ROCKWOOL®

TECHNICAL INSULATION

# BASF Antwerp tests ROCKWOOL® ProRox® WR-Tech™ pipe insulation

No corrosion under insulation with ROCKWOOL WR-Tech after three years testing in extreme conditions

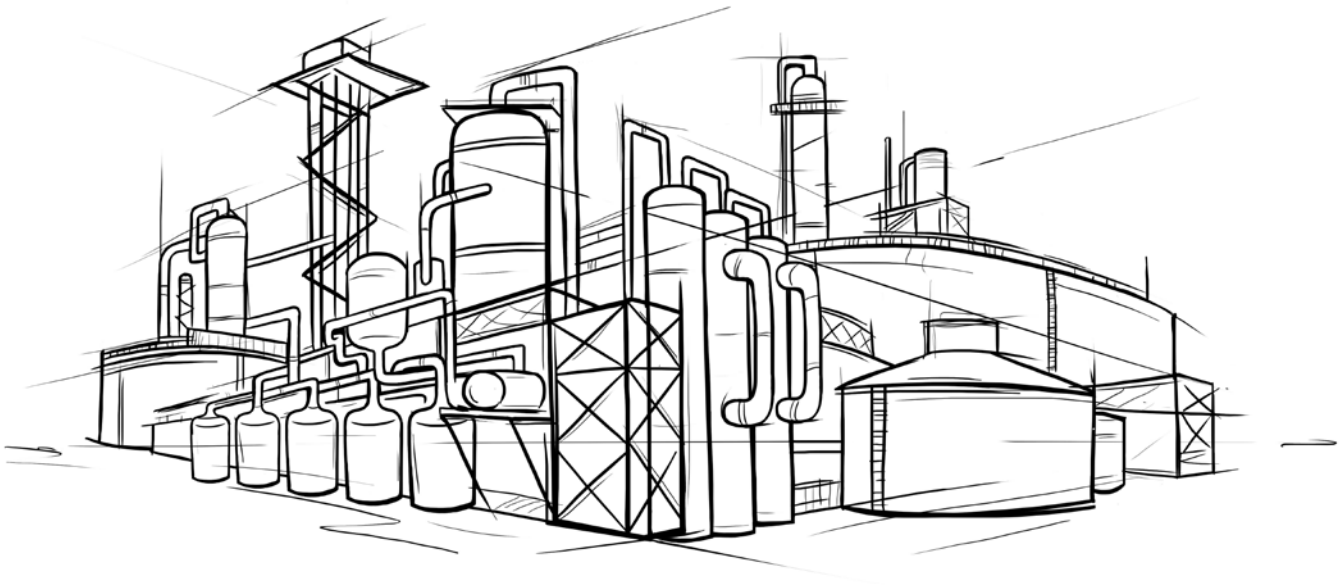
Geert Vriesacker has worked at BASF Antwerp since 1997. With a team of 38 supervisors and many hundreds of contractors, he controls sustainability, safety, and process reliability for the largest chemical production plant in Belgium. One of his priorities is the prevention of corrosion under insulation (CUI) in the 1,200 km of pipes at the site. A three-year practical test with ROCKWOOL WR-Tech technology provided valuable information for CUI prevention. According to Vriesacker: "Practical tests such as these provide us, as a potential user, with the facts so we can see whether products function to specification or even better."

Geert Vriesacker has been responsible for corrosion prevention and control, insulation, and platform/scaffolding construction at BASF Antwerp since 1997. His department ensures that all piping, tanks, and fittings are in tip-top condition through a programme of maintenance, repairs, and quality checks. To achieve this, the site's more than 50 systems are covered day-to-day by about 1,000 contractors. Vriesacker heads a department of about 38 supervisors, whose job it is to ensure the contractors carry out their duties correctly. "The Committee Industrial Insulation (CINI) standard is the basic international standard for industrial insulation, which we supplement with our own specifications to deliver the desired level of performance," says Vriesacker.

Maintenance of pipes and systems is a never-ending duty. "We work based on planned schedules. The production site is divided into different zones. For example, the zone around the cracker measures 10x5m," continues Vriesacker. "We use the most effective approach: inspection, scaffolding construction, followed by repair or replacement."

The cracker receives a major service once every five years; other systems, every three, five or seven years, based on safety, process, and legal guidelines and standards. "We always start with a visual inspection," explains Vriesacker. "Then we remove the insulation. Depending on what we discover, we will fix a section or all of the line. If we suspect any corrosion, we deal with it immediately, even if the pipe or area is not scheduled for maintenance until a later date."


According to Geert Vriesacker of BASF Antwerp, "practical tests – such as those run on ROCKWOOL WR-Tech – provide us, as the potential user, with the facts, so we can see whether products function to specification or even better. We also test coatings in the field, so we can analyse the results." This approach to testing has led BASF Antwerp to specify the application of ROCKWOOL products, which have become an integral element of its CUI-prevention policy.



## CUI prevention

Temperatures in the pipes at BASF Antwerp range from extremes of -180°C to 1,110°C, but about 70% of thermal insulation covers temperatures between 50°C and 600°C. The company utilises stone wool for this purpose. Cellular glass and Polyisocyanurate (PIR) are used for the coldest applications; ceramic wools and other products for the highest temperatures. Insulation minimises heat loss and plays a major – even critical – role in issues such as process reliability, safety, energy control, and plant integrity, as well as investment and operating costs. BASF Antwerp was built in 1964.

"In recent years, CUI has become the main focus point," says Vriesacker. "Annually, we spend much time and energy on CUI prevention. We plan our inspection work schedules years in advance, particularly for the cracker, as this is such an essential part in our production process. Everything must function properly, safely, securely, and trouble free."

