

WACKER

CREATING TOMORROW'S SOLUTIONS



VINNAPAS®

CONSTRUCTION | FLOORING | DISPERSIBLE POLYMER POWDERS

VINNAPAS® –
SELF-LEVELING FLOORING
COMPOUNDS FOR PERFECT
SURFACES



WHO SAYS YOU CAN'T HAVE IT ALL?

Demands on today's self-leveling flooring compounds are high. On one hand, users expect them to form perfect surfaces that are ready for use in very little time, but also want to have as much processing time as possible.

Builders, on the other hand, are looking for cost-efficient leveling compounds that they can install with as few personnel as possible. As if that were not enough, the products are also expected to be environmentally friendly. Can you have it all?

With VINNAPAS® you can.



Faster Construction Progress

VINNAPAS® dispersible polymer powders can adjust the rheological properties of pumpable screeds and self-leveling flooring compounds so that large amounts can be pumped within a short period of time. Plus, because the setting and drying times for optimized self-leveling flooring compounds are short, the resulting flooring is ready for foot traffic within a few hours.



Smooth Surfaces

VINNAPAS® dispersible polymer powders optimize flow, self-smoothing and defoaming properties to produce flawless, smooth surfaces.



Highly Durable

By improving adhesion, abrasion resistance and surface hardness, VINNAPAS® dispersible polymer powders yield floors that have long service lives.



Healthy Living

VINNAPAS® dispersible polymer powders for self-leveling flooring compounds support low-emission solutions that meet major eco-standards, such as EMICODE® EC1 Plus and Blue Angel, in full.

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THE INNER WORKINGS OF TODAY'S TRENDS

Our ideas about flooring are changing. But no matter whether we want large tiles or highly flexible flooring materials such as natural rubber or cork, the subfloor still has to have the right properties. The role of self-leveling compounds here is to act as a leveling or smoothing layer. All these considerations place unique demands on the dry-mix mortar used. VINNAPAS® puts tried and tested solutions at your fingertips to give you a modern response to these demands.

New Floor Coverings Mean a New Preparation Method.

Renovation work is a major application for self-leveling flooring compounds. It entails preparing the existing floor for a new covering, such as large tiles or natural rubber. That requires a mortar with the following properties:

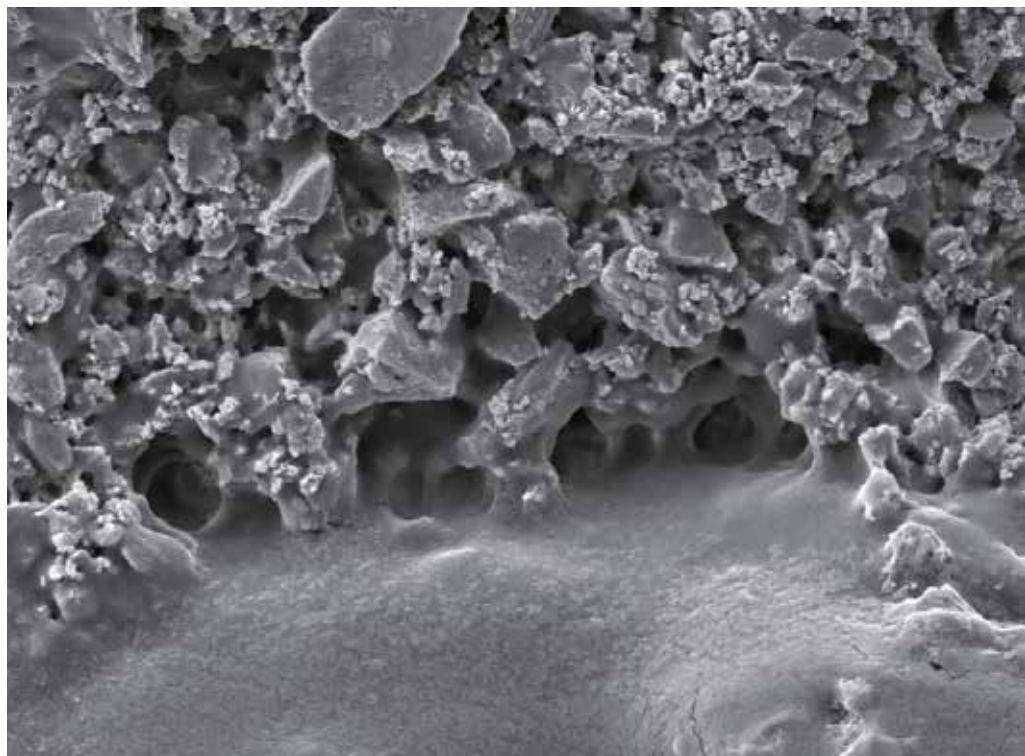
- Excellent adhesion to an extremely wide variety of subfloors (wood, metal, etc.)
- Excellent leveling capacity
Exceptionally smooth surfaces
- Considerable flexibility in order to dissipate stress and counteract cracking

