



## Protection & Restoration of Wastewater Infrastructure





## SAUEREISEN Advanced Material Specialists Since 1899

Sauereisen's roots run deep in the field of protective linings and restorative materials. We bring decades of experience to preserving the assets of the wastewater industry. Our tradition of innovation, dating to 1899, continues today.

Our mission is to deliver quality products and services that add value to the stakeholders of municipal and industrial infrastructure. In doing so, we serve facility owners, engineers and contractors that rely on dependable solutions for aggressive environments. Ultimately, this benefits both taxpayers and the environment.

At Sauereisen, we are not constrained by a limited scope of technology. Our engineered-systems approach to each project distinguishes us. This approach has proven successful in both the collections realm and the treatment arena. Basically, where there are aggressive conditions that threaten the longevity of concrete, brick or steel infrastructure, there is at least one Sauereisen system to offer protection...and security.

Our solutions are not limited to any single chemistry or method of application. This is the type of credibility that lasts for generations.

# Restoration



Restoring and preserving collection and treatment infrastructure is a critical issue for municipalities, industrial facilities, engineers, contractors... and taxpayers.

### Sewer Systems: Out of Sight, Out of Mind...And Typically Out of Order

The prospect of investing public funds for the expansion, upgrade or replacement of municipal wastewater infrastructure typically offers little appeal. Wastewater treatment plants on the edge of town, combined with the underground network of pipes, tunnels and sewage transfer structures, are mainly out of sight and out of mind. Too often, these municipal assets also are out of order.

Much is at stake: water quality...health...public finances. In many cases, effective environmental stewardship has enabled advances in addressing the deterioration of sewer systems. Yet the projected costs to correct aging, under-designed or inadequately maintained sewer systems can be staggering.

How can a municipality pursue adequate wastewater infrastructure fortification practices that are sustainable? The foundational place to start is with the specialty construction materials that constitute the system. There is a lot to consider among service conditions, protective lining technologies and methods of application. At Sauereisen, our expertise and experience positions us to provide confidence among those responsible for specifying solutions.

# SAUEREISEN We Are Solutions for...

## Corrosion and Inflow & Infiltration

Sauereisen understands corrosion. Our history of success in aggressive chemical environments throughout diverse industries transfers to wastewater. The SewerGard™ family of products was developed specifically to withstand the hydrogen sulfide and sulfuric acid common to microbially induced corrosion. As such, we have formulated an ideal blend of chemical resistance, low permeability and high strength.

Likewise, expertise in concrete and substrate repair serves you well in addressing the problems of water inflow and infiltration (I&I). To prevent the costly effects of I&I, Sauereisen offers cementitious materials for spot repairs and full surface rehabilitation and sealing.

## Collection Systems and Treatment Plants

Sauereisen materials are frequently specified throughout both wastewater collection systems and treatment plants. In between a residence and the plant, common applications are found in manholes, lift stations, interceptors and medium to large diameter tunnels.

At sewage treatment plants, Sauereisen products protect the surfaces of headworks, grit chambers, sedimentation tanks and clarifiers.

A fiber-filled polymer lining by Sauereisen protects the weir walls of a clarifier subject to corrosion and abrasion.



# Protection

## Restoration and New Construction

Sauereisen's experience and diversity in both cements and polymer technologies lends itself to understanding the needs of surface restoration. Consequently, we offer the products to enable both a return of structural integrity and the protection against future deterioration. When it comes to rehabilitation, the compatibility of an engineered system is key.

Naturally, these materials have suitability for new construction too. Where proactive planning follows a preventive approach for maximum service life, Sauereisen materials are available in various application grades and thicknesses. Methods of installation include trowel, spray (both conventional airless and plural component), spincast or roller.



For large structures, a spray-applied version of SewerGard® provides lasting protection while allowing an increased application rate in the anaerobic digesters.

## Specialized Corrosion-Resistant Lining

Sauereisen's renowned SewerGard® No. 210 is a field-proven, unique polymer lining system. It is specifically formulated for municipal wastewater environments and offers an economical solution to Microbiologically Influenced Corrosion (MIC). SewerGard® resists high concentrations of sulfuric acid and treatment chemicals. It also exhibits moisture tolerance allowing it to bond directly to damp concrete. SewerGard® No. 210 is 100% solids and environmentally compliant.

