

**WACKER**

CREATING TOMORROW'S SOLUTIONS



HEALTHCARE | ORTHOTICS & PROSTHETICS

# SILICONES FOR ORTHOTIC & PROSTHETIC APPLICATIONS

ELASTOSIL®

# HEALTH. CARE. WACKER.



We care. And that's why we keep researching and developing medical solutions that improve quality of life. In applications such as medical devices, orthotics, prosthetics and medical silicone adhesives, you will feel the difference with our innovative silicones. Our experienced WACKER team knows how to find the right solution to the challenge of your specific product.

[More information](#)

[www.wacker.com/healthcare](http://www.wacker.com/healthcare)



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# WACKER SILICONES ARE BENEFICIAL FOR A WIDE RANGE OF APPLICATIONS IN ORTHOTICS & PROSTHETICS

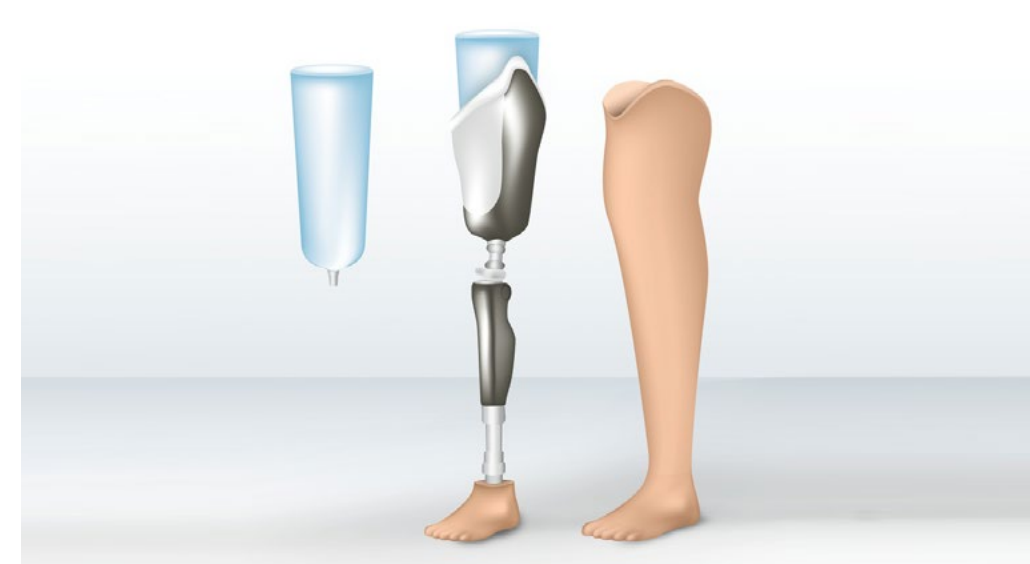
The human body is a wonderful work of art and a highly complex piece of engineering. When it is necessary to provide support or artificial replacements for particular physical functions in the human body, or to promote healing, WACKER provides an impressive range of high-quality silicone products and related services.

This brochure provides information regarding the use of silicone rubbers and gels for the following healthcare applications:

## External mammary prostheses



## Liners



## Prosthetics



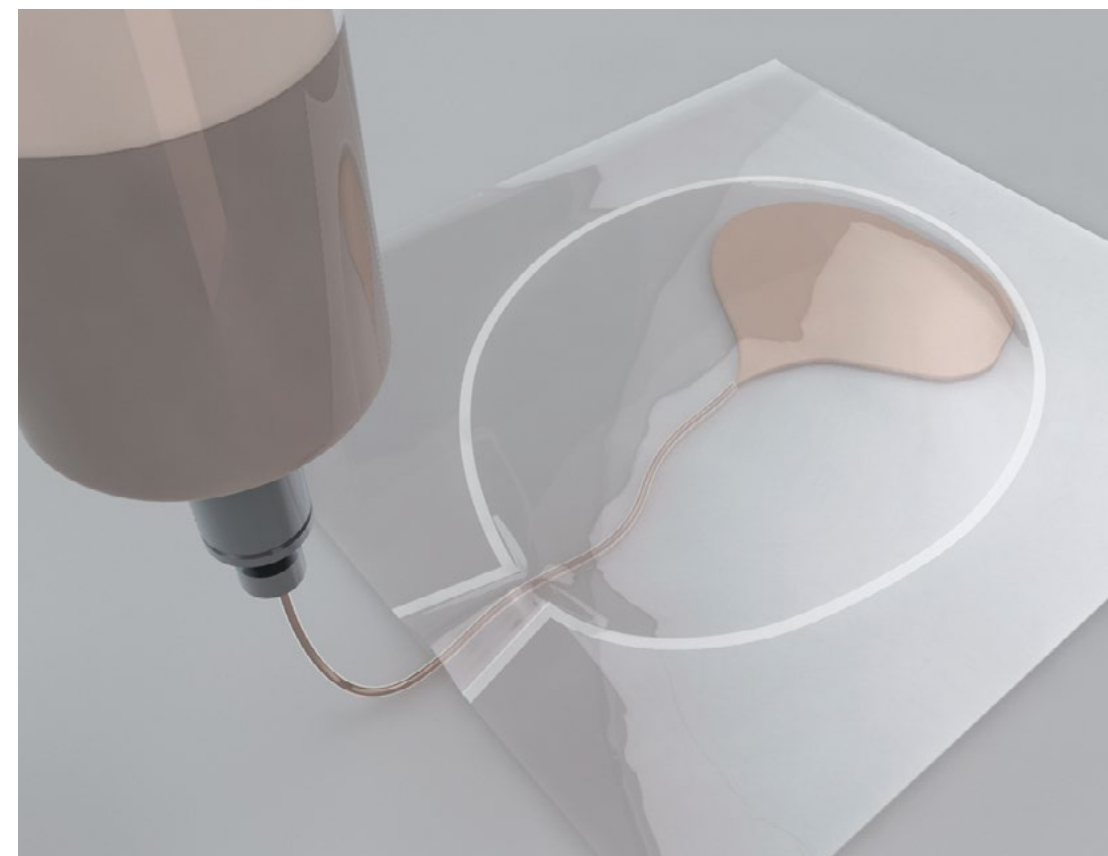
## Orthotics



From Soft Prostheses That Mimic Bio-Mechanics to Functional Body Support for Medical as well as Sports Applications