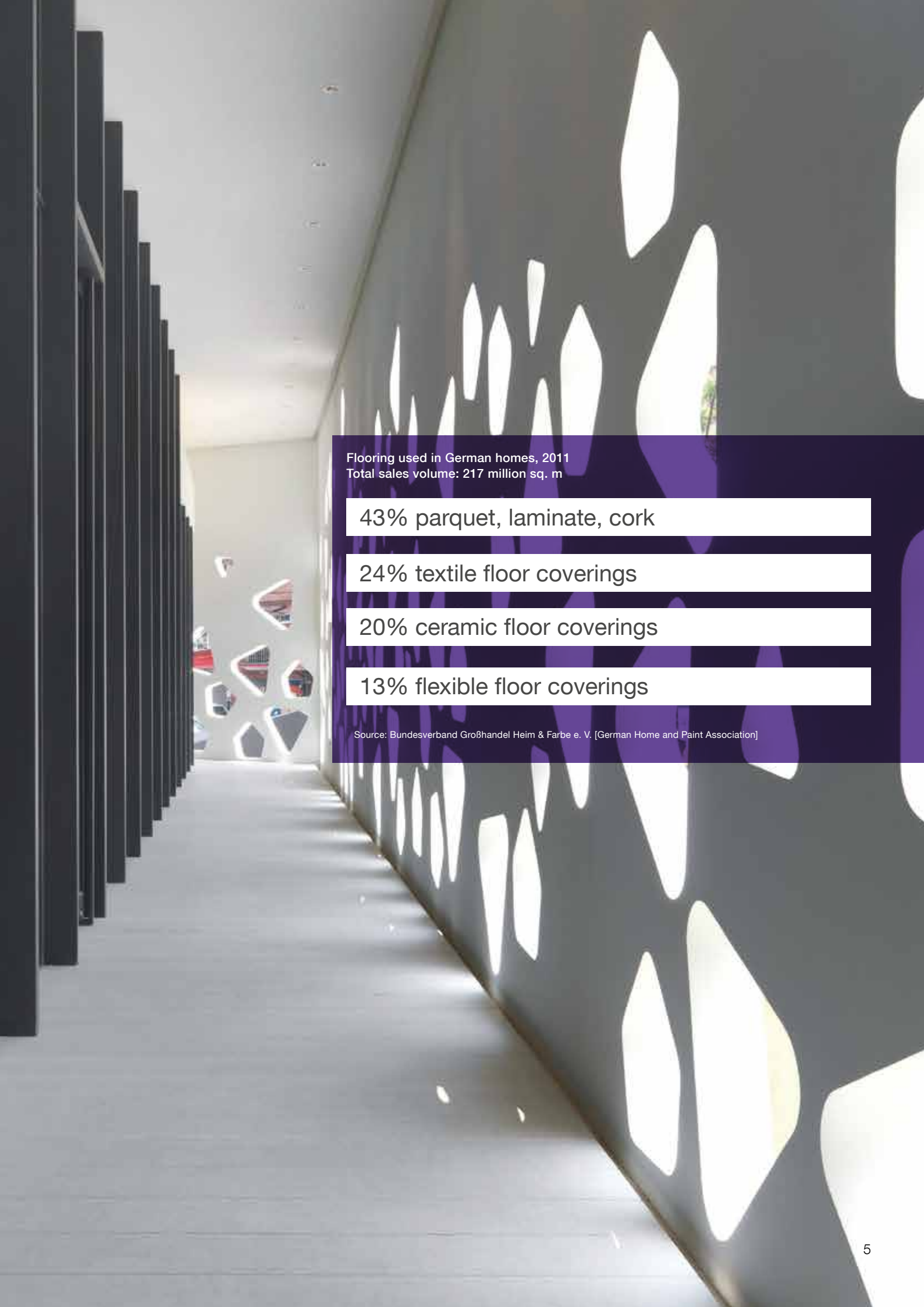
Nothing on Top? You Need Top Quality Below.