SewerGard® is available in six different variations – Trowelable, Sprayable, Rotary Spray, Glaze, High-Strength and Fast-Set. Each variation is engineered to maximize protection of various wastewater treatment structures and application methodology.

**SewerGard® No. 210 - Trowelable** formulation is an aggregate-filled epoxy. Its nonsagging consistency makes it the material of choice for vertical and overhead surfaces where access is limited. Standard application thickness is 1/8 inch, however, greater thicknesses can be achieved.

**SewerGard® No. 210S - Sprayable** formulation is fiber-reinforced for a high degree of durability. No. 210S allows quick installation by a single 60-mil coat when applied by standard airless equipment. It is ideal for large-scale applications.

**SewerGard® No. 210RS - Rotary Spray** formulation is a pumpable grade of SewerGard® specifically designed to line the interior of manholes from street level. No. 210RS is applied at 125 mils using typical rotary application equipment.



# Corrosion

(Above) Various methodologies are used to apply SewerGard.® Depending on project parameters, application by trowel, airless spray, plural-component spray or spincasting may be appropriate.

**SewerGard® No. 210G - Glaze** formulation is a two-component, chemical-resistant, 100% solids polymer for use as an optional (20-mil) topcoat. This coating forms a smooth surface that is easy to maintain and cosmetically appealing. Easily applied by plural-component or conventional airless spray equipment, or hand-applied by roller, No. 210G may also be used as a stand-alone lining, up to 60-mils per coat over steel or concrete.

**SewerGard® No. 210X - High-Strength** formulation is a high-strength lining that enables high-build capabilities wherever extreme corrosion conditions exist. It is easily applied by plural-component or conventional airless spray equipment up to 60-mils per coat.

**SewerGard® No. 210FS (Fast-Set)** formulation is a fast-setting epoxy material engineered for use in wastewater environments. It is particularly useful for the protection of manhole benches, inverters and other structures which are subject to very little maintenance downtime.

Due to the nature of MIC, deterioration in manholes tends to be greater in the vapor zone. SewerGard® is typically specified along with compatible Sauereisen underlays where rough surfaces and open mortar joints are prevalent.



## Preventing Inflow and Infiltration

Of course, wastewater collection systems do not have to be depleted by sulfuric acid to require attention. The costs associated with treating the inflow and infiltration (I&I) of groundwater can be staggering. Sauereisen offers several products to reduce I&I.

**SewerSeal™ No. F-170** is a high-strength, calcium aluminate-based product to be used as a waterproofing and corrosion-resistant lining for sewage collection structures. This material prevents infiltration and resists mild acids and alkalis on concrete or brick structures. No. F-170 is designed for rotary, straight-shot spray applications, can be troweled, and can be applied at various thicknesses in a single pass.

**SewerSeal™ No. F-170FS (Fast-Set)** is a rapid-setting variation of the original formula that is ideal for quickly repairing damaged concrete, filling voids, and patching manhole benches and invert while minimizing or eliminating costly bypass pumping.

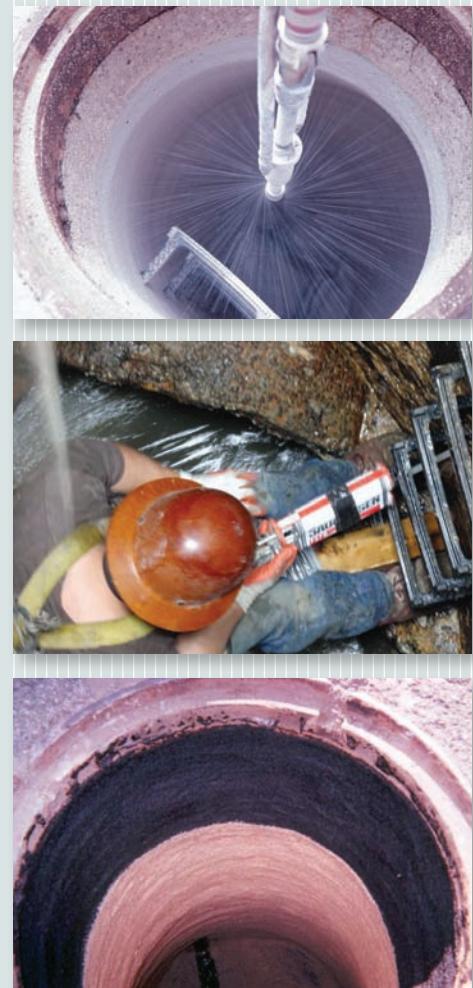
**InstaPlug™ No. F-180** is a rapid-setting, hand-applied hydraulic water plug material for sealing active water leaks and filling small voids prior to the application of a waterproofing, structural repair or corrosion-resistant barrier.

