



## MasterSeal 7000 CR

360° Protection for  
Extreme Conditions



# Challenges in Wastewater Treatment: Dealing with Aggressive Environments

The concrete infrastructure of wastewater treatment systems is subject to complex physical and chemical corrosion processes. MasterSeal 7000 CR is specially designed to address these challenges.

The complex nature of wastewater treatment and its degradation process creates challenging problems for the surrounding infrastructure. The rate of chemical attack depends on various factors related to the conditions in both the wastewater and the environment and can decrease the pH level below 1 in some cases.

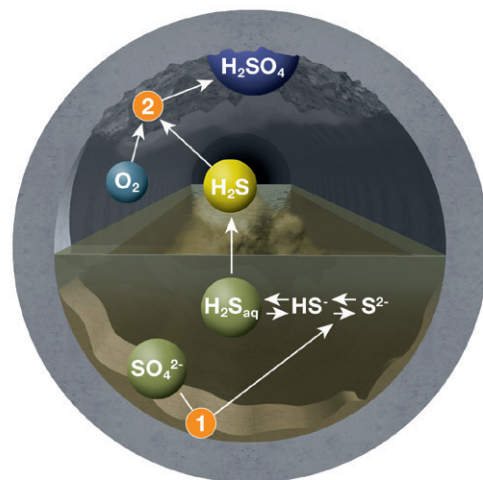
## Biogenic sulfuric acid corrosion can lead to structural concrete damage

Uncoated concrete is particularly susceptible to so called biogenic sulfuric acid corrosion (BSA) leading to structural, rather than just cosmetic concrete damages.

BSA corrosion is caused by bacteria from the genus *Thiobacillus*, which metabolizes hydrogen sulfide ( $H_2S$ ) and liberates sulfuric acid.  $H_2S$  is generated in wastewater systems where sulfur compounds are broken down as part of the general microbiological degradation process. This degradation to  $H_2S$  requires anaerobic (oxygen-free) conditions for the bacteria to thrive **1**. These conditions can be found where there is minimal airflow, turbulence, or water flow.

BSA corrosion is a result of the second process, in which  $H_2S$  is released into the headspace. This release from the water also depends on sewer conditions, such as turbulence. Accumulation of  $H_2S$  in the headspace varies with airflow, but even low concentrations are sufficient to promote *Thiobacillus* colonization **2**. Metabolization of  $H_2S$  by *Thiobacillus* deposits sulfuric acid directly onto the concrete or iron surface being colonized. Chemical attack then takes place very quickly. On concrete, the expansive generation of salt causes surface erosion, while the decrease in pH of the normally alkaline concrete creates the ideal environment for

successive colonization of *Thiobacilli*. In addition to BSA corrosion in the headspace, chemical attack is also caused by the wastewater itself, either from the organic acids generated as oil and fat are broken down or from other contaminants.



The illustration above represents the different reactions involved in the process of biogenic sulfuric acid corrosion.



Durable for a minimum  
of five years – proven  
under real conditions

MasterSeal 7000 CR has been tested at the Fraunhofer Institute under conditions that simulate those of a real sewer during 5 years. The results of the test show no significant changes on the properties of MasterSeal 7000 CR.



# MasterSeal 7000 CR

## 360° Protection for Extreme Conditions

MasterSeal 7000 CR is the waterproofing and concrete protection system with a unique combination of application and performance properties that meet the challenges of aggressive wastewater environments. The performance-proven MasterSeal 7000 CR system significantly extends the life cycle of concrete structures.

### Product benefits at a glance:

Specific chemical resistance, including high concentrations of biogenic sulfuric acid\*



Excellent curing properties, which reduce downtime



Crack-bridging for gaps of up to 0.7 mm



Proven durability



Fast and easy application by rolling or spray at temperatures from 5°C to 35°C



Maximum moisture tolerance, including application on humid substrates

### Fields of application:

Urban and industrial wastewater treatment in both in- and outflow areas

Secondary containment in industrial plants

Biogas plants

Sewage effluent pipes

\*"Specific chemical resistance" refers here to the chemical resistance to BSA and also organic acids



## Xolutec® – Durability by Design

**MasterSeal 7000 CR is powered by Xolutec®** – Our unique technology developed for improved durability, to solve the problems of demanding environments.

Xolutec® is the result of our development work on advancing PU and PUA materials. The goal was to solve the problems of concrete and steel in demanding environments.

