



CONSTRUCTION | SILICONE SEALANTS

BUILDING THE FUTURE – WACKER® AL-POLYMERS

THE SAFE SOLUTION WACKER® AL-POLYMERS

The quest for a healthy living environment and clean indoor air has become a central issue in modern construction. In keeping with the growing demand for harmless building materials, WACKER offers a range of polymers for neutral curing, odorless alkoxy sealants that meet all health and safety requirements and can be formulated swiftly and easily using standard production equipment.

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EXPANDING TRADITIONAL SYSTEMS

In the construction sector as well as in industrial applications, silicone sealants are the products of choice for connection and expansion joints. Acetoxy has been the most dominant curing system for decades. Due to raised health awareness, alternative neutral curing solutions have gained in importance over the last years. To date, however, all systems have advantages and shortcomings.

| | Acid Systems | Oxime | Alkoxy |
|---------------------------|--|--|--|
| Performance | Reliable curing, robust mechanical properties, outstanding storage stability | Robust performance in exterior and interior applications | Superior adhesion on a wide variety of substrates in exterior and interior application |
| Production Process | Easy formulation for reliable and constant product quality | Easy formulation for reliable and constant product quality | Traditional in-situ processes use initial endcapping followed by compounding. These proved exceedingly difficult to steer with resultant fluctuating sealant quality ⓘ |
| Application | Traditional use as elastic joint sealing in sanitary area, bath and kitchen, with typical smell due to acetic acid release | Neutral system in applications where acetoxies unsuitable. Former release pungent smelling ketoximes upon cure | An almost odourless all-rounder for indoor and outdoor areas, as well as special applications, e.g: Natural stone |

OUR SOLUTION

WACKER® AL-POLYMER TECHNOLOGY

For robust alkoxy compounding technology, WACKER has developed AL-Polymers that are already end-capped when supplied. This means the formulator obtains highly functionalized polymers in a consistent quality. Although the polymer itself contains cross-linkable end-groups it is stable enough for handling in typical batch compounding equipment.