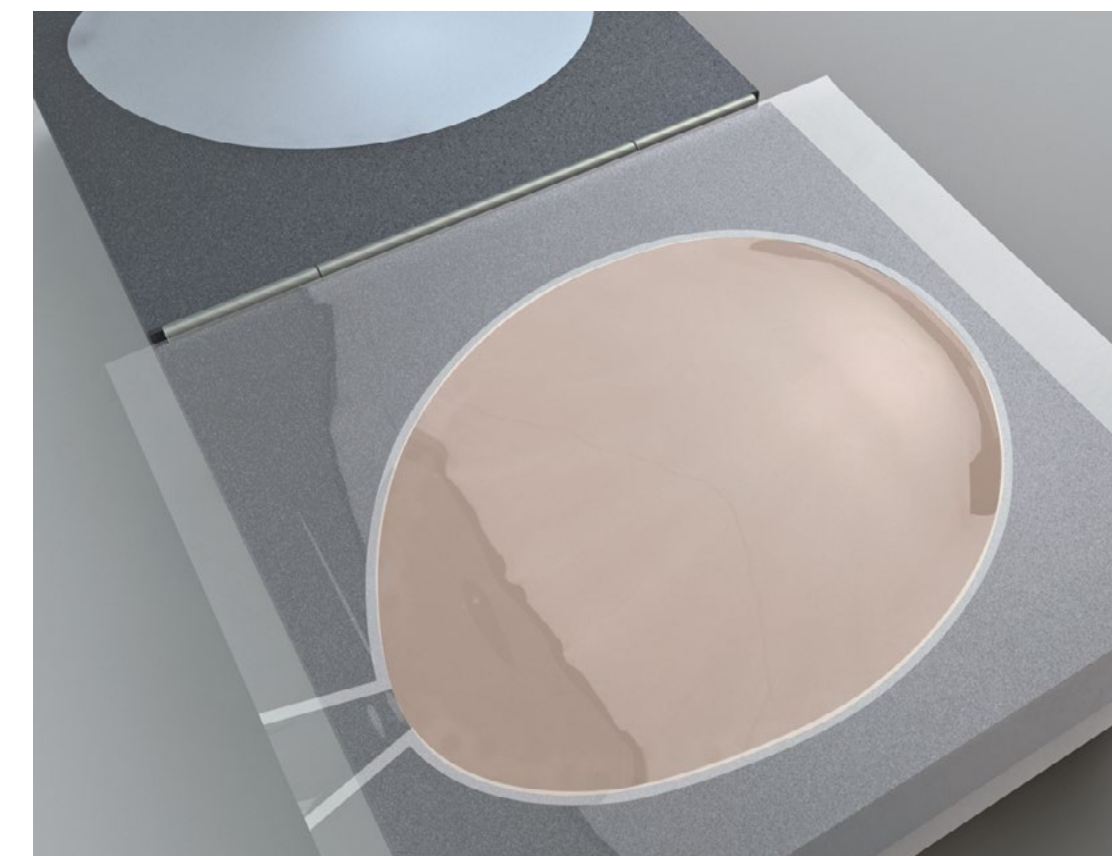


# NATURAL BREAST TISSUE IMITATION WITH ELASTOSIL<sup>®</sup> P SILICONE GELS



## Step 1

- An external mammary prosthesis mold consists of a thin shell (e.g. PUR) filled with ELASTOSIL<sup>®</sup> silicone gel
- The use of thermoplastic shell material allows individual shapes and sizes



## Step 2

- The shell is filled with ELASTOSIL<sup>®</sup> P silicone gel
- The shape of the prosthesis is set using a negative mold



## Step 3

- ELASTOSIL<sup>®</sup> P silicone gel begins curing at room temperature
- The process can be accelerated by heat input (approx. 80 °C to 120 °C)
- The prosthesis is then demolded and packed

# AESTHETIC PROSTHETICS & LINERS WITH LIFELIKE APPEARANCE

## As Versatile as the Requirements

Prosthetics is a highly sensitive area. WACKER's RTV-2 silicone rubbers and gels have an extraordinary property profile that make them ideal for:

- Producing aesthetic and functional prostheses for fingers, hands and partial feet
- Life-like and skin friendly epitheses
- Prosthetic liners
- External mammary prostheses

They provide excellent mechanical properties and can be easily combined

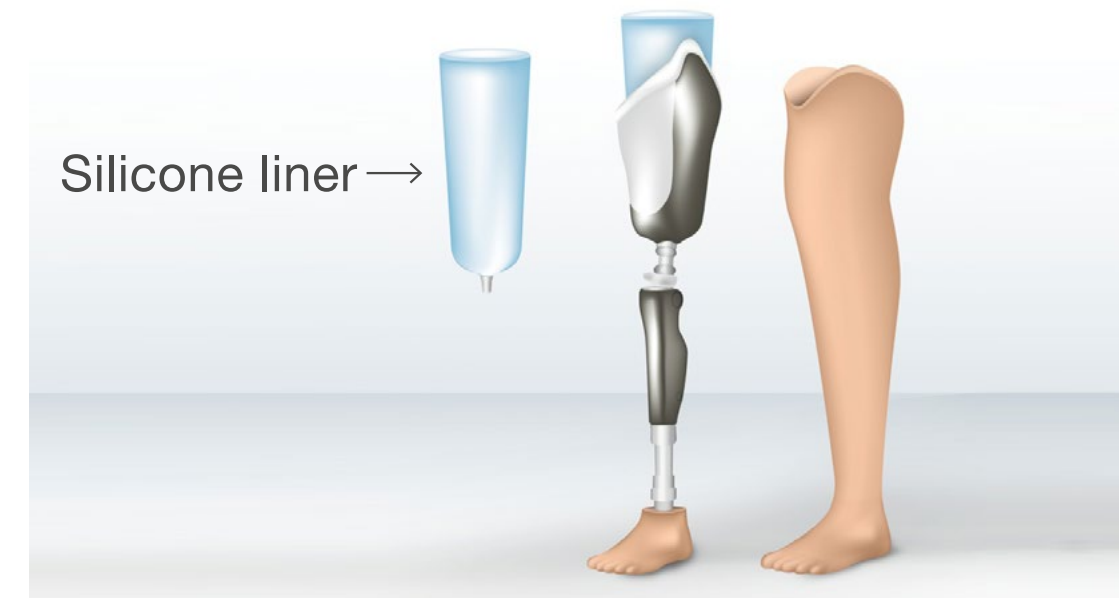
with WACKER ELASTOSIL® FL color pastes to create perfectly matching prostheses that are comfortable to wear and are nearly invisible.

