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WACKER **SILICONES**

ELASTOSIL®

GASKETING TECHNOLOGIES WITH
ELASTOSIL® SILICONE RUBBER

INTELLIGENT INDUSTRY SOLUTIONS

YOUR SEAL OF SUCCESS



WITH ELASTOSIL® SILICONE RUBBER
YOU CAN SAVE A WHOLE LOT OF
MONEY AND TROUBLE, OR JUST MAKE
SUPERB GASKETS.

WHERE TO FIND WHAT

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Gaskets are critical components that must perform under extremely difficult conditions. That is in their nature. As the last line of resistance between interior and exterior, hot and cold, or wet and dry, they must withstand all these opposite poles, however great the differences. What is more, they must be absolutely reliable and have the longest possible service lives. ELASTOSIL® meets these extreme demands perfectly.

As a material of extremes, it is ideal for all types of gaskets. Moreover, ELASTOSIL® can reduce costs significantly if used with the right gasketing technologies, providing direct application

of the material to the substrate. Such techniques are gaining increasing importance in the automotive, electrical, chemical and household appliances industries. We have therefore devoted this brochure especially to direct-application gasketing technologies, to their applications and to the ELASTOSIL® products most suitable for these technologies.

If you need further information, just call us any time. Our technical service team will be pleased to answer your questions.

* ELASTOSIL® is a registered trademark of Wacker-Chemie GmbH.

You have a competent partner in the
WACKER technical service team



DIRECT MATERIAL APPLICATION IS HALF THE BATTLE

Preformed elastomeric gaskets are increasingly being superseded by gasketing technologies, which permit the direct application of ELASTOSIL® silicone rubber.

The term covers bonded or "formed-in-place" gaskets (FIPG), compressive or "cured-in-place" gaskets (CIPG) and liquid-injected seals (LIS). With all these technologies, the sealing material is injected directly into the assembled joint. WACKER supplies a whole range of excellent standard products for these techniques.

The best gasketing technology for a particular application is determined by various factors: the contact media, the material, the operating conditions and, most importantly, by the question of whether the assembly needs to be dismantled.

| | FIPG | LIS | CIPG |
|--------------------------|--|---|---|
| Application | Pasty to free-flowing, fully automatic application | Pasty, fully automatic injection | Pasty to free-flowing, fully automatic application |
| Bonding | Both sides | None | One side |
| Assembly | Before curing | Before injection and curing | After curing |
| Dismantling | Not possible | Possible | Possible |
| Sealing function | By bonding | By expansion | By compression |
| Silicone sealants | ELASTOSIL® RT (RTV-1) | Silicone sealant ELASTOSIL® LIS (RTV-2) | ELASTOSIL® RT (RTV-1 and RTV-2), ELASTOSIL® SC (foams as protection against dust and splashes, for large tolerances and low contact pressure) |

IN BLACK AND WHITE

| ELASTOSIL® | SC 870 | RT 713 | RT 723 | RT 727 | N 189 | N 191 | N 2189 | LIS 4000 | ELASTOSIL® |
|---------------------|----------------|---------------|---------------|---------------|--------------|--------------|---------------|---------------|---------------------|
| Curing system | 2-part, RTV-2 | 1-part, RTV-2 | 2-part, RTV-2 | 2-part, RTV-2 | RTV-1, Oxime | RTV-1, Oxime | RTV-1, Alkoxy | 2-part, RTV-2 | |
| Properties | | | | | | | | | Properties |
| Color A | Black | Darkgray | Transparent | Opaque | Black | Gray | Black | Black | Color A |
| Color B | Transparent | Black | Black | Black | Black | Black | Black | Creamy white | Color B |
| Viscosity A | [mPa·s] 50,000 | 800,000 | 300,000 | 1,500,000 | 1,100,000 | 2,300,000 | 800,000 | 250,000 | Viscosity A |
| Viscosity B | [mPa·s] 50,000 | - | 1,000,000 | 1,500,000 | - | - | - | 350,000 | Viscosity B |
| Mixing ratio | 1:1 | - | 1:1 | 1:1 | - | - | - | - | Mixing ratio |
| Extrusion rate | [g/10 s] - | - | - | - | 10 g | 2 g | 6 g | 60 g | Extrusion rate |
| Pot life | 150 s | - | 12 h | 24 h | - | - | - | 90 s | Pot life |
| Skin-over time | [min] - | - | - | - | 25 | 15 | 25 | - | Skin-over time |
| Density | [g/cm³] 0.35 | 0.75 | 1.08 | 1.13 | 1.1 | 1.2 | 1.2 | 1.46 | Density |
| Hardness | [Shore A] 10 | 23 | 30 | 60 | 32 | 35 | 45 | 85 | Hardness |
| Tensile strength | [N/mm²] 0.35 | 1.5 | 5.0 | 4.0 | 2.0 | 2.5 | 2.2 | 4 | Tensile strength |
| Tear strength | [N/mm] - | 7 | 10 | 10 | 7 | 8 | - | - | Tear strength |
| Elongation at break | [%] 100 | 350 | 550 | 400 | 250 | 400 | 250 | 25 | Elongation at break |