Xolutec® – developed by Master Builders Solutions experts – uniquely combines complementary chemistries. Optimization of the inter phase interactions between the highly crosslinked resin blocks and the separately cured inorganic elements, creates a high-density organic-inorganic material with outstanding characteristics. This network allows the enhancement of various characteristics.

Xolutec® is very low in volatile organic components (VOC) and is quick and easy to apply with both spray and hand application equipment, depending on the requirements. It cures rapidly, even at low temperatures thus reducing application time and enabling fast return to service with minimal downtime.

The technology is insensitive to moisture and tolerates a wide variety of site conditions, greatly expanding the application window while reducing the potential for delays and failures.

Long maintenance cycles and lower life cycle costs significantly reduce the total cost of ownership.

Xolutec® enables a wide variety of solutions with enhanced durability.



## MasterSeal 7000 The Solution for

MasterSeal 7000 CR fully bonds to:



Steel



Concrete (with primer  
MasterSeal P 770)

MasterSeal 7000 CR is suitable for:



Horizontal,  
vertical and  
overhead  
application



In- and outdoor  
application



The two MasterSeal 7000 CR colors – red and grey – allow safe application even in environments with poor visibility.

# CR

## Extreme Challenges

**1** Primer  
MasterSeal P 770

Thickness (approx.)  
0.25 mm

Consumption (approx.)  
0.3 kg/m<sup>2</sup>

**2** Membrane  
MasterSeal M 790

Thickness (approx.)  
0.7–0.8 mm

Consumption (approx.)  
0.8–1 kg/m<sup>2</sup>

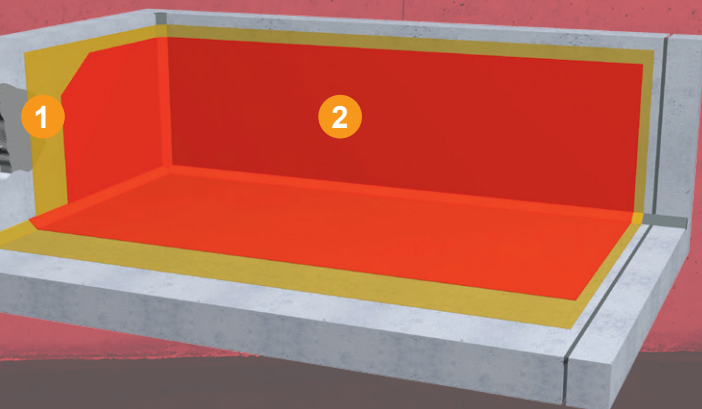
With its unique combination of application and performance properties, MasterSeal 7000 CR is the right solution for waterproofing and protecting wastewater treatment concrete structures and sewers.