## More Comfort by Reducing Friction

Silicone elastomers are product of choice for when reduction of friction is needed to avoid skin abrasion or creation of blisters. One example is the use in prosthetic liners, where the soft and flexible material can be fitted to an amputee's residual limb to protect the patient from pressure soreness and stress from the outer prosthetic device.

### Benefits of ELASTOSIL® P

- Easy metering and mixing
- Low viscosity
- Excellent mechanical properties
- Easy coloring with WACKER ELASTOSIL® FL color pastes



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# SILICONE RUBBER FOR ORTHOTICS: DAMPING SHOCK AND VIBRATION

## Improving Comfort Every Day

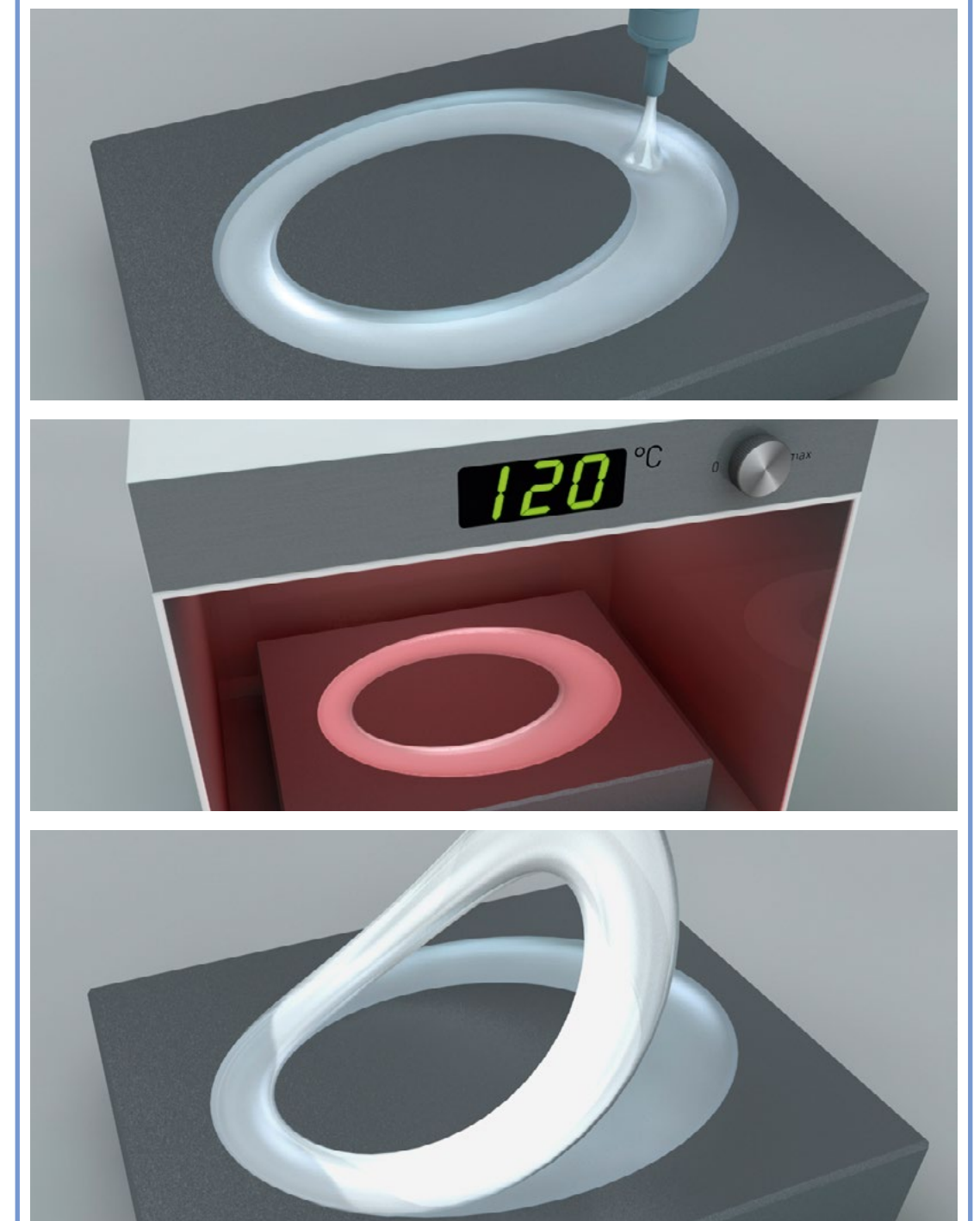
Orthopedic products must be able to damp a considerable amount of shock or vibration, and to apply gentle, comfortable compression. This is where ELASTOSIL® P silicone elastomers come into play, as they give manufacturers of orthopedic devices a comprehensive portfolio of products and services. WACKER silicone rubbers are first choice for orthotic devices and other products. The ability to combine different degrees of hardness and the compatibility with a large range of WACKER ELASTOSIL® FL color pastes gives manufacturers freedom of design to find the perfect fit for their patients' needs.

