND MOST PLASTICS FOR INCREASED RELIABILITY
- * HIGH FLEXIBILITY TO REDUCE STRESS ON COATED COMPONENTS DURING THERMAL CYCLING
- MIL-I-46058C
- * Self-levelling to provide an even coating with excellent point coverage
- * Non-corrosive
- * Resistant to moisture, corona, ozone and weathering
- * Clear
- * Solventless
- * Room temperature cure

DESCRIPTION

Dow Corning® 3140 RTV coating is a clear, flowable, one component silicone elastomer. This material reacts with moisture in the air to cure, giving a high strength, rubbery solid. It is easy to handle, requires no mixing or heating and does not contain any solvents.

Dow Corning 3140 RTV coating is flowable and self-levelling which allows it to be simply applied as a conformal coating to printed circuit boards or to encapsulate electronic assemblies. The non-corrosive cure mechanism produces non exothermic heat and as a result, it can be used in corrosion sensitive electronic equipment with no adverse effects.

APPLICATIONS

Dow Corning 3140 RTV coating is used for protecting corrosion sensitive components and printed circuit boards and for encapsulating small circuits or connectors. Typical applications include conformal coating for printed circuit boards and thick film hybrids, cushioning oscillator crystals and other fragile components. In addition, this material is used for sealing cable terminations in electronic enclosures and for repairing RTV silicone rubber encapsulation.

TYPICAL PROPERTIES

As Supplied

CTM 0364*	Consistency	Flowable
	Viscosity, mPa.s	35000
	Coating Thickness per dip, mm	0.4
	Skin-Over Time, minutes	25
CTM 0095	Tack-Free Time, hours	1.5
	Cure Time, 0.5 mm thickness, hours	24
	Cure Time, 3.2 mm thickness, hours	72
	Full Cure, 3.2 mm thickness, days	7
CTM 0208	Non-Volatile Content, percent	98

Physical-after 7 days at 25°C and 50% relative humidity

CTM 0022*	Colour	Clear
CTM 0099	Specific Gravity, g/cm ³	1.05
CTM 0137A	Durometer Hardness, Shore A	25
CTM 0137A	Tensile Strength, MPa	2.0
CTM 0137A	Elongation, percent	350
CTM 0159A	Tear Strength, die B, kN/m	3.6
CTM 0293	Peel Strength from primed aluminium, kN/m	4.22
CTM 0539	Thermal Conductivity (25°C to 100°C) W/m.K	0.12
	Volume Expansion (25°C to 100°C) 1/K	8.8 x 10 ⁻⁴

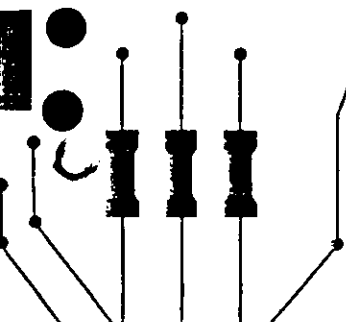
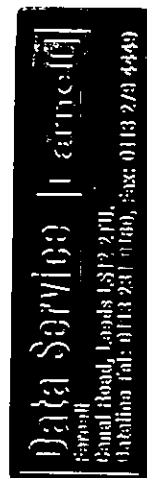
Electrical-after 7 days at 25°C and 50% relative humidity

CTM 0114	Electric Strength, kV/mm	20
CTM 0249	Volume Resistivity, ohm.cm	5.0 x 10 ¹⁴
CTM 0112	Permittivity at 25°C 100 Hz	2.64
	100 KHz	2.63
CTM 0112	Dissipation Factor at 25°C 100 Hz	0.0016
	100 KHz	0.0004

* In most cases, CTM's (Corporate Test Method) correspond to ASTM standard tests. Copies of CTM procedures are available upon request.

These values are not intended for use in preparing specifications.

Specification Writers: Please contact Dow Corning Europe, La Hulpe, Belgium, before writing specifications on this product.



HOW TO USE

Substrate Preparation

Dow Corning 3140 RTV coating should always be applied to clean, dry surfaces. A satisfactory bond will usually be formed without using a primer on degreased surfaces. For maximum adhesion, however, the use of Dow Corning® 1204 primer is recommended as described below.

1. Thoroughly clean and degrease metal and plastic surfaces, then rinse all surfaces except plastic, with acetone (see Handling Precautions). Rubber surfaces should be roughened with sandpaper, then wiped with acetone and allowed to dry.
2. For maximum adhesion, apply Dow Corning 1204 primer (see Handling Precautions) to all surfaces except silicone rubber. Allow the primer to dry for 30-90 minutes at room temperature.

