



# REFURBISHMENT

# Sika MonoTop<sup>®</sup>-4400 MIC FOR MICROBIAL INDUCED CORROSION IN SEWERAGE SYSTEMS

FOR OWNERS

# EXTENDING THE SERVICE LIFE AND MAINTENANCE CYCLE

**SEWERAGE SYSTEMS HAVE BEEN** an important part of our cities since the 19<sup>th</sup> century. At this time the growing urbanisation and general lack of sanitation, including the removal of human and animal effluent with surface water from the streets along open sewers into our waterways, had disastrous consequences for the environment and public health, with frequent outbreaks and epidemics of diseases.

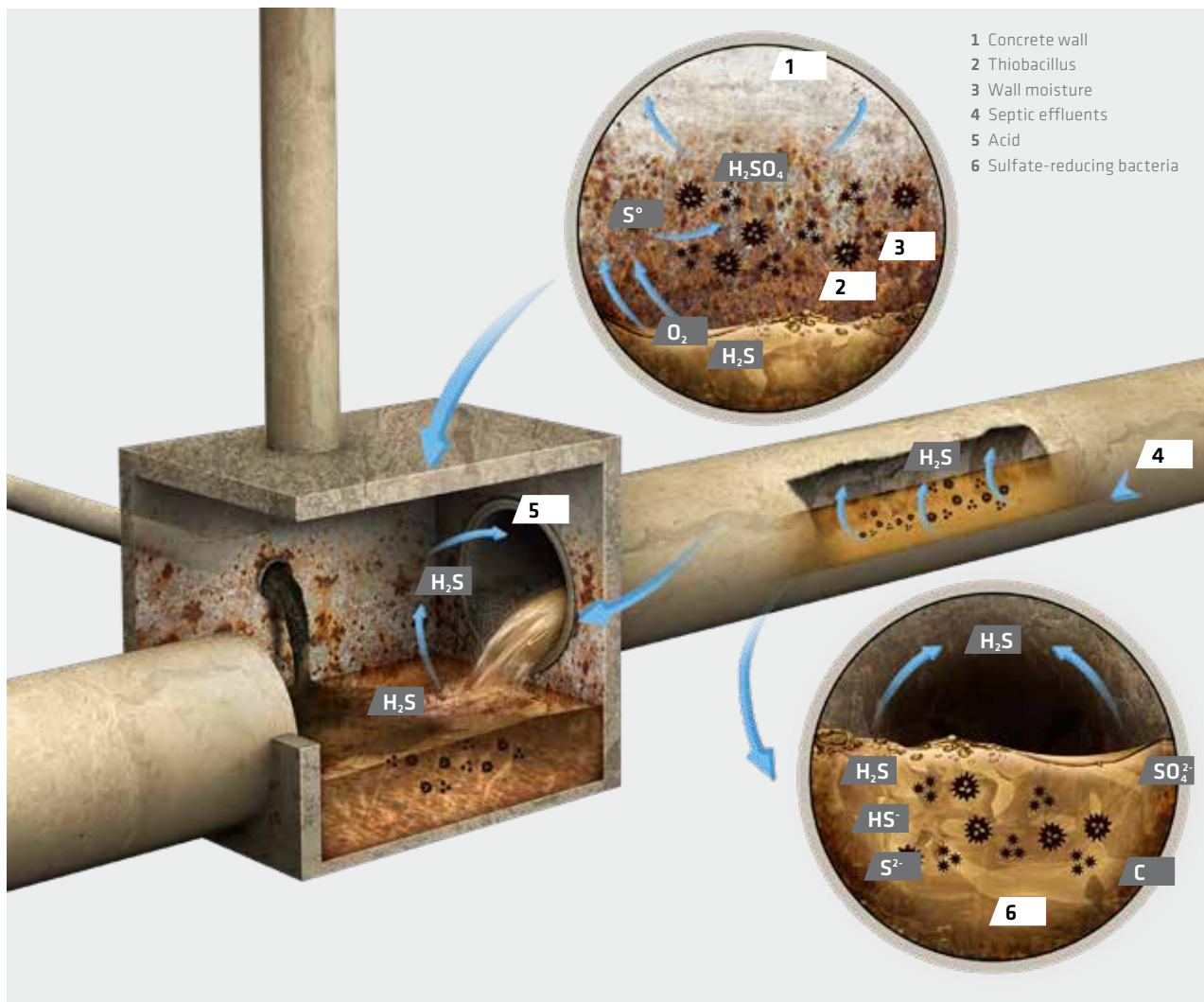
Municipal sanitation systems were therefore developed for the efficient evacuation and treatment of this effluent and waste water. Sewerage system designs have evolved a great deal, but microbial induced corrosion of the structures remains a growing problem

for the responsible authorities and their engineers throughout the world.