**Benefits of WACKER ELASTOSIL®  
P Silicone Elastomers** 

## Benefits of WACKER ELASTOSIL® P Silicone Elastomers

- High transparency
- Biocompatibility
- Breathability
- No byproduct formation on curing
- Do not support microbial growth
- No organic plasticizers involved
- Anti-allergenic
- Easily adaptable to skin temperature
- Good resistance to a large number of solvents and chemicals
- Sterilizable by steam, ethylene oxide, electron beam and  $\gamma$ -radiation
- Highly resistant to aging, weathering, heat and radiation
- Durability: low surface tension, thermal and chemical stability
- Broad range of Shore hardnesses


## Example of Cushion Molding Using an ELASTOSIL® P Silicone



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# RTV-2 SILICONE RUBBERS AND GELS FOR ORTHOTICS & PROSTHETICS

When it comes to matters of human health and when certain physical functions need to be relieved or replaced, it is essential that the materials employed meet the highest quality requirements. 

## WACKER RTV-2 Systems Make All the Difference

WACKER supplies room-temperature-curing (RTV) ELASTOSIL® silicone rubber grades designed to meet specific prosthetic and orthopedic demands. The addition-cure products are formulated as two-component systems: A and B. After components A and B have been mixed, the mixture cures to an elastomer at room temperature.

The process can be greatly accelerated by raising the temperature to between 70 and 130 °C.

## Broad Range of Viscosities: From Pourable to Spreadable to Kneadable

The broad product range covers a big variety of hardness (Shore 00 to Shore A) and viscosities from easily pourable to spreadable and even kneadable. The offered curing times of ELASTOSIL® P products make these rubbers suitable for standard manufacturing processes such as casting, brushing or dipcoating.

## More information

<https://www.wacker.com/healthcare>

## Safe Application Characteristics

- Biocompatibility
- Durability: low surface tension, thermal stability and chemical stability
- Good resistance to a large number of solvents and chemicals
- No organic plasticizers involved
- Sterilizable for single and repeated use (sterilizable with steam, ethylene oxide, electron beam and y-radiation)
- The excellent mechanical properties are highly resistant to aging, weathering, heat and radiation
- Silicones do not support microbial growth (due to their hydrophobicity)
- Easy processing due to low viscosity and good mixing characteristics
- Addition-cure RTV-2 systems do not release any byproducts on curing
- Broad hardness range
- High degree of comfort for wearer; breathability