Easy Compounding

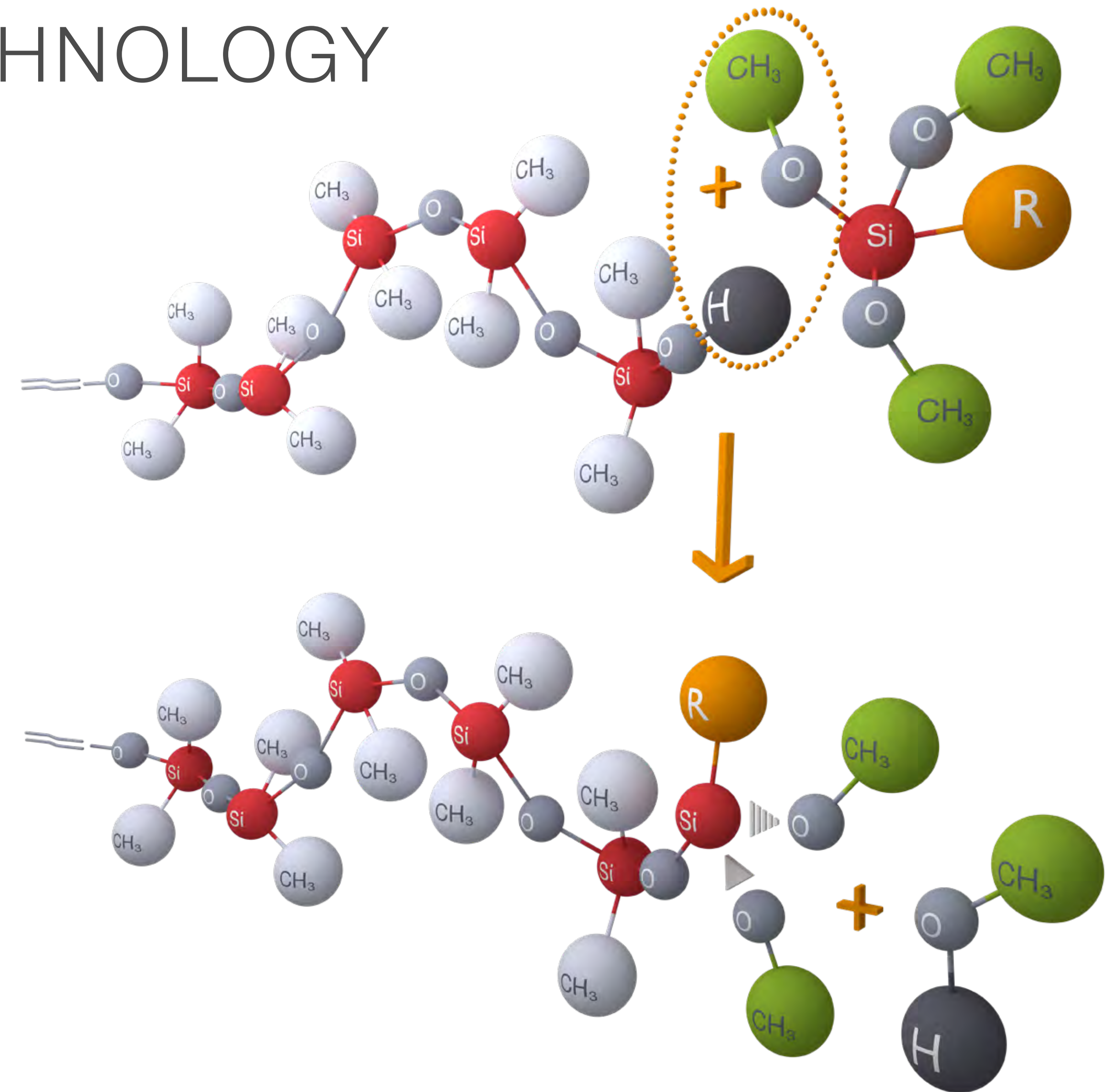
With AL-Polymers, the compounding process becomes fast and easy and guarantees reliable and constant product quality.

High Flexibility

Five different WACKER AL-Polymers cover the major needs in neutral curing sealants yet give the required flexibility to formulate products for diverse and specialized applications.

Ready-to-Use

Three grades are customized available with formulation proposals for well-defined and ready-to-go recipes for formulators looking to step into alkoxy technology without finetuning the suggested recipes.



PRODUCT OVERVIEW

ONE TECHNOLOGY, FIVE POLYMERS

| WACKER Raw Materials for Compounding of Alkoxy Silicone Sealants | | | | | | | |
|--|---|---|---|--------------------------|------------------|--------------------------------------|---------------------------|
| Product | Type | End Group | Special Features | Viscosity (mPa·s, 25 °C) | Molecular Weight | Density (g/cm ³ at 20 °C) | Flash Point (°C ISO 2719) |
| Alkoxy-Polymers | | | | | | | |
| <u>WACKER® Polymer AL 100</u> | Dimethoxy-terminated-polydimethylsiloxane | – OCH ₃ | High-functional polymer for all uses, plasticizer-free | ~ 100,000 | ~ 80,000 | 0.97 | 90 |
| <u>WACKER® Polymer AL 60</u> | Dimethoxy-terminated-polydimethylsiloxane | – OCH ₃ – CH ₃ | Polymer designed for low-modulus transparent formulations | ~ 60,000 | ~ 70,000 | 0.97 | 90 |
| <u>WACKER® Polymer AL 55 M</u> | Dimethoxy-terminated-polydimethylsiloxane | – OCH ₃ proprietary | Polymer designed for non-staining natural stone formulations | ~ 55,000 | ~ 70,000 | 0.97 | 90 |
| <u>WACKER® Polymer AL 110</u> | Dimethoxy-terminated-polydimethylsiloxane | – OCH ₃ – CH ₃ | Polymer designed for low- modulus filled formulations | ~ 110,000 | ~ 120,000 | 0.97 | 90 |
| <u>WACKER® Polymer AL 08</u> | Dimethoxy-terminated-polydimethylsiloxane | – OCH ₃ | Low viscous polymer for higher- crosslinking and flowable systems | ~ 8,000 | ~ 35,000 | 0.97 | 83 |