Flooring that used to be confined to factories is now making its way into our living rooms, as more and more consumers decide to use self-leveling flooring compounds without any other floor covering. That places new demands on mortars too:

- Excellent mechanical properties
- Very smooth, even surfaces with no seams
- No material abrasion and no roller damage
- High flexibility
- Optimum defoaming for perfect surfaces
- Suitable for customized flooring made with one or more pigments

A look inside a cured formulation reveals one of the key properties of VINNAPAS®: VINNAPAS® guarantees adhesion to an extremely wide variety of surfaces by forming flexible bonding courses between the subfloor and self-leveling flooring compound. VINNAPAS® also enhances cohesion, which prevents cracking and optimizes the overall results.





Flooring used in German homes, 2011
Total sales volume: 217 million sq. m

43% parquet, laminate, cork

24% textile floor coverings

20% ceramic floor coverings

13% flexible floor coverings

Source: Bundesverband Großhandel Heim & Farbe e. V. [German Home and Paint Association]



Our well-equipped technical centers help our customers

- Test existing formulations for compliance with national and international standards
- Update formulations to incorporate new raw materials or meet new customer requirements
- Develop new formulations

ACHIEVE EVEN MORE – WITH LESS

Less material, less waste, shorter installation time, fewer emissions, fewer formulation components – the most important objectives for the future are all about reduction. Exciting solutions for cutting back already form part of our portfolio, and we continue to work toward our goal of achieving more with less.

Example: Less Defoaming Agent

Specialty VINNAPAS® L-grade (L for leveling) powders produce smooth, even surfaces with considerable abrasion resistance, flexural strength and compressive strength. What makes them unique, however, are their defoaming properties: using select VINNAPAS® L powders in your formulations eliminates the need for additional defoaming agents.

Another advantage of these products is their high tolerance to excess water: specialty VINNAPAS® L powders have an outstanding stabilizing effect that prevents sedimentation and floating, even when too much gauging water has been used

Example: No Plasticizer Required

Besides acting as a polymeric binder, new VINNAPAS® F-grade (F for flow) powders are also highly efficient plasticizers. Concentrations of 1% to 2% eliminate the need for adding more plasticizer to the formulation, reduce sedimentation and bleeding (because the plasticizing effects are immediate), and improve pumpability thanks to their shear-thinning rheological properties.

Example: Fewer Emissions

All VINNAPAS® dispersible polymer powders for self-leveling flooring compounds are low in VOCs and contain no plasticizers. Using specialty VINNAPAS® L and F powders reduces emissions from the final product still further, as they allow manufacturers to omit additional defoaming agents and plasticizers that would elevate emissions.

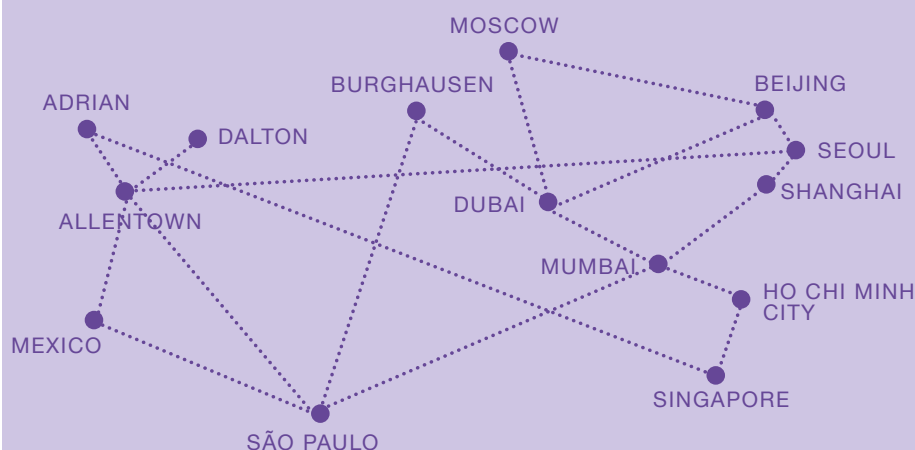
Example: More Service

VINNAPAS® dispersible polymer powders were the first dispersible polymeric binders available on the market in powder form. Today, VINNAPAS® has made WACKER a global market and technology leader – a position the company also owes to its status as one of the most research-oriented corporations in the chemical industry. And our scientists working in basic and applied research are constantly devising new solutions for the construction industry.

