

# DOW CORNING®

## HS IV RTV High Strength

### Moldmaking Silicone Rubber and Thixo Additive

**DESCRIPTION**

DOW CORNING® HS IV RTV high strength moldmaking silicone rubber was developed especially for applications requiring extremely low durometer rubber with excellent strength.

DOW CORNING HS IV RTV high strength moldmaking silicone rubber is a two-part elastomer with a low mixed viscosity.

Applications include molds for intricate objects, skins for animated robotic characters, and silicone pads for transfer pad printing.

For intricate parts, the added softness of the rubber ensures easy demolding. The formulated softness also ensures excellent physical properties.

The DOW CORNING HS IV RTV high strength moldmaking silicone rubber product line features the DOW CORNING HS IV RTV high strength moldmaking silicone rubber base with two catalysts; DOW CORNING® HS IV 10:1 colored catalyst (pink) and DOW CORNING® HS IV 10:1 clear catalyst (clear catalyst allows custom coloring by the end user).

- Both catalysts provide the same low durometer. Due to the extreme softness of the cured rubber, the Shore 00 scale is used to accurately measure the durometer.
- Both catalysts are formulated to cure against ROMA™<sup>1</sup> plastilina and CHAVANT™<sup>2</sup> plastelina clays.
- DOW CORNING® HS thixo additive: a liquid additive that, when mixed with catalyzed DOW CORNING HS IV RTV

**DOW CORNING® HS IV RTV High Strength Moldmaking Silicone Rubber and Thixo Additive**

Type . . . . .	Very low viscosity, two-part elastomer
Physical Form . . . . .	Pourable liquid
Special Properties . . . . .	Extremely low durometer; low shrink; high elongation; good tear strength; excellent mold release
Special Features . . . . .	Two unique catalysts; thixo additive
Primary Uses . . . . .	Reproduction of intricate objects; robotic skins; pads for transfer pad printing

high strength moldmaking silicone rubber, converts the mixture to a non-flowable paste ideal for producing skin molds or casting against vertical objects.

- DOW CORNING HS IV RTV high strength moldmaking silicone rubber sprays easily when used with standard spraying equipment. For information on spraying DOW CORNING HS products, see DOW CORNING mold-making Technical Bulletin "Spraying DOW CORNING HS Products."

Benefits of the DOW CORNING HS IV RTV high strength moldmaking silicone rubber product line include:

- Extremely low durometer
- Low shrinkage
- Low mixed viscosity
- Excellent tear strength and elongation
- Excellent detailed reproduction

**HOW TO USE — GENERAL**

To ensure maximum reliability and performance, the following information should be read carefully.

**Preparation**

The original from which the mold is to be made should be thoroughly cleaned to remove dirt and all contaminants. When a solvent is used, care should be taken to ensure that it is compatible with the original, and sufficient time should be allowed for the solvent to evaporate fully. If required, the original and the holding box should be coated with a release agent. This is particularly important with porous substrates. Suitable release agents are solvent solutions of petroleum jelly or aqueous soap solutions.

When the original is a sulfur-containing clay, either DOW CORNING HS IV 10:1 clear catalyst or DOW CORNING HS IV 10:1 colored catalyst can be used. When casting in thick sections (1/4 -inch thickness or greater), no surface treatment is required. However, when casting in thin sections (less than 1/4 -inch in thickness), minimal surface treatment may be required.

<sup>1</sup>"ROMA" is a trademark of Sculpture House, Inc.  
<sup>2</sup>"CHAVANT" is a trademark of Chavant, Inc.

## TYPICAL PROPERTIES

These values are not intended for use in preparing specifications.

### As Supplied – HS IV Base

Color	White
Specific Gravity	1.16
Nonvolatile Content, percent	98
Viscosity, cps	30,000

	10:1 Clear Catalyst	10:1 Colored Catalyst
<b>As Supplied</b>		
Color	Clear	Pink
Viscosity, cps	24	24
<b>As Catalyzed</b>		
Specific Gravity	1.15	1.15
Viscosity, cps	15,000	15,000
Working Time, approximate hours	1	1
<b>As Cured — 7 Days at Room Temperature 25°C (77°F)</b>		
Durometer Hardness, Shore 00	50	50
Tensile Strength, psi	436	436
Elongation, percent	731	731
Tear Strength, die B, ppi	110	110
Circle Shrink, percent		
after 24 hours at 25°C (77°F)	0.14	0.14
after 7 days at 25°C (77°F)	0.15	0.15

**Specification Writers: Please contact Dow Corning Corporation, Midland, MI, before writing specifications on this product.**

### Mixing

DOW CORNING HS IV catalysts should be mixed into the base material just before use (with either manual or mechanical stirring). It is always good practice to stir/shake both the base and the catalyst prior to use.

Mixing should be complete within 2 minutes and the temperature should not exceed 35°C (95°F). Hand mixing is satisfactory, but care should be taken to avoid entrapping too much air or splashing the catalyst.

### De-airing

To ensure void-free molds and to obtain the maximum pot life, it is important that the catalyzed mixture is de-aired prior to use.

De-air the mixture under a vacuum of 26 to 29 inches of mercury and hold until it completely expands and recedes to the original level (3 to 5 minutes maximum).

