

METZ SAUEREISEN 54 & 54LW

ACIDPROOF CONCRETES



DESCRIPTION:

Metz Sauereisen 54 is a potassium silicate based acid proof concrete for gunited or cast construction of monolithic chimney and tank linings.

Metz Sauereisen 54LW is recommended for applications that require a lower K factor, lightweight materials or higher temperature resistance.

FEATURES AND BENEFITS:

- Excellent Acid Resistance - Resistant to all acids in all concentrations, except hydrofluoric acid and fluoride salts. Especially recommended for all concentrations of sulphuric, nitric, hydrochloric and phosphoric acids. Unaffected by 98% sulphuric acid. Also refer Metz Chemical Resistance Chart.
- Superior Performance -100% potassium silicate bonded. Out performs sodium silicate based monolithics.
- High Service Temperature
Metz Sauereisen 54 withstands temperatures to 670°C.
Metz Sauereisen 54LW withstands temperatures to 870°C.
- Ideal Repair Material - May be applied over damp, acid-attacked concrete or brick.
- Economic - Fast chemical set - less construction delay.
- Easy to Apply - May be gunited or cast
- Safe to Use - Does not emit hazardous fumes during mixing, application or setting.

RECOMMENDED:

As a monolithic lining in

- Chimneys
- Tanks
- Precipitators
- Ducts
- Stacks
- Process Vessels and other equipment
- Scrubbers
- Breechings

NOT RECOMMENDED:

For alkalis in any form (that is, any solution with pH above 7.0).

For hydrofluoric acid or fluoride salts.

Without a suitable membrane protecting substrate. Refer Metz Sauereisen 89.

For cast applications requiring structural strength, refer to Metz Sauereisen 54SG structural grade acid proof concrete.

PHYSICAL PROPERTIES:

	No.54	No. 54LW
Density** (cast):	1.95 - 2.05 g/cm ³	1.35 - 1.45 g/cm ³
Maximum Service Temperature:	670°C	870°C
Shrinkage	0.4%	0.4%
Flexural Strength	4.8 MPa	4.6 MPa
Modulus of elasticity	370 MPa	1000 MPa
Thermal Conductivity (93-593 °C)	0.91-0.78 w/m °K	0.46 w/m °K

** Density of gunned material can vary 10% - 15% from this value.

COVERAGE:

Theoretical quantity (allow for wastage)

Metz Sauereisen 54 2.0 kgs (mixed)/sq.metre, per millimetre of thickness.

Metz Sauereisen 54LW 1.41 kgs (mixed)/sq.metre, per millimetre of thickness.

Note: Does not include losses during application (e.g. rebound), or normal density variations.

APPLICATION TEMPERATURE:

The recommended temperature range for application is 10°C - 38°C. At temperatures below 10°C curing may be inhibited and final technical properties may be affected. At temperatures above 38°C consistency and setting times may be affected. If necessary, consult Metz.

Note: Materials should be kept as cool as possible. Reducing material temperature will increase pot life.



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INSTRUCTIONS FOR USE

1. Temperature of Working Area

Maintain a temperature of 10-38°C on the Metz Sauereisen 54/54LW Liquid and Powder and substrate during mixing and application. At temperatures below 10°C, Metz Sauereisen 54/54LW will not cure properly. At temperatures above 38°C, the material will set too quickly.

2. Surface Preparation

- Chemical Resistant Membrane:** The use of a suitable membrane (such as Metz Sauereisen 89) is recommended on steel or concrete. Consult METZ Pty Ltd for recommendations.
- New Concrete:** A surface must be dry, firm, free of laitance and structurally sound. Surface preparation should be in accordance with membrane requirements.
- Old Concrete:** Concrete must be sound. Abrasive blast or hydroblast surface to remove laitance, old coatings and attacked or deteriorated concrete. Chemically clean surface to remove any contaminants. Ensure surface is sound and has a pH of 8 or above. If necessary, repair substrate with approved repair materials. Apply appropriate chemical resistant membrane. For a temporary repair, Metz Sauereisen 54/54LW can be applied to acid attacked concrete after removing all attacked concrete and obtaining a clean, sound surface.
- Metal:** Surface preparation should be in accordance with membrane requirements.
- Brick:** Remove oil, grease and other contaminants by chemical cleaning. Sandblast or hydroblast mortar joints to a 12 mm depth to remove all loose material and provide a clean, firm surface. Obtain a firm surface on the brick by blast cleaning the face of the brick.