We also support our customers by maintaining over 20 technical centers around the globe, as well as 14 WACKER ACADEMY sites offering seminars and training workshops specifically for the construction industry.

The WACKER ACADEMY holds regular training workshops throughout the world on the subject of self-leveling flooring compounds. These courses cover theory, sample formulations and practical exercises, and involve testing formulations in accordance with national and international standards. Find out more at www.wacker.com/wacker-academy.

WACKER ACADEMY and Technical Centers: Our Global Network of Experts



FRESH MORTARS:

VINNAPAS® PUTS THEM IN A CLASS OF THEIR OWN

VINNAPAS® L (for leveling) and F (for flow) series have been specifically developed for use in self-leveling flooring compounds, where they improve flow and workability, as well as the properties of the finished product.



VINNAPAS® L:
Excellent Leveling Properties

When combined with casein and synthetic plasticizers such as polycarboxylate ethers, VINNAPAS® L dispersible polymer powders yield very smooth, crater-free surfaces. Their excellent, inherent defoaming properties allow our customers to create extraordinarily smooth surfaces with no bubbles – all with no additional defoaming agent.



Flow Properties

VINNAPAS® dispersible polymer powders allow you to adjust the flow properties of self-leveling flooring compounds to suit your individual needs, and to meet the demands of the subfloor and processing method involved.

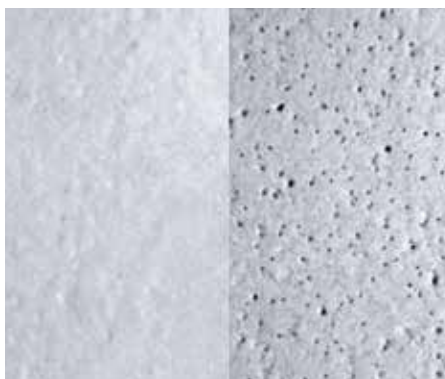
VINNAPAS® F:
All the Plasticizer You Need

Based on ethylenic copolymers, VINNAPAS® F dispersible polymer powders lend formulations the properties of casein and of classic and modern synthetic plasticizers (such as melamine sulfonate and polycarboxylate). Depending on the type of VINNAPAS® F used, this allows users to adjust rheological characteristics to meet their individual needs. Suitable for manual or mechanical processing.