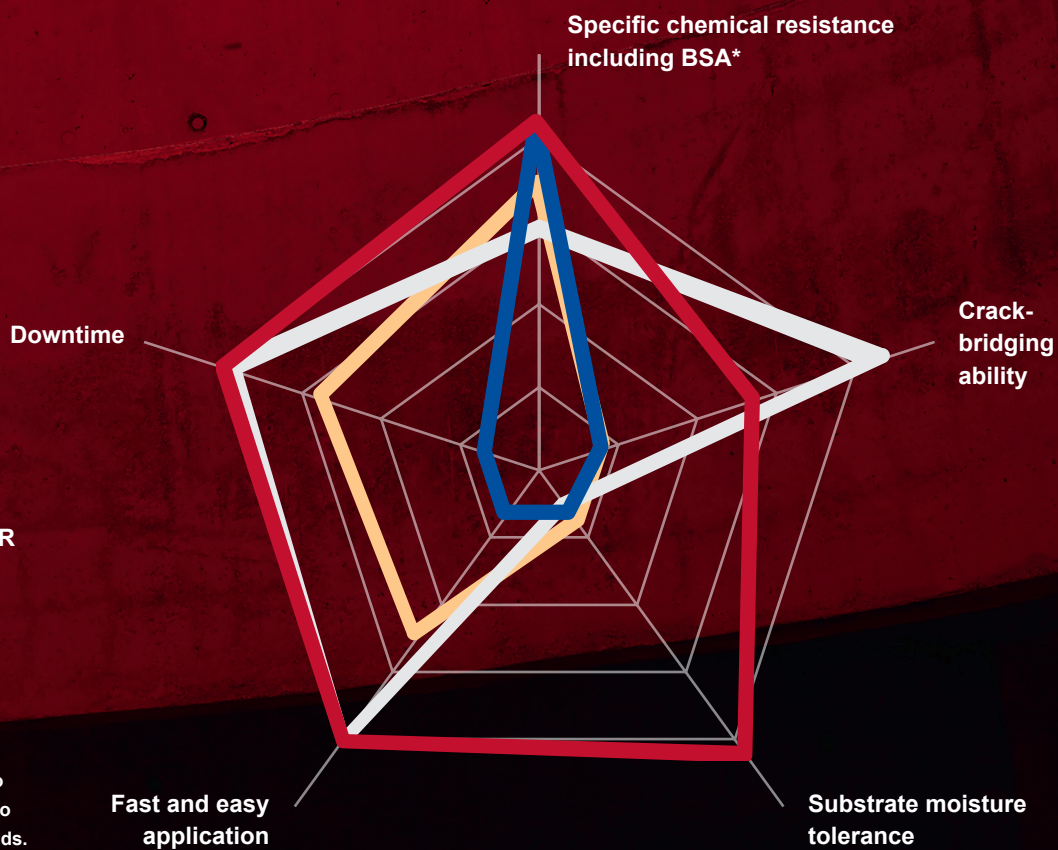
### Performance

MasterSeal 7000 CR's high resistance to abrasion and biogenic sulfuric acid corrosion are ideal to withstand the severe conditions that occur in pretreatment and aeration tanks, digesters, or sewers. Its dynamic and static crack-bridging abilities protect concrete from cracks thus prolonging the structure's life cycle.

### Application

The easy application of MasterSeal 7000 CR by spray or roller, as well as its compatibility with damp substrates, suit the conditions of wastewater facilities particularly well. Downtime – which is always critical when stopping a wastewater process – is also reduced because of its fast-curing properties that allow contact with water only 24 hours after application at 20 °C.





\* "Specific chemical resistance" refers here to the chemical resistance to BSA and also organic acids.



## Your Access to More Support and Relevant Information



### Discover more about MasterSeal 7000 CR

<https://masterseal-7000cr.master-builders-solutions.com>



### Plan your wastewater treatment project in an easy, fast and smart way

It takes only three steps to create a customized specification report of your project with our Online Planning Tool. Plan and organize your construction challenge, define your working area, and get a detailed project report – whether from your PC in the office or your tablet on site.

[online-planning.master-builders-solutions.com](https://online-planning.master-builders-solutions.com)



### Technical support and services

Our Master Builders Solutions experts collaborate across multiple areas of expertise and regions to draw on the experience gained from countless construction projects worldwide. Our knowledge and skill are available to you from the conception through to the completion of your construction project.



# Master Builders Solutions for the Construction Industry

## MasterAir

Complete solutions for air entrained concrete

## MasterBrace

Solutions for concrete strengthening

## MasterCast

Solutions for the manufactured concrete product industry

## MasterCem

Solutions for cement manufacture

## MasterEase

Low viscosity for high performance concrete

## MasterEmaco

Solutions for concrete repair

## MasterFinish

Solutions for formwork treatment and surface improvement

## MasterFlow

Solutions for precision grouting

## MasterFiber

Comprehensive solutions for fiber reinforced concrete

## MasterGlenium

Solutions for high performance concrete

## MasterInject

Solutions for concrete injection

## MasterKure

Solutions for concrete curing

## MasterLife

Solutions for enhanced durability

## MasterMatrix

Advanced rheology control for concrete

## MasterPel

Solutions for hydrophobization, anti-efflorescence and surface protection

## MasterPolyheed

Solutions for mid-range concrete

## MasterPozzolith

Solutions for water-reduced concrete

## MasterProtect

Solutions for concrete protection

## MasterRheobuild

Solutions for high strength concrete

## MasterRoc

Solutions for underground construction

## MasterSeal

Solutions for waterproofing and sealing

## MasterSet

Solutions for set control

## MasterSphere

Solutions for guaranteed freeze-thaw resistance

## MasterSuna

Solutions for sand and gravel in concrete

## MasterSure

Solutions for extraordinary workability retention

## MasterTop

Solutions for industrial and commercial floors

## Master X-Seed

Advanced accelerator solutions for concrete

## Ucrete

Flooring solutions for harsh environments



## QUANTIFIED SUSTAINABLE BENEFITS ADVANCED CHEMISTRY BY MASTER BUILDERS SOLUTIONS

Let the numbers do the talking: We have portrayed some of our most eco-efficient product solutions for concrete and precast production, construction, civil engineering, and flooring.

[sustainability.master-builders-solutions.com](https://sustainability.master-builders-solutions.com)



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MBS-01-2021-ICR-0052-EN