

# Features

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## **Streamlining Construction Work – Self-Leveling Fillers Produce Level Surfaces**

The modern construction industry values versatility together with quick and easy handling. That is particularly true for flooring compounds, where good adhesion to any substrate and crack-free hardening are required. The floors must be smooth and set firm enough to walk on after only a short time, but also wear-resistant and durable enough to satisfy even the most heavy-duty industrial applications. VINNAPAS® dispersible polymer powders from WACKER can produce flooring compounds that combine all these virtues.

### **The time thieves ...**

Time thieves are everywhere nowadays – in the office, at the municipal planning office and on the construction site. To outwit them, property developers, architects and building contractors are always on the look-out for better materials that can be processed rapidly on site. Such systems should also harden as quickly as possible, so that the next construction operation can follow immediately, with the minimum of delay. “Time is money” – that is particularly true in the construction sector, where the lion’s share of overheads are labor costs.

### **... and how to outsmart them**

Floor screed is a typical example. The best known and most traditional screed is the “CT” cementitious screed defined in EN 13 813. The advantage of CT is that it is resistant to water once it has hardened. CT screed is produced from cement and aggregates with a mixture of grain sizes. Only a small amount of water is added, so that a plastic mortar is produced. It is surface

**Why cement screed shrinks**

treated by hardening with fluorosilicates, impregnation, sealing or coating. Since the mortar takes weeks to harden and volume shrinkage occurs during this time, it generally cannot be applied in areas larger than 36 square meters.

**Looking for new solutions**

Screeds are a vivid example of the dynamic changes taking place in the construction industry. Since they are used in the most diverse of buildings, they must satisfy ever more complex requirements. Processing speed, material consumption and drying time are now just as important as adhesion, surface quality and the load-bearing strength of the finished screed. To remain competitive, companies must continually offer new solutions.

**A smooth surface is essential**

The most elegant solutions for providing good underlayments for flooring are “self-leveling” compounds. Self-leveling compounds can be classified according to their consistency as self-leveling or non-slump. Self-leveling flooring compounds are primarily intended for smoothing and leveling over large areas, while the main application of non-slump compounds is for forming gradients or repairing defects.

**Large quantities needed for renovation**

“Self-leveling flooring compounds are mainly used for renovation,” emphasizes Armin Hoffmann, Technical Service Manager at WACKER POLYMERS. Thin elastic floorings, such as linoleum or PVC, require an especially level surface, since any unevenness would be immediately conspicuous. The same applies to parquet or laminate flooring.

**It’s the mixture that counts**

“Self-leveling compounds are a complex mixture of special cements and a number of other additives,” explains Hoffmann. Typical components are cementitious binders, fillers and polymer binders, such as dispersible polymer powders. “Without these ingredients, it would be impossible to satisfy the wide vari-

**“Self healing” is more than metaphysics**

ety of demands.”

In fact, self-leveling compounds are required to meet seemingly contradictory requirements, not unlike the famous problem of “squaring the circle.” For example, the compounds are required to set rapidly and offer high strength, but at the same time to provide the longest possible processing time for the installation personnel. Moreover, they should show a certain “self healing” when poured into the mold, so that they do not produce seams when they flow together, but rather form a monolithic surface.

**Better adhesion and flexibility thanks to polymer bridges**

The technology of self-leveling flooring compounds would not be possible without the use of dispersible polymer powders. These products derive their name from their special property of forming a dispersion when water is added. As the mortar sets, flexible polymer bridges are formed between the brittle, mineral constituents of the mortar, thus greatly improving its adhesion to a wide range of substrates. The polymer bridges also increase the system’s flexibility.

**Compensating for stresses**

VINNAPAS® dispersible polymer powders from WACKER can produce flooring compounds that combine many virtues. The more polymer powder is used, the better is the adhesion to the substrate. Therefore, for critical substrates such as wood or metal, larger amounts of polymer must be used – as much as 12 percent. A particularly helpful feature for users is that brittle cementitious mortars can be rendered elastic by the use of dispersible polymer powders. The increased plasticity greatly improves the anchorage to the substrate, since the material can compensate for any stresses caused by temperature differences or movement of the substrate.

**Machine processing is in vogue**

The capability of special polymer powders such as VINNAPAS® F to render mortars free-flowing is of major economic importance. "This paves the way to using mortar pumps to cover large areas," explains Hoffmann. That wouldn't be possible with a conventional floor screed. Besides the other processing advantages, this provides another way of speeding up work, in turn greatly optimizing costs.

Even "solvent-free" products can contain small amounts of heavy volatile substances, which are gradually emitted and can be detected in the ambient air. One example is terpenes from tree resins. These substances are generally only present in extremely small amounts and can be kept within safe limits by regularly ventilating the room. In 1997, the German Association for the Control of Emissions in Products for Flooring Installation (GEV) introduced the EMICODE® classification system as a reliable way of describing the emission behavior of products. EMICODE® is based on the strictly defined GEV test methods in emission test chambers and the GEV classification criteria, and outlines three emission classes: EC1 (very low-emission), EC2 (low-emission) and EC3 (not low-emission)

**Shown to be ecological**

VINNAPAS® polymer powders are free of plasticizers. They therefore permit the formulation of products that meet strict regulations for very low-emission products according to EMICODE® EC1. Consequently, polymer powders satisfy extreme ecological demands, as well as economic criteria.

**The right underlayment for any floor covering**

Self-leveling flooring compounds have extremely complex compositions and must meet a wide range of demands. Polymer-modified self-leveling compounds are perfectly in line with the trend towards rapid construction products for surfaces and

floor toppings that set and develop their strength quickly. Since the results can only be convincing if the basis is right.

### **Background Information on VINNAPAS®**

With its VINNAPAS® dispersible polymer powders, WACKER has been the global market and technology leader for fifty years in the field of polymeric binders for modifying cementitious systems. More than a million metric tons of VINNAPAS® polymer powders have been sold worldwide since they were first launched. The main applications of polymer-modified premixed mortars are as construction and tile adhesives, exterior insulation and finish systems, self-leveling compounds and grouts, as well as plasters and repair mortars.

WACKER first produced polymeric binders in powder form for the construction industry back in 1957. This revolutionized working methods in this sector, since, for the first time, a one-part, polymer-modified cementitious system was available that only required water to be added on site. To this day, the system represents a much simpler way of working, with substantial cost advantages.

The benefits that VINNAPAS® bestows on the end product include easier processing, excellent anchorage to all substrates, increased flexibility and flexural strength, and enhanced weathering resistance. Another advantage is that VINNAPAS® polymer powders do not contain plasticizers and film-forming aids, and therefore have low emissions levels.

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**The company in brief:**

WACKER is a globally active chemical company with some 14,700 employees and annual sales of around €3.34 billion (2006). WACKER has 22 production sites and over 100 sales offices worldwide.

### **WACKER SILICONES**

Silicone fluids, emulsions, rubber and resins; silanes; pyrogenic silicas; thermoplastic silicone elastomers

### **WACKER POLYMERS**

Dispersible polymer powders and dispersions for applications in the construction industry; PVAc solid resins; VC copolymers; polyvinyl butyrals and acetates

### **WACKER FINE CHEMICALS**

Fine chemicals, biologics and other biotech products, such as cyclodextrins and cysteine

### **WACKER POLYSILICON**

Polysilicon for the semiconductor and photovoltaics industries

### **SILTRONIC**

Hyperpure silicon wafers and monocrystals for semiconductor devices