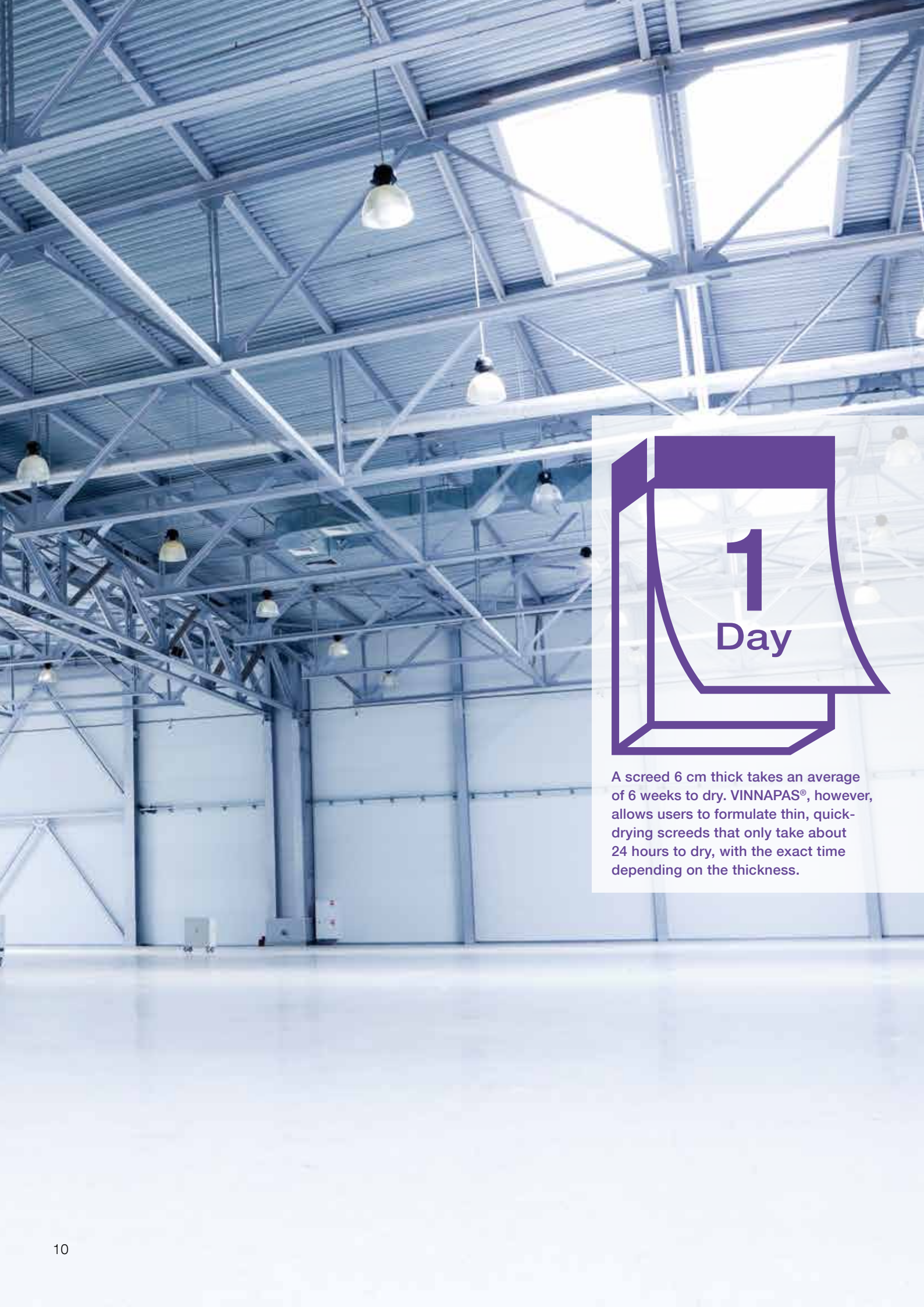


Self-Healing Properties

When used in self-leveling flooring compounds, VINNAPAS® L and F polymer powders improve self-healing, an important property for perfect, smooth surfaces.



The fine-pored surface on the left was achieved using a self-leveling flooring compound with no additional defoaming agent. The compound was modified with a VINNAPAS® L product. The surface on the right shows the results of a formulation produced with a defoaming agent and a conventional dispersible polymer powder.



A screed 6 cm thick takes an average of 6 weeks to dry. VINNAPAS®, however, allows users to formulate thin, quick-drying screeds that only take about 24 hours to dry, with the exact time depending on the thickness.

FRESH MORTARS: PICKING UP THE PACE OF BUILDING

Self-leveling flooring compounds modified with VINNAPAS® dispersible polymer powders are among the most efficient available: they are easy to mix, can be applied quickly, and are ready for foot traffic and subsequent flooring work after a very short time.



Short Mixing Times

The plasticizing properties of VINNAPAS® F take effect immediately after mixing. This feature is particularly advantageous for pumpable compounds, where mechanical processing means that mixing times are extremely short.

Simple Mixing

To prepare a dry-mix mortar modified with VINNAPAS®, simply blend it with water. The rapid dispersion of the dispersible polymer powder eliminates the risk of adding too much gauging water, which in turn reduces the tendency to bleed at the surface.

Fast Application

Using the right VINNAPAS® grades lets you tailor the rheological properties of a formulation to any application method, whether manual or mechanical (pump). And because it stabilizes compounds, VINNAPAS® also extends pot life.

