

RTV C45 + 4% Catalyst 45B

1. DESCRIPTION

RTV C45 + 4% Catalyst 45B is a two part liquid silicone rubber, which, with the addition of Catalyst B cures at room temperature to form a resilient, high temperature resistant silicone rubber.

RTV C45 is a pourable brick-red liquid which gives a superior balance of physical properties when compared with most other silicones RTV 2-part rubbers.

RTV C35 remains flexible over the temperature range -60°C to 250°C, with short periods up to 300°C. It possesses excellent weathering resistance, is resistant to oxidation and to many oils and chemicals and exhibits very good electrical properties.

2. ADVANTAGES

- Excellent resistance to high temperatures
- High hardness
- Low viscosity
- Very good long term ageing
- Deep section cure within 24 hours
- Variable work times
- Excellent weathering.

3. APPLICATIONS

The product is recommended for potting, embedding and encapsulating delicate electrical and electronic equipment, sealing and caulking, making flexible moulds and for the production of adherence-free flexible coatings.

4. TYPICAL PHYSICAL PROPERTIES

The following results on cured compounds were obtained from tests on sheets that had been cold-pressed and cured for 7 days at 23°C and 65% R.H. with Catalyst 45B at 4% by weight.

a) UNCURED COMPOUND

RTV C45	
Colour	Brick red
Viscosity, mPas	40,000
Solids, contents, %	100

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b) CURED COMPOUND

Specific Gravity, 25°C/25°C	1.36
Hardness, °IRHD	55
Tensile strength, Mpa (p.s.i.)	4.5 (650)
Elongation, %	140
Tear strength, kN/m	9
Linear shrinkage, %	0.5
Thermal expansion, cm/cm°C x 10 ⁻⁵	23.6
Thermal conductivity, W/m°C	0.37 (approx)
[cal.cm/s.cm ² .°C]	[8.8 x 10 ⁻⁴]

Tested according to BS 903 : Methods of testing vulcanized rubber.

5. PROCESSING

a) MIXING

RTV C45 rubber must be mixed thoroughly with Catalyst 45B to produce a uniformly cured product. Mixing can be carried out mechanically or by hand, but care should be taken to avoid trapping air in the mixture since this can cause voids in the cured rubber.

b) DE-AERATION

For applications where such voids are undesirable the mixture should be de-aerated under reduced pressure before use.

The time and pressure required for de-aeration depends on the quantity of the RTV C45 liquid being used. As a guide, 150g of RTV C45 can be de-aerated in 5-10 minutes at a pressure of 5-10mm of mercury. Containers should be only two-thirds full to prevent overflow during the initial stages of de-aeration.

b) CURING

With RTV C45 the curing process begins, without heat, immediately the rubber and catalyst are mixed together.

There is no significant change in the physical properties of the final rubber when the curing agent concentration is varied within the recommended limits. The terms used in the table below to describe the various stages of cure are defined as follows:-

Pot life:

The time from the addition of the curing agent until the mixture ceases to flow; it indicates the working life of the material.

Tack-free time:

The time the addition of the curing agent until the surface of the material loses all surface tack or stickiness.

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Cure time:

The time from curing agent addition to obtain a rubber of approximately 40° IRHD hardness, measured on a test piece 13mm thick.

Variations in stage-of-cure times with selected proportions of Catalyst 45B at constant temperature (25°C).

Catalyst 45B (%)	Pot life (h)	Tack-free Time (h)	Cure time (h)
1.0	3 - 4	6 - 8	24
2.0	2.5	5	24
4.00	1.5	3.5	24

c) THICK SECTION CURING

When RTV C45 has to be cured in a thickness of 7mm or more, the best results will be obtained if low curing agent concentrations are used. The recommended concentration of RTV C45 ranges from 1% to 4%.

If curing of thick sections is still a problem, then the use of a 2-Part RTV Accelerator is recommended at levels of approximately 1%.

6. ACCELERATED CURING CONDITIONS

a) ELEVATED TEMPERATURE CURE

Although the reaction involved in the curing process are accelerated by increasing the temperature of the catalyst rubber, too high a temperature can have an adverse effect on the physical properties of the silicone elastomer. If faster cure is essential, it is recommended that the temperature is not increased above 40°C.

b) RAPID CURING CATALYSTS

Very fast cure can be achieved by the use of a rapid curing agent. Great care should be taken using this catalyst which, because of its rate of catalysis, produces a very short pot-life. The recommended concentration of rapid curing agent is less than 0.4% by weight of the liquid rubber, and for most purposes 0.1 to 0.2%.

c) USE AT ELEVATED TEMPERATURES

If cured RTV C45 is intended for use at temperatures in excess of 150°C, it should first be temperature-conditioned by progressively heating it up to its service temperature.

A suitable cure schedule is 48 hours at room temperature followed by 2-4 hours at 120°C and then 2-4 hours sequentially at incremental temperature intervals of 25-30°C until the service temperature is reached.

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d) BONDING

In order to achieve satisfactory adhesion to most metals, plastics, glass., it is necessary to use a primer.

e) ELECTRICAL PROPERTIES

The following properties are typical of those obtained with RTV C45 catalysed with 2.0% Catalyst 45B and allowed to cure for 24 hours at room temperature.

Property	Test Method	Result
Electrical Strength, KV/mm	BS903 : Part C4	20
Power Factor, 1Mhz	BS903 : Part C3	3×10^{-3}
Permittivity, 1Mhz	BS903 : Part C3	3.1
Volume Resistivity, ohm cm	BS903 : Part C2	10^{14}

7. STORAGE

RTV C45 should be stored in clean covered containers at low temperatures i.e. below 25°C, if it is stored for extended periods. It is recommended that RTV C45 be used within 6 months of manufacture.

8. PACKAGING

RTV C45 is available in non-returnable packages containing the following net quantities:-

1kg, 5kg, 25kg, 200kg.

The Catalyst 45B will be supplied in the appropriate quantity with each container as standard. Other curing agents and ancillaries must be ordered separately.

9. HEALTH & SAFETY

(Refer to Health & Safety Data Sheet)

Handling and mixing of **RTV C45 + 4% Catalyst 45B** require the following precautions:

- i. Wear gloves and goggles.
- ii. Do not eat, drink or smoke.
- iii. Avoid swallowing, skin or eye contact.
- iv. If contact does occur, wash with clean water immediately and in case of eye contact, consult a doctor.

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