3. Cast Applications

Metz Sauereisen 54SG Structural Grade Concrete is suitable for many cast applications. Consult Metz for recommendations.

- Mixing Equipment:** Mixing should be done mechanically with a slow speed paddle or mortar mixer. The mixing equipment must be clean and free from any Portland cement or other contaminants.
(Note: standard concrete mixers are not suitable)

The liquid may separate in the container upon standing undisturbed for a long period of time. Therefore, it is essential that it be thoroughly remixed prior to use. This can be done by placing an air lance in the drum and agitating the liquid, or by rolling the drum.

- Mixing Proportions:** The recommended mixing proportions for castings are:

(parts by weight)	54	54LW
Liquid	1.0	1.0
Powder	4.0	2.0
OR		
Liquid	5.0 kgs (3.7 litres)	9 kgs (6.7 litres)
Powder	20 kg bag	18 kg bag

- Mixing Procedure:** Remix liquid thoroughly before use. Pour the amount of liquid required for the batch into the mixer. Add the powder gradually, stirring continuously to reduce entrapment of air. Mix slowly and thoroughly for at least 5 minutes until cement is smooth and free of lumps. Remove the entire batch from the mixer when mixing is complete to prevent build-up on the equipment. While pouring one batch, another should be mixed so as to permit a continuous operation. All equipment should be cleaned by scrubbing with a stiff brush and water at the end of each working period, or when build-up becomes pronounced.

- Pot Life:** Metz Sauereisen 54 and 54LW:

Temperature °C	Pot Life Minutes (approx.)
10	45
20	40
30	20
40	15

Temperatures above 38°C cause the initial set to take place too rapidly. This difficulty can be overcome by mixing in a cooler area, cooling the equipment with iced water, cooling the liquid and/or storing materials in a cool area.

- Installation:** After mixing, place Metz Sauereisen 54/54LW on a properly prepared substrate to the specified thickness. A minimum of 40 mm is required. Consult Metz Pty Ltd for recommendation on required material thickness to protect substrate against specific service conditions.

Metz Sauereisen 54/54LW should be poured into place. Do not trowel surface of poured material as this can result in breaking of surface layer and subsequent surface cracking.

The thickness of Metz Sauereisen 54/54LW should be maintained with formwork. A straight edge should be used to level the concrete between the forms. Forms must be securely anchored and leakproof, and must not be disturbed until the Metz Sauereisen 54/54LW has reached its final set (refer to final set/temperature table below). Forms may be of wood or metal and should be given a light coating of form release agent. The Metz Sauereisen 54/54LW should be worked into the forms to avoid entrapment of air.

Cold joints require priming of the previously placed Metz Sauereisen 54/54LW with a light coat of Metz Sauereisen 54 Liquid. This liquid should not be allowed to dry prior to placing the freshly mixed materials.

- Expansion Joints:** Appropriate chemical resistant expansion joints should be placed in the same manner as with ordinary concrete floors. Consult Metz Pty Ltd for recommendations.

4. Guniting Application

- Anchoring System:** When Metz Sauereisen 54/54LW is gunned, it must be anchored, and applied at a minimum thickness of 40mm. Longhorn or "T" type anchors are preferred to anchor Metz Sauereisen 54/54LW linings. Anchors can be used for all operating temperatures. The anchor design for steel should be similar to Anchors Unlimited CA5 Special; for concrete it should be similar to Anchors Unlimited CA5. Metz Pty Ltd should be consulted before wire or expanded metal mesh is used. The studs should be placed in a diamond shaped pattern. Tine direction should be randomly oriented using the following guidelines for placement.