SELECTED ADDITIVES

ALKOXY CROSSLINKERS

| Alkoxy Crosslinkers | | | | | | |
|--------------------------|---|---|---------------------|-----------------------|--------------------------------------|-------------------|
| Product | Type | Special Features | Mol. Weight (g/mol) | Boiling (°C, 1013hPa) | Density (g/cm ³ at 20 °C) | Flash Point (°C) |
| GENIOSIL® VTM | Vinyltrimethoxysilane | Fast X-linker for robust curing | 148.2 | 122 | 0.97 | 25 (ISO 13736) |
| GENIOSIL® VTE | Vinyltriethoxysilane | X-linker for adjusted curing speed and improved green strength | 190.3 | 158 | 0.91 | 37 (ISO 3679) |
| CROSSLINKER ALX | Crosslinker package for tin-catalyzed AL systems | Allround crosslinker for formulations with improved skin forming time | – | 236 | 0.95 | 36 (ISO 3679) |
| CROSSLINKER ME 15 | Methyltrimethoxysilane | High purity methoxy-X-linker | 136.2 | 102 | 0.95 | 11 (DIN 51755) |
| CROSSLINKER ME 60 | Crosslinker/stabilizer package for transparent formulations | Designed for 25LM in transparent Polymer AL 60 formulations | – | >102 | 1.00 | 11 (DIN 51755) |
| CROSSLINKER ME 63 | Crosslinker/stabilizer package for filled formulations | Designed for 25LM in filled Polymer AL110 formulations | – | >102 | 0.99 | 11 (DIN 51755) |

