

## Church on the Edge of Rome Offers a Solution to Smog

<http://www.nytimes.com/2006/11/28/world/europe/28smog.html>



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A church by Richard Meier is coated with a particle-eating concrete. A key material, titanium dioxide, is being tested in Europe and Japan.

By ELISABETTA POVOLEDO  
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MILAN, Nov. 27 — When the American architect [Richard Meier](#) was asked to design a church in Rome to commemorate the 2,000th anniversary of Christianity, he offered an imposing white concrete structure dominated by three soaring “sails.”

The project’s main technical sponsor got to work on a coating that would enhance Mr. Meier’s trademark white sculptural forms. It came up with a material that essentially cleans itself, minimizing the need for maintenance.

What the sponsor, the Italcementi Group, did not know was that the new material — which contains titanium dioxide, a white pigment — has another peculiarity. It “eats” surrounding smog.

Extensive testing has since determined that construction products containing titanium dioxide help to destroy pollutants found in car exhaust and heating emissions, scientists say.

Several companies are now developing smog-eating products that can be used not only for the facades of buildings but also in paint, plaster and paving materials for roads. The new substances are now being tried in buildings, squares and highways in Europe and Japan.

Hailed by some scientists as a breakthrough, the process is still being evaluated by others. The question, said Melanie L. Sattler, professor of civil and environmental engineering at the University of Texas at Arlington, is "whether coatings on buildings would be able to treat enough of the atmospheric air to make a difference."

Titanium dioxide had been used in self-cleaning coatings before because of its photocatalytic properties: sunlight sets off a chemical reaction that accelerates natural oxidation. Upon testing its new compound, however, Italcementi realized that the material could also break down nitrogen oxides emitted in the burning of fossil fuels.

"Theoretical work in photocatalysis has been going on since the 1980s," said Enrico Borgarello, Italcementi's director of research and development. "The problem is that no one had developed any practical applications."

According to Italcementi, tests in urban settings determined that some pollutants could be reduced by 20 to 70 percent.

The reduction of pollutants is greatest within about eight feet of a surface that has been treated, the company said. This means that a pedestrian on a street with traffic would inhale fewer pollutants while passing treated buildings.

In one test, paving material using photocatalytic cement was used to cover the asphalt surface of a 1,000-foot stretch of road outside Milan with an average traffic flow of 1,000 vehicles an hour. Tests showed a reduction of about 60 percent in nitrogen oxides at street level, according to Italcementi.

Environmental scientists and engineers are following the development with keen interest.

"Philosophically, it is better never to form pollutants than to find ways to destroy pollutants, but this is a useful technique for air pollutants that humans already make," said Dr. Howard Liljestrand, a specialist in environmental chemistry at the University of Texas at Austin.

But he cautioned that the cost efficiency of such products would depend on long-term performance, adding, "Catalysts tend to lose their effectiveness over time."

Now that Italcementi's product, TX Active, has gone beyond the testing phase, does it work? Three years after Mr. Meier's church opened in Tor Tre Teste, in eastern Rome, the bulk of the majestic structure remains remarkably bright, in contrast to the grimy gray joints, which were not treated with the product.

"It's hard to say if it's revolutionary," Mr. Meier said by telephone, "but we're happy with the results."

## Past made present at Meier's Jubilee Church in Rome

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**By: Dr. Laura Flusche/Contributing Writer**

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*Invenzione*. In Renaissance and Baroque Italy, this word signified the artistic imagination and the ability of an artist to conceive something new. Something new, however, was not invented out of thin air. Early modern artists studied the achievements of their predecessors in an effort to discern the rules that governed the making of art. An artist praised as displaying *invenzione* was an artist who knew the rules and could create something new within them.

Though we don't use the word *invenzione* in the same way anymore, the concept is alive and well in Rome and can be seen in American architect Richard Meier's Jubilee Church in the suburban neighborhood of Tor Tre Teste. Consecrated in October 2003 after years of construction, Meier's church appears to be made out of light. Three huge cast concrete "sails" delineate the building's form as they arch toward the heavens. Glass walls between the "sails" allow light itself to be the element that defines the sacred space within. At night, light emanates from the building, creating an ethereal presence and animating the surrounding suburban landscape.

Though his church is ultra-contemporary, Meier cites 17th-century architect Francesco Borromini as being among the artists who inspired his design. Meier particularly admires Borromini's church of Sant'Ivo alla Sapienza near Piazza Navona for its magnificent white interior and its ability to capture and direct sunlight, thereby providing the visitor with a transcendental experience. He wanted his church to offer something similar:

"Light is the protagonist of our understanding and reading of space. Light is the means by which we are able to experience what we call sacred. Light is at the origins of this building... In the Jubilee Church, the three concrete shells define an enveloping atmosphere in which the light from the skylights above creates a luminous spatial experience, and the rays of sunlight serve as a mystical metaphor of the presence of God."

Meier is more than happy to acknowledge the influence of the past on his work. Though he wanted to create a church firmly grounded in our own contemporary aesthetic, he also wanted to pay homage to Rome's extensive architectural past.

"With the Jubilee Church, we have worked to create a new Roman Catholic church for the 21st century - a landmark that upholds and builds upon the city's rich architectural tradition," Meier stated.

The Jubilee church is not Meier's first ecclesiastical building. He also designed the Crystal Cathedral's Center for Possibility Thinking in Garden Grove, CA (2003) and the Hartford Seminary in Hartford, CT (1981). In 1995 he was invited by the Vatican to compete with other architectural luminaries like Frank Gehry and Tadao Ando (designer of Ft. Worth's new Modern Art Museum) for the commission of the Jubilee Church. And in 1996 he was awarded the project, becoming the first Jewish architect in history to design a Roman Catholic church.

The 108,414 square-foot complex is not just a place of worship, but is also meant to be a social center for the lower/middle class neighborhood in which it is located. In addition to the Jubilee Church (officially it is dedicated to Dio Padre Misericordioso), Meier also designed a community center that serves as a social, educational, and recreational gathering place for the immediate area's 8,000 residents.

For more information visit [www.diopadremisericordioso.it](http://www.diopadremisericordioso.it)

### **How to visit**

The Jubilee Church is at Via Tovaglierei 1, in Tor Tre Teste, a suburb about six miles east of the center of Rome (just inside the ring road).

By car, take the Via Casilina, either west from the ring road (exit 18) or east from Rome, and turn north on Via Tor Tre Teste. Once in the community, turn left onto Via F. Tovaglieri and the church will be visible.

By public transportation, take the 14 tram from Via Giovanni Amendola, near Termini train station. Ride the tram 23 stops to Togliatti, the end of the tram line. From Togliatti, take the 556 bus in the direction of Tobagi. Ride the 556 for nine stops, until you reach the Tovalieri stop, which is right in front of the church.