

# VitrA

## VitrA Block

Watermark-Free Technology



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VitrA Block

- Eliminates watermark on white wall tiles
- Reduces water absorption of ceramic wall tiles
- Creates a clean and spotless look

Watermark is a general problem occurring on white wall tiles due to water absorption. Wall tiles with VitrA Block Watermark-Free Technology have very low water absorption and therefore show no sign of watermark on the surface.

VitrA Block Watermark-Free Technology improves the performance of tile for the watermark problem and ensures customers satisfaction. A new engobe recipe has been developed with 0% water absorption without making any change on body recipe, firing cycle and tiling. Material science, chemical disciplines and microstructure characterization techniques were used to develop the innovative VitrA Block Watermark-Free Technology.



# Water Absorption of Wall Tiles

Wall tiles differ from porcelain and floor tiles with their higher water absorption properties. The water absorption rate of porcelain tiles is between 0.0-0.5% while the water absorption rate of wall tiles is between 10-20%. Wall tiles are much more porous and have lower density. Both characteristics are required for easy application on the walls, making tiles easy to hold on the walls during tiling and creating less vertical load.

As seen in the following figure, glaze is a glassy phase that does not absorb water, but just below it engobe and body layers have water absorption of 8-15% for engobe and 10-20% for body side due to the porosity inside the structure.

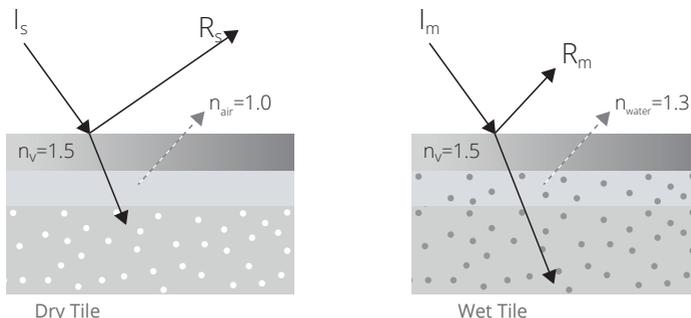




# Watermark Problem

Wall tiles high water absorption property is required for easy tiling on the walls, on the other hand this higher water absorption may create watermark problem especially on plain white and light colored wall tiles.

Watermark problem is darkening of color on glazed surface due to the absorption of water by porous body which causes customer complaints due to stain like plots on tiles. Especially at Scandinavian countries due to the application of backboards at laying of wall tiles, the watermark attend to form much more easily because all the water stay between the tile and backboard. Watermark formation is directly related to visualization on the glaze surface of porous body when it became wet as darkening in color. The mechanism of watermark formation is given in the figure. At the dry state, tile has porous structure where the pores are fulfilled with air and incident light does not penetrate inside the pores, but at wet state since the pores are filled with water and the difference between the refractive index, incident light pass through the pores which is seen as darkening of colour at glazed surface.



Watermark formation of wall tile





# Watermark-Free Technology

**A new engobe recipe is developed by VitrA R&D teams allowing much better watermark test performance results for VitrA Block products. Tiles performance has been improved significantly meeting the highest customer expectations. The tests performed as colour change after 60 seconds or dry-wet L+a+b differences test  $\leq 2.5$ .**

The new engobe recipe with 0% water absorption requires no change on body recipe, firing cycle and tiling. New material and chemical technologies were used to develop the innovative VitrA Block Watermark-Free Technology ensuring much lower water absorption and therefore shows no sign of watermark on the surface.

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