SELECTED ADDITIVES

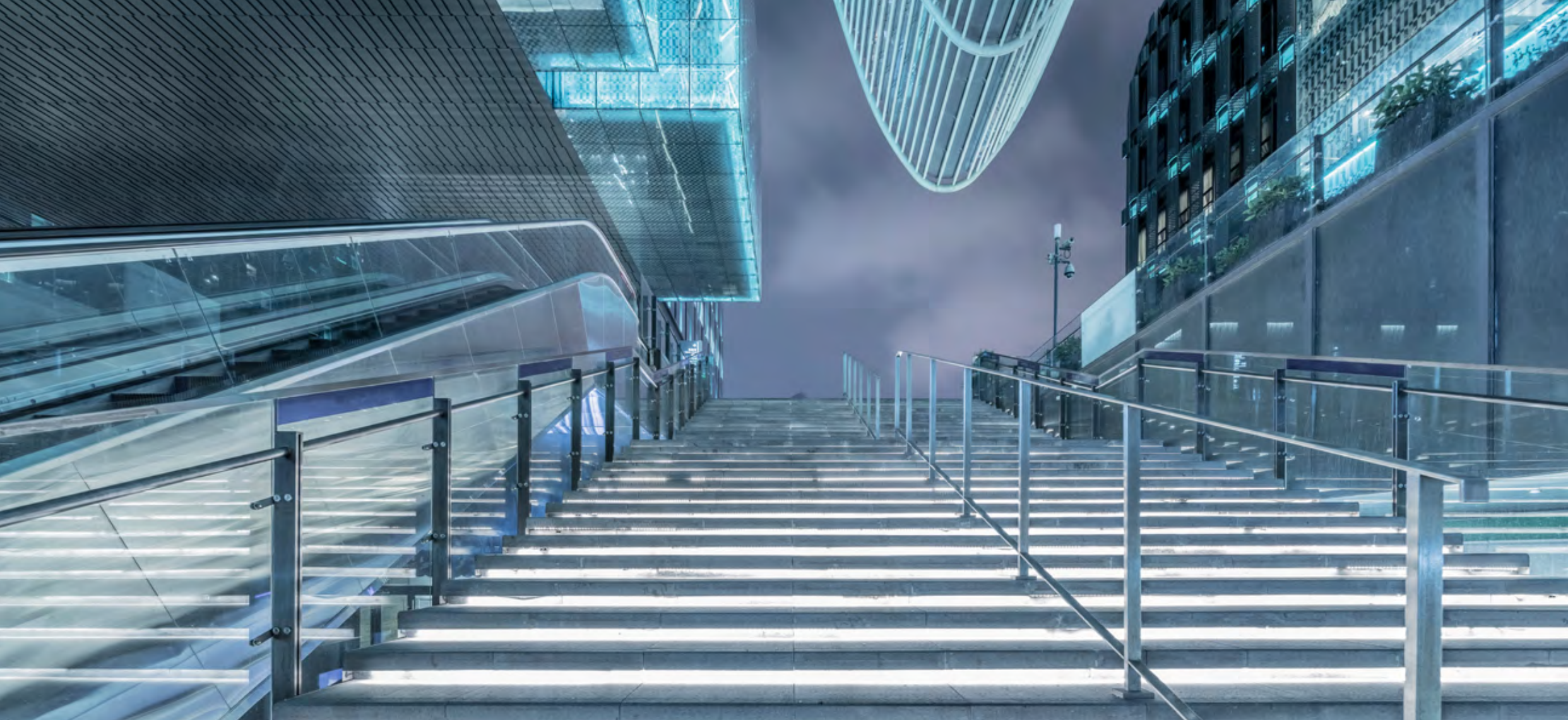
ADHESION PROMOTERS

| Adhesion Promoters | | | | | | |
|---------------------------------|---|--|----------------------|-----------------------|--------------------------------------|------------------|
| Product | Type | Special Features | Amine Number (meq/g) | Boiling (°C, 1013hPa) | Density (g/cm ³ at 20 °C) | Flash Point (°C) |
| GENIOSIL® DAPTM | Aminoethyl-aminopropyl-trimethoxysilane | Adhesion promoter and very efficient X-linker | 9.1 | 147 (16 hPa) | 1.02 | >100 (EN 22719) |
| GENIOSIL® GF 94 | Aminoethyl-aminopropyl-triethoxysilane | Adhesion promoter and X-linker for filled systems | 7.3 | >110 (3 hPa) | 0.97 | >100 (ISO 2719) |
| GENIOSIL® APTE | Aminopropyl-triethoxysilane | General adhesion promoter – ethoxy | 4.5 | 217 | 0.94 | 93 (ISO 2719) |
| GENIOSIL® APTM | Aminopropyl-trimethoxysilane | General adhesion promoter – methoxy | 5.6 | 210 | 1.01 | 79 (EN 22719) |
| Adhesion Promoter AMS 50 | Aminofunctional silicone resin | Filled systems (diamino, methoxy) | 3.0 | >170 | 1.02 | >100 (EN 22719) |
| Adhesion Promoter AMS 60 | Aminofunctional silicone resin | Higher amine level compared to AMS 50 | 4.8 | >170 | 1.00 | >100 (EN 22719) |
| Adhesion Promoter AMS 61 | Aminofunctional silicone resin | Good paintability (secondary amine, methoxy) | 2.3 | >200 | 1.02 | >100 (ISO 2719) |
| Adhesion Promoter AMS 68 | Aminosilane modified resin | Adhesion to plastics (primary amine, ethoxy) | 2.5 | >168 | 1.05 | 48 (ASTM D56) |
| Adhesion Promoter AMS 70 | Aminofunctional silicone resin | Broad adhesion profile, robust curing; low yellowing (primary amine, ethoxy) | 2.2 | >150 | 1.04 | 55 (ISO 3679) |