**H<sub>2</sub>OPruf™ No. F-190** is a spray- or brush-applied lining that prevents moisture seepage into below-grade surfaces. Two 1/16-inch coats will withstand water pressure up to 62 feet of head, while three coats will seal a substrate exposed to 100 feet of water head pressure.



**Hydroactive Polyurethane Grout No. F-370** is a hydrophobic, injection-applied material that expands when it meets any source of moisture before it cures. F-370 bonds tenaciously to wet/dry concrete (substrate), effectively sealing cracks or voids and stabilizing soil erosion. F-370 is pumped through pre-placed injection packers (available from Sauereisen). Note: pumping equipment must be capable of delivering 250 psi (routine projects require at least 1,000 psi). F-370 cartridge materials are also provided by Sauereisen in an easy-to-use, 20-ounce dual-package system for use in standard dual-cartridge guns.

**Manhole ChimneySeal™ No. F-88** is an elastomeric lining composed of fiber-reinforced, asphalt-modified urethane. It is easily applied by hand to the chimney sections of manholes to prevent water inflow. As a high solid elastomeric, ChimneySeal™ maintains excellent elasticity and adhesion over a temperature range of -30°F to 250°F. It accommodates the environmental stresses and thermal movement of nearly all climates.



Three approaches for combating I&I problems in manholes: (Top) calcium-aluminate monoliths for 'weeping' surfaces, (Middle) injected chemical grout for active leaks, (Bottom) elastomeric linings for moving chimney sections.



Sauereisen's multi-component products are supplied as kits:  
Dual cartridge of flexible hydroactive grout. (Shown)

## Substrate Repair Materials

Where concrete deterioration is severe, structural integrity may need to be restored prior to the application of a Sauereisen SewerGard® lining system. Sauereisen's full line of underlays are the ideal substrate repair materials for the job.

For patching small bug-holes and minor irregularities, RestoKrete™ Epoxy Filler Compound No. 209, RestoKrete™ Epoxy Filler Compound No. 209HB and RestoKrete™ Epoxy Mortar No. 208 offer a fast and efficient repair method.

Sauereisen underlays are high-strength, fast-curing and able to be top-coated with minimal downtime.



**RestoKrete™ Underlayment No. F-120** is a fast-setting, high early-strength resurfacing material. It is composed of a blend of Portland and calcium aluminate cements and is applied by gunite, trowel or cast-in-place. Benefits include a quick cure devoid of out-gassing, which permits a topcoat of SewerGard® after five hours. Material selection is made to accommodate depth and extent of repairs, contractor equipment and access to job site.

**RestoKrete SubstrateResurfercer™ No. F-121** is a Portland-based cementitious repair material that is pumpable for a wet spray application and may be applied at a thickness of greater than one-inch (500 mils). No. F-121 may be applied by traditional straight-shot method, or in manholes from street level, utilizing standard rotary application equipment. It can also be trowel applied.

**RestoKrete™ Underlayment No. F-120FS (Fast-Set)** is a Portland-based resurfacing material that develops strength very rapidly and is ideal for rebuilding deteriorated or missing manhole benches and inverts.

# Material

## Filler Compounds

**RestoKrete™ Epoxy Mortar No. 208** is a substrate repair material and water-resistant barrier for the prevention of inflow and infiltration in concrete or brick substrates. As an epoxy-based mortar, it is used specifically for resurfacing applications requiring tenacious bonding properties. Excellent for use in dry, arid environments.

- Moisture tolerant
- Applied by spincast spray equipment, straight shot equipment or hand-applied trowel
- Designed to be compatible with Sauereisen's epoxy and urethane topcoats

**RestoKrete™ Epoxy Filler Compound No. 209** is an epoxy formulation specifically designed to fill small voids, irregularities and air pockets in concrete and steel. The filler compound provides a smooth surface for the application of Sauereisen SewerGard® linings and coatings.