Microbial induced corrosion happens when sulphates in biological waste are converted into sulphides through a biological process under the anaerobic

conditions below the waste-water line in the sewers. Above the waste-water line, the hydrogen sulphide gas that is released in this process forms aggressive and corrosive condensates with water such as sulphurous and then sulphuric acid.

## MICROBIAL INDUCED CORROSION PRINCIPLES





**Even though these processes** and the resulting corrosion and maintenance problems on concrete and steel structures are really well known, including the bad smell of rotten eggs that is given off, our sewerage systems still suffer constantly from it.



Manhole sewer entry after only 3 years in service exposed to biogenic corrosion.



Manhole entry to storm water network after 3 years of service showing no deterioration.

## THE USE OF EFFICIENT, DURABLE MATERIALS IS ESSENTIAL TO REDUCE ANY NECESSARY DOWNTIME AND TO EXTEND THE SERVICE LIFE

As a consequence of the continuing sanitary improvements for much of the world's population, the sewerage systems have to accommodate and transport more and more waste and waste water every day. In addition, any downtime or diversions for this essential infrastructure, due to essential maintenance work, is very difficult and expensive.

An additional issue nowadays is the trend to reduce the volume and load on sewage treatment plants by creating separate storm water collection and holding / disposal systems. This has several important advantages in reducing cost and possible pollution, but also concentrates effluent in the sewerage system and accentuates the problem and severity of microbial induced corrosion.

In the past, epoxy resin coatings were used to provide some degree of additional protection against chemical attack including microbial induced corrosion, but in many situations this solution has also failed due to the extremely onerous application conditions in this environment. Many years of experience have now shown that in many situations the only reliable solution is to provide the necessary additional protection to the concrete surfaces with specially designed calcium aluminate cement based mortars.

In these severely exposed, highly stressed and critically important structures, the use of efficient, durable materials is also essential to reduce any necessary downtime and – wherever possible – to extend the service life and maintenance cycle.

## SIKA SOLUTION

**Sika MonoTop®-4400 MIC helps to** increase the durability of structures in and along the sewerage system. Its key characteristics include:

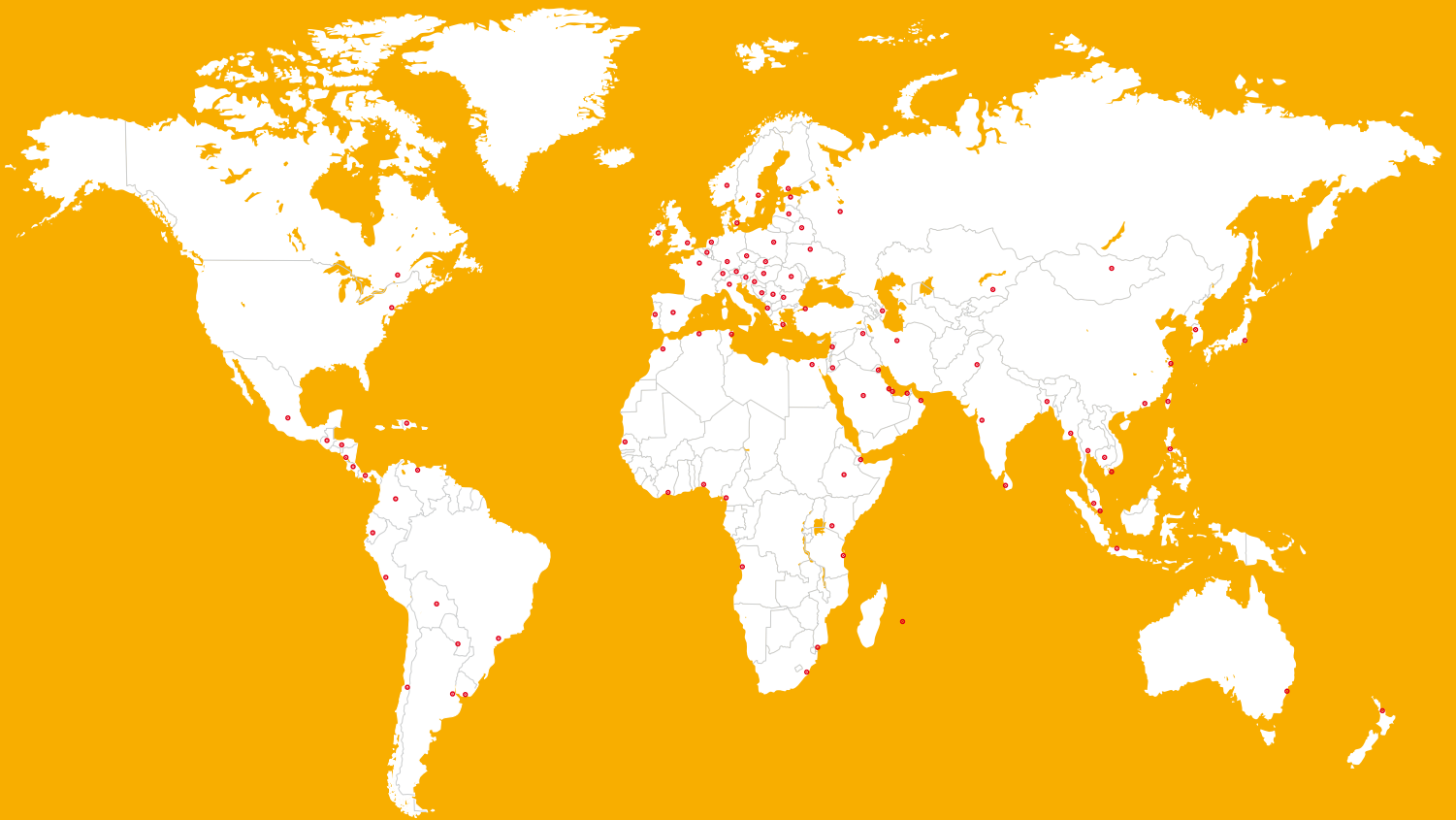
- Acid neutralisation, increasing the durability of the concrete
- Promoting a bacteriostatic environment, stopping the bacterial production of acids

Sika MonoTop®-4400 MIC is particularly suited to the repair and refurbishment of sewerage system structures, including manholes, inspection galleries, lifting pits and stations, the main trunk sewers and other steel and concrete structures and pipes etc. Sika MonoTop®-4400 MIC is produced using the unique 100% Calcium Aluminate Technology that has been developed and used since 1940 for the protection of sewerage and waste water systems worldwide.



- 1 Example of polymer lining failures under H<sub>2</sub>S microbial induced corrosion conditions.
- 2 Example of polymer lining having failed to protect a mould from H<sub>2</sub>S corrosion.

# GLOBAL BUT LOCAL PARTNERSHIP



## FOR MORE INFORMATION:

### WHO WE ARE

Sika Limited and Sika Ireland Limited are part of the global Sika Group, specialising in the manufacture and supply of chemical based products. Sika have a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing, and protecting in the building sector and the motor vehicle industry. Sika has subsidiaries in 97 countries around the world and manufactures in over 190 factories. With over 17,000 employees Sika generates annual sales of CHF 5.75 billion (£4.69bn). We are also committed to providing quality, service, safety and environmental care.

In the UK and Ireland, we provide market-leading solutions for concrete, waterproofing, roofing, flooring, refurbishment, sealing & bonding, and industry, and have manufacturing sites in Welwyn Garden City, Preston, Leeds, Redditch and Dublin.

The information, and, in particular, the recommendations relating to the application and end use of Sika® products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The proprietary rights of third parties must be observed. Please refer to our homepage [www.sika.co.uk](http://www.sika.co.uk) for our current standard terms & conditions applicable to all orders. Users should always refer to the most recent issue of the Product Data Sheet for the product concerned, copies of which will be supplied on request.



### SIKA LIMITED

Head Office  
Watchmead  
Welwyn Garden City  
Hertfordshire, AL7 1BQ  
United Kingdom

### Contact

Phone 0800 112 3865  
E-Mail [constructionolutions@uk.sika.com](mailto:constructionolutions@uk.sika.com)  
[www.sika.co.uk](http://www.sika.co.uk)  
X @SikaLimited  
in @Sika  
@SikaLimited

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