SELECTED ADDITIVES


AUXILIARIES


| Auxiliaries | | | | | | |
|--------------------------|---|--|-------------------|-----------------------|--------------------------------------|---------------------------|
| Product | Type | Special Features | Metal Content (%) | Boiling (°C, 1013hPa) | Density (g/cm ³ at 20 °C) | Flash Point (°C ISO 2719) |
| STABILIZER POP | Phosphonic acid modified silicone resin | Stabilizer | – | >102 | 1.05 | 18 |
| STABILIZER Alkoxy | Bis-trimethylsilylurea-mixture | Stabilizer, alcohol scavenger | – | – | 0.96 | 122 |
| CATALYST C88 | Diocetyl tin-catalyst | Silicate resin modified catalyst | ~ 6 % Sn | >150 | 1.05 | 48 |
| CATALYST AL-T | Titanium-catalyst | Catalyst formulation for filled Alkoxy | ~ 7 % Ti | >102 | 0.98 | 11 |




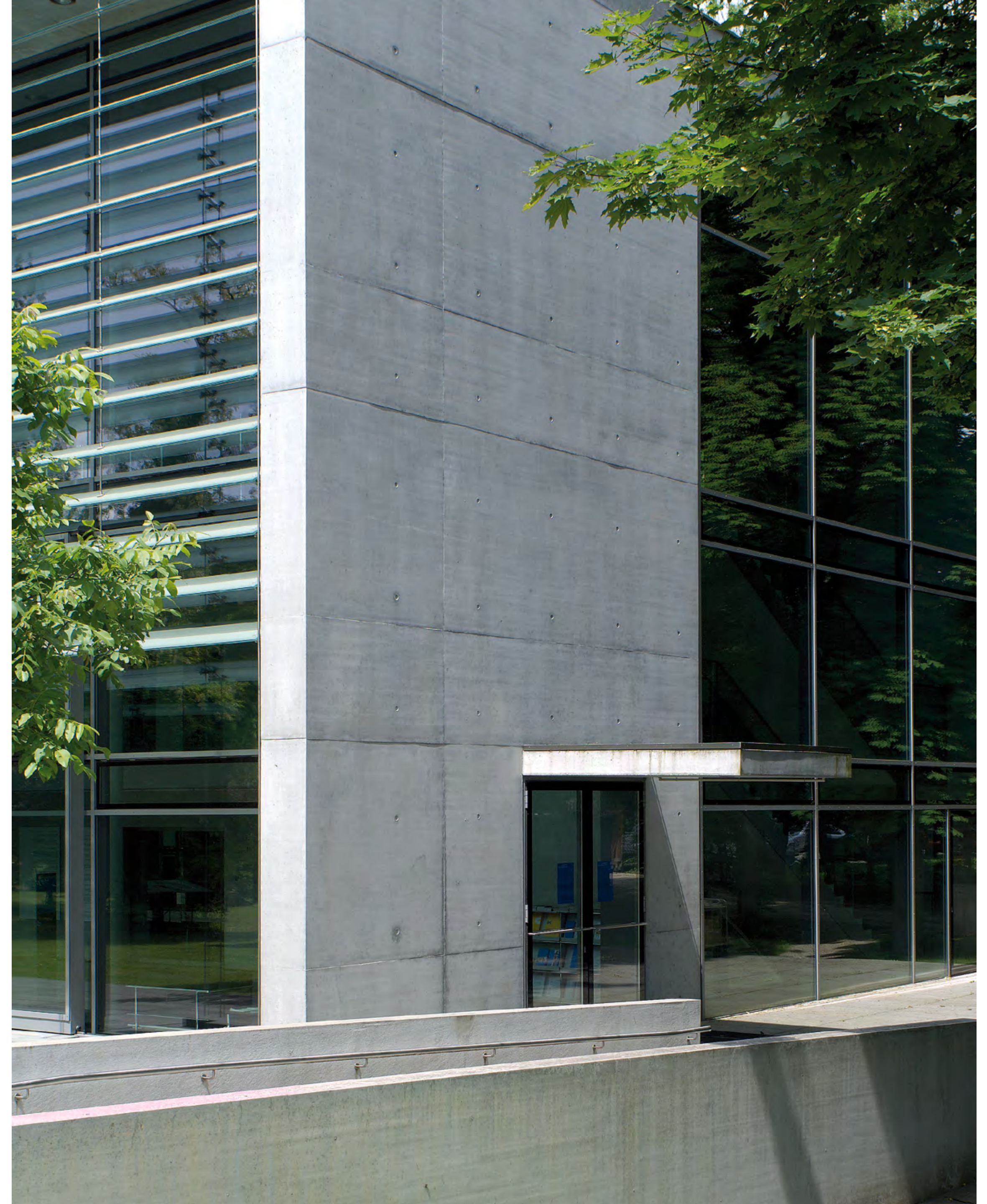
WACKER® POLYMER AL 100

POLYMER FOR ALL USES

- Base polymer for fast and simple compounding
- Plasticizer-free for maximum formulation latitude
