



True to the original  
in every detail

Bluestar Silicones. Delivering Your Potential.

**BLUESTAR**  
**SILICONES**





# Silicones for molding applications

Bluestar Silicones is one of the world's leading fully integrated silicone manufacturers with applications and research laboratories, production sites and sales offices located around the globe.

We focus on developing state-of-the-art application expertise to help our customers challenge their boundaries.

At Bluestar Silicones, we're more than just high quality silicone products.

We are dedicated people located around the world committed to your success. From technical support to customized formulations and regulatory support Bluestar Silicones has the people in place when and where you need them.

50 years ago,  
Bluestar Silicones  
developed the Bluesil™  
RTV-2 range for  
the moldmaking market.  
As a global leader  
in moldmaking  
silicones market,  
Bluestar Silicones  
offers a complete line  
of innovative silicones  
RTV-2 products  
to meet your various  
moldmaking needs.

## Our Technical Service

**Bluestar Silicones technical service is ready to suggest the best moldmaking product that fulfills not only the technical requirements but also the economics of the production cycle in which the molds are to be used.**

This is possible through the accurate reproduction in the R&D laboratories of the real conditions at which the molds are used, such as the size of the mold, the demolding capabilities, the reproduction resins in use, the temperature/humidity of casting, and all specific additional variables that differ from customer to customer.

With such customer-focused technical assistance the RTV-2 that really fits all customer requirements is readily identified. Bluestar Silicones support continues as required also out of the R&D lab, by showing at the customer facility the best practices to work with the RTV-2 product, from the moldmaking process to the use of the obtained mold, exploiting the full potential of each grade.





# Our applications



## General purpose

- Unbeatable reproduction fidelity of details
- Long mold durability
- Room temperature Moldmaking
- Good fluidity
- Excellent flexibility
- Easy processing
- Self releasing molds
- High resistance to PUR resins
- Large choice of hardnesses and always excellent mechanical properties
- Large choice of catalysts which allows fulfillment of requirements for various applications



## Construction/ Architectural Molding

- Ease of processing
- Resin resistance
- Low linear shrinkage
- Highly accurate reproduction
- High mechanical properties
- Easy demolding from vertically developed shapes
- High compatibility with water rich casting materials (i.e. gypsum)
- Better compatibility to high performance concrete



## Rapid Prototyping/ Composite manufacturing

- Very good transparency
- Exceptional mechanical properties
- Long moldlife
- Accurate reproduction of details
- No shrinkage upon cure
- Free matching within product range
- Chemical resistance
- Easy mold release









# True to the original...

## Our technology makes the difference

### Innovations

For Bluestar Silicones, innovation is the basis for the development of new products and services, offering a competitive advantage to its partners and customers through a large range of technologies and applications.

The idea is to respond effectively and rapidly to customers' needs. For example, one of our last innovations is concerning our SPU range: now, customers can make 200 castings of polyurethane with the same mold.



### Close collaboration

Supporting its clients daily, constantly seeking progress and respect for commitments made, all Bluestar Silicones' employees are aware of the need to put their skills, knowledge, know-how and motivation to daily use in order to offer suitable products and solutions with the aim of continuously improving quality and listening to their customers' needs.

### A global presence

Bluestar Silicones is present worldwide, with a strong industrial base in Europe and China. Its two major intermediates production sites for upstream applications in Roussillon in France and in Xinghuo in China, provide the group with two important geographical anchor-points. Bluestar Silicones is also present in Spain, Germany, Italy, United States and Brazil.







# Construction and Architectural Molding

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ARCHITECTURAL MOLDING is the art of manufacturing construction pieces that resemble high value materials – such as middle-age stones or marble - by using concrete or gypsum.

If a villa needs a facade made of middle-age stones, either every single stone is picked-up from somewhere and assembled together, or the whole facade can be made as one piece: just by casting a designed concrete formulation into a Silicone mold.

