WATER ABSORPTION (UNE EN 1SO 10545-3).
Mosaics are dried up to a constant weight, immersed in boiling water and then kept there for 2 hours, leaving them to cool down in the water for 4 hours. It is determined if there has been a variation in the weight after the test so as to check whether there is or is not a water absorption

Results of TMF- VAL3D mosaics: E = O,1%.
Classification of the tiles: E<3% Low water absorption.
3%< E < 10% Average water absorption.
E>10% High water absorption.

ABRASION RESISTANCE (UNE EN ISO 10545-7).
The method is based on the rotation of an abrasive load (steel balls, aluminium oxide and water) on the mosaic surface and the wearing evaluation by a visual comparison of the specimen submitted to tests with mosaics not submitted to tests.

Classification 2 was obtained. Defects were visible at 600 revolutions.
(Scale of results 0 to 5 from lower resistance to higher resistance).

FREEZE RESISTANCE (UNE EN ISO 10545-12).
Mosaics are submitted to 100 freezing-unfreezing cycles in the following way: the mosaics temperature is lowered until –5† for 15 minutes, later they are immersed until reaching a +5† temperature and they are kept there for other 15 minutes. The water absorption is determined and a visual examination is carried out in order to watch any damage in both the mosaic face and edges.

No mosaic showed any defects after carrying out the test..

CHEMICAL RESISTANCE (UNE EN ISO 10545-13).
Mosaics are submitted to the following solutions:
- Domestic cleaning products
- Swimming-pool salts
- Acids and bases: weak and strong concentrations

And they are classified depending on the impact caused on the mosaics by the different agents, being **TMF-VAL3D** classified in the best of the possible positions.

Chemical Resistance	Test solutions	Classification
Domestic cleaning products	Ammonia chloride	A
Swimming-pool salts	Sodium hypochlorite	A
Acids and bases Weak concentrations	Chlorhydric Acid (%3) Citric Acid (100 gs/l) Potassium hydroxide (30 gs/l)	A A A
Acids and bases Strong concentrations	Chlorhydric Acid (18%) Potassium hydroxide (100 gs/l)	A A

A,B,C classification with A being the best going down to C.

RESISTANCE TO STAINS (UNE EN ISO 10545-14).

Mosaics are submitted to different agents causing stains and some cleaning procedures from the most simple to the most complicated are established. The test result determines 5 types

of tiles depending on their capacity to make a specific kind of staining agent disappear. **TMF-VAL3D** mosaics have the best possible classification (5) with regard to each of the tested staining agents.

Type of stain	Agent	Classification
Stains leaving traces (pastes)	Green stain agents in a light oil	Class 5
Stains with an oxidizing chemical action	Iodine (alcoholic solution of 13 gs/l)	Class 5
Stains forming a film	Olive oil	Class 5

Classification from 1 to 5, being 5 the best going down to 1.

SCRATCH HARDNESS (UNE 67101).

It is carried out according to the Mohe scale, by rubbing with the hand certain materials of known hardness on the mosaic surface.

Result obtained: 5 (Results scale 0 to 10, from the highest to the lowest resistance).

ACCELERATED AGING.

Mosaics are submitted to 25 cold-heat cycles according to the following procedure 4 hours immersed at room temperature. 4 hours immersed in water at 85†C and 18 hours in a freezing chest at –15†C. After carrying out the test, no effect in TMF-VAL3D mosaics was reported.