How to Apply

Dow Corning 3140 RTV coating is a flowable liquid and should be applied as a conformal coating to printed circuit boards or thick film hybrids by dipping. Slowly immerse the assembly into a bath of the silicone elastomer to avoid entrapment of air bubbles. After one minute, withdraw the assembly and allow the excess to drain back into the dip tank. Whilst draining, position assemblies having sharp points, such as soldered component leads, with the points facing downwards to obtain the best point coverage. Curing on the surface of the Dow Corning 3140 RTV coating in the dip tank can be minimised by maintaining a blanket of dry nitrogen above the silicone elastomer in the bath.

For individual component fixation or sealing applications, Dow Corning 3140 RTV coating can be applied directly from a collapsible tube fitted with a plastic nozzle which has been cut to the desired orifice size and shape.

1. Apply Dow Corning 3140 RTV coating in a uniform thickness. Best adhesion is obtained with an approximately 0.5 mm glue line. When bonding two surfaces, join the surfaces with enough uniform pressure to displace any excess adhesive.
2. Let the unit stand undisturbed at room temperature with at least 30 percent relative humidity to cure.

Cure

On exposure to moisture in the air, the surface of Dow Corning 3140 RTV coating will form a skin in about 25 minutes at room temperature with 50% relative humidity. At this point, the coating is no longer flowable and after 90 minutes under these conditions, the coating will become tack-free, allowing limited handling until the cure is fully complete.

Curing proceeds inward from the surface at a rate which depends upon the relative humidity, the degree of confinement and the thickness of the coating. Too little moisture or too thick an application will extend the cure time. Likewise, cure time is generally proportional to the degree of confinement if Dow Corning 3140 RTV coating is placed between two impermeable surfaces. The larger the unexposed area, the longer the cure time and an overlap of 25 mm represents the largest practical joint.

A 3 mm thickness of Dow Corning 3140 RTV coating will cure in 72 hours at room temperature and a relative humidity of at least 30 percent. Lower levels of relative humidity are not recommended. Optimum physical and electrical properties are reached after curing for 7 days at room temperature.

Repairability

Dow Corning 3140 RTV coating can be cut away with a sharp knife for repair or modification. Soaking the coated unit in Chloroethene⁽¹⁾, Freon⁽²⁾, toluene or similar halogenated or aromatic solvents (see Handling Precautions) will cause swelling and deterioration of the coating that will aid in its removal. The clean, dry surface may then be recoated with Dow Corning 3140 RTV coating.

⁽¹⁾ Registered trademark of Dow Chemical Co.
⁽²⁾ Registered trademark of E.I. DuPont de Nemours.

HANDLING PRECAUTIONS

Dow Corning 1204 primer is flammable. Keep away from heat and open flames. Use only with adequate ventilation. Avoid prolonged breathing of vapour and prolonged or repeated skin contact.

In addition, when using solvents, avoid heat, sparks and open flames. Always provide adequate ventilation. Obtain and follow hand-

ling recommendations from solvent supplier.

A Safe Handling Instruction sheets on Dow Corning 3140 RTV coating and Dow Corning 1204 primer should be obtained from your nearest Dow Corning sales office prior to use.

STORAGE AND SHELF LIFE

When stored in original unopened containers at or below 30°C, Dow Corning 3140 RTV coating has a shelf life of 6 months from date of shipment.

Refrigerated storage is not essential but will extend the useful life of this material. Containers should always be kept sealed when not in use. After a container of sealant has been opened, a plug of cured material may form in the nozzle or tube tip during storage. This is easily removed and does not affect the remaining contents.

PACKAGING

Dow Corning 3140 RTV coating is supplied in 3fl.oz., 10.7fl.oz., 310ml and 4.5 U.S. gal. containers.

IMPORTANT USERS PLEASE NOTE

The information and data contained herein are believed to be accurate and reliable; however, it is the user's responsibility to determine suitability of use. Since Dow Corning cannot know all of the uses to which its products may be put or the conditions of use, it makes no warranties concerning the fitness or suitability of its products for a particular use or purpose.

You should thoroughly test any proposed use of our products and independently conclude satisfactory performance in your application. Likewise, if the manner in which our products are used requires governmental approval or clearance, you must obtain it.

Dow Corning warrants only that its product will meet its specifications. There is no warranty of merchantability or fitness for use, nor any other express or implied warranties. The user's exclusive remedy and Dow Corning's sole liability is limited to refund of the purchase price or replacement of any product shown to be otherwise than as warranted. Dow Corning will not be liable to consequential damages of any kind.

Suggestions of use should not be taken as inducements to infringe any patent.