**SILICONE RTV-2** are the key to obtain an accurate copy of any model stone: the outstanding reproduction fidelity of every single detail leads to reproduced stones showing veins and microcraps, forcing the observer to pass the finger onto such imitations to tell they do not come from the past middle age.

Architectural molding needs just 3 kind of materials:

1. Model stones (either real or artificial ones )
2. **BLUESIL™ RTV-2** silicone for moldmaking, to be casted onto the model stones in order to obtain their silicone mold
3. A suitable concrete formulation, that once casted and dried in the silicone mold, will look like exactly as the model stone.

BLUESIL™ grades dedicated to architectural molding combine the unbeatable reproduction fidelity of the silicone chemistry with the very high mechanical resistance and ease of processing required by the application.

The artificial stones produced thanks to such **BLUESIL™ RTV-2** products will show every single vein of the original middle-age stone from which they replicate.

BLUESIL™ RTV Polyaddition			3428	3430 SB <sup>(1)</sup>	3512 NB <sup>(2)</sup>	3522	3433	3436
Special Feature			General Purpose	Self Bleeding	Very Soft	Hydrophilic	High Resistance	High Hardness
Benefits			high mechanical properties	self-releasing molds	easy demolding from vertically developed shapes	high compatibility with water-rich casting materials	better compatibility to high performance concretes	high dimensional stability (self-supporting molds)
Mix Ratio			10:1	10:1	1:1	1:1	10:1	10:1
Hardness	Sh.A		28	30	12	20	30	35
Working Time	[min]		60	90	60	90	90	150
Setting Time	[h]		16	16	6	6	6	16
Viscosity A	[mPa.s]		25000	25000	9000	20000	25000	20000
Viscosity B			8000	2500	7000	20000	10000	7000
Colour A+B			white	gray	white	light blue	colorless	red or colorless
Tensile Strength	[MPa]		7.5	6.0	4.5	3.5	6.0	5.0
Elongation at Break	[%]		600	450	800	400	450	400
Tear Strength	[KN/m]		20	20	20	15	15	18

(1) SB = Self Bleeding

(2) NB = Non Bleeding



## ■ Selector guide

BLUESIL™ RTV	3428 A&B	3430 SB A&B	3512 NB A&B	3522 A&B	3433 A&B	3436 A&B
Standard construction materials (gypsum, plaster, ...)	✓			✓		✓
High performance concrete					✓	
Vertical shapes (pillars)			✓			
Artificial resins		✓		✓	✓	

## ■ Why choosing silicone vs the PU alternative?

	SILICONES RTV-2	PU
<b>Application</b>	<ul style="list-style-type: none"> <li>• All applications: from simple to complex forms with excellent reproduction fidelity</li> </ul>	Only flat products of simple geometry: panels, bricks, borders, ...
<b>Processing</b>	<ul style="list-style-type: none"> <li>• No H&amp;S issues for skin contact or skin touch</li> <li>• No heat evolution upon curing</li> <li>• Mix of 2 parts with a ratio of 1:1 or 10:1</li> </ul>	<ul style="list-style-type: none"> <li>• Toxic due to certain components of PU</li> <li>• Sensible to humidity</li> <li>• Very exothermic curing</li> <li>• Mix of 2 parts with various mix ratio possibilities (depending on grade)</li> </ul>
<b>Chemical &amp; Mechanical Properties</b>	<ul style="list-style-type: none"> <li>• Intrinsic release properties</li> <li>• Neglectible shrinkage</li> <li>• Weathering resistant (molds can be stored outdoors)</li> </ul>	<ul style="list-style-type: none"> <li>• Need of treatment with release agents before each casting</li> <li>• Hydrolizable, oxidizable and UV-yellowing</li> </ul>

**Users have to perform preliminary tests in order to check the compatibility between the silicone mold and the reproduction material in use and so assess the durability performance of the silicone mold. These preliminary tests must be performed every time a new reproduction material is to be used with the mold.**

Bluestar Silicones guarantees only the sales specifications of the **BLUESIL™ RTV-2** product, but cannot guarantee its compatibility with reproduction materials.





