



Product Information Sheet

March 2014

SILCRETE GUNNING

Description

Silcrete Gunning (Guniting/Gunning Grade) is an inorganic silicate-based gunning concrete for the construction of chemically resistant surfaces such as in stacks, chimneys and molten sulphur pits. It replaces the requirement for concrete bonded by Portland Cement, in new construction and maintenance operations. Silcrete Gunning has been specifically developed for guniting application to non-castable applications. It is provided in two-component format, a potassium silicate solution and a catalysed mineral filler powder. Silcrete Gunning can also be used as a guniting, monolithic acid resistant lining to tanks, vessel and storage areas which are exposed to hot gas and high temperature environments where acid condensate and vapours are present. Silcrete Gunning is resistant to a number of acids, such as 98% sulphuric acid, 70% nitric acid and 37% hydrochloric acid (except HF), oleum and in-particular a number of other organic compounds, to a pH range of 0.0 – 7.0 and up to 900°C.

Typical Uses

Silcrete Gunning is recommended as a construction concrete in most applications where strong acids and vapours are present, in particular for areas where brick, tile or newly shuttered concrete areas are not appropriate. For casting applications please refer to Silcrete SG. Silcrete Gunning has a relatively high surface porosity which is useful in thermal cycling conditions. However, care should be taken in exposure to variable temperature environments where moisture is present. Freeze-thaw variances can lead to premature disintegration of the castable body. We would recommend the use of Silcrete Gunning in: Sulphur Recovery Units (SRUs), Molten Sulphur Pits, Chimneys, Stacks, Pits, Tanks and Ductwork.

Advantages

Silcrete Gunning displays excellent chemical resistance to literally all acids (except hydrofluoric) and is recommended for all applications with sulphuric and other strong oxidising acids. Silcrete Gunning also displays excellent resistance to organic materials such as solvents and oils. Silcrete Gunning is applied using the 'dry guniting' method, whereby the powder component is pneumatically conveyed through the dry powder hose, whilst the solution component is pumped through the water line. The two components are then mixed at the guniting nozzle just prior to application onto

the substrate surface. By gunning the mixed material on to the surface, reduced project downtime and labour costs can be achieved. Further to this, Silcrete Gunning has been specifically formulated to have excellent gunning properties with minimal rebound (less than 15% on vertical surfaces). For vertical surfaces it is recommended that the substrate should have anchors (studs and/or mesh) to mechanically secure the Silcrete Gunning on to the substrate. Typical minimum thickness of 50mm is recommended. Silcrete Gunning can perform up to refractory temperatures of 900°C. Where higher temperatures are required, please contact ACCS Ltd for alternatives.

Chemical Resistance

Full details are available on ACCS website: www.protectivelinings.co.uk. Silcrete Gunning will not withstand hydrofluoric acids, concentrated bases or crystallising salts. For instances where environmental restrictions inhibit the use of halogenated products, please contact ACCS Ltd.

Surface Preparation

For all pre-existing surfaces of metal or concrete, abrasive blast or scarify to remove all laitance and surface contamination. A roughened surface is conducive to guniting adherence. It is recommended to prime the surface prior to application with the Silicate solution component and allow to go tacky. This will act as a primer and key to the Silcrete Gunning.

To ensure sufficient adherence of Silcrete Gunning to the substrate surfaces, it is recommended that anchors/mesh are used and it is applied at a minimum thickness of 40mm. Anchors should also be treated with Silcrete solution prior to Silcrete Gunning application. The installation of anchors must be completed before abrasive blasting of the surface. Please contact ACCS for further information regarding primers, anchor types and placement.

Do not apply over any standing water. Do not impose loads until final set has been achieved. Lower temperatures will require longer cure periods before removing formers.

Application

Silcrete Gunning comprises a silicate solution and a catalysed powder. Nominal thickness of >40mm are recommended.



ACCS Ltd

Industrial Protective Linings

Unit 6, Scott Lidgett Industrial Estate,
Scott Lidgett Road, Longport,
Stoke-On-Trent, ST6 4NQ, United Kingdom
Tel: +44 (0) 1782 817 107
Tel: +44 (0) 1782 824 979
Email: info@accsltd.co.uk
Skype: accs.ltd
Registered in England: 6090394
VAT No GB 880-1983-03
www.protectivelinings.co.uk

Values are an intended guide.

Mixing Ratio	5 parts powder to 1 part solution
By weight	~25kg powder to 5kg solution
By volume	~4L powder to 1L solution

Silcrete Gunning should be applied with a standard rotary-type or double chamber gunite machine with a low production bowl. The use of a pre-damped powder can aid application. The solution component should be pumped at a constant pressure of 550 kPa (80 psi) using a standard air operated booster pump, e.g. a diaphragm pump or other pressurised liquid pumping system. The two components, powder and solution, are mixed at the gunite nozzle just prior to application onto the substrate. For maximum efficiency during application, a "Spirolet" nozzle should be used. It is recommended that the water holes in the water ring at the gunite nozzle should be enlarged to a size double that of a standard water ring. This will better accommodate mixing in the nozzle when using the Silcrete Gunning solution instead of water. Adjustments should be made onsite to achieve the required viscosity to prevent slippage or slumping with the use of a needle valve typically achieving the best results.

