**Inventor of the self-cleaning city: Luigi Cassar’s “smog-eating” concrete garners nomination for the European Inventor Award**

* **Self-cleaning facades and roads for cleaner cities**
* **Innovative construction materials cut air pollution**
* **EPA President Benoît Battistelli: “A major innovation in construction materials with tremendous value for the cities of the future.”**

Munich/Bergamo, 29 April 2014 – Air pollution and its consequences are a problem for every major city: exhaust fumes are detrimental to the environment and our health. They also discolour buildings. Thanks to an invention from chemist Luigi Cassar, building exteriors can now not only stay cleaner longer, but also help neutralize pollutants and improve air quality. Just a thin layer of an innovative cement coating combined with sunlight are all that is required to initiate long-term self-cleaning, both for facades and the air around them. This groundbreaking invention earned Cassar and his team at the Italian cement manufacturer Italcementi S.p.A. a nomination for the European Inventor Award 2014 in the category “Industry”. The European Patent Office will present the prize on 17 June in Berlin, Germany.

Today, we would be hard-pressed to imagine a city without concrete. The material has also long shed its negative image – silky, sleek surfaces make concrete an attractive material for modern architecture. However, it does have its adversaries, the most important being emissions and dirt particles in the air. They discolor the surface, leaving dark stains that require time-consuming removal with expensive, aggressive chemicals. Various technologies such as protective water-repellent silicone coatings have been applied in an effort to sidestep this process. Nonetheless, these solutions can also be expensive and tend to lose their effectiveness over time.

**Cleansing power of sunlight**

Convinced that there must be a better solution to preserve the aesthetic properties of concrete, Cassar decided to embark on a completely different path with his team: they decided to harness solar energy to break down harmful substances before they could form a residue on surfaces and cause discoloration. To accomplish this goal, the scientists created a cement mixture containing substances known as “photocatalysts”. This photocatalytic principle in the cement uses sunlight to break down pollutants into less harmful substances. They are then simply washed away by rainwater. The added bonus: the new material not only cleans concrete but also the surrounding air.

“The dual effect of the cement developed by Luigi Cassar is an invaluable contribution to the quality of life in the world’s cities and an extremely attractive product for future construction and modernisation projects. As well as reducing the visible effects of environmental pollution, it helps to ensure cleaner, more breathable air,” said EPO President Benoît Battistelli announcing the finalists for the European Inventor Award 2014.

**Smog-eating properties as an unintended side-effect**

Since he joined Italcementi in 1991, Cassar has focused his development work on the self-cleaning properties of cement. The discovery that the surface oxidation measurably reduced air pollutants was an unexpected yet very welcome side-effect. The breakthrough came when titanium oxide minerals were added to the cement mixture. In 1996, the spectacular construction of the Dives in Misericordia church in Rome with its enormous, sparkling white concrete sails finally put Cassar’s product to the test and became a first impressive testament to its effectiveness.

“During the construction of the church in Rome, we could confirm that the air around the new structure was in fact less contaminated than before. The titanium oxide in our cement accelerated the oxidation of pollutants in the air,” Cassar explains.

Scientific testing confirmed this smog-eating property, which quickly took centre stage in terms of development and marketing. According to a study, walls that are coated with the product from Italcementi reduce nitrogen oxide content in the surrounding air by approximately 80 percent. Nitrogen oxides are the detrimental compounds that contribute to the formation of low-lying smog. Consistent, widespread use of the product in cityscapes would therefore result in quantifiable improvements in air quality. “Our measurements revealed that when houses in large cities were coated with our special cement mixture, air pollution could be reduced by up to 50 percent,” Cassar says.

**Strong appeal for building projects the world over**

Cassar’s invention has been on the market and sold as “TX Active” since 2006. Its special properties make the product attractive for construction and modernization projects throughout the world. TX Active has already been successfully used for coating and renewing road surfaces. Major market potential to the tune of billions also exists in emerging countries such as China, where the construction industry has registered dynamic annual growth rates in recent years and the reduction of pollutants has become increasingly important. Worldwide sales of concrete and cement generate an annual market volume of approximately 330 billion euros.

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| **Media and services package for Luigi Cassar** |
| **Media package:**  [**Video materials and photos of Luigi Cassar for online use**](http://www.epo.org/news-issues/press/inventoraward/industry/Luigi-Cassar-und-Team.html)  **Background to the invention:**  **How it works**  **Economic aspects – facts and figures**  **View the patents:** [**EP0946450**](http://worldwide.espacenet.com/publicationDetails/originalDocument?FT=D&date=20110216&DB=worldwide.espacenet.com&locale=en_EP&CC=EP&NR=0946450B1&KC=B1&ND=4)**,** [**EP2242806**](http://worldwide.espacenet.com/publicationDetails/originalDocument?FT=D&date=20110817&DB=worldwide.espacenet.com&locale=en_EP&CC=EP&NR=2242806B1&KC=B1&ND=4)**,** [**EP2282203**](http://worldwide.espacenet.com/publicationDetails/originalDocument?FT=D&date=20120314&DB=worldwide.espacenet.com&locale=en_EP&CC=EP&NR=2282203B1&KC=B1&ND=4)  **Beyond concrete**  Concrete is one of many everyday building materials that have received a significant makeover. Not only has Luigi Cassar helped transform concrete into a grime-resistant pollution fighter, inventors such as Belgian engineer and 2011 European Inventor Award winner [Ann Lambrechts](http://www.epo.org/learning-events/european-inventor/finalists/2011/lambrechts.html) have greatly expanded the ways it might be used. Other material scientists have developed new concrete composites that improve its insulation properties and have designed new faster-drying mixes.  Take a look at some recent advances in [building materials development](http://www.epo.org/news-issues/press/inventoraward/industry/Luigi-Cassar-und-Team.html) and see [four trends that are paving the way for increased energy efficient construction](http://www.epo.org/news-issues/issues/sustainable-technologies/green-construction.html)**.**  **How to track green construction inventions in patents:**  [**http://www.epo.org/news-issues/issues/classification/classification.html**](http://www.epo.org/news-issues/issues/classification/classification.html)  **Statistics on patent applications in the construction sector 2004 to 2013**  ***For more information about these topics send us an email***  **About the European Patent Office:**  [**The EPO - Promoting innovation to enhance Europe's competitiveness**](http://www.epo.org/news-issues/press/background/epo.html)  **Study on the economic impact of patents and other IP rights:**  [**Executive summary**](http://documents.epo.org/projects/babylon/eponet.nsf/0/8E1E34349D4546C3C1257BF300343D8B/$File/ip_intensive_industries_en.pdf)  **For more information, please contact:**  Oswald Schröder  Spokesperson/Project Manager  Tel. +49 (0)89 2399 1800,  [oschroeder@epo.org](mailto:oschroeder@epo.org)  Rainer Osterwalder  Media Relations Officer  Tel. +49 (0)89 2399 1820  [rosterwalder@epo.org](mailto:rosterwalder@epo.org)  Isabella Lamera  Shepard Fox Communications  Tel. +39 338 702 6584  [isabella.lamera@shepard-fox.com](mailto:isabella.lamera@shepard-fox.com) |