- Suitable for transparent and chalk-filled formulations
- Provides alkoxy sealants with enhanced curing properties, improved crack resistance and greater storage stability
- Compatible with all AL-Polymers to adjust properties, e.g. combination of AL 100 and AL 110 optimizes modulus and elongation 

 **Transparent formulation:**
Guide Recipe and Mechanical Properties


 **Chalk-filled formulation:**
Guide Recipe and Mechanical Properties



WACKER® POLYMER AL: FOR TIN FREE FORMULATIONS

AN ALTERNATIVE FOR SELECTIVE APPLICATIONS


- AL100 as an example for Sn-free formulations – suitable with all AL-Polymers
- Easily compatible with typical silicone plasticizers to aid processing
- Catalyst AL-T suitable for systems containing wide range of active and inactive fillers
- Good adhesion profile e.g. to metal, glass, concrete, selected plastics and additional substrates

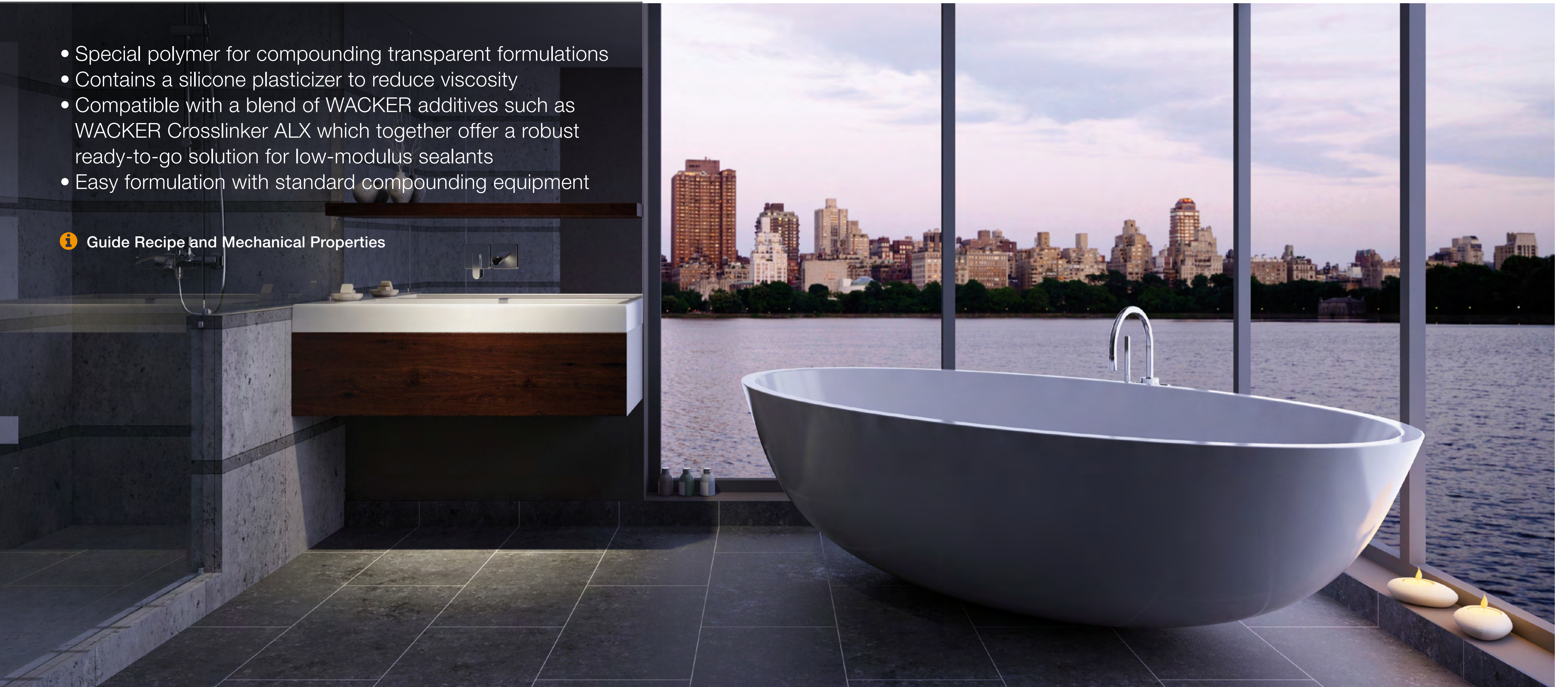
 **Guide Recipe and Mechanical Properties**