Faster Construction Progress

Initial setting and solidification times are fast for self-leveling flooring compounds prepared with VINNAPAS® dispersible polymer powders, yielding surfaces that can be walked on after just 2 hours. They will be dry enough for further flooring work to begin after roughly 24 hours, the exact time depending on the thickness.

550 m² in four hours

This video on leveling the floor of a school auditorium shows how it works. It only took 2 hours to apply the leveling mortar modified with VINNAPAS® polymer powder, and the floor could be walked on just 2 hours later.



www.wacker.com/construction

CURED MORTAR: TOUGHNESS MEANS FLEXIBILITY

Self-leveling flooring compounds are applied to old and new flooring, and to concrete, wood and even tiles. VINNAPAS® dispersible polymer powders produce a secure bond, yet allow for flexible coatings that can absorb modest subfloor movement without cracking.

Tensile Adhesive Strength

VINNAPAS® dispersible polymer powders optimize adhesion to the subfloor, whereby the higher the proportion of the VINNAPAS® dispersible polymer powder, the better the adhesion to the substrate. A sufficiently high polymer content will produce secure adhesion to even the most difficult-to-bond subfloor materials, such as wood or metal.

Greater Flexibility

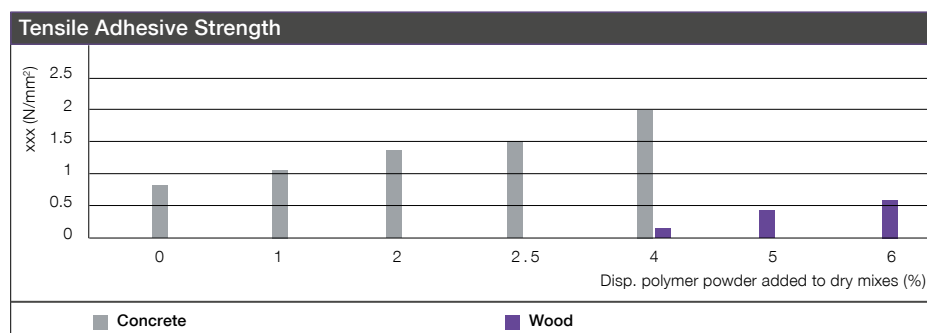
At the same time, dispersible polymer powders also make mortar more flexible, allowing the flooring compound to better accommodate subfloor deformation and the stresses generated as the coating dries.

Tensile Strength and Elongation

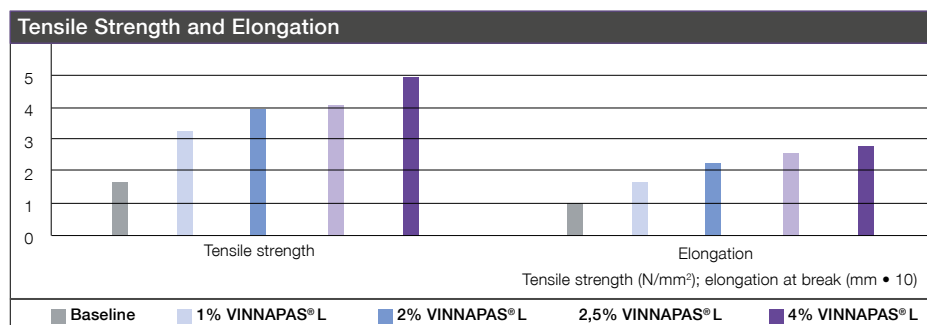
The behavior of polymer-modified self-leveling compounds can be demonstrated by a tensile test. As the polymer content increases, tensile strength and elongation at break likewise increase. Greater plasticity reduces the risk of cracking and helps compensate for applied stresses.

Abrasion Resistance

Improving plasticity also helps compensate for dynamic loading, such as that caused by the rolling or maneuvering wheels of a turning forklift truck. This has been demonstrated by a number of different tests conducted in accordance with European standards on screeds and flooring compounds.

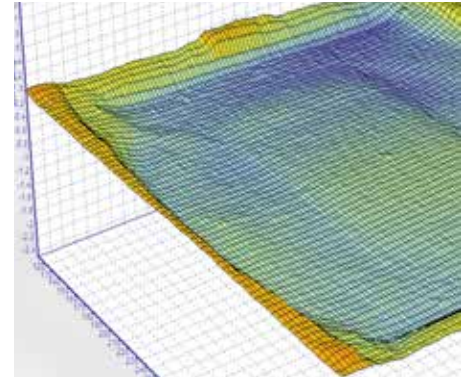


Conditioned for 28 days under standard climatic conditions (23 °C/50% rel. humidity)



Increasing the polymer/cement ratio increases the tensile strength and plasticity, which, in turn, increases the load-bearing strength.

