



Newsletter no. 2

What key requirements must urban flooring products meet?

The difficulty of comparing different types of urban flooring

One of the most important initial tasks of the LIFECERAM project consisted of performing a comparative study of the main technical characteristics of different products typically used in urban flooring. The study focused on natural stone slabs, terrazzo tile, concrete flags, and porcelain stoneware tile, as shown in the picture:

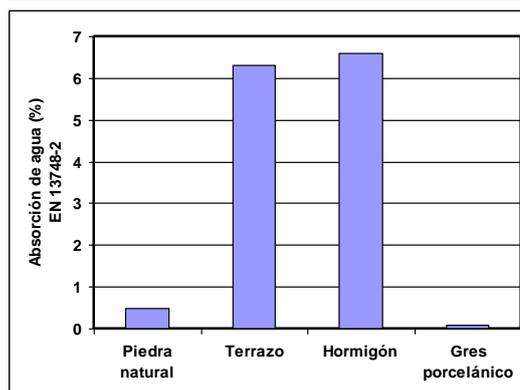
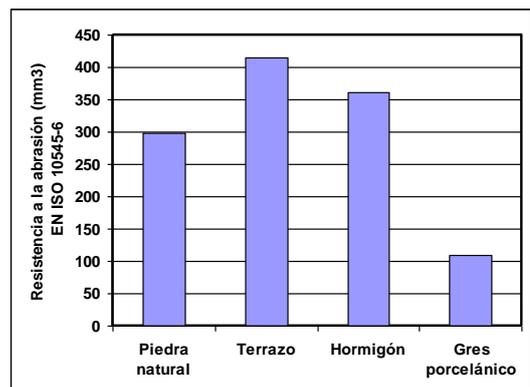
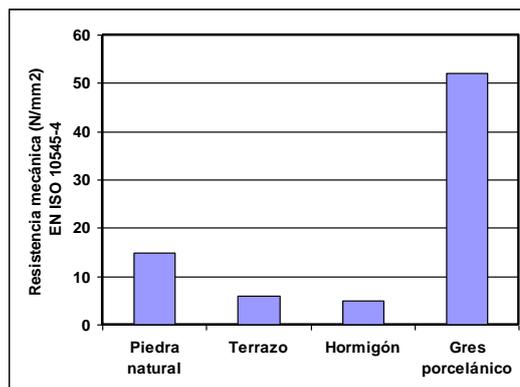


Each product mentioned has its own standard test methods and standard specifications or technical requirements, which make it difficult to compare product properties. The following table details the different reference standards:

Type of flooring	Standards
Natural stone slab	UNE-EN 1341:2013. Slabs of natural stone for external paving. Requirements and test methods
Concrete flag	UNE-EN 1339:2004 and UNE-EN 1339:2004/AC:2006. Concrete paving flags. Requirements and test methods
Terrazzo tile	UNE-EN 13748-2:2005. Terrazzo tiles. Part 2: Terrazzo tiles for external use
Porcelain stoneware tile	UNE-EN 14411:2013. Ceramic tiles. Definitions, classification, characteristics, evaluation of conformity and marking

The different standard test methods were studied, and the test methods were selected that might be expected to provide the best information on actual tile behaviour during use as urban flooring.

Study results



Características técnicas	Piedra natural	Terrazo	Hormigón	Gres porcelánico
Resistencia al impacto. Cahier CSTB 3735	Resiste	Resiste	Resiste	Resiste
Resistencia al deslizamiento. ENV 12633. USRV	> 45	> 45*	> 45	> 45
Resistencia hielo/deshielo EN ISO 10545-12	Resiste	Resiste	Resiste	Resiste
Retención de suciedad. Mancha carbón activo	Baja	Media	Media	Muy baja

What technical specifications must the new flooring product targeted by the LIFECERAM project meet?

The new LIFECERAM urban flooring product must meet a number of key requirements. These include:

It shall exhibit **sufficient mechanical strength** to withstand occasional light vehicle traffic and loading and unloading lorries, in addition to heavy pedestrian traffic. It shall also display appropriate **impact resistance**, so that it will withstand without damage heavy objects that might fall on it, particularly in commercial areas with loading and unloading areas.

It shall furthermore display sufficient **slip resistance** to assure safe pedestrian traffic across both dry and wet flooring, in addition to having appropriate frost resistance and low dirt retention, since it is intended for use in environments where there are likely to be large amounts of dust, as well as surface-staining substances.

Taking into account the requirements to be met, the following table summarises the product's "target values":

Technical characteristics	Urban ceramic flooring
Breaking load. (N) EN ISO 10545-4	> 4500
Mechanical strength. (N/mm ²) EN ISO 10545-4	> 35
Deep abrasion resistance. (mm ³) EN ISO 10545-6	< 175
Impact resistance. Cahier CSTB 3735 Annex 6	Pass
Slip resistance. ENV 12633. USRV	> 45
Frost/thaw resistance. EN ISO 10545-12	Pass
Water absorption by capillarity. (g/cm ²) EN 13748-2	< 0.01
Total water absorption. (%) EN 13748-2	< 3
Moisture expansion. (mm/m) EN ISO 10545-10	< 0.6
Thermal expansion. (K ⁻¹) EN ISO 10545-8	< 9 x 10 ⁻⁶
Dirt retention. Activated charcoal stain	Low

Thus, in order to be able to develop the new product, a new raw material needs to be formulated using the wastes generated in the ceramic tile manufacturing process itself. However, as the material is to be used in making urban flooring, it needs to meet the relevant requirements to be truly useful and to withstand intended use.

The comparative study conducted on a number of the principal flooring products used at present enabled the requirements to be established that need to be met with regard to both the standards and intended use.

Forthcoming issues of this Newsletter will provide further information on the progress being made, until the type of raw materials required for the targeted LIFECERAM product can be determined.

For further information on LIFECERAM+, please check out: <http://www.lifeceram.eu>



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