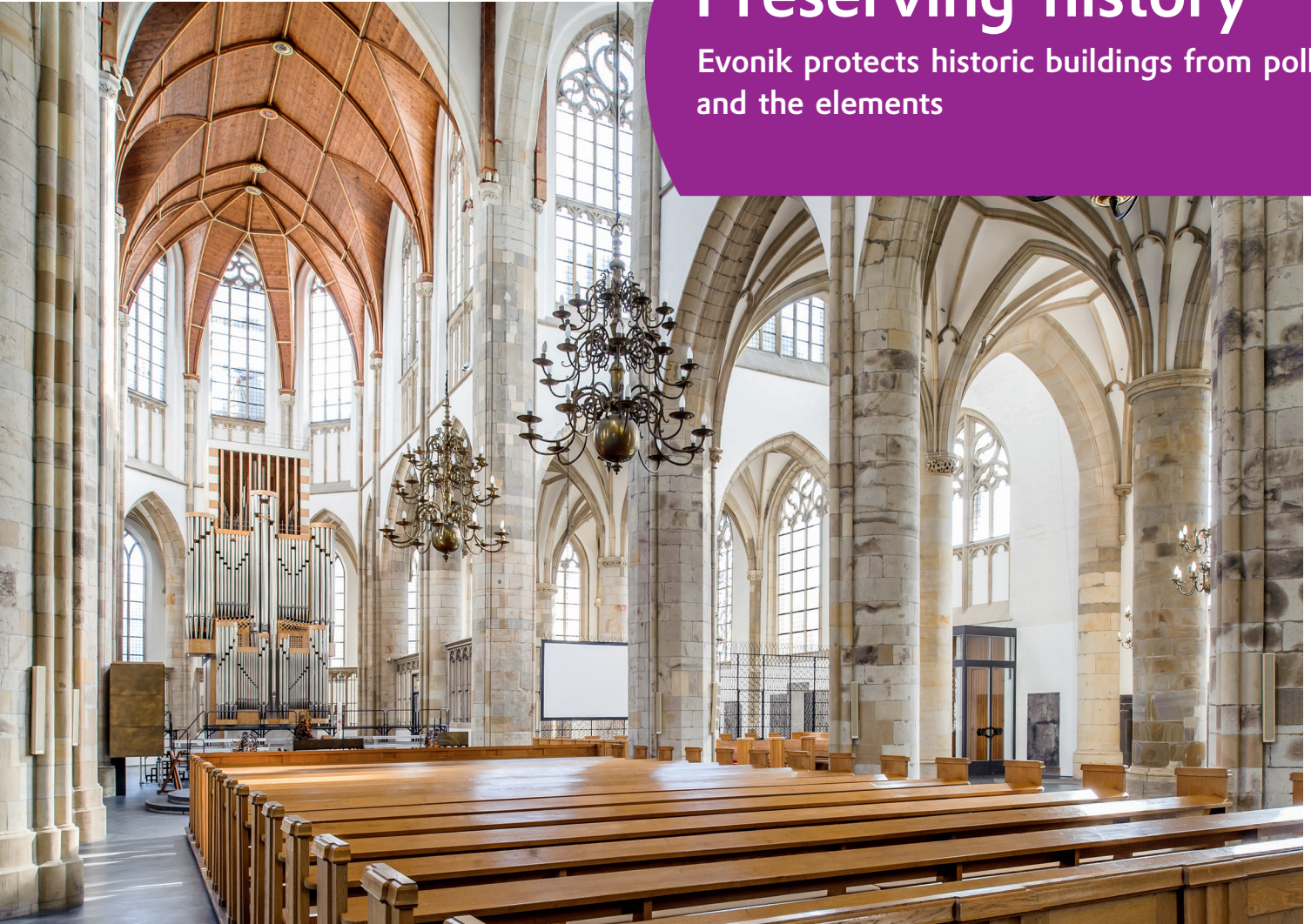


Preserving history

Evonik protects historic buildings from pollution and the elements



It has experienced a lot: the Willibrordi Cathedral in Wesel, Germany, was built in a gothic style in two construction progresses between 1380 and 1540. While its interior looks nearly flawless, the outside has been impacted by rain, snow, and frost every year and every decade. Inside dozens of antique glass windows flood the basilica with daylight, and light up the communion table and organ. The building is supported by enormous buttresses and arcade arches, while its wood ceilings and slate floor lend the space a brilliant, almost festive atmosphere.