The wear test for abrasion-resistant coatings specified in EN 13982-5 uses a single steel wheel with a load of 2,000 Newtons. The steel wheel is moved back and forth on the surface of the test substrate in two directions, at right angles to each other. After 10,000 cycles of the steel wheel, the abrasion dust is determined both gravimetrically and volumetrically by measuring the surface profile. The test is carried out after conditioning for 28 days under standard climatic conditions.



CURED MORTAR: HOW MUCH AIRPLANE CAN A SELF-LEVELING FLOORING COMPOUND HANDLE?

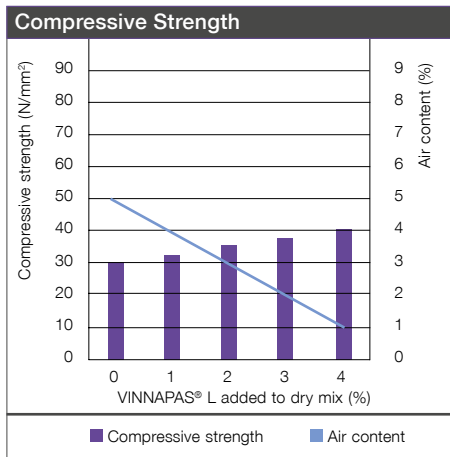
Whether applied in 5 centimeters of a flowing screed or 5 millimeters of a leveling compound, VINNAPAS® dispersible polymer powders allow you to improve two key flooring properties: compressive strength and flexural strength.



How much airplane can a screed withstand? It depends on the formulation. An empty Boeing 747-8, for instance, places 200 metric tons of pressure on the hangar floor. This calls for a screed that has exceptionally high compressive and flexural strength – hardly achievable without the use of polymer modifiers.

Adjusting Compressive Strength

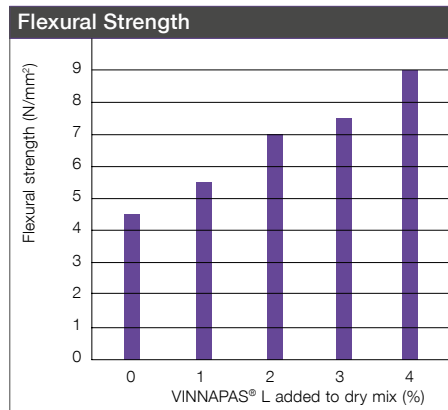
Compressive strength depends on the water/cement ratio, air-pore content and air-pore distribution. Adding VINNAPAS® can improve compressive strength, which increases if the addition reduces the water/cement ratio or air-pore content.



Reduced air-pore content raises compressive strength as levels of defoaming VINNAPAS® L or F powders increase.

Improved Flexural Strength

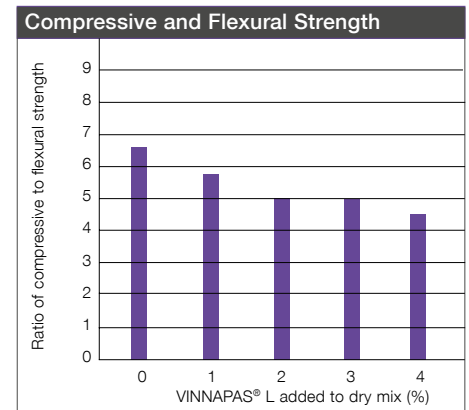
By forming resin bridges between the fillers and hydrate phases of the cement, VINNAPAS® binder increases the cohesion – and thus the flexural strength – of the system. The flexural strength is seen to increase with a higher polymer content (see graph 3).



Prisms, 160 x 40 x 40 mm, conditioned for 28 days under standard climatic conditions (23 °C/50% rel. humidity). Increasing the polymer/cement ratio increases the flexural strength.

Reduced Cracking

The ratio of compressive strength to flexural strength correlates to the cracking tendency. By reducing the compressive strength of self-leveling compounds while increasing their flexural strength, VINNAPAS® lowers this ratio, thereby reducing cracking.