## CUI strategy and test set-up for WR-Tech pipe sections

CUI occurs when moisture penetrates the insulation system and can cause corrosion of the pipe. A combination of measures are needed to prevent this from happening: proper maintenance of the pipes; the proper type of insulation; proper plating; and a drainage assembly. "It's always the correct combination of measures that results in good corrosion protection," explains Vriesacker. "At BASF Antwerp, we focus on the prevention of moisture ingress; yet we also have to address any condensation that may occur inside the metal plating."

After three years of use, the ProRox® WR-Tech test section scored 0.1kg/m² water absorption, well within the limits of European standard EN 13472 (<1kg/m²). This value also remains within the standard of <0.2kg/m² imposed by ROCKWOOL on its own products, which includes a safety margin as standard.

In order to analyse the role of stone wool in CUI prevention, BASF and ROCKWOOL set up a multi-year test on a pipeline with process temperatures ranging from 120°C to 140°C. During the test period, ROCKWOOL's ProRox PS 960 pipe sections with WR-Tech were utilised for three years on operational pipes within the Antwerp facility.

ROCKWOOL WR-Tech insulation after three years at 120°C to 140°C.

WR-Tech is a water-repellency technology developed by ROCKWOOL Technical Insulation, which is specialised in developing custom insulation solutions for industry. WR-Tech is supplied as standard on the company's main product groups for insulation (pipe sections, wired mats). Thanks to its water-repellent properties, WR-Tech significantly contributes to the prevention of CUI. In addition, the fibrous structure of ProRox PS 960 pipe sections naturally allows moisture to evaporate. This results in the lowest-possible water absorption, even over long periods of time and in applications that experience cycles of heating and cooling. The technology thus minimises moisture absorption into the insulation system, while preserving long-term insulating performance.

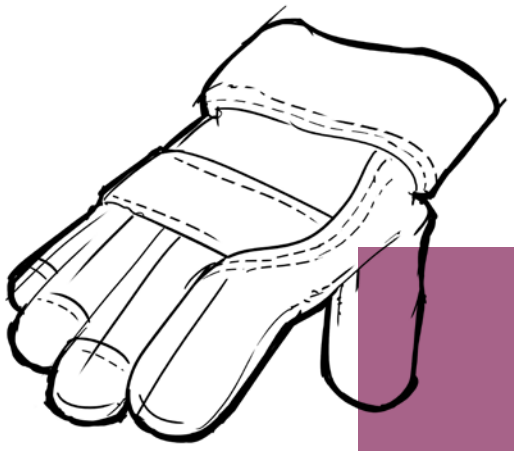
## Testing results

"BASF Antwerp had a very good experience with ROCKWOOL," says Vriesaker. A test section of ProRox PS 960 pipe with a 60 mm insulating diameter, part of a 5m functioning pipe, was first exposed to all weather conditions over a four-month period, beginning in February 2018. Aluminium-zinc plating was then installed, according to specification, for the remaining 32-month test period. "Disassembly and visual inspection revealed the ProRox WR-Tech stone wool became a little fluffy on the surface; however, it also showed that no moisture had penetrated any further. There was no CUI visible on the pipe."

## Moisture detection system

BASF Antwerp depends mainly on visual pipeline inspections for its CUI prevention efforts. Together with several other organisations, the company is working on the development of pipe insulation moisture detection systems. In the current project, the developers and BASF are aiming to scale up the technology to relevant pipe section lengths, as well as to improve transmission of the measurement data.

"Our site has 1,200 km of pipes, so sensors may assist in preventing CUI," concludes Vriesacker. "However, our main focus is on the prevention of moisture ingress with a proper insulating system, as well as finding the right products for this – such as those provided by ROCKWOOL."



**About BASF Antwerp**

BASF is the world's largest multinational chemical group with production sites on all continents. Its Antwerp factory was constructed in 1964 and is currently the largest production centre in Belgium, as well as one of the largest in the global BASF Group. Located in Scheldelaan, Antwerp, the site employs about 3,500 permanent BASF employees, and boasts over fifty production installations, interconnected via 1,200 km of insulated pipes. Covering 6 km² (or about 1,200 soccer fields), BASF Antwerp is as big as Antwerp city centre and has 60 km of paved roads and 53 km of railroads.

The factory produces a variety of chemical products, which are utilised in many industries. Naphtha is delivered by ship and cracked to benzene, ethylene (styrene and nitrobenzene), and propylene (acrylic acid and super-absorbents). The entire production facility is configured as a so-called production combination process, whereby the by-products of one process may serve as feedstock for another process. Even the energy supply is handled as an interlinked process with steam-producing systems feeding those that need steam.

Geert Vriesacker, BASF, and Rony Blommaert, regional sales manager for Belgium at ROCKWOOL Technical Insulation.

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ROCKWOOL Technical Insulation is a global business with a local presence, supplying advanced stone wool insulation solutions to the process and marine & offshore industries. Part of the ROCKWOOL Group, with approx. 10,500 passionate colleagues in 38 countries, we have manufacturing and service facilities around the world, ensuring we're there when you need us, with the right expertise and products to meet your requirements. See our key ROCKWOOL Technical Insulation locations below.


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ROCKWOOL Group is the world leader in stone wool products, from building insulation to acoustic ceilings, external cladding systems to horticultural solutions, engineered fibres for industrial use to insulation for the process industry and marine & offshore. We are committed to enriching the lives of everyone who experiences our products and services, and to helping customers and communities tackle many of today's biggest sustainability and development challenges including energy consumption, noise pollution, fire resilience, water scarcity, urban flooding and more.