Silcrete Gunning should only be applied by an experienced nozzle man and gunite crew, who are familiar with applying speciality, gunite linings. If the material is too wet, gunite will sag and run on the walls. If the material is shot too dry, excessive rebound will occur and overall physical properties will be adversely affected. Carefully adjust the gunite consistency during application and monitor the prescribed mix ratio (powder to solution by weight as indicated above), throughout the application procedure.

During application, the nozzle should be held at least 0.5m away from substrate surface and always at a perpendicular angle. Apply gunite over reinforcement, moving nozzle in a circular motion, building thickness of the lining slowly to the specified thickness.

All mixing, pre-dampening, application equipment and hoses must be clean, dry and free of contaminants including Portland Cement, refractory and other shotcrete materials prior to use. Do not re-use rebound material.

The gunned surface should not need any finishing as trowelling after gunning application could lead to cracks forming. However, some trowelling may be necessary if the surface finish requires it.

All tools, mixing equipment, gloves and application equipment should be cleaned up immediately after use with hot, soapy water. Any material that is allowed to cure prior to clean up should be chiselled or chipped off, then dirty items should be soaked in hot, soapy water overnight and then cleaned and dried.

Pot-Life

at 15°C – 40mins
at 20°C – 30mins
at 30°C – 15mins

An initial set occurs approximately 12hours after mixing, with light foot traffic permissible after 24hours and with a full chemical cure occurring after 5-7days. Silcrete Gunning should never be exposed to water, steam or chemical environments before the primer is completely cured.

Note: Do not mix more material than required by pot-life. It cannot be reconstituted. Never add unapproved materials to the mix, in particular Portland Cement or excess water.

Coverage

Typical coverage on a relatively smooth concrete surface for a mixed Silcrete Gunning system:

at 10mm thickness - 20kg/m²
at 20mm thickness - 40kg/m²
at 50mm thickness - 100kg/m²
at 100mm thickness - 200kg/m²

Values are approximate requirements.

Acidification

In cases where exposure to neutral conditions (eg rain water before completion and beginning of service life, it is recommended that all joints should be liberally treated with an acid wash to ensure complete reaction of the silicate components. This should occur after setting has taken place (7 days). Washing with a 25% solution of HCl in a solvent; or 35% solution of H₂SO₄ in a solvent, is recommended.

Standard Packing

Powder – 25kg lined polyweave bags (40 per pallet)
Solution – 34kg in 25L UN drums (24 per pallet)

Storage

Store in a cool, dry, frost-free place. Normal storage conditions in up to 25°C should provide shelf life of:

Powder – 24 months
Solution – 12 months

Do not store a combined stack of solution and powder components. Accidental leakage could lead to flash setting of material.



ACCS Ltd

Industrial Protective Linings

Unit 6, Scott Lidgett Industrial Estate,
Scott Lidgett Road, Longport,
Stoke-On-Trent, ST6 4NQ, United Kingdom
Tel: +44 (0) 1782 817 107
Tel: +44 (0) 1782 824 979
Email: info@accsltd.co.uk
Skype: accs.ltd
Registered in England: 6090394
VAT No GB 880-1983-03
www.protectivelinings.co.uk

Safety

Safety data information available on request. Adequate ventilation must be provided whilst work is in progress and is compulsory for closed or indoor applications. The instructions on storage, fire and explosion are to be observed. No releases to the sewers or drains are to be permitted under any circumstances. Always refer to MSDS data sheets for hazard and transport information.

Warranty

We warrant that our products will conform to the description contained in the order and that we have good title in all goods sold. WE PROVIDE NO WARRANTY, WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE,

EXPRESS OR IMPLIED, OTHER THAN AS EXPRESSED SET FORTH HEREIN. We are glad to offer suggestions or to refer you to customers using ACCS Ltd cements and compounds for similar applications. Users shall determine the suitability of the product for intended application before using, and users assume all risk and liability whatsoever in connection therewith regardless of any suggestions as to application or construction. In no event shall we be liable hereunder or otherwise for incidental or consequential damages. Our liability and your exclusive remedy hereunder or otherwise, in law or in equity, shall be expressly limited to our replacement of non-conforming goods at our factory or, at our sole option, to repayment of the purchase price of non-conforming goods.

Technical Data

Parameter	Test Method	Unit	Value
Density	BS1902	kg/m ³	1900
Specific Volume		m ³ /tonne	0.52
Tensile Strength	BS1902	kg/cm ²	50
Compressive Strength	BS1902	kg/cm ²	240
Flexural Strength	BS1902	kg/cm ²	115
Water absorption	BS1902	%	11
Maximum Operating Temperature		°C	900

Disclaimer

The technical data contained in this document represents the current state of our product knowledge and is for information purposes only. It does not constitute a guarantee or specification.