Typical automotive applications

| Application | Description | ELASTOSIL® |
|--------------------|--|--|
| Oil pan | The silicone is applied uncured to the oil pan, which is assembled with the engine block. The silicone cures directly between the metal components, resulting in a firmly bonded seal. | SC 870, RT 713, RT 723, RT 727, N 189, N 191, N 2189, LIS 4000 |
| Oil pump | Our oil and heat-resistant silicone sealants are applied to form a LIS or CIPG gasket. | LIS 4000, RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Engine cover | Silicones are applied by the CIPG technique. The ELASTOSIL® SC foams used here provide excellent acoustic insulation while sealing against dust and dirt. | SC 870, RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Valve cover | CIPG compounds are mainly used here. They owe their effectiveness to the low compression set of our materials. | RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Oil separators | The bond to the valve cover with RTV-1 (FIPG) ensures that the gas return systems are leak-tight. | RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Oil filter | A CIPG gasket makes sure the engine stays clean. | RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Water pump | A specially developed RTV-2 silicone with high Shore-hardness provides excellent long-term stability. | RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Timing chain cover | Acoustic insulation and decoupling, together with a sealing action, is provided by RTV-2 foams applied by the CIPG process. | SC 870, RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Intake module | An efficient seal and effective fixture is provided with RTV-1 systems, assembled in an uncured state. | RT 713, RT 723, RT 727, N 189, N 191, N 2189 |
| Headlamps | Special sealants prevent "blinding" of headlamps. | SC 870, RT 713, RT 723, RT 727, N 189, N 191, N 2189 |



OUR STANDARD PROGRAM ALSO CATERS FOR SPECIAL CASES

The automotive and electronics sectors both include highly specialized applications that make extreme demands on the sealing materials used. They include engine gaskets, control unit gaskets, electronic encapsulation and special elements for decoupling noise and vibrations.

For all these special cases, WACKER offers suitable special grades:

- Oil-resistant RTV-1 and RTV-2 silicone rubbers for cylinder head gaskets, valve covers, oil pumps or oil pans.
- Antifreeze-resistant RTV-1 and RTV-2 silicone rubbers for radiators, heat exchangers and water-pump gaskets.
- Highly compressible foams and RTV-2 silicones for sealing fragile housing parts.
- Special heat-stabilized foams for gaskets and sealing lips in the region of the engine and exhaust system.
- Heat-conductive silicone rubbers for heat dissipation.



REDUCE YOUR COSTS BUT NOT THE DESIRABLE PROPERTIES

ELASTOSIL® silicone rubber combines the virtues of silicones with the advantage of significantly lower production costs for gaskets and seals.

Despite saving you costs in your production workflows, our ELASTOSIL® silicone rubbers make no compromises on the qualities typical of silicones. These properties ensure that your products have long service lives and function effectively.

ELASTOSIL® silicone rubbers are characterized by:

- Low-temperature flexibility
- Heat resistance up to 250 °C
- Good chemical resistance
- Outstanding resistance to ozone, UV and weathering
- Excellent electrical properties
- Excellent setting characteristics thanks to low compression set, and low modulus of elasticity

How you save:

- Lower materials costs through minimum sealant consumption
- No warehousing costs for prefabricated gaskets
- Reduced development costs thanks to much simpler design of the components
- No surface finishing costs
- Lower production costs through rapid, simple and automatic application of the gasket and simple assembly
- Lower costs thanks to greater process reliability



Integrated Management System certified to ISO 9001 and ISO 14001. Elastomers Business Unit also certified to QS 9000.

WACKER AT A GLANCE



WACKER is a globally active company with a well-balanced mix of chemical and semiconductor operations, as well as promising new business fields with good profitability prospects.

WACKER's four specialized, independently operating business divisions hold technology leadership positions in many markets and provide tailored solutions that create added value for customers.

With over 17,000 employees, WACKER generates annual sales of about EUR 3 billion. Europe accounts for about 50% of sales, North America (NAFTA) 30% and Asia + ROW 20%. Over the last five years, capital expenditures have averaged 18% of sales and R&D spending 5 to 6%.

WACKER SILTRONIC ranks among the world's leading producers of hyperpure silicon, the indispensable starting material for the semiconductor industry's highly complex electronic devices. WACKER SILTRONIC's leading-edge technology ensures long-term growth and innovation in this key industry.

WACKER SILICONES is one of the world's leading silane and silicone producers. Silicones offer highly diverse product properties for virtually unlimited applications. Thanks to their excellent characteristics, silicone products are ideal for intelligent, customized solutions in a broad range of industries.

WACKER SPECIALTIES is the global leader for high quality binders and a supplier of expert, customized solutions in specialty chemicals and biotechnology. Its business fields encompass functional polymers for paints, coatings and construction chemicals; industrial salt and acetils; and chemically and biotechnically produced building blocks for syntheses in the pharmaceutical, food, cosmetic and agrochemical industries.

WACKER CERAMICS is a provider of groundbreaking solutions for ceramic materials. It has extensive experience in the fields of advanced ceramics, ceramic powders, functional coatings and microporous insulation materials. Its outstanding expertise translates into efficient, customer-specific solutions.

WACKER

CREATING TOMORROW'S SOLUTIONS