FORTIUS
MARKETING LLP

FORTISIL®

Specialty Silicone Rubbers

FORTIUS MARKETING LLP

+91 90677 36557 - +91 96076 36557 - sales@fortiusmarketing.in - www.fortiusmarketing.in

2nd floor, Suma Vilas, Off Old Mumbai-Pune Highway, Shivajinagar, Pune, India - 411003

FORTIUS
MARKETING LLP

Partner and distributor in India for

Zhermack
Industrial

Hi-Tech Silicone RTVs, manufactured in Italy

FORTIUS MARKETING LLP

Since 2009, Fortius Marketing LLP has supplied high performance materials to the moulding and casting industry.

Our constant endeavor to learn and improve has helped us develop knowledge about the materials in this field that only our suppliers can match. We are happy to represent such technologically advanced and dynamic suppliers, by bringing not only an excellent range of products, but also strong technical expertise backed by complete customer service.

We aim to exceed customer expectations in quality through industry feedback, R&D, competitor review, workflow setup and innovation. The ability to work together with the customer helps us grow stronger together and build a professional relationship for years to come. After all, our own success depends on that of our customers.

We have helped change manufacturing processes by **scaling up production, improving precision, reducing turnaround times and streamlining supply.**

Our deep domain product expertise enables us to respond rapidly to the needs of users and customers, to identify the best possible solutions and to select the most suitable products, whatever the application.

FORTIPHI Advanced Process Equipment

FORTISIL® Specialty Silicone Rubbers

FORTICAST High-Performance Casting Resins

Fortisil, introduces a range of speciality silicone rubbers and additives.

The industries/ applications that have been able to take advantage of the truly exceptional performance of our materials have been Mould Making for Jewellery, Construction, Vacuum Casting, Composites as well as Pad printing, Cinematic special effects, Medical, Potting and Metrology.

We offer a wide range of Platinum Addition cure and Tin Condensation cure Liquid Silicone Rubber RTVs, manufactured in Europe and Asia. The materials are highly customized to suit the needs of every application.

- **Mixing Ratio:**
  Different mixing ratios such as 1:1, 10:1 and 20:1 available for ease of use.

- **Viscosity:**
  From extremely low viscosity RTVs (for use without vacuum), to brushable and sprayable thixotropic grades.

- **Hardness:**
  A wide range of hardnesses from 0 to 50 ShA to suit every application.

- **Setting Time & Working Time:**
  Extremely fast setting times as low as 30 min to high working times, depending on the needs of a customer.

- **Chemical & Bio Compatibility:**
  Broad range chemical compatibility with most aggressive casting materials such as resin, gypsum, concrete, edibles, wax, ceramic, soaps etc. Safe & Non Toxic for food, prosthetic and medical applications.

- **Colour:**
  Different colours from clear to opaque for easy differentiation and customisation.

- **Physical Properties:**
  Great physical characteristics such as high elasticity, tear strength which allows moulds to be used even after 20 years if stored correctly.

- **Dimensional Variation:**
  Little to no shrinkage ensures perfect replication of the original.

Mould Making for General Applications

Resins, candles, edibles, ceramics, tyres, soaps, etc.

The reproduction of any object, especially one with a complex shape, is a process that has to be well understood and also demands user-friendly materials if a good end result is desired. Fortisil provides the materials and the technical know-how needed to achieve this.

Our qualified sales team can help you choose the right silicone for your application, from casting edibles to casting resins. The materials can be used by industries as well as hobbyists.

Some of the special properties of our products for mould-making are:

- **Good resistance to different casting materials**
- **Ease of use**
- **Fast setting times**
- **Versatility in choice of products**
- **Safe and non-toxic materials**

For low-volume production (below 1000 pieces), where design change is constant, silicone moulds are the fastest and most cost effective option in the market today.

Recommended Products:

10A CLEAR LV, ZC 10, ZA 12 LT, ZA 13 MOULD, 15C WHITE, 20A CLEAR LV, HT 24 TRANSPARENT, ZA 22 MOULD, 25C WHITE, 30A CLEAR, HT 33 TRANSPARENT, ZA 35 MOULD FAST

FORTISIL®
Specialty Silicone Rubbers

Mould Making for Jewelry Manufacture

Gold and Imitation Jewelry

Fortisil RTVs are particularly used for and suited to the mass production of gold and imitation jewelry.