# Silicone solutions for General Molding

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Bluestar Silicones RTV-2 for general molding is about high fidelity and reliable reproduction of chosen objects and multiple copies using the same silicone mold.

Bluestar Silicones offers a broad range of hardnesses and curing kinetics meet the high requirements of moldmaking. Two technologies are proposed:

■ **Polycondensation** curing grades, historically known for classical moldmaking, are at the highest level of development aiming at the longest resistance (mechanical/chemical).

When selecting the suited Bluesil™ catalyst the choice can be made according to the used reproduction material but also the best suited curing time.

Polycondensation curing	BLUESIL™ CATALYST (5% add-on to RTV)		Kinetic	BLUESIL™ RTV											
				RTV 3306	RTV 3310	RTV 3315	RTV 3318	RTV 3318 SPU	RTV 3322	RTV 3325	RTV 3325P	RTV 3327P	RTV 3330	RTV 3330 SPU	RTV 3335 SPU
				Aspect	Viscous liquid							Putty		Viscous liquid	
	Color	White		White	White	White	Beige	White	White	Gray	Blue	White	White	White	
	Viscosity	20K		25K	17K	35K	35K	35K	35K	paste	paste	35K	35K	50K	
	Shore A	5	10	15	18	18	22	25	25	27	30	30	35		
	Cata 24H (Trans)	Multipurpose	PL	120	120	120	120	120	120			120	120	120	
			DT	24	24	24	24	24	24	24			24	24	24
	Cata 6H (Trans)	Multipurpose fast curing	PL	40	40	40	40	40	40	40			40	40	40
			DT	6	6	6	6	6	6	6			6	6	6
Cata 2H (Red)	Multipurpose very fast curing	PL	15	15	15	20	15	20	20			15	15	15	
		DT	2	2	2	2	2	2				2	2	2	
Cata 83# (Yellow)	Paste	PL								90	80				
		DT									24	24			
Cata SPE (Yellowish)	Resistance to PES	PL	120	90	120	120	120	120	120			120	120	120	
		DT	24	24	24	24	24	24	24			24	24	24	
Cata SPU (Yellowish)	Resistance to PUR	PL					150						150	150	
		DT					24						24	24	
Cata P13 (Yellowish)	Anti-reversion Anti-ageing	PL	120	120	120	120	120	120	120	120	120	120	120	120	
		DT	24	24	24	24	24	24	24	24	24	24	24	24	

PL = Pot-Life [min]      DT = Demolding Time [h]

■ **Polyaddition** curing grades complete the range where high performance is required.

Polyaddition curing	BLUESIL™ product	Viscosity [mPas] A/B	Colour Once Mixed	Pot-life [min]	Demol. Time [h]	ShA	Tear Res. [KN/m]	Tensile Res. [MPa]	Elong. at Break [%]
	RTV 3512NB <sup>(1)</sup>	9.000/ 5.000	White	75	6	12	20	4.5	800
	RTV 3428	25.000/ 8.000	White, Pink, Translucent	60	16	28	20	7.5	600
	RTV 3542 HV <sup>(2)</sup>	23.000/ 23.000	Colorless (Blue)	10	1	42	10	4.5	250
	RTV 3460	95.000/ 5.000	Gray	210	16	60	25	6.0	230

(1) NB = Non Bleeding

(2) HV = High Viscosity



## ■ Polyurethane Casting

Bluestar Silicones has very efficient polycondensation grades with high resistance to polyurethane resins.

Comparative trials showed that Cata SPU produces molds that resist considerably longer to polyurethane resins than molds made with standard catalysts.