The higher the polymer/cement ratio, the better the compressive/flexural strength ratio, and therefore the lower the tendency to crack.

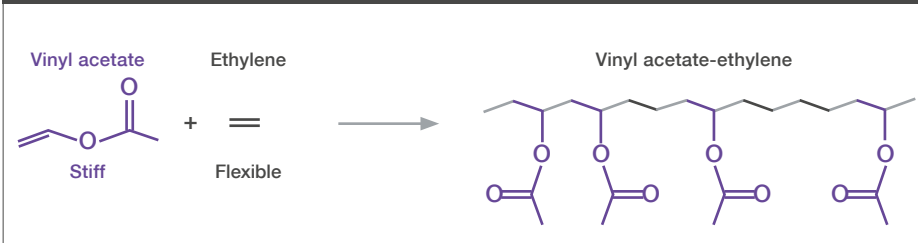
The studies were performed on a formulation consisting of Portland cement/high-alumina cement/anhydrite, VINNAPAS® dispersible polymer powder, and a large number of other components.

EMISSIONS: NOBODY NEEDS THEM

VINNAPAS® dispersible polymer powders lend inherent functionality to self-leveling flooring compounds, allowing customers to create unusually simple, low-emission formulations. Talk to us!

VINNAPAS® grades for self-leveling flooring compounds are copolymers based on vinyl acetate-ethylene. The ethylene is incorporated to act as an internal plasticizer, thereby eliminating the need for external plasticizers. All VINNAPAS® grades produce very few emissions and can be used for final product formulations that meet environmental requirements such as those specified in EMICODE® EC1 Plus.

Two Monomer Bases Create the Desired Balance Between Stiffness and Flexibility

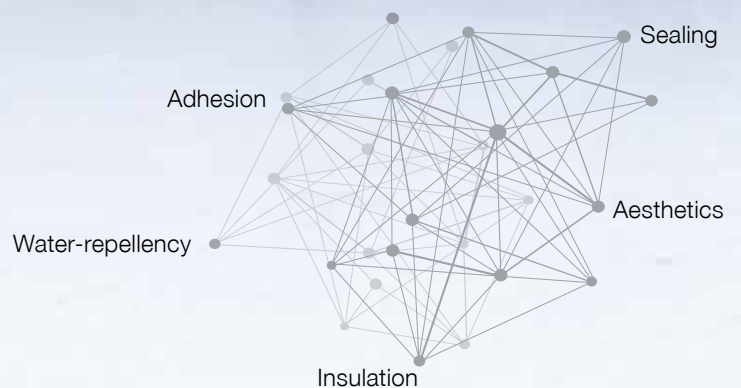




Only WACKER is all of the following at once:

- A technology and market leader in polymeric binders
- One of the largest silicone producers in the world
- Always nearby thanks to its regional experts
- A technical support powerhouse thanks to its 14 technical centers throughout the world
- Our extensive portfolio, our many years of experience and our comprehensive services mean that we can always find the optimum solution for your specific application.

GO FOR THE OPTIMUM!



EXPERTISE AND SERVICE NETWORK ON FIVE CONTINENTS



WACKER is one of the world's leading and most research-intensive chemical companies, with total sales of €4.63 billion. Products range from silicones, binders and polymer additives for diverse industrial sectors to bio-engineered pharmaceutical actives and hyperpure silicon for semiconductor and solar applications. 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. Spanning

the globe with five business divisions, we currently operate 24 production sites worldwide. WACKER is represented by subsidiaries and sales offices in 29 countries in the Americas, Asia, Australia and Europe. With a workforce of 16,300, WACKER sees itself as a reliable innovation partner that develops trailblazing solutions for, and in collaboration with, its customers. WACKER also helps them boost their own success. Our technical centers employ local specialists who assist customers worldwide in the development of products tailored to regional demands, supporting them during every

stage of their complex production processes, if required. WACKER e-solutions are online services provided via our customer portal and as integrated process solutions. Our customers and business partners thus benefit from comprehensive information and reliable service to enable projects and orders to be handled fast, reliably and highly efficiently. Visit us anywhere, anytime around the world at: www.wacker.com



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