The complex requirements of the industry are covered by our addition cure RTVs which:

- **Reproduce details up to 2 microns**
  Give more flexibility for the designer as they see their luxurious, complex designs turn into reality. Especially suited for 'micro pave'.
- **Experience no shrinkage**
  It is very important not to have any dimensional variation to avoid wastage, especially when it comes to gold.
- **Are low viscosity**
  Makes the RTV easy to mix, pour and vacuum, thus reducing mould rejection.
- **Have Fast setting times**
  Reduce delivery times and increase production.
- **Have High tear strength**
  Moulds last longer, giving more castings per mould, thus making it more cost effective for larger volumes.
- **Showcase Ideal hardness**
  Hardnesses between 20-40 ShA are ideal to demould complicated wax pieces without damaging them.
- **Are Transparent**
  To see whether the casting material has spread sufficiently as well as for ease in cutting the mould.

Our RTVs have been perfected following inputs and advice from world renowned master goldsmiths.

Recommended Products:

30A CLEAR, HT 33 TRANSPARENT, HT 45 TRANSPARENT, 40A CLEAR PROTO

Mould Making for Construction Applications

Statues, Sanitaryware, Facades, Faux Stone, etc. made from Gypsum, Cement, FRP, GRC and other materials

This is one of the most common applications of Silicone RTV. The shift of focus from pure functionality to aesthetics and fine design has been made possible with Silicone RTVs. Shapes, materials and patterns have become more intricate, increasing the importance of superior quality materials like ours which offer these advantages:

- **Thixotropic grades available**
  Due to the sheer size of some of the moulds, it is not practical to make block moulds. Fortisil has brushable and sprayable grades which minimize the usage of Silicone, albeit giving a very good result.

- **High flexibility and tear strength**
  Moulds can be stretched 3 - 6 times their original size to demould a casting without damage. When stored properly, they can be reused even after 20 years.

- **Cost effective condensation cure grades**
  High performance condensation cure grades which offer a long working time are the best option in this price sensitive sector. Also a good option to avoid inhibition.

- **Good compatibility with casting materials and high casting output**
  In this application, casting materials are usually mixed with water. They also release a high amount of heat. This makes Silicone the only feasible option for long term use, easily surpassing the performance of other rubbers such as nitrile, latex & polyurethane.




Recommended Products:

ZC 10, ZA 13 MOULD, 15C WHITE, ZA 22 MOULD, HT 24 TRANSPARENT, ZA 25-6 SPRAY, 25C WHITE, HT 33 TRANSPARENT

Please see the product list for more information

Mould Making for Vacuum Casting

Prototype parts for fitment and functional testing of appliances, vehicles, electronics and other plastic parts

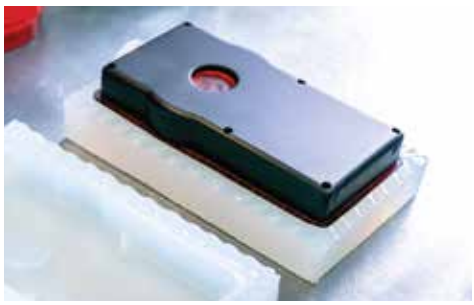
Vacuum Casting is the process of production of plastic resin parts under vacuum using silicone moulds. It is usually used in the pre-production phase for testing or when production volumes are low. It is critical that the prototype be as close as possible to the final product. This requires the right materials to accurately replicate the engineering design. Some of the advantages of Fortisil materials for this application are:

- **Rubbers having good resistance to resins**
  Resins undergo strong chemical reactions, releasing high heat when mixed and poured inside the silicone mould, which leaves the surface dry and etched after a few castings. Our rubbers have added fillers thus resulting in a much larger number of castings from the silicone rubber mould.

- **High Transparency**
  In order to ensure that the casting material has reached all crevices of the complex mould geometry, one must be able to see through the rubber. High transparency grades leave no doubt.

- **High tear strength**
  Demoulding complex parts might involve stretching and twisting the rubber mould but excellent tear strength ensures there is no deformation in it.

- **Supporting products**
  We provide additives such as Delayer for a longer working time as well as castable PU Resins for better compatibility with our Silicones.




