

SAUEREISEN

ACIDPROOF CONCRETE NO. 54 GUNITE

PHYSICAL PROPERTIES

Color	Off White
Density	126 pcf (2.0 gm/cm ³)
Flexural Strength	690 psi (48.5 kg/cm ²)
Maximum service temperature	1,250°F (677°C)
Mix ratio (Powder to Liquid, by weight)	6 to 1
Modulus of elasticity	3.1 x 10 ⁶ psi (2.18 x 10 ⁵ kg/cm ²)
Thermoconductivity (65°F to 1500°F; (18°C to 817°C))	5.4 - 6.3 BTU · in/ ft ² · hr · °F
ASTM C1113 Hot Wire Method	2.17 - 1.86 x 10 ⁻³ Cal · cm/cm ² · sec·°C

Physical properties were determined on specimens prepared under laboratory conditions using applicable ASTM procedures. Actual field conditions may vary and yield different results; therefore, data are subject to reasonable deviation.

CHARACTERISTICS

- Potassium silicate-bonded.
- Resists most solvents, oil, acids and acid salts (except hydrofluoric) over a pH range of 0.0 to 7.0.
- Withstands water and vapor without special treatment.
- Applied by guniting.
- Fast chemical set - less construction delay.
- Safe to use - nonflammable; will not support combustion.
- Specially recommended for all concentrations of sulfuric, hydrochloric, nitric, and phosphoric acids.

Sauereisen Acidproof Concrete No. 54 Gunite with almost a half century of successful applications and varied service - is the original acid-resistant material for gunite construction. For those applications that require a lower K factor, lightweight materials, or higher temperature resistance, No. 54 LW is available.

No. 54 Gunite is a potassium silicate, acid-resistant refractories for use as monolithic linings in chimneys, stacks, ducts, breechings, scrubbers, precipitators, sulfur pits, tanks, process vessels, floors and sumps. This two-component materials consist of Powder and Liquid which are mixed together on the job.

Benefits of No. 54 Gunite include the capability to protect or restore acid-attacked areas while avoiding the costs of brick or tile construction. Downtime will be reduced. (At 70° to 80°F, full operation can be resumed in 24-30 hours, depending on application). The acidproof concrete system typically incorporates an impervious, chemical-resistant membrane such as Sauereisen High Temperature Membrane No. 89.

No. 54 Gunite is not formulated for cast applications. For cast applications, refer to Sauereisen No. 54SG.

AREA PREPARATION

Temperature of Working Area

Maintain an optimal temperatures are 50°F-100°F on No. 54 Gunite Powder & Liquid, air and substrate during storage mixing, application and cure.

Installation in higher temperatures are acceptable if material can be properly handled and applied at recommended thickness.

Anchoring System

When No. 54 Gunite is applied by gunite method on vertical surfaces, they must be anchored and applied at a minimum thickness of 1⁵/₈ inches. For horizontal applications, an anchoring system may be required, depending on specific project conditions. Anchors should also be coated with a chemical-resistant membrane.

"T"- type anchors are preferred to secure the No. 54. Anchors can be used for all operating temperature ranges. The anchoring system must be completed before abrasive blasting and membrane application when installing over a steel substrate. For concrete or brick substrates, prepare the surface before installing anchors and membrane. The anchor design for steel should be similar to Anchors Unlimited CA5 Special; for concrete it should be similar to Anchors Unlimited CA5. A Sauereisen representative should be consulted before wire or expanded metal mesh options are considered.

Anchors should be placed in a diamond-shaped pattern. Tine direction should be randomly oriented using the following guideline for placement:

Location	Distance Between Centerlines
Overheads	6" - 8"
Walls	8" - 12"
Floors	12" - 16"

The distance of the spread of the tines from tip to tip should be 4-5 inches. The centerline of the tine should be held at a minimum distance of 5/8 inch from the substrate, with this distance increased as the thickness of the applied lining increases. The tines of the studs must have a minimum 1 inch coverage of refractory over their highest point. The tines should be essentially parallel to the substrate.

