Green Consciousness of Mappy Italia SpA:
The Sustainability of PET for thermal and acoustic insulation made of recycled polyester

Nowadays “building” your own wellness with the help of natural and ecological materials has become a growing trend in construction. Designers and builders, aware of public opinion on issues related to ecology and energy saving, look for practical and nature-friendly solutions to develop relaxing, comfortable and built for people living spaces. Having environmental awareness means discovering the potential of elements found in nature. The Mappy Natural Line comes from this simple consideration and the experience that MAPPY ITALIA SPA gained over the past thirty years: a range of products studied by MAPPY ITALIA SPA’s laboratories and technical staff consisting of eco-friendly and technologically advanced products made of recyclable and recycled PET.

MAPPYFIBER LINE

SILSONIC –SILSONIC AL

MAPPYSIL CR 400 - 404

“It is impossible to promote a culture of silence with no respect for the environment where we live.”

For this reason, MAPPY ITALIA SPA applies environmental protection policies on a daily basis. From the choice of its suppliers throughout the production process to packaging and transport, MAPPY ITALIA prefers materials and products which are:

- Recyclable
- Reusable
- Regenerated
- With reduced CO2 emissions

All Mappy Natural Line products are ideal for those who desire:

- To reduce impact on the environment
- To improve the living quality while maintaining the warmth of the house both in summer and winter
- To increase the energy efficiency of our homes, reducing pollution in the environment

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Mappy ITALIA S.p.A.
SINCE 1974 ACOUSTIC AND THERMAL INSULATION

Benefits of The Natural Line


Produced with recycled raw materials


100% recyclable


Respect the environment


Exceptional acoustic and thermal insulation


Excellent reaction to fire properties


The high performances remain unchanged over time


Does not irritate the skin of those handling it


During installation gloves and masks are not required


Does not rot in humid environments


Resistant to moth attack

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CSI CERT ISO 9001

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PET fibers: the most widely recycled plastic

Polyethylene terephthalate (PET) is a highly recyclable plastic resin made by the combination of modified ethylene glycol and terephthalic acid.
According to PETRA, the PET Resin Association, the EU recycling rate is about 52% making PET the most widely recycled plastic.
The use of recycled PET in place of virgin resin typically results in reduced energy consumption, lower cost, reduced environmental impact in terms of reduction of the amount of waste sent to landfills and incinerators, prevention of pollution by reducing the need to collect new raw materials PET Recycling Process.

Recycling terms definitions

Recycled-content product - The product was manufactured with recycled materials either collected from a recycling program or from waste recovered during the normal manufacturing process. The label will sometimes include how much of the content was from recycled materials.

Post-consumer content - Very similar to recycled content, but the material comes only from recyclables collected from consumers or businesses through a recycling program.

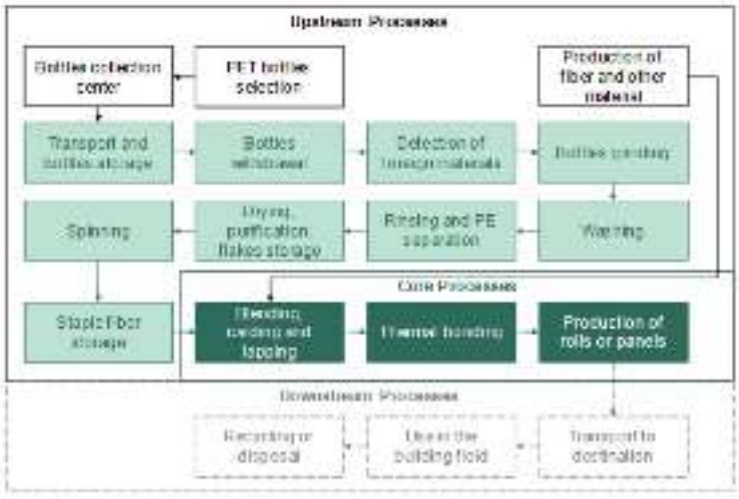
Recyclable product - Products that can be collected, processed and manufactured into new products after they have been used. These products do not necessarily contain recycled materials.

Production of PET fibers products

Mappyfiber line products and Silsonic are purely manufactured with polyester fiber obtained by recycling PET bottles.