### Benchmark vs standard catalysts

Casting experiments using a solvent-free PUR resin  
(15 castings/day,  $T_{\text{peak}} = 110^{\circ}\text{C}$ )

**RESISTANCE to PUR of molds made with RTV 3330SPU + 5% of:**



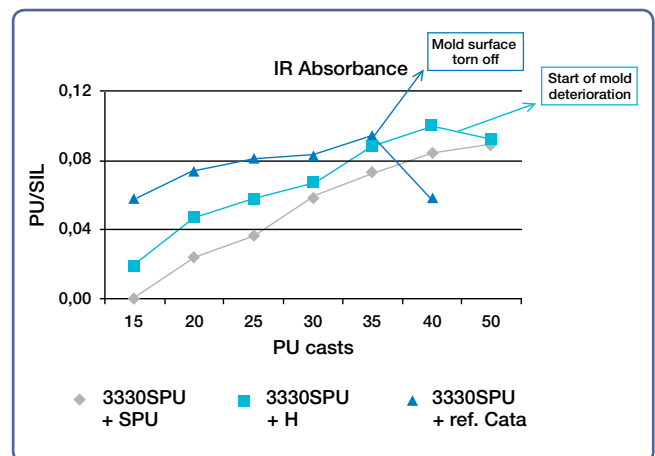
\* referred to max castings achieved with reference catalyst (normalized to 100)

**Legenda:**

- Mold disposed
- Mold broken
- Start of silicone leakage
- Normal use

The lower PU-signal of molds **produced with Cata SPU** agrees with casting experiments demonstrating **longer resistance of SPU molds**.

Infrared analysis of molds cast-after-cast: intensity of PU band over silicone band as measure of PU diffusion into the molds.



### RTV 33--SPU range offers the versatility of using standard catalysts & Cata SPU

In a moldmaking workshop, it is ideal to have one high performance silicone and a set of catalysts with different properties: need a mold in an eyeshut to have a quick idea? **RTV + Cata 2H.**

Instead of the usual polyurethane a new customer requires polyester manufacts?

**RTV + Cata SPE.**



## ■ Product Selector Guide

	BLUESIL™ RTV	3512NB A&B	3428 A&B	3542HV A&B	3460 A&B	3318 SPU	3330 SPU	3335 SPU	3325 3322	3255	any 33xx
	Cat					SPU			PES	24H	P13
	Curing	PA	PA	PA	PA	PC			PC	PC	PC
casting material	PU			✓	✓ (foam)	✓					
	PES								✓		
	Epoxy	✓		✓							
	Plaster	✓	✓	✓	✓	✓			✓	✓	✓
	Concrete	✓	✓								
	Wax	✓	✓	✓	✓	✓			✓	✓	✓
	Food		✓								
	Dimensional stability	✓	✓	✓	✓						
	Long term storage	✓	✓	✓	✓						✓
	Max service-T	200°C	200°C	200°C	200°C	60°C			60°C	150°C	60°C





# How would you like to replicate?

<b>Artificial wood</b>	▶ Dedicated grades for polyurethane casting
<b>Artificial stone</b>	▶ Architectural molding with plaster casting
<b>Metal manufact</b>	▶ Temperature resistant RTV-2 solutions
<b>Fiber-reinforced resin</b>	▶ Special catalysts (SPE/SPU)
<b>Wax</b>	▶ General purpose grades

If the question is “how many copies”, the answer is  
**BLUESIL™ Moldmaking Solutions.**

## Range of additives for polycondensation curing

Additive	Feature	Usage level	Special notice
<b>Additive PC-Thixo</b>	Imparts thixotropic behavior without changing pot-life	0.01 ÷ 0.1 %	A/ To be used in addition to a catalyst B/ Do not use with 3318SPU, 3330SPU, 3335SPU
<b>PC-accelerator</b>	Shortens pot-life & demolding time	0.1 ÷ 0.5 %	To be used in addition to the catalyst
<b>PC-retarder</b>	Increases pot-life	0.1 ÷ 0.8 %	To be used in addition to the catalyst
<b>Primer PM820</b>	Adhesion promoter on aluminum, steel, wood, artificial resins	Thin layer on surface	Works also for adhesion on cured polyaddition silicone