Surface Preparation

Where operating parameters and substrate conditions permit, No. 54 should be used in conjunction with an appropriate chemical-resistant membrane.

Proper surface preparation is critical to the acidproof concrete application. All surfaces in contact with the corrosion-resistant system must be clean and free of dust, dirt, water, grease, oil or other contaminants.

Metal - All welds must be continuous and free of flux. Welds should have a smooth, rounded radius without any sharp edges. Metal surfaces should be abrasive blasted in accordance with membrane requirements.

Concrete - Refer to SSPC-SP13/NACE 6 "Surface Preparation of concrete" for detailed guidelines.

New Concrete - The surface must be dry, firm, free of laitance and structurally sound as specified by the architect or engineer.

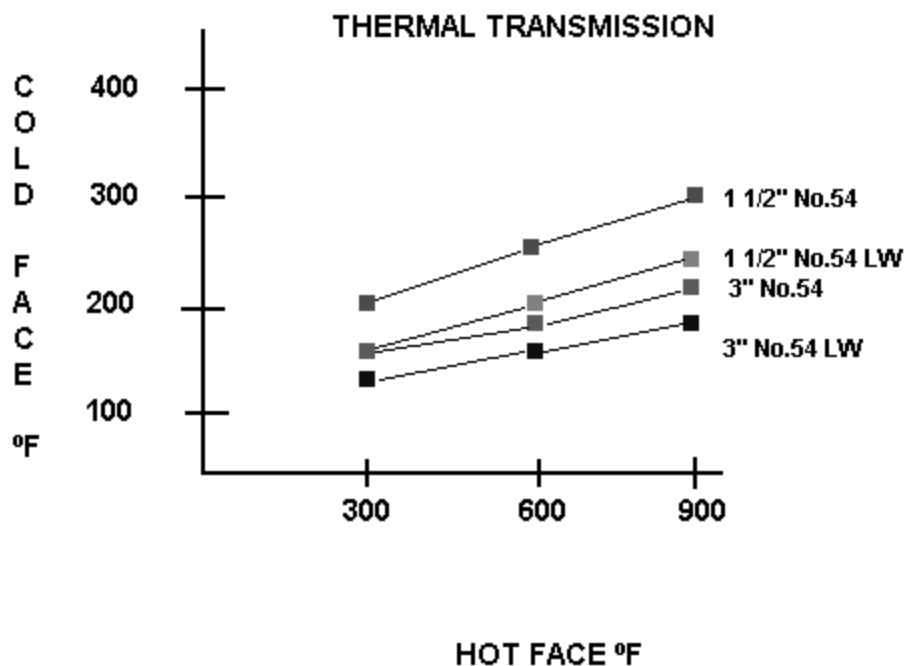
Old Concrete - Chemical cleaning is suggested to remove oil, grease and other contaminants. Abrasive blast or hydroblast surfaces to remove attacked concrete. Assure that concrete is dry, firm and structurally sound prior to application.

Brick - After removal of oil, grease, and other contaminants by chemical cleaning, hydroblast or abrasive-blast mortar joints to a depth of 1/2 inch to remove all loose material and to provide a clean, firm surface. Loose brickwork must be regouted with appropriate Sauereisen mortar to ensure structural integrity.

GUNITE APPLICATION

Predampening

The acidproof concrete Powder component should be predampened. Add 1 1/4 pints of No. 54 Liquid or potable water to each 50 lbs. of No. 54 Gunite Powder.



The Graph above illustrates the thermal transmission of No. 54 and 54 LW through various thicknesses.* Properties were obtained at an ambient temperature of 80°F and 10 mph wind velocity.

This can be achieved by mixing in a rotating blade mixer equipped with a water meter. Mix thoroughly to distribute moisture throughout the Powder. The predampened refractory must be gunited within a 10-minute period after mixing. Avoid overdampening as this may cause premature set to occur within gunning equipment.