40 bottles = 1 m^2 of environmentally friendly insulation Silsonic/Mappyfiber

The production of polyester starts with the recycling of post-consumer PET bottles, which are sorted, washed and ground to flakes. The flakes are then used in the production of fibers.



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Recycling of Mappy Naturale Line Products

All the Mappy Naturale Line products are recyclable as PET and can be differentiated from other recyclables at local material recovery facility. As with other scrap material, focus should be on proper bale handling and storage to minimize product contamination. After the sorting process, the PET material is ground into particles known as flakes. Further separation techniques involve washing, where material either sinks or floats, which helps separate residual foreign materials. Washing can be undertaken at standard or elevated heat levels. The use of disinfectants and detergents aids in achieving a complete cleaning. The material is then rinsed to eliminate any remaining contaminants or cleaning agents. The recycled PET is then dried and pelletized plastic provides a uniform-sized material that can be reintroduced into the manufacturing process.

Green Building Associations and LEED Rating Systems

Sources: USGBC, GBC ITALIA
LEED® - Leadership in Energy and Environmental Design - is a building certification system that was established on a voluntary basis and is applied in more than 140 countries worldwide. LEED standard is born in America by U.S. Green Building Council (USGBC), a nonprofit association founded in 1993, which now counts more than 20,000 members and has as its purpose the promotion and development of a comprehensive approach to sustainability, giving an acknowledgment to the virtuous performance in key areas of human and environmental health.

LEED standards, developed by USGBC, indicate the requirements to build environmentally friendly buildings, from an energy point of view and from the point of view of the consumption of all environmental resources involved in the implementation process.

LEED is a voluntary and consensus-based, for design, construction and management of sustainable land areas and high-performance buildings and is becoming more and more international. It can be used on any type of building and promotes an integrated design system that covers all aspects of the building.
Certification is a third party independent audit of the performance of an entire building (or part of it) and / or urban areas. Internationally acknowledged LEED certification states that a building is environmentally friendly and is a healthy place to live and work.

Considering the entire process, from design to construction to testing, LEED requires a holistic approach, otherwise you can not achieve their goals. Only with a comprehensive integrated design and coordination with all the stakeholders involved you can create a harmonious building in all areas mentioned above.
Competitive advantages for those who adopt LEED standards, whether professionals or companies, are identifiable especially in the high quality of the building, in significant savings of operating costs that these buildings allow to obtain when compared to traditional buildings. In addition obviously to the benefits of third party certification.
LEED certification, in fact, provides a common approach to the market, on which to base choices and a measurable standard for every feature treated.

The LEED rating system is structured in a set of protocols (manuals) depending on the type of building you want to certify. We will then have a protocol certifying new buildings and major renovations (LEED New Buildings, LEED BUILDING DESIGN AND COSTRUCTION LEED BD + C), a LEED FOR SCHOOLS protocol, a certification of retail and The building's interior (LEED COMMERCIAL INTERIOR and LEED RETAIL), a protocol certifying existing

buildings (LEED EXISTING BUILDING OPERATION AND MAINTENANCE, LEED EBOM), a protocol certifying building sets, Neighborhoods (LEED FOR NEIGHBORHOOD), and so on.

The setting of all these protocols is the same, in the sense that they are all organized in the same areas or chapters, which are: Sustainable Sites (SS), Water Efficiency (WE), Energy and Atmosphere (EA), Material and Resources (MR), Indoor Environmental Quality (IEQ)

For completeness, there are two other areas / chapters, which concern aspects that are more related to the certification process: Regionality: credits (points) are made in certain geographical areas for the strong relationship between territorial context and credit requirements; Innovation in design: they highlight aspects that either in the specific protocol are not considered but are present in the other protocols, or they give more performance scores for some protocol credits. All is regulated by the text of the manuals.

All these areas / chapters contain the prerequisites and credits. Prerequisites are mandatory and do not score, while credits can be chosen or not by the design team but are the ones that give the score, which must be achieved to get the certification level defined as a goal by certification.
Prerequisites and credits cover all aspects of a building, plant, design details, soil permeability, drinking water consumption, site relationship with servicemen near the building, or availability of public transport. Some of these also refer to materials, meaning materials have features that help the building to meet certain requirements defined in prerequisites and protocols. What was done in this document was the first step to identify the possible credits that could be covered by the products of MAPPY ITALIA considered in the project, on the other hand, to verify their characteristics and documentation in line with what is required in the requirements. The credits to which the products can contribute are explained in the following paragraphs.