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DOW CORNING**PRODUCT SAFETY DATA SHEET**

Page: 1

Issue date: 18/07/95

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Version number: 5

DOW CORNING(r) 3140 RTV COATING**1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY**

1.1 Product Name:	DOW CORNING(r) 3140 RTV COATING	
1.2 Use:	General purpose.	
1.3 Address:	Dow Corning Europe 62, Rue General De Gaulle 1310 La Hulpe Brussels Belgium	
1.4 Service:	Dow Corning (Reading)	Tel: +44 1189507251
1.5 Emergency:	Dow Corning (Barry, GB 24h)	Tel: +44 1446732350
	Dow Corning (Brussels, B)	Tel: +32 2 6552111
1.6 Health & Safety Information:	Health, Environment and Regulatory Affairs Department, Dow Corning, Brussels, B.	Tel: +32 2 6552523 Tel: +32 2 6552304

2. COMPOSITION & INFORMATION ON INGREDIENTS**2.1 Chemical characterisation:** Silicone elastomer. (Preparation)**2.2 HAZARDOUS INGREDIENTS¹**

Name	CAS No.	%(w/w)	Symbols & Health Risk Phrases
Alkoxysilane	Mixture.	~6	HARMFUL. (Xn) R22 Harmful if swallowed.
Silica (amorphous)	7631-86-9	~16	
Methanol	67-56-1	~0.10	TOXIC. (T) R23/25 Toxic by inhalation and if swallowed.

¹According to Commission Directive 88/379/EEC (Article 3 [6a]).**3. HAZARD IDENTIFICATION**

Not hazardous.

4. FIRST AID MEASURES

- 4.1 Skin:** Wipe off and wash with soap and water.
- 4.2 Eyes:** Flush with water for 15 minutes.
- 4.3 Inhalation:** Remove to fresh air.
- 4.4 Ingestion:** Note presence of methanol.
- 4.5 Other first aid information:** None known.

DOW CORNING(r) 3140 RTV COATING**5. FIRE FIGHTING MEASURES**

- 5.1 Extinguishing media:* Carbon dioxide, foam, dry powder or fine water spray.
- 5.2 Unsuitable extinguishing media:* None known.
- 5.3 Unusual firefighting hazards:* None known.
- 5.4 Special firefighting procedures:* None known.
- 5.5 Other recommendations:* None known.
- 5.6 Combustion products:* Silica, carbon dioxide and traces of incompletely burned carbon products.
Formaldehyde.

6. ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions:* Wear proper protective equipment. Ventilate area well. Avoid eye contact. Avoid prolonged or repeated skin contact.
- 6.2 Precautions to protect the environment:* None established, do not allow large quantities to enter drains.
- 6.3 Cleanup procedures:* Mop, wipe or soak up with absorbent material and place in a vented container.

7. HANDLING AND STORAGE

- 7.1 Handling precautions:* Local ventilation is recommended. General ventilation is required. Avoid eye contact. Avoid prolonged or repeated skin contact.
- 7.2 Storage:* No special measures required.
- 7.3 Unsuitable packaging materials:* None known.
- 7.4 Incompatibilities:* None known.
- 7.5 Other information:* None known.

DOW CORNING(r) 3140 RTV COATING

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 Exposure controls: Refer to section 7

8.2 Exposure controls for hazardous components.

Name	CAS No.	Exposure limits ¹
Alkoxysilane	Mixture.	200 ppm (OES,8hr TWA). 250 ppm (OES,15min STEL) as methanol.
Silica (amorphous)	7631-86-9	6mg/m ³ (TWA tot.inhal.dust). 3mg/m ³ (TWA,respirable dust).
Methanol	67-56-1	200 ppm (OES,8hr TWA). 250 ppm (OES,15min STEL) Sk

8.3 Personal protective equipment:

Respiratory: Respiratory protection is not normally required.

Hand: Rubber or plastic gloves should be worn, where repeated or prolonged contact can occur.

Eye: Safety glasses.

Skin: Additional protective equipment is not normally required

Industrial Hygiene: Wash after handling, especially before eating, drinking or smoking. Exercise good industrial hygiene practice.

¹According to Health and Safety executive document EH40.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance:

Form: Liquid. **Colour:** Translucent white. **Odour:** Slight.

9.2 Safety related information

pH:	Not determined.
Boiling point/boiling range:	-
Melting point/melting range:	Not determined.
Flashpoint:	>101
Flammability (solid, gas):	Not determined.
Autoflammability:	Not determined.
Explosive Properties:	Not determined.
Oxidising properties:	Not determined.
Vapour pressure:	<0.70 kPa
Specific gravity:	~1.05
Solubility in water:	<0.10% w/w 10°C
Solubility in fat:	Not determined.
Oil/water partition coefficient:	Not determined.
Other data:	
Vapour density (air = 1):	-
Evaporation rate (ethyl ether = 1):	<1
Viscosity:	300 cst
% Volatiles:	<5
Molecular weight:	Not determined.

The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.

