



# CONCRETE Sigunit®

SHOTCRETE ACCELERATOR

BUILDING TRUST



# OUTSTANDING SPRAYED CONCRETE PERFORMANCE WITH Sigunit® TECHNOLOGY



## TECHNOLOGY

The accelerator technology for sprayed concrete has been significantly developed and improved during the last 20 years. This was not only driven by the change from dry to wet spraying, but also by the challenging new requirements on the fresh and hardened shotcrete – including extended workability and higher durability. The sprayed concrete has to meet or exceed these requirements in a safe and cost-effective way. In the last decades, the use of shotcrete also increased as it became the preferred and most important rock supporting method for tunnel construction and mining. This trend also led to the higher demands being placed on the shotcrete accelerator performance and its product logistics. In underground construction works, the requirements are always especially challenging, for example the requirement for fast and high compressive strength development for rapid excavation, but with minimal rebound to reduce wastage. Many new accelerator types were therefore developed to meet such requirements or indeed to set new benchmarks and possibilities. Sika has long been a pioneer in this area with the introduction of new technologies and innovations to the market. For instance, with the introduction of alkali-free accelerators, Sika revolutionized the quality and sustainability of shotcrete, and with the innovation of instant Sigunit® new delivery and logistical possibilities were realized, e.g. for remote projects. As another example, the development of the Sika MiniShot laboratory system innovatively streamlined the process of developing new and virtually tailor-made Sigunit® accelerators for our customers and client's project requirements, as and when they need them. The strong Sika brand Sigunit® stands for almost 100 years expertise and experience in shotcrete.

## Sigunit®- THE ACCELERATORS

Individual situations require specific solutions and therefore different Sigunit® types. Hence, Sika provides a broad Sigunit® product range that covers all of these requirements and many specific challenges. There are alkaline and alkali-free products, powder and liquid versions, as well as the instant products developed for just-in-time production on site. The following graphic (figure 1) gives an overview of the different possibilities and variations with Sigunit®. The global trend in accelerator technology continues to move towards using liquid and alkali-free products, due to rightly increasing EHS restrictions, the increased durability and performance of shotcrete linings, the leaching resistance behavior of the finished shotcrete and also importantly for the simpler dosing of the accelerator into the shotcrete.

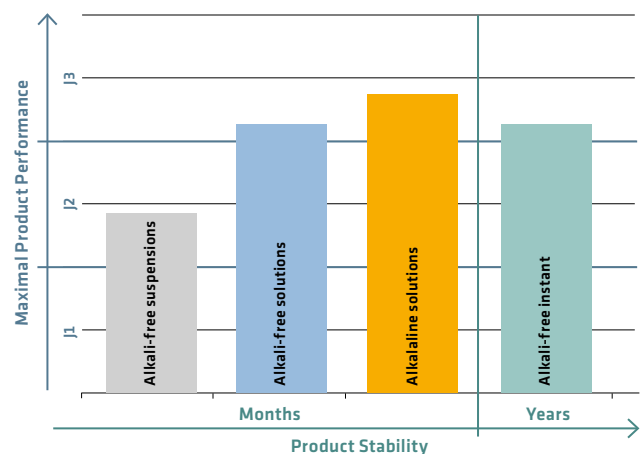


Figure 1: Cost-performance and product stability of different types of Sigunit® accelerator



## ALKALI-FREE: Sigunit®AF

In modern tunneling and mining, there are now compelling arguments when looking to choose the right set accelerator technology for a project:

**Compressive Strength:** Alkaline products generate very high early strength development in freshly applied shotcrete, but they can reduce the final strength that can be achieved, therefore alkali-free accelerators are the choice when highest final strength is desired.

**Rebound:** Alkali-free accelerators develop more moderate levels of compressive strengths in the very early phases of spraying and this can be helpful as it leads to much lower rebound than by using faster alkaline accelerators.

**Leaching:** Alkali-free sprayed concrete set accelerators do not introduce any additional alkalis into the sprayed concrete mix and therefore this also greatly reduces leaching, which effectively helps to prevent the clogging of drainage pipes and the discharge of highly alkaline waste water.

**EHS:** The use of alkaline set accelerators with their inherent high pH is always a potential EHS risk as these can attack human tissue. These materials are therefore a potential hazard and classified as dangerous during transportation and storage as well as in use. The alternative use of alkali-free products prevents the risk of such accidents or injuries and they do not pollute the rebound waste with alkalis either.



Figure 2: Significantly better EHS conditions with alkali-free Sigunit® types



Figure 3: Simple site mixing equipment for producing liquid Sigunit® accelerator from instant Sigunit® powder

## Sigunit®- INSTANT TECHNOLOGY

Sigunit®-P10 AF types are designed for the production of liquid alkali-free sprayed concrete accelerator from instant powders on site (figure 3). These Sigunit® instant powders are ideally suited for use in medium and large remote mines and tunnel construction projects and they are also particularly suitable for very cold or warm conditions, where other liquid accelerators have a shortened shelf life due to the risks of freezing and separation.

The advantages of this **just-in-time accelerator production:**

**High Volume Availability** – Due to the long shelf life of the powder and the simple production as required on site.

**Extended Shelf Life** – Even under extreme conditions the powder itself has a much longer shelf life than all liquid accelerators (more than 3 years).

**Adjustable Performance** – The more powder in the liquid mix, the more powerful the accelerating effect of the solution.

# ALSO AVAILABLE FROM SIKA



## FOR MORE CONCRETE INFORMATION:



### WHO WE ARE

Sika AG, Switzerland, is a globally active specialty chemicals company. Sika supplies the building and construction industry as well as manufacturing industries (automotive, bus, truck, rail, solar and wind power plants, façades). Sika is a leader in processing materials used in sealing, bonding, damping, reinforcing and protecting loadbearing structures. Sika's product lines feature highquality concrete admixtures, specialty mortars, sealants and adhesives, damping and reinforcing materials, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply.  
Please consult the Data Sheet prior to any use and processing.



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