Recommended Products:

HT 45 TRANSPARENT, 40A CLEAR SLOW, 40A CLEAR PROTO

Please see the product list for more information

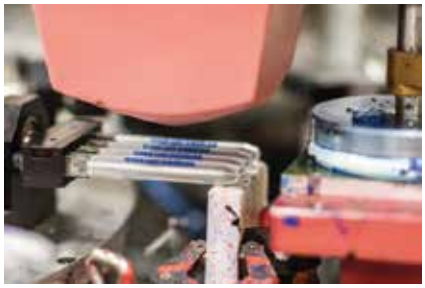
FORTISIL®
Specialty Silicone Rubbers

Pad Printing

Pads and rollers for the printing industry

Besides mold-making, Silicone RTVs are extensively used for printing over plastic and metal surfaces. A wide range of rollers and pads can be made in a variety of hardnesses based on the shape and size of the object to be printed on. Ideally the printing pad or roller should last as long as possible so as to not disrupt the flow of the production process.

Our materials help achieve this due to their superior properties, such as:



- **Flexibility and high tear strength**
  Complicated object shapes require the pad to bend or stretch over the surface sufficiently so as to not distort the print job. We have RTVs with a flexibility upto 550% in order to fulfill every print job.

- **Anti-static pads**
  Pads tend to be static in nature due to constant contact with plastic surfaces. This tends to attract dust and other particulate matter to the pad surface which is undesirable as it affects print quality. We have antistatic materials which prevent this from happening.

- **Good ink transfer**
  The rubber needs to have the property to pick up ink from the ink cup and transfer it to the substrate completely without any residue. Pads that leech oil are undesirable and affect ink transfer. Our pad materials have a low oil content, eliminating this issue.

- **Reducible hardness**
  Due to the low oil content in our RTV, it gives a user the option of adding oil to modulate the hardness without the oil leeching to the surface while printing. Fortisil also has multiple grades in different hardnesses to avoid the need for adding oil, thus increasing pad life.

- **Fast Curing**
  Our materials usually cure within 2 hours, thus allowing for faster production of pads.

- **High Print Output**
  Due to the presence of good fillers, pads from our RTVs are known to give 700,000 to 1 million prints per job.

Recommended Products:

ZA 4 LT, ZA 12 LT, ZA 32 RED, ZA PAD 32-20

Please see the product list for more information

Vacuum Bagging for Composites

High Tech Composite Parts for Defence, Boats, Aerospace, Racecars, Windmills, Trains, etc.

Vacuum bagging which has replaced traditional hand layup methods, is a process used in Vacuum Infusion Technology. Vacuum bags are usually made from Plastic film. However now modern companies have changed to Permanent Silicone vacuum bags, custom made to the shape of the part, which can be used for a number of vacuum cycles. These bags are more expensive than plastic film, but in the right production situation can readily pay for themselves.

Normally the thickness of the Silicone bag must be at least 8 to 10 mm, but with Fortisil Silicones, thickness of 3-4 mm is sufficient. With 3mm thickness the porosity of the Silicone bag allows the Styrene solvent to go through the membrane and increases the life of the bag.

Silicone Vacuum Bags are most effective and mainly used in case you have to make a minimum of 30-40 pieces of the same object

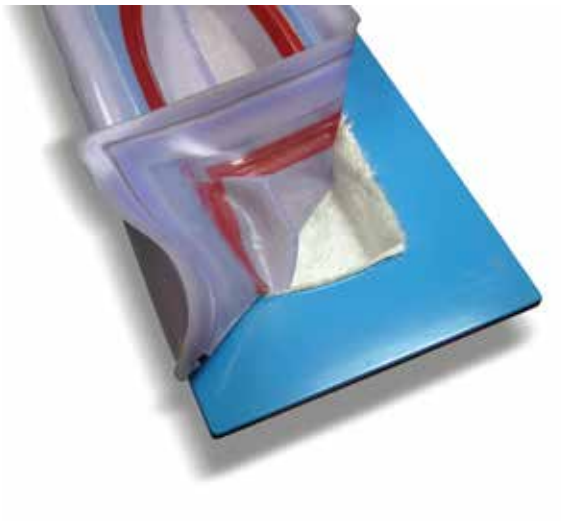
Advantages of Vacuum Bagging over Conventional Hand Layup or Clamping Techniques:

- **Even Clamping Pressure**
- **Control of Resin Content**
- **Custom Shapes**
- **Efficient Laminating**
- **Accurate control of part thickness**

FORTISIL®
Specialty Silicone Rubbers

Advantages of Silicone Vacuum Bags over Plastic Film:

- **Reduced tooling costs**
- **Higher fibre to resin ratio**
- **Faster production times**
- **Less labour usage**
- **Little to no plastic waste**
- **Lower resin usage**
- **Cost-Effective**
- **Reusable**
- **Used for production of negative draft parts**
- **Operates at high temperatures up to 200 °C**
- **Wrinkle free surface**



Recommended Products:

ZA 25-6 SPRAY, ZA 26 THIXO

FORTISIL®
Specialty Silicone Rubbers

Cinematic Special Effects

Prosthetics, Impressions, Movie Sets, Stunts

One of the biggest challenges of the movie industry is for the artists to bring the moviemaker's imagination to life. In the recent past, Fortisil Silicones have been used in Hollywood and Bollywood films to bridge the gap between reel and real. Silicones are used by makeup artists for impressions & prosthetics, by set designers for construction, by stunt coordinators for safety, and much more.

Benefits our products offer:

- **Safe and non-toxic with excellent biocompatibility**
- **Economical**
- **Low viscosity with high tear strength**
- **Similarity to skin**
- **Can be used with additives to reach any desired consistency to show burns, injuries, etc.**
- **Detailing up to 2 microns can accurately replicate minute details such as fingerprints, wrinkles, etc.**
- **A wide variety of hardnesses to suit every need**

Recommended Products:

00A CLEAR GEL, ZA SFX 10, ZA 22 THIXO BODY, HT 24 TRANSPARENT, ZA 35-15 GLASS, DEADNER SFX

Please see the product list for more information

FORTISIL®
Specialty Silicone Rubbers

Medical

Otology, Podiatry, Prosthetics, etc.

Due to their softness and compatibility with skin, Silicones have opened up a world of possibilities for the medical industry. Otologists, Dentists, Podiatrists & Prosthetists worldwide are at the cutting edge of innovation to bridge the gap between robotics and realism. Whether it is an artificial limb or an impression material, our range of Silicones provides a one-stop solution for medical professionals. Our Silicones are made in Italy and are tested for cytotoxicity and biocompatibility.

Besides this, our Silicones offer the following advantages:

- **A wide range of hardnesses from 0-50 ShA to replicate any body part**
- **Different Silicone forms, such as putty, and thixotropic liquids, are available for easy, non-messy workability**
- **Fast and slow working times available for different impression materials**
- **Low-viscosity grades are available, eliminating the need for industrial equipment**
- **Good technical support team for medical professionals**
- **Detailing up to 2 microns can accurately replicate minute details such as fingerprints, wrinkles, etc.**

Recommended Products:

0A CLEAR GEL, ZA SFX 0020, ZA 4 LT, ZA SFX 10, ZA 13 MOULD, ZA 22 THIXO BODY, HT 24 TRANSPARENT, ZA PODOS 25, ELITE ZA OT 38

Electronic Potting and Encapsulation

For Dampening & Insulation

One of the most common applications for Silicone RTVs is potting to protect electronic parts from humidity, dust, etc. Sometimes the parts are exceptionally delicate, and potting is done to ensure no damage due to movement and transportation. It is also used for dampening vibration.

Silicone RTVs are soft, chemically inert and excellent insulators, making them a great option for this application.

Besides all RTV grades, our Silicones are also available as gels and foams.

Fillers can be added to modify the properties such as conductivity, density, etc.

Recommended Products:

00A CLEAR GEL, SILICON FOAM

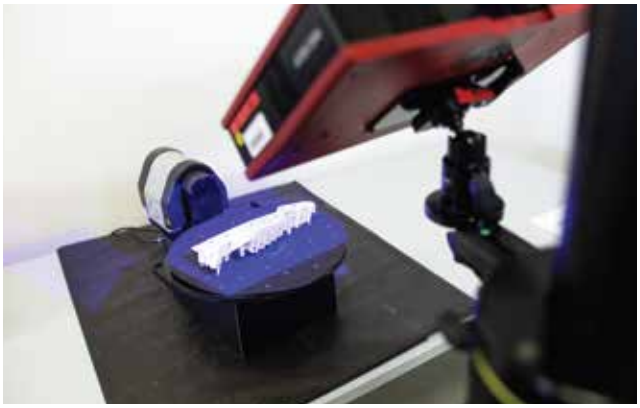
Metrology

For accurate measurement

Recently, Silicones have been used in the science of measurement. In most scenarios, microscopes, countourscopes, micrometres, sensors, etc., can be used. However, there are some cases where these fail. The Silicone can be poured into holes, gaps, crevices, etc. Once it flows and hardens, it can be removed and measured by conventional instruments. The impression is highly accurate.