## Range of additives for polyaddition curing

Additive	Feature	Usage in the final mix	Special notice
<b>Additive PA Thixo</b>	Imparts thixotropic behavior	0.1 ÷ 0.5 %	Do not use with pad printing range
<b>Accelerator PA39</b>	Shortens pot-life & demolding time	0.05 ÷ 0.5 %	To be added to Pt-containing part
<b>Retarder PA40</b>	Increases pot-life	0.1 ÷ 2 %	To be added to part not containing Pt
<b>Primer PM820</b> <b>Primer PM811 A&amp;B</b>	Adhesion promoters on steel, aluminum, wood, artificial resins	Thin layer on surface	Adhesion promotion works as result of both primers: 1st treatment w. PM820, followed by PM811 A&B
<b>Primer PS810E</b>	Adhesion promoter on <b>cured</b> silicone	Thin layer on surface	Does not work for adhesion on polycondensation cured silicones
<b>CAF 3</b>	Glue for cured silicones	As needed	For both polyaddition and polycondensation





# Rapid prototyping and composite materials manufacturing

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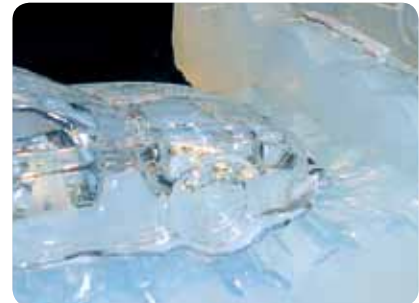
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## ■ Glass-like transparent silicone molds for rapid prototyping

### Moldmaking at room temperature for rapid prototyping

High transparency grades will not hide the object inside the mold. Reproducing with artificial resins (PU, Epoxy, PES) will not detriment mold quality. Pulling the object out of the mold will not damage the mold. All of this is **RTV 3040** family.



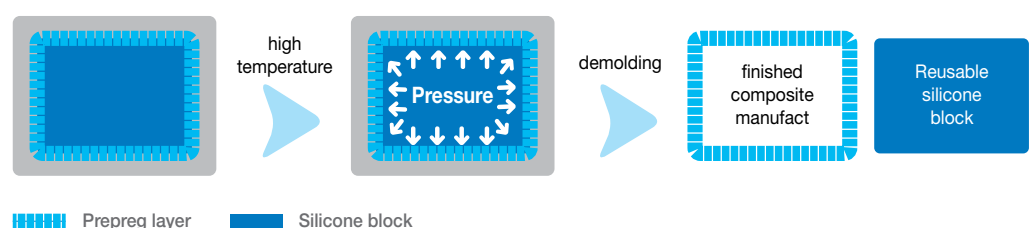
### Silicone range for rapid prototyping

BLUESIL™ RTV A BLUESIL™ RTV B	3040 A				
	3040	3040 SB	3040 HARD	3040 1:1	3040QC
Special Feature	standard	self-bleeding	higher hardness	1:1 mix ratio	quick cure
Mix ratio A:B	10:1	10:1	10:1	1:1	10:1
Hardness [Sh.A]	38	38	44	37	35
Working Time [min]	75	75	75	60	50
Demolding Time [h]	12	12	24	12	6
Mix Viscosity [mPa.s]	42000			56000	42000
Tensile Strength [MPa]	5.2	5.2	5.5	5.5	5.5
Elong. at Break [%]	350	350	330	400	300
Tear Strentgh [KN/m]	19	19	22	22	20

## ■ Silicone pressure intensifiers for thermal expansion molding

**Thermal expansion molding** is a low-cost manufacturing method for fabricating fiber-reinforced-resin composite structures. In its simplest form, the tooling is **self-pressurized by thermal expansion of solid silicone blocks** inside a closed hard mold box.

