

PRODUCT DATA SHEET

Sika® Sigunit®-5460 AFL

Liquid, high-performance alkali-free set accelerator for shotcrete

DESCRIPTION

Sika® Sigunit®-5460 AFL is a high-performance alkali-free set accelerator for sprayed concrete. It is a liquid admixture whose dosage can be varied to the desired setting and hardening times.

USES

Sika® Sigunit®-5460 AFL is suitable for both dry and wet spraying processes and it is used for:

- Excavation stabilization in tunnelling and mining
- Rock, slope and trench stabilization
- High quality lining shotcrete

CHARACTERISTICS / ADVANTAGES

- The quick setting property, allows rapid work progress and the ability to construct thick sprayed concrete linings via layered application, during one construction sequence.
- High early strength development
- Minimal strength loss of the accelerated concrete
- No pollution of groundwater by leached out alkalis
- Distinct reduction of rebound and dust
- Improved bond of shotcrete to the substrate
- Chloride-free, no negative affect on reinforcement steel
- Non-aggressive properties provide improved working safety, reduced environmental impact and lower handling costs.

PRODUCT INFORMATION

Chemical Base	Inorganic aluminium complexes
Packaging	1000 Litre IBC
Shelf Life	If stored in tightly closed original containers under the described storage conditions, it has a shelf life of 12 months from date of manufacture. Periodical remixing can extend the shelf life further.
Storage Conditions	<ul style="list-style-type: none"> ▪ Must be stored at minimum +5 °C and maximum +35 °C (optimum temperature for storage and performance +20°C). ▪ Has to be kept in closed containers made of plastic, glass fiber or stainless steel. ▪ Storage in bulk tanks requires the use of agitation and / or circulation systems. ▪ After prolonged storage or transport we recommend to fully agitate it prior to use by mechanical stirring or re-circulation pumping. ▪ Please contact your local Sika technical representative prior to the use of any product that has been frozen. ▪ After prolonged storage, performance testing should always be carried out before use. ▪ Sika® Sigunit®-5460 AFL must not be stored in standard steel containers.
Appearance / Colour	White to beige suspension

Density	~ 1.43 kg/l
Viscosity	300 – 1000 mPa.s (Brookfield, + 20°C) (Viscosity is dependent on degree of product agitation and temperature)
pH-Value	~ 2.5
Total Chloride Ion Content	< 0.1 %
Equivalent Sodium Oxide	< 1.0 %

TECHNICAL INFORMATION

Concreting Guidance The substrate should be clean and free from loose particles and preferably damp.

It is recommended to use only fresh cement as the age of the cement can have a negative influence on the setting characteristics of the mix.

Sika® Sigunit®-5460 AFL can be sensitive to the type of cement. With some cements the setting characteristics can be too slow. We recommend the use of Portland cements (PC/HPC), which normally give faster setting than blended or sulphate resistant cement types.

However, Sika® Sigunit®-5460 AFL also works well with composite cements types (blended cements, fly ash/slag). In all cases, it is strongly recommended to carry out preliminary tests to check setting and the 24 h strength of the cements planned for use in a project.

Evaluation of setting and 24 h strength should be carried out on a test mortar in accordance with EFNARC European Specification for Sprayed Concrete (1996), Appendix 1, Clause 6.3.

The following results should be taken as a performance guide only:

Initial set	Final set	24h Strength	Rating
2 min.	6 - 8 min.	18-20 MPa	Good
5 min.	8 -12 min.	12-15 MPa	OK
>10 min.	> 15 min.	<10 MPa	Poor

Specific Advice Sika® Sigunit®-5460 AFL is added at the nozzle. Accurate and constant dosing into the concrete flow is essential.

CLEANING OF DOSING PUMP

After the use of Sika® Sigunit®-5460 AFL, the dosing pump and other parts of the system must be thoroughly cleaned with plenty of water. Failure to do so provokes blockages in the dosing system when next used. Make sure that all operators involved in testing and application are fully informed.

Concrete Mix Design

When Sika® Sigunit®-5460 AFL is used for wet mix spraying, the w/c+b ratio should be below 0.5 and preferably <0.45.

When targeting extremely high early strength, 0.40 or lower.

The lower w/c+b ratios provide faster setting, higher early strength, better durability, lower accelerator dosage and thicker layers can be applied overhead.

For good performance a basic mix temperature of at least 15 °C is recommended (EFNARC recommendation).

APPLICATION INFORMATION

Recommended Dosage

The correct dosage must be determined by preliminary testing under site conditions. Changing cement and fresh concrete properties must be considered. Lower temperatures require usually higher accelerator dosages.

Depending on the purpose and on the conditions, the recommended dosage is **between 3 % and 10 % by weight of binder**.

Sika® Sigunit®-5460 AFL can be sensitive to the type of cement. With some cements the setting characteristics can be too slow. In all cases, it is strongly recommended to carry out preliminary tests to check setting and the 24 h strength of the concrete planned for use in a project.

Overdosing (>10%) may result in decreased final strength.

Dispensing

Sika® Sigunit®-5460 AFL is added at the nozzle. It is essential to have a constant and accurate dosage of accelerator into the concrete stream. To ensure quality sprayed concrete, follow the pump selection guidelines given below:

Works very well with:

- Mono pumps (stator & rotor pumps)
- Peristaltic pumps (Bredel)

Should not be used with:

- Piston pumps
- All pumps with ball and seat valves
- Pressure tanks
- Gear pumps

Do not use a filter on the suction hose as this causes obstructions. Preferably draw the material off the bottom of the drum/container.

Compatibility with other accelerators:

Sika® Sigunit®-5460 AFL can be interchanged with most of Sika Sigunit AF alkali-free accelerators. For advice, please contact your local Sika technical representative.

Do not mix or interchange Sika® Sigunit®-5460 AFL with any type of accelerator produced by another manufacturer, as this can cause immediate clogging of dosing pumps and hoses.

BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LIMITATIONS

The accelerator's effect depends on the content, type and age of cement, as well as on the shotcrete temperature. Furthermore, the shotcrete quality is widely affected by the substrate, the applied layer thickness, the spraying process, the quality of equipment and the application technique. The w/c ratio of the basic concrete mix in the wet spraying process, and the quantity of gauging water in the dry spraying process are also parameters influencing the acceleration effect of Sika® Sigunit®-5460 AFL. When using sulphate resistant cements strength development can be slower. Sika® Sigunit®-5460 AFL is not compatible with al-

kaline shotcrete accelerators. Before using Sika® Sigunit®-5460 AFL the accelerator hoses must be cleaned thoroughly. The use of Sika® Sigunit®-5460 AFL requires technically correct dosing and conveying / spraying technology. Metal parts of the pump and piping that come into direct contact with Sika® Sigunit®-5460 AFL must be made of stainless steel. Contact your local Sika company for any additional technical support required.

ECOLOGY HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

The substrate must be clean, free of loose stones and free of water under hydrostatic pressure.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

Sika South Africa (Pty) Ltd

9 Hocking Place,
Westmead, 3608
South Africa
Phone +27 31 792 6500
www.sika.co.za



Product Data Sheet
Sika® Sigunit®-5460 AFL
September 2024, Version 01.01
021401011000000288

SikaSigunit-5460AFL-en-ZA-(09-2024)-1-1.pdf