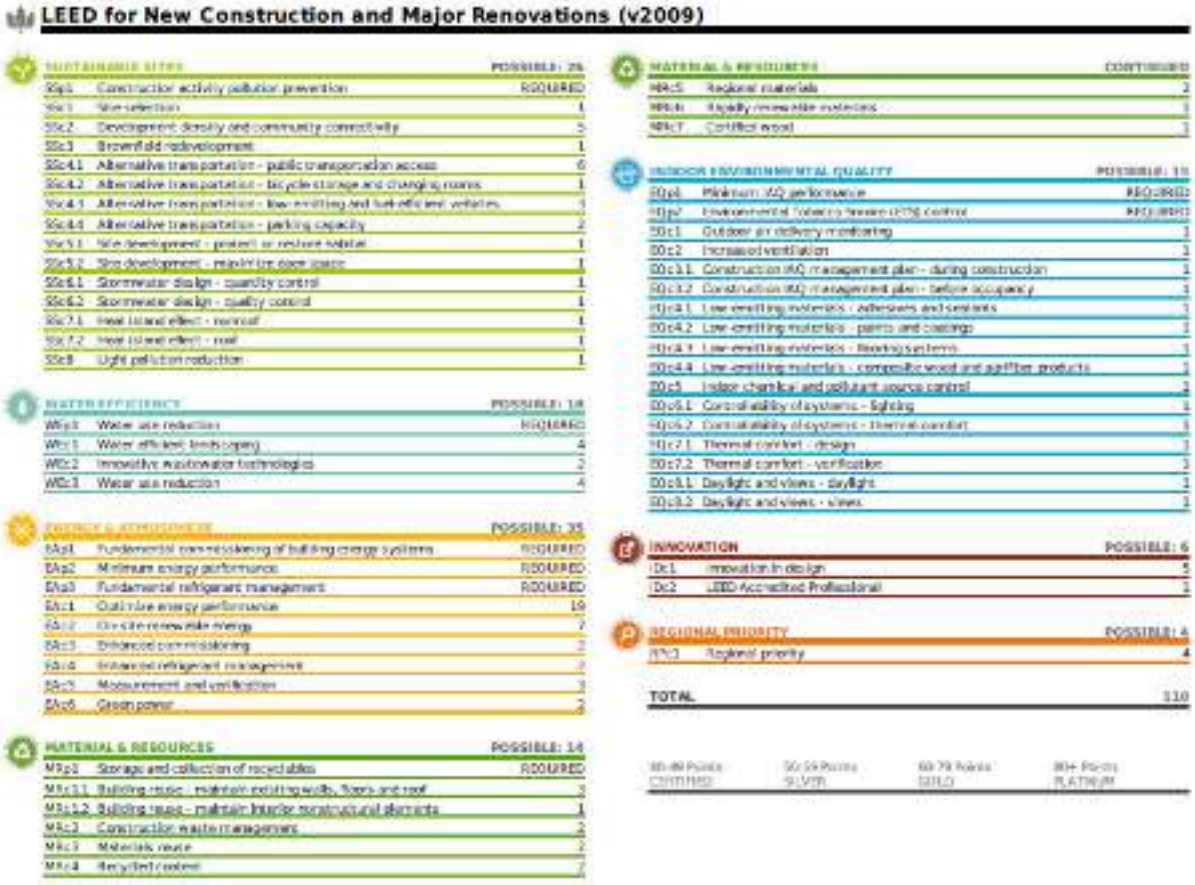
This also implies that the product may not have a score, the score is always and only of the building, but it can help the building get the score.

As already mentioned, in the following paragraphs we will show the excellence of MAPPY® ITALIA SPA in relation to LEED credits. As described first in the text, all protocols are structured in the same areas, and for the most part the credits are the same or similar. In the present work, for the sake of clarity and avoiding unnecessary repetitions (and which could create confusion), reference was made to the LEED NC NUOVE COSTRUZIONI protocol, including all the credits of that protocol that could affect MAPPY ITALIA products taken into account in this document . Credits of other protocols have been added, and therefore there are no new builds in LEED NC, but they are also related to MAPPY ITALIA products1.
A last note on the LEED system. The LEED rating system is a system that evolves over time. The drafting of this document coincides with a transition period between version 3 of the edited protocol in 2009 and version 4. Considering that there are still many projects that will be certified according to version 3 (2009) and that there are requests for Characteristics of version 4 include gray boxes that describe the contributions compared to version 4 or simply relate the credit considered in the two versions if the features required for the product are similar.