**BLUESIL™ RTV 3428** (see main characteristics of this material in the general molding sheet) can easily do the job: thanks to its volumetric thermal expansion coefficient  $\alpha$  of about  $5 \cdot 10^{-4} / ^\circ\text{C}$  and a Young modulus of about 1MPa, the elastomer allows for a pressure increase of about 0.05 bar every  $10^\circ\text{C}$  of heating.





# ■ Silicones for composite materials manufacturing – vacuum resin infusion bag

When naming SILICONE to the composite industry, the term was initially linked to “anti-adherence” or “no paintability”.

**BLUESIL™ RTV 3720** could make a mind-change when its 0,5 mm-thick film could be stretched up to 5 times its length: its potential as vacuum bag was immediately discovered.

**BLUESIL™ RTV 3720** can be sprayed onto the mold so that, after curing, a thin silicone film is readily available, adapting to every spot of the mold surface. Such film is a **silicone vacuum bag** that can be repeatedly used, and disposed only when the mold itself is not needed anymore.

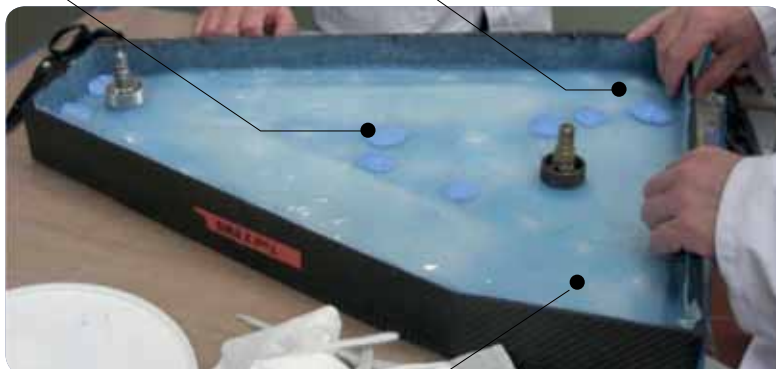
The mold construction is carried out as usual, and cast after cast instead of a new plastic bag the same silicone bag is applied, which contains already the vacuum valve and the sealing tape... that is the silicone itself.

The preparation of a vacuum bag with silicone is just different: you make **one bag for several production cycles**. If the silicone bag good, the economical return is granted! After **spraying or casting RTV 3720**, you may need to reinforce sharp corners of the bag: RTV 3535P is a silicone paste that, after kneading just in your hands, can be applied as a mastic on the silicone bag.

If the bag should be composed of multiple silicone layers, these can be attached together by means of **CAF 3, the silicone glue**. Finally, to prevent the silicone bag from moving out of the mold frames, the bag can be treated with RT Gel, a bicomponent **silicone adhesive** that adheres chemically to the bag: thanks to its tack, the silicone bag is vacuum-tightly attached to the mold frame.

**RTV 3535P:** silicone paste to protect / reinforce the bag where needed

**CAF 3:** silicone glue to join together cured silicone parts



**RT Gel:** silicone RTV-2 self-adhesive gel for removable adhesion of cured RTV parts on frame

<b>Silicone property</b>	▶ Silicone advantage in Resin Infusion
<b>Applicable by spray/brush</b>	▶ Time saving (i.e. no bag clamping)
<b>Silicone is self-sealing</b>	▶ No need for sealing tape (i.e. butyl tape)
<b>Resin resistance Good mechanical properties</b>	▶ Reusable > minor disposal efforts
<b>Elasticity self-release</b>	▶ Easy demolding No need for release agents



BLUESIL™ RTV	3720	3720 SC	3535P
<b>Hardness [Sh.A]</b>	20		35
<b>Working Time [min]</b>	3	60	3
<b>Demolding Time [min]</b>	15	150	15
<b>Mix Viscosity [MPa]</b>	40000	40000	putty
<b>Recommended Application</b>	spray	brush big molds	bag protection

**BLUESIL™ RTV 3720 is sold also in bi-cartridges!**



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