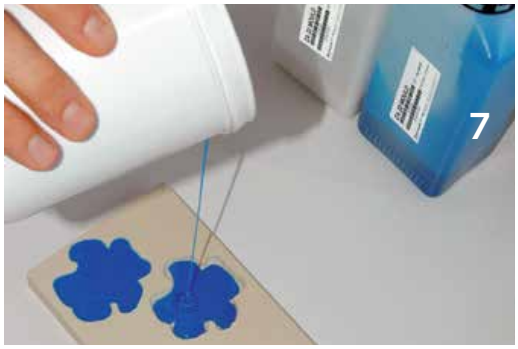
Significant Features:

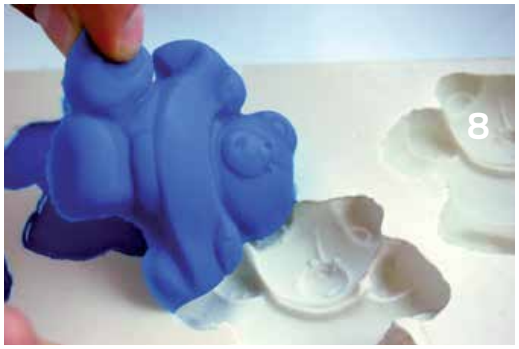
- **Our silicones have significantly less oil and can replicate details up to 2 microns.**
- **Cured Silicones show no dimensional variation for 20 years.**
- **They are anti-static and have very low surface tension.**
- **They are available in a variety of hardnesses depending on the complexity of the part to be measured.**
- **They have a low viscosity and flow easily into small spaces.**



Recommended Products:

ZA 955





Weigh out the base and catalyst in the recommended mixing ratios. Mix vigorously until the product assumes a uniform color. Once the product is thoroughly mixed, put it in a vacuum chamber to remove the bubbles generated in the mix. Once degassed, pour the liquid mix slowly into the frame preferably from a height above 15 cm. Vacuum again after pouring, if required. (Please choose a container with 6-8 times more volume than the liquid mix, to prevent overflow during degassing). Complete the entire process before the indicated WT. Wait for the indicated ST for complete hardening of the product. Wait for at least 24 hours before using the mould/ end product, for best results.

*The illustrations above are for 1:1 addition-cure silicone.

