SAUEREISEN

# CHEMICAL-RESISTANT GUNITE 35

**Typical industry applications:**

**Linings in power plant stacks and ducts, fire training towers and jet engine test cells subject to dry, abrasive flue gases.**

For protection of concrete floors in high temperature areas, a castable version of the product, No. 35SG, is available. Consult Sauereisen for details.

Sauereisen Chemical-Resistant Gunite 35 is a gunite grade, hydraulically setting, calcium aluminate cement. No. 35 is recommended for protection of concrete and steel surfaces from high temperatures, thermal shock, abrasion and chemical attack by mild acids or alkalies.

Where operating parameters and substrate conditions permit, No. 35 should be used with an appropriate chemical-resistant membrane applied over the substrate and anchors. Consult Sauereisen for recommendations.

## CHARACTERISTICS

- Resists mild acids/alkalies over a pH range of 3.5 to 11.0
- Withstands temperatures to 2100ºF (1149ºC)
- Hydraulic set, simply mix with potable water - does not require any special binder
- Low shrinkage, high strength
- Non-corrosive - may be used in direct contact with steel, iron, lead and most other materials
- Excellent thermal shock resistance. Safe to use - does not emit noxious or hazardous fumes or odors during mixing, application or setting

## PHYSICAL PROPERTIES

| | |
|---|---|
| Compressive strength (ASTM C109) modified | |
| 24-hours | 3,000 psi (211 kg/cm$^2$) |
| 7 days | 4,700 psi (331 kg/cm$^2$) |
| Coefficient of thermal expansion | |
| 68º - 1040ºF (20º - 560ºC) | 1.21 x 10$^{-5}$/Fº (2.18 x 10$^{-5}$/Cº) |
| 1085º -1832ºF (585º - 1000ºC) | 2.4 x 10$^{-5}$/Fº (4.33 x 10$^{-5}$/Cº) |
| Density (ASTM C-905) | 131 pcf (2.1 gm/cm$^3$) |
| Flexural Strength (ASTM C580) | 1000 psi (70.3 kg/cm$^2$) |
| Maximum service temperature (ASTM C 24) | 2100ºF (1149ºC) |
| Mix ratio (Powder: Liquid, by weight) | 9:1 |
| Modulus of elasticity (ASTM C-580) | 2.5 x 10$^5$ psi (1.72 x 10$^5$ kg/cm$^2$) |
| Recommended pH range of use | 3.5-11.0 |
| Thermal conductivity (C-1117) | 5.9-4.9 BTU•in/ft$^2$•hr•ºF |
| 200º - 1100oF (93º - 593ºC) | (2.05 x 10$^{-3}$ - 1.5 x 10$^{-3}$ Cal•cm/cm$^2$•secºC) |

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.

## AREA

**Temperature of Working Area**

Maintain a temperature of 50 - 90 ºF on air, substrate, potable water, and No. 35 Powder throughout mixing, application, and cure.

**Anchoring System**

When No. 35 is applied on vertical surfaces it must be anchored and applied at a minimum thickness of 1-5/8 inch. For horizontal applications, an anchoring system may be required, depending on specific project conditions. Consult Sauereisen for recommendations.

"T" type anchors are preferred to secure the No. 35. Anchors can be used for all operating temperature ranges. For concrete substrates, the Anchors Unlimited CA5, or similar, is preferred to wire or expanded metal mesh alternatives. Abrasive blasting should be completed before anchor and membrane installation when applying No. 35 over concrete.

When applying No. 35 over steel surfaces, abrasive blast and apply membrane after affixing the anchoring system. The anchor specification for steel should be similar to the Anchors Unlimited CA 5-Special. Consult Sauereisen for appropriate membrane recommendations.

The anchors are to be placed in a diamond-shaped pattern. Tine direction should be randomly oriented using the following guidelines for placement:

| Location | Distance Between |
|---|---|
| Overheads | 6 - 8 inches |
| Walls | 8 - 12 inches |
| Floors | 12 - 16 inches |

The distance of the spread of the tines from tip to tip should be 4 to 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 No. 35 over their highest point. The tines shall be held together parallel to the substrate. The anchoring system should also receive a chemical-resistant membrane unless appropriate stainless steel or alloy anchors are used.

