Make Your Sanitaryware Body Stronger

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Complex washbasin forms, lighter bathroom and the growth of solid surface allowing larger freedom of design, have recently made thin ceramics a strong trend in washbasins. In the past few years, ceramic sanitaryware has suffered from the comparison of solid surface with sharp edges and thin walls as their main advantage.

Imerys Ceramics Technology Center Limoges/FR developed a new product range to close this gap: StrongSan. This innovation enables sanitaryware end-users to benefit from the ceramics age-old advantages, such as hygiene, durability, environmental compliance, but with an extended freedom of design.

What is StrongSan?

StrongSan is a solution designed to bring solidity and reduce deformation so as to enable the manufacturing of large, thin and complex sanitaryware pieces. Its range encompasses premix and complete bodies, particularly well-suited for washbasins, on/in countertops and counter freestanding (Fig. 1).

What are the main benefits of StrongSan?

Compared to fireclay and Fine Fireclay (FFC), the StrongSan products range are increasing the bending strength by two or three times, while the other parameters, i.e. water absorption, shrinkage, deformation, are remaining in the same range.

When compared with vitreous China for instance, StrongSan products range are bringing a significant increase of the bending strength, but a far lower deformation, allowing the production of larger items (Fig. 2).

Microstructure

A SEM analysis performed at Imerys Ceramics Technology Center Limoges is clearly showing that after polishing and chemically treating the sample, at 2000x magnification, a fine network of crystals has grown, thus reinforcing the microstructure of the body and giving this unique performance (Fig. 3).

Impact resistance

For the evaluation of the impact resistance, Imerys Ceramics Technology Center
Limoges has implemented a new testing method. The goal is to measure the defect caused by a 0.36 J impact on the glazed surface of a ceramic item. With StrongSan and the use of a suitable glaze, the impact diameter is reduced by 15–25% compared to a standard FFC. Fig. 5 shows that StrongSan also avoids the spread of radial cracks thus increasing the lifetime of the product.

Crazing resistance
Thanks to their very low moisture expansion of the body and with a properly adjusted glaze, StrongSan's items are shown to have a crazing resistance at 10 bar autoclave.

Process
On a regular basis, StrongSan products fit with usual process conditions, such as the same glaze or the same firing cycle as standard production. Due to its low shrinkage, StrongSan also fits with standard FFC moulds, which makes it convenient for the developments of further collections.

StrongSan product forms
The StrongSan range consists of three products, available throughout several product forms:
• StrongSan Premix is a non-plastic blend that is well fitted with a standard FFC clay slurry. Hence, it only has to be blunged in a clay slurry, in replacement of other non-plastic materials, such as chamotte and quartz. The flexibility of the final formulation will result from the choice of plastic materials.
• StrongSan is a complete body compound ready to blung, developed with Imerys Ceramics’ best fitting ball clays and kaolins. Its ready-made blend improves the ease of use and makes it ideal for short series.
• These last characteristics are also shared by the third product of the range i.e. StrongSan+. This premium complete body in spray-dried form has enhanced mechanical properties up to +25% in comparison with StrongSan and +65% compared to vitreous China.

Furthermore, StrongSan Premix and StrongSan offer a better compromise between casting properties and mechanical strength. Thanks to its very high mechanical performances, the StrongSan products range offers new potential for improved designs. Washbasin walls can now be finer and even stronger, radii are sharper which allow designs to be in line with the market trends.

On the production side, the range is close to fine fireclays, thus the production of fashionable large sanitaryware pieces is now accessible with ceramic materials.

Originally designed in France for the European market and in Italy for the Civita Castellana cluster, these products are also available worldwide.

The technical teams of Imerys Ceramics are continuously looking at ways to develop solutions to better meet manufacturers’ needs based on current technology as well as meeting the demands of new technologies and production techniques coming into the market.

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