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Evonik. Power to create.



When you leave the church, you can see how the slow yet inexorable march of time has been at work on Wesel's landmark: algae and lichens adorn several areas of the basalt and sandstone foundation. Over decades, dust and pollution from the air have discolored window ledges and cornices, turning them gray to black. Now, however, a product from the chemistry labs at Evonik will not only remove the traces of time—it will also protect the cathedral in the years to come.

Evonik has a long tradition of preserving masonry in this way, with employees in various parts of the company working on it. The experts at Evonik have the right answer for such diverse applications as impregnating mineral façades, coating buildings with special silicon-containing paints, and making concrete water repellent. While each product is highly specialized, the basic chemistry involved is often the same: the materials are based on silanes, along with polysiloxanes or silicone resins that have been tailored to the application at hand. One example of how Evonik uses these is in products that generate desirable impregnating effects in an extraordinarily wide variety of materials and building types—protecting large buildings from water just as effectively as single-family homes. What makes these products special is that the silanes, siloxanes, or silicone resins used in impregnating agents and paints repel rainwater without sealing off the substrate. This intelligent moisture management in the construction material keeps buildings safe from damage caused by algae, molds, and freezing water. "Basically, coatings like this work a lot like a windbreaker: it protects you from rain but lets moisture from your body escape as water vapor," says Jürgen Kirchner, an engineer at Evonik. "Raindrops bead off of it, but much smaller water vapor molecules can still escape through the pores to the outside of the building," adds Dr. Christopher Studte, the head of Silanes Application Technology in the Building Protection unit of Evonik. This method allows damp masonry to dry without letting new moisture penetrate from outside.

While that may sound simple, considerable chemistry expertise and years of research have gone into it—and the Willibrordi Cathedral in Wesel is one of the beneficiaries. That's because the Cathedral's preservation society and its master builder, the engi-

neer Professor Wolfgang Deurer, can turn to Evonik expertise for the work that needs to be done. Deurer has been taking care of the Wesel church for 53 years, and the advice and experience of this architect and monument conservator are sought after in other European countries as well. Deurer knows the harm that water and moisture can do to buildings—restoring and renovating historic preservation sites are his forte.



Evonik PROTECTOSIL® keeps buildings safe from damage caused by algae, lichen and fungi—which are shown in the picture.

Preventing algae and lichens

Following a test phase that lasted several years, PROTECTOSIL® from Evonik will now be used for impregnating the exterior of the Willibrordi Cathedral on a large scale. The church suffered extensive damage during World War II and was rebuilt over the course of several decades—a process in which builders followed the old plans and used many of the same traditional construction materials employed in the Middle Ages. Like many churches in Germany's Lower Rhine region, the Cathedral was built of sandstone from the area near the town of Oberkirchen. "While this stone is very strong," explains the Cathedral's master builder, "it also unfortunately absorbs pollution from the air very quickly and discolors." The light-colored stones—especially those on profiles and corners—turn gray and black. In addition, it stops buildings from getting gray. Surfaces treated with PROTECTOSIL® remain dry which is why algae and lichen cannot grow because the water needed for the growth is missing.



The Willibrordi Cathedral is a perfect example for late gothic architecture.

“Building and preserving means a lifetime struggle against water and moisture,” says Deurer from experience. Water works its way up from the foundations, pipes leak, the masonry “perspires” in the summer, and in the winter the water freezes and expands—and can force stones apart with incredible force. That’s why he was so interested when he heard about PROTECTOSIL®. The product does more than provide long-term masonry protection—In addition, it stops buildings from getting gray. Surfaces treated with PROTECTOSIL® remain dry which is why algae and lichen cannot grow because the water needed for the growth is missing. “It’s the perfect solution for our church,” says Deurer, “because cleaning the exterior all the time just costs too much.”

Starting in 2014, a total of 900 square meters of Oberkirchen sandstone will be coated with a PROTECTOSIL® impregnation. According to plans, all areas consisting of Oberkirchen sandstone will be impregnated with PROTECTOSIL® by the end of 2015. The master builder is confident: “Good impregnation will mean no more cleaning expenses for at least the next ten years.” It’s an advantage that Professor Deurer can well appreciate—after all, being responsible for combating the ravages of time has given him a fondness for long-term thinking.