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# RTV-1 AND RTV-2 ADHESIVE SILICONE GEL PRODUCT RANGE

## SILPURAN® – Two-Component Medical Skin Adhesives

Adhesive Strength	Product Name	Viscosity A* [mPa s]	Viscosity B* [mPa s]	Penetration [1/10 mm]	Adhesive Strength** [N/2.5 cm]	Tack [N]**	Pot Life at 23 °C [min]
<b>Low</b>	SILPURAN® 2130	1,100	1,000	220	1.8	55	74
<b>Medium</b>	SILPURAN® 2112	11,600	11,500	225	2.6	55	76
	SILPURAN® 2100	34,000	35,500	205	2.7	54	73
	SILPURAN® 2117	33,000	13,000	210	3.0	63	40
<b>Strong</b>	SILPURAN® 2114	12,000	10,000	200	3.5	66	70
	SILPURAN® 2124	3000	3000	155	6	46	40

[Watch our video](#) to see how a penetration measurement is done.

## SILPURAN® – One-Component Adhesive for Medical Components

Application	Product Name	Viscosity [mPa s]	Final Hardness Shore A (ISO 868)	Tensile Strength (ISO 37) [N/mm <sup>2</sup> ]	Elongation at Break (ISO 37) [%]	Tear Strength (ASTM D 624 B) [N/mm]
<b>Substrate bonding</b>	SILPURAN® 4200	200,000	35	5.5	300	10

\* For standard specifications and technical parameters, refer to the technical data sheet

\*\* On stainless steel

All figures are intended as a guide and should not be used in preparing specifications.

Measurement conditions for penetration: hollow cone 62.5 g, 60 sec.

## Benefits of SILPURAN® Adhesives:

- Biocompatibility (e.g. ISO 10993, USP Class VI)
- FDA Master Files (MAF)
- Anti-allergenic, soft and comfortable on skin
- Good breathability
- Does not support microbial growth
- Biodurability, low surface tension, thermal and chemical stability
- Good media resistance
- Sterilizable for single or multiple use (ethylene oxide)
- Good UV and aging resistance
- High transparency
- Repositionable





# ELASTOSIL® RTV-2 SILICONE RUBBER

## PRODUCT RANGE FOR THE PROSTHETIC INDUSTRY

	Special properties/ typical application	Mixing ratio	Viscosity A	Viscosity B	Hardness Shore A ISO 868	Hardness Shore 00 ASTM 2240	Tensile strength ASTM D 624 B	Elongation at break ISO 37	Tear resistance ISO 37
<b>ELASTOSIL® FX Tool-Box System to Match Your Individual Needs</b>		<b>A:B</b>	<b>[mPa s]</b>	<b>[mPa s]</b>			<b>[N/mm<sup>2</sup>]</b>	<b>[%]</b>	<b>[N/mm]</b>
ELASTOSIL® FX 10 A/B	Low viscosity; fast curing; tool box system with 4 bases in broad Shore-hardness range and 4 additives to adjust texture/softness (FX Softener), curing speed (Slow/Fast Cure) and flowability	1:1	4,000	6,000	10	-	4.5	950	20
ELASTOSIL® FX 20 A/B		1:1	6,000	6,000	20	-	6.0	750	25
ELASTOSIL® FX 28 A/B		1:1	10,000	10,000	28	-	6.0	500	28
ELASTOSIL® FX Gel 30 A/B		1:1	4,000	4,000	-	30	1.5	900	5.5
<b>Silicone Rubbers for Easy Casting and High Durability/High Mechanics</b>									
ELASTOSIL® P 7600 A/B	Insoles/cushions; translucent; good damping properties	1:1	4,000	2,000	-	28	1.2	650	3
ELASTOSIL® P 7670 A/B	Insoles/cushions; good damping properties; high Shore 00 hardness	1:1	1,800	1,800	7	55	1.9	580	3
ELASTOSIL® P 7671 A/B	Insoles/cushions; good damping properties	1:1	1,500	1,800	-	21	0.5	400	2
ELASTOSIL® P 7683/25 A/B	Liner; soft; good mechanics at low viscosity	1:1	1,200	3,500	-	25	1.5	650	5
ELASTOSIL® P 7684/40 A/B	Liner; medium Shore 00 hardness; excellent mechanics at low viscosity	1:1	1,500	2,300	-	40	2.2	670	8
ELASTOSIL® P 7684/60 A/B	Liner; high Shore 00 hardness; excellent mechanics at low viscosity	1:1	1,400	2,600	12	60	3.8	650	13

These figures are intended as a guide and should not be used in preparing specifications.



