

SIMPLIFIED TOOL FOR OBTAINING ECO-MARKS

**T.Ros-Dosdá⁽¹⁾, G.Benveniste⁽²⁾, I.Celades⁽¹⁾, V.Zaera⁽³⁾,
C.Gazulla⁽⁴⁾, V.Sanfelix⁽¹⁾**

⁽¹⁾ Instituto de Tecnología Cerámica (ITC). Asociación de Investigación de las Industrias Cerámicas (AICE) Universitat Jaume I. Castellón. Spain.

[\(teresa.ros@itc.uji.es\)](mailto:teresa.ros@itc.uji.es)

⁽²⁾ Cyclus Vitae Solutions, S.L. Barcelona, Spain.

⁽³⁾ Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCKER). Castellón, Spain.

⁽⁴⁾ Cátedra UNESCO de Ciclo de Vida y Cambio Climático. Escola Superior de Comerç Internacional (ESCI). Universitat Pompeu Fabra (UPF). Barcelona, Spain.

1. INTRODUCTION

In the past 15 years the construction sector has experienced exponential growth, whereas the inevitable environmental consequences produced as a result of this growth have tended to be overshadowed. Worldwide the construction sector consumes 24% by volume of the raw materials extracted from the lithosphere. In Europe, these figures translate into an average consumption equivalent to 4.8 tonnes of minerals per inhabitant per year [1], and the sector is also responsible for 40% of the total energy consumed in Europe. In Spain, each habitable¹ square metre requires a total of 2.3 tonnes of over a hundred different materials, considering only those materials directly related to building

Given these figures, and faced with a difficult economic situation, the ceramic tile manufacturing sector needs to increase its competitiveness by adapting its structure and strategies to deliver new and better services and products that respect the environment. One line of action by which the Spanish Ceramic Tile Manufacturers' Association (ASCER) has committed itself in this sense, via its members, in addition to minimising the impact of their activities above and beyond compliance with the legislation, is to communicate these activities in a highly transparent way, using those communication symbols or tools that currently enjoy the widest recognition: the **Environmental Product Declarations**. In this way the sector is able to position itself and respond to market demands.

2. I.T. TOOLS FOR ECO-LABELS

There are currently a number of voluntary and regulatory calculation tools (the Technical Building Code (*Código Técnico de la Edificación*), Lider, Calen, CERMA, etc.) available for studying and limiting the environmental consequences in the building use phase, although tools for calculating the environmental impacts due to raw material extraction and product manufacturing are less advanced.

This information cannot be ignored when calculating the environmental impacts of buildings. For this reason, a number of government environmental policies are emerging that promote the use of sustainable resources and the maintenance of acceptable levels of environmental quality. These policies favour those products that either have a better environmental performance or provide quantified and objective environmental information.

From 2008 to 2010, together with Giga-CSEC, ITC therefore developed the ACV-Tile project [2], which involved both carrying out a comprehensive Life Cycle Analysis (LCA) study of the sector and also acquiring the Product Category Rules for obtaining Environmental Product Declarations (EPD) for ceramic tiles in Spain. Based on the complex calculation model developed in this project, a software tool

¹ The habitable area of a dwelling refers to the usable surface area, excluding passageways, stairways, garages, gardens, etc.

has now been created capable of generating valid, objective and quantified documentation on the environmental impacts of ceramic tiles. In this way the tool allows an EPD to be obtained based on an LCA, thereby reducing implementation times and the economic costs of obtaining them.

Scientifically and technically innovative, this software tool will allow the ceramic tile manufacturing sector to gain a high level of differentiation, as well as providing a stimulus to improve products and processes from the point of view of sustainability. The design and programming of the tool has been carried out using PE International's GaBi software², with a series of preliminary activities being performed: defining the calculation rules to be followed in developing the EPD (Product Category Rules), extending the LCA sector model for ceramic tiles, and lastly, carrying out industry data, sensitivity and scenario analyses.

The aim is for the calculation model to be validated by AENOR, in order to ensure a consistency and compliance with the provisions set out in applicable reference standards (such as ISO 14025 or the future EN 15 804).

The tool will help in collecting the EPDs of individual products, as well as industry averages that represent their mean behaviour, thereby reducing costs and saving time for homogeneous sectors, as well as obtaining valuable information for comparing with alternative products or for LCA studies into construction projects. Moreover, the EPDs can be carried out on groups of products manufactured by an organisation and that differ by a maximum of 5% in any impact category. The information for each product model or presentation should be obtained separately from the information included in the EPD, either because they appear separately or because conversion factors are offered.

ACKNOWLEDGMENTS

This tool has been developed by ITC and the UNESCO Chair in Life Cycle and Climate Change at the request of ASCER via the competitive plans for the sector for 2011, and funded by the IMPIVA and the European Regional Development Fund (ERDF).

² ACV GaBi software: <http://www.gabi-software.com/gabi/gabi-4/>

REFERENCES

- [1] WADEL G. La sostenibilidad en la construcción industrializada. La construcción modular ligera aplicada a la vivienda. Tesis Doctoral. Universidad Politécnica de Cataluña-Departamento de construcciones arquitectónicas; 2009. Disponible Online en <http://www.tdx.cat/TDX-0122110-180946>.
- [2] BENVENISTE, G.; GAZULLA, C.; FULLANA, P.; CELADES, I.; ROS, T.; ZAERA. V.; GODES, B. Análisis de ciclo de vida y reglas de categoría de producto en la construcción. El caso de las baldosas cerámicas. *Informes de la Construcción*, 63 (522), 71-81, 2011
- [3] Bovea, M.D.; Díaz-Albo, E.; Gallardo, A.; Colomer-Mendoza, F.J.; Serrano, J. Environmental performance of ceramic tiles. Improvement proposals. *Materials and design* 31 (1), 35-41, 2010.