Product List & Technical Details

FORTISIL®
Specialty Silicone Rubbers

Name	Mixing ratio	Colour	Main Applications	Unvulcanised Form Properties				Vulcanised Form Properties		
				Hardness after 100% Cure (ShA)	Working Time - WT (@ 23°C)	Setting Time - ST (@ 23°C)	Visc (cP)	Tensile strength (N/mm2)	Tear Strength (N/mm)	Elongation at Break (%)
00A CLEAR *GEL*	1 : 1	Transparent	Special Effects, Potting, Medical	Gel	30'	3h	1,000	-	-	0%
ZA *SFX* 0020	1 : 1	Translucent	Special Effects, Medical	23 (sh00)	25'	1h 10'	5,200	1.2	3.5	770%
ZA 4 *LT*	1 : 1		Pad Printing, Medical	4	11'	1h 30'	1,800	1.2	4.5	650%
10A CLEAR *LV*	1 : 1	Translucent	General Mouldmaking	10	30'	3h	2,200	3.8	15.0	600%
ZA *SFX* 10	1 : 1	Translucent	Special Effects, Medical	10	12'	40'	10,000	3.3	14.0	650%
ZC 10	20 : 1		Construction Mouldmaking, General Mouldmaking	12	60'	24h	50,000	3.2	20.0	590%
ZA 12 *LT*	1 : 1		Pad printing, General Mouldmaking	12	20'	1h 30'	3,500	3.0	8.6	550%
ZA 13 MOULD	1 : 1	Translucent	General Mouldmaking, Medical, Construction Mouldmaking	13	45'	8h	4,500	3.0	12.0	500%
15C WHITE	20 : 1		Construction Mouldmaking, General Mouldmaking	15	60'	8h	15,500	3.8	19.0	480%
20A CLEAR *LV*	1 : 1	Translucent	General Mouldmaking	20	30'	3h	2,800	5.0	22.0	500%
ZA 22 MOULD	1 : 1		General Mouldmaking, Construction Mouldmaking	22	15'	1h 30'	4,500	4.5	20.0	480%
ZA 22 *THIXO* BODY	1 : 1		Special Effects, Medical	22	10'	25'	50,000	2.5	14.0	360%
ZA *PODOS* 25	1 : 1		Medical	23	1'	3'	-	-	-	0%
HT 24 TRANSPARENT	1 : 1	Translucent	General Mouldmaking, Construction Mouldmaking, Special Effects	24	20'	3h	4,500	5.5	15.0	530%
25C WHITE	20 : 1		Construction Mouldmaking, General Mouldmaking	25	60'	8h	22,000	4.3	24.0	450%
ZA 25-6 *SPRAY*	1 : 1		Vacuum Bagging for Composites, Construction Mouldmaking	25	6'	30'	8,000	4.5	26.0	420%
ZA 26 *THIXO*	1 : 1		Vacuum Bagging for Composites, Construction Mouldmaking	26	9'	1h	-	4.0	20.0	400%
ZA PAD 32-20	1 : 1		Pad printing	32	20'	2h	6,000	4.5	15.0	370%
ZA 32 RED	1 : 1		Pad printing	32	10'	1h 30'	6,000	4.5	10.0	370%
HT 33 TRANSPARENT	1 : 1	Translucent	Construction Mouldmaking, General Mouldmaking, Jewelry Mouldmaking	33	20'	3h 30'	7,500	5.0	20.0	460%
30A CLEAR	1 : 1	Translucent	General Mouldmaking, Jewelry Mouldmaking	35	30'	3h	5,600	7.0	13.0	480%
ZA 35 MOULD *FAST*	1 : 1		General Mouldmaking	35	7'	40'	4,000	4.2	8.0	310%
ELITE ZA OT 38	1 : 1		Medical	36	1'	3'	-	-	-	0%
40A CLEAR *SLOW*	10 : 1	Transparent	Vacuum Casting	40	60'	12h	34,000	5.0	13.0	300%
40A CLEAR *PROTO*	10 : 1	Transparent	Vacuum Casting, Jewelry Mouldmaking	43	90'	12h	30,000	4.5	25.0	300%
HT 45 TRANSPARENT	1 : 1	Translucent	Jewelry Mouldmaking, Vacuum Casting	43	12'	2h 30'	8,500	5.0	15.0	250%
ZA 955	1 : 1		Metrology, Master Model	50	5'	25'	5,000	3.6	5.0	150%

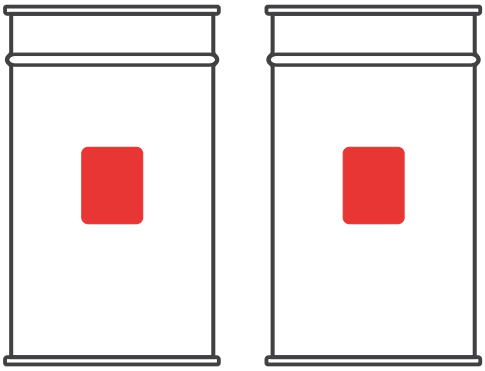
NOTE: The figures are intended as a guide and should not be used in preparing specifications