Installation

No. 54 should be applied with a standard double chamber or rotary-type gunite machine. The potassium silicate liquid should be pumped to the nozzle through a piston-primed airless pump to assure a constant 80 psi pressure at the nozzle. Normal adjustments may be made to get the correct proportions for good adhesion without slipping or slumping.

Consult a Sauereisen representative for a recommendation on the required material thickness to protect the substrate against service conditions.

No material should be placed over rebound. All rebound and other loose material on surfaces already gunited

must be carefully removed without damage to the membrane or lining. **DO NOT USE REBOUND.**

Cold joints should be primed liberally with No. 54 Liquid. Gunite application should continue while the primer Liquid is still tacky.

COVERAGE

QUANTITIES* REQUIRED PER SQUARE FOOT (GUNITE)

Thickness (inches)	Approximate Amount (Lbs) No. 54
1"	10.5
2"	21.0

Quantities do not include loss during application or normal density variations.

FINISHING

Gunite - The acidproof concretes harden rapidly by a chemical-setting action. Troweling will break up the partially set material and damage the surface. For this reason, troweling or finishing is not recommended.

CLEAN-UP

Gunite - All equipment must be cleaned with soap and water before the material cures. If removal is required after cure, consult Sauereisen for recommendations.

SETTING/CURING

No. 54 Gunite is self-hardening due to a chemical reaction which occurs when the Powder and Liquid are mixed together. Proper curing is critical to the serviceability of the completed structure; therefore, the substrate and material temperatures should not be allowed to fall below 50°F until final cure has been achieved.

Higher temperatures will accelerate the cure and are not detrimental to the material performance.

The completed application should not be cured with water, curing membranes or covered with any type of material. No. 54 should not be subjected to chemicals, water, steam, or allowed to freeze until final cure has been achieved. If the material will be exposed to freezing temperatures immediately after set, call Sauereisen for force cure procedures.

Refer to the following table for working and final set times.:

Temp. (°F)	Final Set Gunite (Hours)
50	24
60	24
70	24
80-100	24

For installations that will be exposed to temperatures above 200°F, a controlled drying cycle is required to ensure that all moisture is forced out of the lining prior to placing the unit in service. The controlled drying cycle requires that the No. 54 be allowed to dry for a 24-hour period after completion of the application.

The force cure may begin at a temperature of 150°F. Hold at this temperature for a period of 6 hours. After 6 hours, the temperature should be raised to a maximum of 220°F, and held at that temperature for a 12-hour period. The temperature should then be elevated to the unit's maximum operating temperature at a rate not to exceed 100°F per hour. At this point, the unit can be placed into service.

PACKAGING

Acidproof Concrete No. 54

Powder: 50-lb. moisture-resistant bags on a plastic-wrapped pallets.

Liquid: 50-lb. pails or 600-lb. drums.

SHELF LIFE

Sauereisen No. 54 Gunite Powder have a shelf life of one (1) year. No. 54 Gunite Liquid have a shelf life of one (1) year when stored unopened in a dry location at 70°F.

Avoid freezing the potassium silicate Liquid component. If there is doubt as to the quality of the materials, consult a Sauereisen representative.

CAUTION

Consult Material Safety Data Sheets and container label Caution Statements for hazards in handling these materials.

WARRANTY

We warrant that our goods will conform to the description contained in the order, and that we have good title to all goods sold. WE GIVE NO WARRANTY, WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE OR OTHERWISE, EXPRESS OR IMPLIED, OTHER THAN AS EXPRESSLY SET FORTH HEREIN. We are glad to offer suggestions or to refer you to customers using Sauereisen cements and compounds for a similar application. 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 nonconforming goods at our factory or, at our sole option, to repayment of the purchase price of nonconforming goods.

- ❑ **Distributors and agents in major cities throughout the world. Consult manufacturer for locations.**
- ❑ **Sauereisen also produces inorganic compounds for assembling, sealing, electrically insulating and grouting.**

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