Location	Distance between Centrelines
Overhead	150mm to 200mm
Walls	200mm to 300mm
Floors	300mm to 400mm

The distance of the spread of the tines from tip to tip should be 100-125mm. The centre line of the stud tine should be held at a minimum distance of 16 mm from the substrate, with this distance increased as the thickness of the applied lining increased. With increased lining thickness, the depth of the stud penetration into Metz Sauereisen 54/54LW linings should vary from 50% to 75%

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Sauereisen 54/54LW linings should vary from 50% to 75% of the lining thickness. The tines of the studs must have a minimum 25 mm coverage of Metz Sauereisen 54/54LW over their highest point. The tines should be parallel to the substrate. The anchoring system, should also receive a chemical resistant membrane, where applicable.

- b) Predampening: Metz Sauereisen 54/54LW powder should be predampened to reduce dusting. This can be achieved by mixing in mortar mixer equipped with a spray bar, or in a rotating blade mixer equipped with a water meter. Avoid overdampening.

USE: 0.3 litre Metz Sauereisen 54 Liquid or portable water per 20 kg bag of Metz Sauereisen 54 Powder or 54LW Powder. The predampened powder must be gunited within 10 minutes of mixing.

- c) Installation: Metz Sauereisen 54/54LW should be applied with the standard double tank or rotary-type gun, or approved similar model. Metz Sauereisen 54/54LW liquid should be pumped to the nozzle through a piston primed airless pump to assure a constant 80 p.s.i. pressure at the nozzle.

The recommended mixing ratios for gunning are:

(parts by weight)	54	54LW
Liquid	1.0	1.0
Powder	6.0	4.5
OR		
Liquid	3.33 kgs (2.5 litres)	4 kgs (3.0 litres)
Powder	20kg bag	18 kg bag

Normal adjustments may be made by the operator to achieve correct proportions for good adhesion without slumping or too much rebound.

Consult METZ Pty Ltd for recommendations 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 lining. DO NOT REUSE REBOUND.

THE FOLLOWING SECTIONS REFER TO BOTH CAST AND GUNITING APPLICATIONS

5. Finishing

Finishing must be done immediately after placing the Metz Sauereisen 54/54LW. Subsequent trowelling will break up material which has set, providing a rough, cracked surface. To prevent surface tear cracks from developing at 32°C and above, fog spray a mixture of 1 part liquid to 1 part potable water onto the surface after finishing has been completed and while the Metz Sauereisen 54/54LW is still in a plastic state.

6. Protection of Finished Installation

Metz Sauereisen 54/54 LW must be protected from direct sun, wind, chemicals, water, steam and temperatures below 10°C until it has reached its final set. It should not be cured with water, curing membranes or compounds or covered with any type of material.

Temperature °C	Final Set (hours)	
	Casting	Gunite
10	48	24
16	36	24
21	30	24
28-38	24	24

- (i) If temperature drops below values noted above, additional time may be required to achieve final set.
(ii) Final set is achieved when material has set hard throughout entire mass.

7. Acid Treatment

If, after final set, the installation is liable to be subjected to water prior to exposure to acid, it should be treated by applying a mixture of 1 part commercial strength (33%) hydrochloric acid to 2 parts water to the surface. Prior to acid treatment, Metz Sauereisen 54/54LW must achieve final set.

8. Curing/Drying

For installations that will be exposed to temperatures above 93°C, a controlled drying cycle is required to ensure that all moisture is forced out of the lining prior to placing the unit in service. This controlled drying cycle requires that Metz Sauereisen 54/54LW be allowed to dry for a 24 hour period after completion of the application. Temperature on the surface of the Metz Sauereisen 54/54LW should then be raised to 65°C and held for 6 hours. The temperature should then be raised to a maximum of 100°C and held for 12 hours. The temperature should then be elevated to the unit's maximum operating temperature at a rate not exceeding 38°C per hour. The unit can then be placed in service.

9. Storage

Store in original, sealed containers in a cool, dry place. Protect liquid from freezing. Under these conditions minimum shelf life is 6 months

10. Safety

- a) Liquids: -
Avoid any contact with eyes. Wear safety glasses when mixing. If contact occurs, wash with copious amounts of water. Seek medical attention. Avoid contact with skin. Wear protective gloves.
- b) Powder: -
Avoid breathing dust. Ensure adequate ventilation.

For full safety precautions refer to the relevant Material Safety Data Sheet.