**Surface Preparation**
**Metal**
Remove oil, grease and other contaminants. Abrasive blast all surfaces employing a SSPC- SP10 Near White Blast with a nominal 2.5 mil profile. All welds must be continuous, free of flux and have a smooth, rounded radius without any sharp edges.

**Concrete**
Concrete or masonry surfaces which do not receive a membrane must be kept damp with water at least six hours prior to installation of No. 35. Remove any standing water before application of the

Surfaces should be made free of oil, grease, water, and other contaminants that may inhibit bond.

*New Concrete* - All structures must be properly designed and capable of withstanding imposed loads. Abrasive blast or high-pressure water blast to remove laitance and obtain uniform surface texture exposing fine aggregate resembling coarse sandpaper.

*Old Concrete* - Concrete must be firm and structurally sound as specified by the architect/engineer. Abrasive blast or high-pressure water blast to obtain a sound substrate with uniform surface texture similar to coarse sandpaper.

*Brick* - Abrasive blast or high-pressure water blast to remove all contamination and attacked or unsound mortar from the joints to a depth of 1/2 inch. Loose brickwork should be regrouted with appropriate Sauereisen mortar to ensure structural integrity. Anchors placed in brick substrates must be placed into the brick, not into mortar joints.

## APPLICATION

**Predampening**
No. 35 should be predampened by adding 1 1/4 pints of potable water to each 50 pounds of Powder. 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 No. 35 material must be gunited within a ten- minute period after mixing. Avoid over- dampening as this will cause premature set and reduce the strength of the cured material.

**Installation**
No. 35 should be applied with a standard double-chamber or rotary-type gunite machine. Potable water should be pumped to the nozzle through a piston-primed airless pump to assure a constant 80 psi pressure at the nozzle. Adjustments may be made to get the correct proportions for good adhesion without slipping or slumping.
No material should be placed over rebound. All rebound and other loose material on surfaces already gunited should be removed prior to application of the No. 35. DO NOT REUSE REBOUND.

Consult Sauereisen for procedures for application by methods other than gunite.

## COVERAGE

**QUANTITIES***
**REQUIRED PER**

| Thickness (Inches) | Approximate Amount (Pounds.) |
|---|---|
| 1 | 10.9 |
| 2 | 21.8 |

* Quantities do not include losses incurred during application or normal density variations.

## FINISHING

No. 35 hardens with a hydraulic-setting action. Troweling will break up the partially set material and damage the surface. Do not attempt to achieve a smooth trowel finish.

## CLEAN-UP

All equipment should be cleaned by scrubbing with a stiff brush and water at the end of each working period, or when-buildup becomes pronounced. If removal is required after cure, consult Sauereisen for recommendations.

## SETTING/CURING

Proper curing of the No. 35 is critical to the serviceability of the completed structure. If a resin-based curing compound is used it should meet ACI 547 Standards for curing compounds. For applications that will operate above 200°f, the minimum curing procedures are as detailed below are required but consult Sauereisen for application specific curing procedures.

At 70°F, a minimum cure of 24-48 hours is needed. After the 24-48 hour cure, controlled drying is required to ensure that all moisture is removed to eliminate the potential of lining failure due to steam impingement and spalling when the unit is brought to operating temperature. It is recommended that the cure temperature be raised to 150°F at the end of a 24-48 hour ambient cure and held at this level for a period of six hours. At the end of the six-hour period, the temperature should be increased by 50°F and held at that temperature for an additional six-hour period. Then elevate the temperature to 220°F and hold at this level for an additional twelve-hour period. The temperature can then be elevated to the unit's maximum operating temperature, at a rate not to exceed 100°F per hour.

## PACKAGING

50-pound moisture-resistant bags on plastic-wrapped pallets.

## SHELF LIFE

Sauereisen No. 35 Powder has a shelf life of one (1) year when stored in unopened, tightly and covered bags in a dry location at 70°F. If there is a doubt as to the quality of the materials, consult a Sauereisen representative.

## CAUTION

Consult 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.

## LEGAL NOTICE

Sauereisen®, SewerGard®, ConoCrete™, RestoKrete®, ConoGlaze™, and FibreCrete™ are all trademarks or registered trademarks of Sauereisen, Inc. Sauereisen trademarks may not be used in conjunction with any product that is not a Sauereisen product.

SAUEREISEN …Since 1899

160 Gamma Drive
Pittsburgh, PA 15238 USA
Phone: +1 412.963.0303
Email: info@sauereisen.com
www.sauereisen.com