WACKER® POLYMER AL 60

FOR LOW-MODULUS TRANSPARENT SEALANTS

- Special polymer for compounding transparent formulations
- Contains a silicone plasticizer to reduce viscosity
- Compatible with a blend of WACKER additives such as WACKER Crosslinker ALX which together offer a robust ready-to-go solution for low-modulus sealants
- Easy formulation with standard compounding equipment

 [Guide Recipe and Mechanical Properties](#)



WACKER® POLYMER AL 55 M

DESIGNED FOR NATURAL STONE SEALANTS

- Direct offset to WACKER® Polymer AL 60
- Designed for non-staining natural stone formulations
- Contains a special plasticizer:
in combination with the WACKER® Plasticizer MH 30
allows compounders to produce sealants eliminating
natural stone staining

 [Guide Recipe and Mechanical Properties](#)



WACKER® POLYMER AL 110

FOR LOW-MODULUS CHALK-FILLED SEALANTS

- Special polymer with a higher molecular weight for low-modulus chalk-filled sealants
- Contains an adjusted plasticizer content to remain in a standard viscosity range
- Provides sealants with robust curing and good storage stability
- Combination with standard calcium carbonates as fillers is possible

 **Guide Recipe and Mechanical Properties**



WACKER® POLYMER AL 08 FOR SILICONE ROOFING COATINGS

- Polymer for compounding a silicone roofing coating
- Provides roofing coatings which can be applied in several layers by spraying, brushing or rolling
- Forming seamless and elastic protection to stop water penetration
- Product of choice where high temperature control and UV stability are imperative

i Guide Recipe and Mechanical Properties for Flowable Coating Formulation



CREATING TOMORROW'S SOLUTIONS

A Diverse Array of Products for Growing Markets

Our product portfolio ranges from silicones, binders and polymeric additives all the way up to bioengineered pharmaceutical actives. Rounding these out is hyperpure silicon for semiconductors and solar applications.

Innovations that Improve Quality of Life

As a technology leader focusing on sustainability, WACKER promotes products and ideas that offer a high 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 chemistry 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.

And most importantly: we are there wherever you need us – worldwide. Our local specialists know your markets and speak your language. 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, and we'll keep you up to date on the latest and discuss current issues with you.



All figures are based on fiscal 2021.



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
- 26 production sites in Europe, Asia and the Americas
- 23 technical centers
- 14 WACKER ACADEMY training centers
- 52 sales offices



Employees: 14,400



Total Sales
€6.21 billion

A wide-angle photograph of the Dubai skyline at sunset. The sky transitions from a pale blue at the top to a warm orange and red near the horizon. The city's skyscrapers are illuminated with various lights, and their reflections are visible in the water in the foreground. The Wacker logo is overlaid on the left side of the image.

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