Additional Products

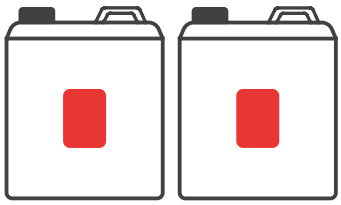
FORTISIL®
Specialty Silicone Rubbers

Name	Chemical	Form	Property	Small Pack	Standard Pack	Large Pack
THIXO AGENT	RTV Additive	Liquid	Adds a Thixotropic Property to Addition Cured RTVs to drastically increase viscosity, and prevent flow	50 g	250 g	-
DELAYER	RTV Additive	Liquid	Increases the Working Time (WT) in Addition Cured RTVs for ease of use	50 g	250 g	-
DEADNER SFX	RTV Additive	Liquid	Used to reach the gel consistency with SFX Grades which make the RTV easier to work with	50 g	250 g	1 kg
Name	Chemical	Form	Property	Small Pack	Standard Pack	Large Pack
SILICONE SPRAY	Spray	Liquid	Lubricant used before castings to improve the life of moulds	300 ml	750 ml	-
SILICONE OIL	Oil	Liquid	Used to reduce the hardness of RTVs by adding as a filler	1L	5L	30L
SILICONE FOAM	RTV-2 Platinum cure	Liquid	Non Toxic Foam with good chemical resistance used for potting. Foam volume is 6-8 times of liquid	1 + 1 kg	5 + 5 kg	25 + 25 kg
Name	Chemical	Form	Property	Small Pack	Standard Pack	Large Pack
PIGMENTS	Pigment	Paste	Variety of colours that can be added to Silicone RTV - White, Black, Blue, etc.	50 g	250 g	1 kg

Packs

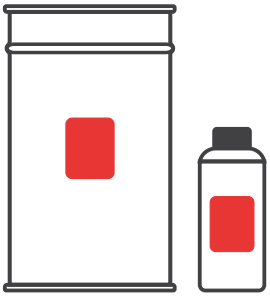


25kg + 25kg

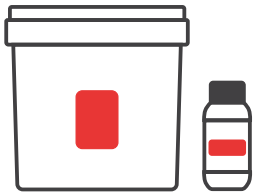


5kg + 5kg

1kg + 1kg



20kg + 1kg



5kg + 250g

1kg + 50g

Addition Cured Silicone Rubbers and Condensation Cured Silicone Rubbers

Mixing Ratio

Even a small variation in catalyst dosing with Condensation-cured Silicones can lead to undesirable results ('dead spots' due to unequal dispersion, over-hardening, varying hardness, and uncured parts) in the final mould, sometimes leading to total mould wastage. With Fortisil Addition Cured Silicones (1:1 ratio), the tolerance for dosing error is up to 5%. With the easier ratio, we bypass all the undesirable outcomes mentioned earlier.

Viscosity

This property ensures easy mixing, easy degassing, and pouring. The lower viscosity also ensures that the dispersion of the base and catalyst occurs more quickly. As a result, those mixing by hand will find it much easier than condensation-cured rubbers. A low viscosity also helps to avoid air entrapment and ensures better flowability of the liquid to small recesses of the master piece.

Hardness

Different applications require different grades of hardness. Softer rubbers allow for a greater range of applicability of moulds for more challenging geometries. It becomes possible to produce higher volumes of increasingly complicated designs. The use range of the Addition cure is much higher than the Condensation cure Silicones.

Mechanical Properties

Even though Addition cure Silicones are more prone to inhibition, they offer much better properties such as a tear, tensile, and elongation. The life and output of the addition cure are much higher than that of the condensation cure.

Price

Due to better mechanical properties, addition cure silicones work out more economical in the long run as they can be used for more than 100 cycles and stored for 20 years. On the other hand, condensation silicones have a lower cost per kg but give lower output and begin to disintegrate after one year.

Shrinkage

Condensation-cured moulds usually shrink after curing. It creates a difference between the master piece and subsequent replicas. Addition Cured Silicone Rubbers exhibit virtually zero shrinkage after curing and therefore deliver 100% accuracy time after time.

Chemical Resistance

Addition-cured Silicone rubbers can withstand temperatures up to 300 degrees C. Besides this, they are highly resistant to aggressive chemicals like concrete, resins etc. Unfortunately, condensation-cured rubbers usually begin to disintegrate when faced with high temperatures and aggressive components after a few cycles.

FORTIUS
MARKETING LLP

FORTICAST
High-Performance Casting Resins

FORTISIL®
Specialty Silicone Rubbers

FORTIPHI
Advanced Process Equipment

FORTIUS MARKETING LLP

+91 90677 36557 - +91 96076 36557 - sales@fortiusmarketing.in - www.fortiusmarketing.in

2nd floor, Suma Vilas, Off Old Mumbai-Pune Highway, Shivajinagar, Pune, India - 411003