DOW CORNING(r) 3140 RTV COATING**10. STABILITY AND REACTIVITY**

10.1 Stability: Stable.

10.2 Reactivity:

Conditions to avoid: None known.

Materials to avoid: Can react with strong oxidising agents. Cures in the presence of water or moisture, releasing a small amount of methanol.

Hazardous decomposition products: Product may emit formaldehyde vapours at temperatures above 150°C in the presence of air.

11. TOXICOLOGICAL INFORMATION

Possible Health Effects.

Skin: ¹ Prolonged or repeated contact may lead to slight irritation.

Eyes: ¹ Slightly irritating.

Inhalation: ¹ No significant effect. See other health hazard information.

Ingestion: ³ No significant effect.

Other health hazard information:

Product may emit formaldehyde vapours at temperatures above 150°C in the presence of air.

Formaldehyde vapour is harmful by inhalation and irritating to eyes and respiratory system at breathing concentrations less than one part per million (1 ppm). Occupational exposure measurement and control within established limits is necessary for applications where formaldehyde may be formed to ensure worker health and safety. Detailed information concerning current formaldehyde exposure limits can be found in UK HSE EH40 Occupational Exposure Limits. Silica is present in a non-crystalline (amorphous) state in this formulation; it is not in a respirable form.

LC50: Not determined.

LD50: >10 g/kg

¹ Based on product test data.

² Based on assessments from related products.

³ This information is based either on test data, extrapolation from tests on similar materials, review of component data, or a combination of these sources.

DOW CORNING(r) 3140 RTV COATING

12. ECOLOGICAL IMPACT

12.1 Elimination¹

Persistence: Not known.

Degradability: Partly biodegradable.

12.2 Behaviour in the Aquatic compartment¹

Mobility: Insoluble in water.

Bioaccumulation: Not known.

12.3 Ecotoxicity¹

Aquatic: Ecotoxic effects not known.

Terrestrial: Not known.

¹ Based on product test data.

² Based on assessments from related products.

³ This information is based either on test data, extrapolation from tests on similar materials, review of component data, or a combination of these sources.

13. WASTE DISPOSAL

13.1 *Product disposal:* Can be incinerated or land-filled in accordance with local regulations.

13.2 *Packaging disposal:* Packaging should be disposed of in accordance with regional and/or national regulations.

14. TRANSPORT INFORMATION

UNNO: Not applicable.

LABEL: Not applicable.

ROAD & RAIL TRANSPORT (ADR/RID)

No special packaging or labelling requirements.

SEA TRANSPORT (IMO)

No special packaging or labelling requirements.

AIR TRANSPORT (ICAO)

No special packaging or labelling requirements.

DOW CORNING(r) 3140 RTV COATING

15. REGULATORY INFORMATION

15.1 EEC Supply classification & labelling: ¹

Contains: ALKOXYSILANE

No special packaging or labelling requirements.

S2 Keep out of reach of children.

S8 Keep container dry.

S24/25 Avoid contact with skin and eyes.

S51 Use only in well-ventilated areas.

15.2 National legislation.

For product information in other EC languages, including appropriate national legislation, please contact the sales office at the above address.

15.3 Other regulations.

German waste number: 57202

German water class: 1 - Slight risk of causing water pollution.

German Vbf: N/A

Ozone depleting chemicals: No ozone depleting chemicals are present or used in manufacture.

EINECS: All ingredients listed or exempt.

TSCA: All ingredients listed or exempt.

MITI: Not determined.

DSL: All ingredients listed or exempt.

AICS: All ingredients listed or exempt.

¹According to 93/18/EEC as adapted for the 3rd time to technical progress commission directive 88/379/EEC.

16. OTHER INFORMATION

This product safety data sheet was prepared in compliance with Commission Directive 93/112/EC, 67/548/EEC and 88/379/EEC as well as their relevant amendments, on the approximation of laws, regulations and administrative provisions relative to the classification, packaging and labelling of dangerous substances and preparations.

It is the responsibility of persons in receipt of this Product Safety Data Sheet to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produces a formulation containing the Dow Corning product, it is the recipient's sole responsibility to ensure the transfer of all relevant information from the Dow Corning Product Safety Data Sheet to their own Product Safety Data Sheet in compliance with Commission Directive 88/379/EEC.

All information and instructions provided in this Safety Data Sheet (SDS) are based on the current state scientific and technical knowledge at the date indicated on the present SDS. Dow Corning shall not be held responsible for any defect in the product covered by this SDS should the existence of such defect not be detectable considering the current state of scientific and technical knowledge.

Please note: for customers sourcing Dow Corning products in regions other than the European Union, the Safety Data Sheet will reflect the requirements of existing local legislation. This may result in a different format and presentation of hazard classification information.