- Suitable for application over damp or dry concrete surfaces
- Easy to apply
- Quick set time

**RestoKrete™ Epoxy Filler Compound No. 209FS (Fast-Set)** is a quick-setting formulation for filling voids, irregularities and air pockets in concrete and steel.

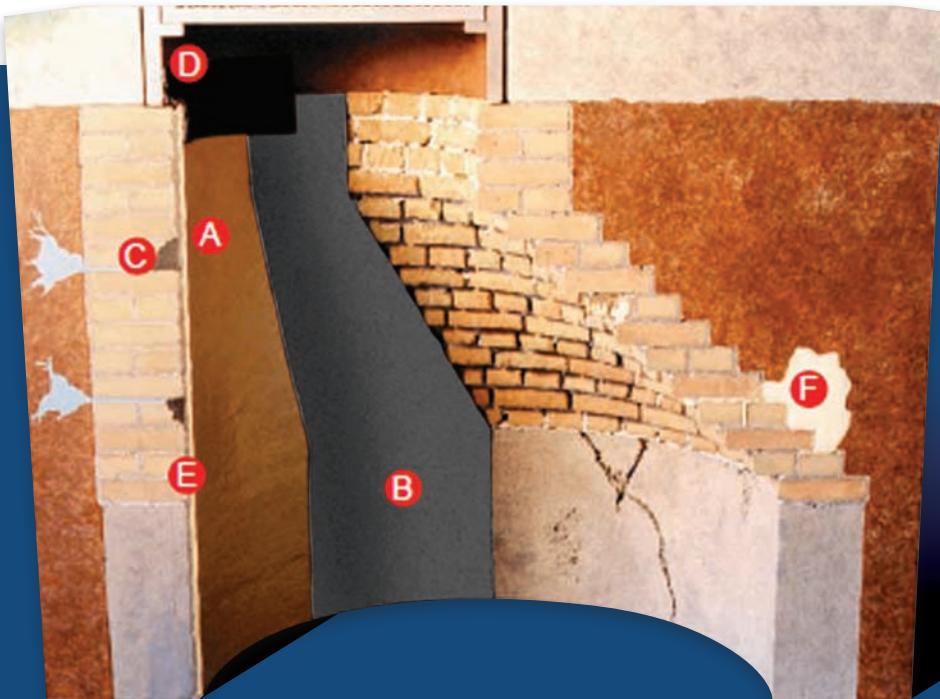
- Initial set is one hour at 70°F
- May be top-coated with a SewerGard® lining after only one hour

**RestoKrete™ Filler Compound No. 209HB (High-Build)** is an epoxy material specifically designed to refinish large surfaces and open joints within concrete. No. 209HB provides a smooth finish and appropriate bonding surface for SewerGard® epoxy topcoats.

- For filling voids larger than typical concrete bug-holes



Filler compounds seal concrete bug-holes to provide a suitable bonding surface and prevent entrapped air.



## Manhole Restoration Solutions

A combination of Sauereisen products are commonly used to restore manholes. This cross-section illustrates:

- A. SewerGard® No. 210
- B. SewerSeal™ No. F-170
- C. InstaPlug™ No. F-180
- D. Manhole ChimneySeal™ No. F-88
- E. RestoKrete SubstrateResurfacer™ No. F-121
- F. Hydroactive Polyurethane Grout No. F-370

# Specialists

## Proven Solutions which Span Generations

The field of municipal wastewater is one that has seen significant proliferation among material suppliers in the 21st century; however, only one party dates back to 1899. Sauereisen solutions span generations with active installations that have been in service for decades. Our family-business culture of innovation and commitment continues today.

For case histories, third-party certifications or specification assistance, call Sauereisen or consult within our network of international representatives.

For specific information: [questions@Sauereisen.com](mailto:questions@Sauereisen.com)



Sauereisen's manufacturing and warehouse facility, Pittsburgh, Pennsylvania.



## We've Got You Covered

Consider Sauereisen as your single source of materials for the wastewater industry.

For corrosion or infiltration, collection systems or treatment plants, new construction or restoration, Sauereisen remains the "Municipal Authority."

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