



Questions and answers on “transparent cement”

Why did Italcementi Group decide to take part in building the Italian Pavilion in Shanghai?

Italcementi Group wanted to take up the challenge of the Italian Commissionship and the architect Giampaolo Imbrighi to collaborate on an ambitious project: to build a pavilion with cement walls, but at the same time able to filter the light.

The target was centered thanks to an innovative material, an example of the *made in Italy* ability to find creative, efficient solutions. Therefore Italcementi Group is the official supplier for the Italian Commissionship for Expo 2010 in Shanghai.

How many panels in “transparent cement” have been used for the Pavilion?

We have used 3,774 transparent panels (and the so-called “semi-transparent” ones, i.e. characterized by a lower degree of transparency due to architectural requirements) made from 189 tons of dry ready-mixed product i.light[®], the “transparent cement”. They will cover an overall surface area of 1,887 m², around 40 per cent of the total covering of the Pavilion, which has a square layout of 3,600 m² with a height of 18 m.

The 3,774 “transparent cement” panels for the Italian Pavilion in Shanghai were made at a rate of around 200 a day to guarantee that the assembly phases would be finished by the month of March 2010.

How is “transparency” possible in cement?

Transparency in cement is obtained by an innovative technology developed by Italcementi Group, in which a new dry ready-mixed product, that allows bonding a light-transmitting plastic resin matrix, is used.

How was the correct technology for the transparency of cement identified?

The first experiments were launched in Italcementi Group laboratories in 2008, leading to the identification of a valid alternative to pre-existing “transparent cements”, difficult to apply at industrial level. The researchers identified the correct thermoplastic polymer to be

pre-inserted into the product through the special technology developed by Italcementi Group.

Which advantages do resins guarantee compared with optical fibers?

The “transparent cement” made from plastic resins is much cheaper than the one made from optical fibers and costs reach one size order less.

Moreover, the ability to “capture” light is greater, since the resins contain a wider visual angle than optical fibers. This characteristic in fact increases the transparency properties of the material and the luminous effects given to buildings.

Finally, the “transparent cement” developed by Italcementi Group is less fragile than that with optical fibers and offers much higher strength guarantees both in the building and in the utilization phase.

How big is a panel of “transparent cement” and how much does it weigh?

“Transparent cement” panels have been made with the prefabrication logic. They measure 500x1000x50 mm and weigh 25 kg.

How many elements in resin does a “transparent cement” panel contain?

In addition to the cement material and other additives, each “transparent cement” panel contains about 50 chains of plastic resins, appropriately inserted according to the technology patented by Italcementi Group. The chains of resins are 2 to 3 millimeters thick.

What is the level of transparency of a “transparent cement” panel?

Around 20% of the surfaces of the panels developed by Italcementi Group is transparent. For “semi-transparent” panels (made to satisfy the architectural requirements of the Pavilion) the transparency percentage is reduced to 10% by modulating the insertion of the resins.

How long does a “transparent cement” panel last?

A panel made with the innovative Italcementi Group “transparent cement” is guaranteed to last as long as a panel made from traditional cement material.

Can “transparent cement” be considered an eco-sustainable material?

With TX Active[®], the famous “smog-eating” cement now known and used all over the world and selected for the “Italy of the innovators” exhibition to be held in the Italian Pavilion, the new “transparent cement” has become one of the traditional eco-compatible products developed by Italcementi Group research. Thanks to its capacity to transport light, the “transparent cement” makes it possible to save electricity for lighting the inside of buildings, contributing positively to energy saving.

How much electricity could be saved by using “transparent cement”?

We are working with Politecnico di Milano on defining a quantitative standard for assessing saved energy correctly.

How has it been possible to develop this new material?

The Italcementi Group team of researchers has worked every day since June 2008 to develop the new “transparent cement”, dedicating more than 3,000 hours of work to this project.

Italcementi Group is one of the industrial realities investing most in the development of new products in a sector which is only apparently “traditional”, such as that of the building industry. In Bergamo and Paris laboratories more than 170 chemists, physicists, geologists and engineers work every day to make an innovative contribution to systems, technologies and products, always keeping in mind the Group’s commitment to Sustainable Development. Italcementi Group has developed a network of scientific co-operations at international level which includes research centers, universities and companies in the sector of materials and building. Today the network is composed of 10 external centers, 30 companies and 26 Italian, European and non-European universities.

Which uses can be envisaged for “transparent cement”?

“Transparent cement” panels are architectural components with diversified, integrable functions, such as internal lighting (techniques to spread light and shadows in interiors).

Is Italcementi Group “transparent cement” on the market?

The new material has been developed by Italcementi Group exclusively for the Italian Pavilion: the product is covered by a patent. At the end of Expo in Shanghai it will be decided whether or not to use it on the world market.