CONCRETE
Sigunit®

SHOTCRETE ACCELERATOR

BUILDING TRUST
CONSTRUIRE LA CONFIANCE

OUTSTANDING SPRAYED CONCRETE PERFORMANCE WITH Sigunit® TECHNOLOGY

SHOTCRETE: AN EVOLVING TECHNOLOGY

While shotcrete has been around since the turn of the 20th Century, its development really took off over the last 20 years. This was driven by the change from dry to wet spraying, and also by the challenging new demands placed on fresh and hardened shotcrete. As a result, today, the sprayed concrete has to meet or exceed requirements for workability and durability, and must be safe to apply and cost-effective.

In the last decades, the use of shotcrete also increased in popularity as it became the preferred method for providing rock support in tunnel construction and mining. This trend also led to the higher demands being placed on the shotcrete accelerator performance and its logistics. In underground construction work, where the requirements have always been especially challenging, fast and high compressive-strength development -- for rapid excavation -- is sought after, 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 broaden the possibilities.

SIKA'S Sigunit® BRAND STANDS FOR 100 YEARS OF EXPERTISE AND EXPERIENCE IN SHOTCRETE

Sika has long been a pioneer in this area thanks to the introduction of new technologies and innovations. With the introduction of alkali-free accelerators, Sika revolutionized the quality and sustainability of shotcrete, and with the innovation of "instant" Sigunit®, made possible the delivery and logistics associated with, for example, remote infrastructure or mining projects. Furthermore, the development of the Sika MiniShot laboratory system innovatively streamlined the process of developing new Sigunit® accelerators and made it possible to virtually tailor-make products for specific project requirements, as and when they were needed.

Sigunit® ACCELERATORS

Each situation requires specific solutions and therefore different types of accelerators. Hence, Sika provides a broad range of Sigunit® products that cover all of these requirements and specific challenges. There are alkaline- and alkali-free products, powders and liquids, as well as the instant products developed for just-in-time, on-site production.

Figure 1 below gives an overview of the different possibilities and variations offered by the Sigunit® range. The global trend in accelerator technologies continues to move towards using liquid and alkali-free products due to: increasing EHS restrictions; the increased durability and performance of shotcrete linings; the leaching-resistant behaviour of the finished shotcrete; and the simplicity of dosing liquid accelerators into the shotcrete.

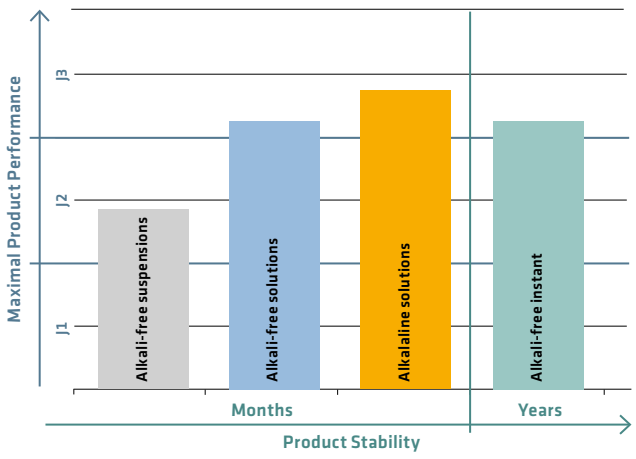


Figure 1: Cost-performance and product stability of different types of Sigunit® accelerators

ALKALI-FREE Sigunit®AF

In modern tunneling and mining, the choice of the best set accelerator for a particular project rests upon a number of key arguments:

Compressive Strength: Alkaline products generate very high early-strength development in freshly-applied shotcrete, but they can reduce the final strength that is achieved. Clearly, when the objective is to reach the highest final strength, alkali-free accelerators are the best choice.

Rebound: The compressive strength development of alkali-free accelerators is moderate in the early phases of spraying which can be very advantageous as it will reduce rebound -- as compared to shotcrete using faster alkaline accelerators.

Leaching: Alkali-free set accelerators do not introduce additional alkalis into the sprayed concrete mix, which greatly reduces leaching. In turn, clogging of drainage pipes is reduced, as is 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 this type of accident or injuries and eliminates the danger of polluting rebound waste with alkalis.

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

Products in the Sigunit®-P10 AF instant powder range are designed for the on-site production of liquid alkali-free accelerators for sprayed concrete (figure 3). These Sigunit® instant powders are ideally suited for use in medium and large remote mine and tunnel construction projects and are particularly suitable for very cold or warm conditions where other liquid accelerators have a shortened shelf life due to the risk 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 on-site production process.
- **Extended Shelf Life:** Even under extreme conditions, the powder itself has a much longer shelf life than any liquid accelerator (more than three (3) years).
- **Adjustable Performance**: The accelerating effect of the solution can easily be adjusted by adding more powder.

SIKA SOLUTIONS FROM ROOF TO FOUNDATION

Roofing Systems

Sarnafil®
Sikaplan®
Sikalastic®

Concrete Production

Sika® ViscoCrete®
Sika® Plastocrete®, SikaSet®
Sika® Air / AER[CA]

Joint Sealing

Sikaflex®
Sikasil®
Sikadur® Combiflex

Grouting and Anchoring

SikaGrout®
Sikadur®
Sika AnchorFix®

Concrete Repair & Protection

Sika® MonoTop®
SikaTop®, SikaRepair®
Sikagard®

Structural Strengthening

Sikadur®, Sika® CarboDur®
SikaWrap®
Sika® CarboShear

Floor & Wall Systems

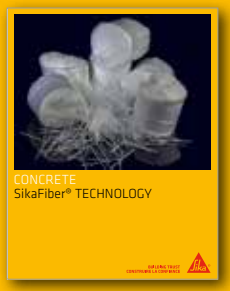
Sikafloor®
Sikagard®
Sikagard® Duroplast

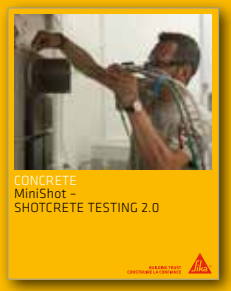
Waterproofing Systems

SikaProof®, SikaFuko®
Sika® Greenstreak®
SikaSwell®, SikaFix®

Sika Canada Inc., a member of the Sika Group, is a leader in the field of speciality chemicals for construction and manufacturing industries. Our product lines feature high quality roofing systems, concrete admixtures, mortars and resins, sealants and adhesives, structural strengthening components, industrial and decorative flooring, as well as protective coatings and waterproofing systems. Our expertise is borne out of a global presence and served by strong, local support. Sika has earned the trust of our customers for over 100 years, by delivering the highest standards of commitment and partnership.

Also Available:





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