**CAUTION:** De-airing for more than 3 to 5 minutes can cause a slower cure and deep section cure problems. The container should have at least 5 times the mixture volume to allow for the expansion.

### Pouring the Mixture

The catalyzed mixture has a working time<sup>1</sup> of 1 hour under normal working temperatures (72°F, ± 5°, 50 RH ± 5%). It should be poured carefully to avoid entrapping air and should be allowed to flow from one corner of the mold to fill the required volume. **DO NOT SCRAPE** the sides of the container holding the catalyzed mixture.

### Cure

The catalyzed mixture will cure to a flexible rubber within 24 hours, after which it can be demolded. Optimum mechanical properties are developed within 7 days.

## HOW TO USE – THIXO ADDITIVE

The substrate from which a mold will be made should first be cleaned, and, if necessary, coated with a release agent (petroleum jelly, PTFE spray, or soap solution are suitable). This is particularly important for porous substrates.

The substrate should then be coated with a thin precoat (print coat) of catalyzed DOW CORNING HS IV RTV high strength moldmaking silicone rubber base and either of the DOW CORNING HS IV 10:1 catalysts (100 parts base plus 10 parts catalyst). Once the print coat has started to cure, a second coat may be applied. These coatings can be applied by either brushing or spraying. To ensure a void-free coating, the mixture should be de-aired prior to use.

Once this layer has started to cure but is still tacky, the thixotropic mixture should be prepared by thoroughly mixing together DOW CORNING HS IV RTV high strength moldmaking silicone rubber base, DOW CORNING HS IV catalyst and DOW CORNING HS thixo additive in the ratio of 100:10:1 (base:catalyst:additive) parts by weight. It is not necessary to de-air this mixture.

This mixture should be applied over the precoat with a spatula. The addition of a pigment to the thixotropic mixture aids in identifying the areas to be coated. Suitable pigments can be obtained from the Ferro Corporation, 1301 N. Flora Street, Plymouth, Indiana 46563, (210) 936-5131.

The pigments are used at a level of 0.5 part by weight. If necessary, more than one layer of the thixo additive can be applied to achieve a thick coating. To ensure optimum adhesion between the layers, the next layer should be applied before the previous one has fully cured and is still tacky.

Full cure is achieved within 24 hours, after which demolding can take place. For large or complicated molds, it is recommended to back the silicone mold with plaster or polyester prior to removal.

<sup>1</sup>Time when catalyzed mixture becomes non-flowable (usually tripling the initial viscosity).

## TYPICAL PROPERTIES – DOW CORNING HS THIXO ADDITIVE

These values are not intended for use in preparing specifications.

### As Supplied

Appearance	Off-white, translucent liquid
Viscosity, cps	350
Specific Gravity	1.04

### As Mixed<sup>1</sup> With Catalyzed DOW CORNING HS IV RTV high strength moldmaking silicone rubber<sup>2</sup>

Working Time, minutes	45
Cure Time, hours	24
Slump on Cure, 8-mm thick coating, mm	4

<sup>1</sup>Recommended mixing ratio is 100:10:1 (base:catalyst:additive), by weight.

<sup>2</sup>The mechanical properties are similar to DOW CORNING HS IV RTV high strength moldmaking silicone rubber.

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## HANDLING PRECAUTIONS

With DOW CORNING HS IV RTV high strength moldmaking silicone rubber base, direct eye contact may cause temporary discomfort. Otherwise, DOW CORNING HS IV RTV high strength moldmaking silicone rubber base is nonhazardous and nonflammable. DOW CORNING HS IV RTV high strength moldmaking silicone rubber catalysts are eye and skin irritants, and their vapors may be harmful. They are also flammable (flash point 29.4°C [85°F]), so appropriate precautions must be taken.

DOW CORNING HS thixo additive is noncorrosive and should present no health or safety hazard when used as recommended.

## STORAGE AND USABLE LIFE

DOW CORNING HS IV RTV high strength moldmaking silicone rubber base and catalysts, when stored in original, unopened containers at 25°C (77°F), have a usable life of 9 months from date of manufacture.

DOW CORNING HS thixo additive, when stored in original, unopened containers at 25°C (77°F), has a shelf life of 12 months. When stored below 20°C (68°F), it may solidify. The product can be readily reliquified by the application of heat.

Base and catalysts are moisture sensitive. Care should be taken to ensure that containers are tightly closed after use.

## PACKAGING

DOW CORNING HS IV RTV high strength moldmaking silicone rubber is sold separately from the catalysts. The base is packaged in 9-, 45- and 440-lb (4.1-, 20.4- and 199.6-kg) containers. DOW CORNING HS IV 10:1 clear catalyst and DOW CORNING HS IV 10:1 colored catalyst are packaged in 0.9-, 4.5- and 44-lb (408-g, 2- and 20-kg) containers. A 1.1-lb (0.5-kg) kit with base and DOW CORNING HS IV 10:1 colored catalyst is also offered. DOW CORNING HS thixo additive is available in a 1-lb (454-g) container.

## MSDS INFORMATION

ATTENTION: PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY WRITING TO DOW CORNING CUSTOMER SERVICE, OR BY CALLING 517-496-6000.

## LIMITED WARRANTY — PLEASE READ CAREFULLY

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