# ELASTOSIL® RTV-2 SILICONE RUBBERS AND SILICONE GELS

	Special properties/ typical application	Mixing ratio	Viscosity A	Viscosity B	Hardness Shore A ISO 868	Hardness Shore 00 ASTM 2240	Tensile strength ASTM D 624 B	Elongation at break ISO 37	Tear resistance ISO 37
<b>Kneadable Silicone Rubbers for Individual Molding to the Body</b>									
		A:B	[mPa s]	[mPa s]			[N/mm <sup>2</sup> ]	[%]	[N/mm]
ELASTOSIL® P 7915 A/B	For individual manual adaptations to the body, soft	1:1		Kneadable	17	70	5	550	1.2
ELASTOSIL® P 7950 A/B	For individual manual adaptations to the body, high Shore hardness	1:1		Kneadable	50	-	7	250	2.4
<b>Silicone Gels for External Mammary Protheses</b>									
	Special properties/ typical application	Mixing ratio	Viscosity A	Viscosity B	Pot life at 23 °C	Gel time at 70 °C	Penetration, hollow cone 62.5 g for 5 s		
		A:B	[mPa s]	[mPa s]	[h]	[min]	[1/10 mm]		
ELASTOSIL® P 7616-160 A/B	Good adhesion to PU films, easily pourable	1:1	350	1,400	> 6	22	160 (hollow cone 25g)		
ELASTOSIL® P 7619 A/B	2:1 mixing ratio, good adhesion to PU films, easily pourable	2:1	100	1,250	> 6	22	200		
<b>Lightweight Gels for External Mammary Protheses</b>									
ELASTOSIL® P 7630 A/B	Low density, very fast cure, good adhesion to PU films	1:1	8,000	8,000	0.5	3	220 (density 0.62 g/cm <sup>3</sup> )		
<b>Silicone Gels for Anti-Decubitus Applications</b>									
ELASTOSIL® P 26028 A/B	Gel with excellent damping properties	1:1	35	1,000	1.15		150		

These figures are intended as a guide and should not be used in preparing specifications.



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# CREATING TOMORROW'S SOLUTIONS

## A Diverse Array of Products for Growing Markets

Our product portfolio ranges from silicones, binders and polymeric additives to bioengineered pharmaceutical actives. In addition, we offer hyperpure silicon for semiconductors and solar applications.

## Innovations That Improve the Quality of Life

As a technology leader focusing on sustainability, WACKER promotes products and ideas that offer considerable value-added potential to ensure that current and future generations enjoy a better quality of life, based on energy efficiency and protection of the climate and environment.

## Global Knowledge for Local Markets

When you work with WACKER, you have 100 years of chemical expertise at your disposal, with access to the research findings and best practices of our experts throughout the world. Our knowledge base consists of a network of 23 technical centers, 14 training centers and our basic-research center.

### More information

[www.wacker.com/sustainability](http://www.wacker.com/sustainability)

**And most importantly: we are there. Worldwide. Wherever and whenever you need us.**

**Our local specialists know your markets and speak your language. By working with them, you will find innovative solutions that win over your customers and make you more competitive.**

### Follow us:

Find us on LinkedIn, YouTube and Twitter. We'll keep you up to date on the latest issues.



All figures are based on fiscal 2022.



## Silicones and Polymers

3,200 specialty products from organic and inorganic chemistry



## Global Market Leader

In dispersions and dispersible polymer powders based on vinyl acetate-ethylene (VAE), in building-protection silicones and in the production of cyclodextrin and cystein.



## Globally Active

- Sites worldwide
- Headquartered in Munich
- 27 production sites in Europe, Asian and the Americas
- 26 technical centers
- 14 WACKER ACADEMY training centers
- 52 sales offices



**Employees: 15,700**



## Total Sales

€8.21 billion



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