Mappy Italia SPA and LEED®

The LEED® rating system only certifies buildings and buildings. However, products can help meet the requirements of LEED credits, and thus help the building get the scores required for certification. In this part of the document you can see the description of the credits that Mappy Italia products considered in this document can contribute. This description is the result of a careful analysis of features and products in the light of the requirements, which led the company to adopt specific procedures for projects related to LEED certification projects.

In the below figures, the checklist of credits (ie prerequisite titles and credits in the relevant reference areas and the scores assigned to the building) are shown and the credits to which the products in this document can contribute through A red box, considering the two main protocols (considered their application on the one hand, and completeness over the credits of interest), namely "LEED FOR NEW CONSTRUCTION AND MAJOR RENOVATION V 2009 (LEED NC 2009)" and "LEED FOR NEW CONSTRUCTION AND MAJOR RENOVATION V4 (LEED NC V4) ". For the text of credits in Italian was taken as reference LEED NC ITALIA 2009, as for the description of the areas of the credits.



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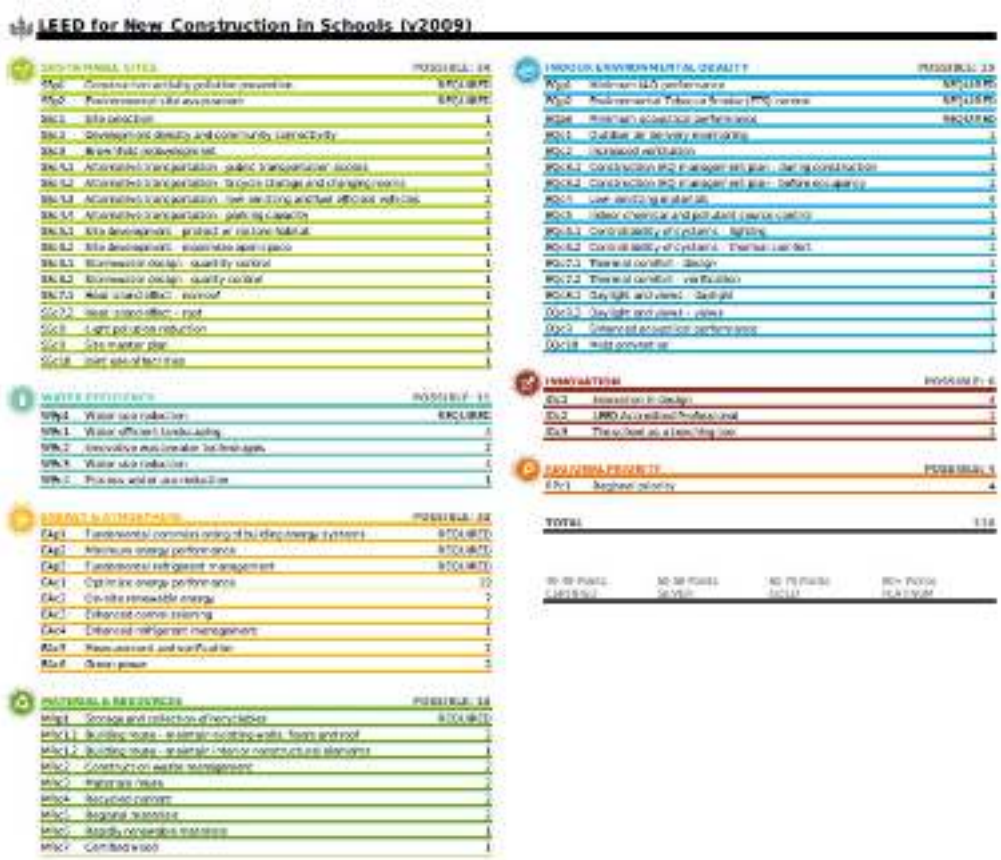
Mappy ITALIA SPA

SINCE 1974 ACOUSTIC AND THERMAL INSULATION



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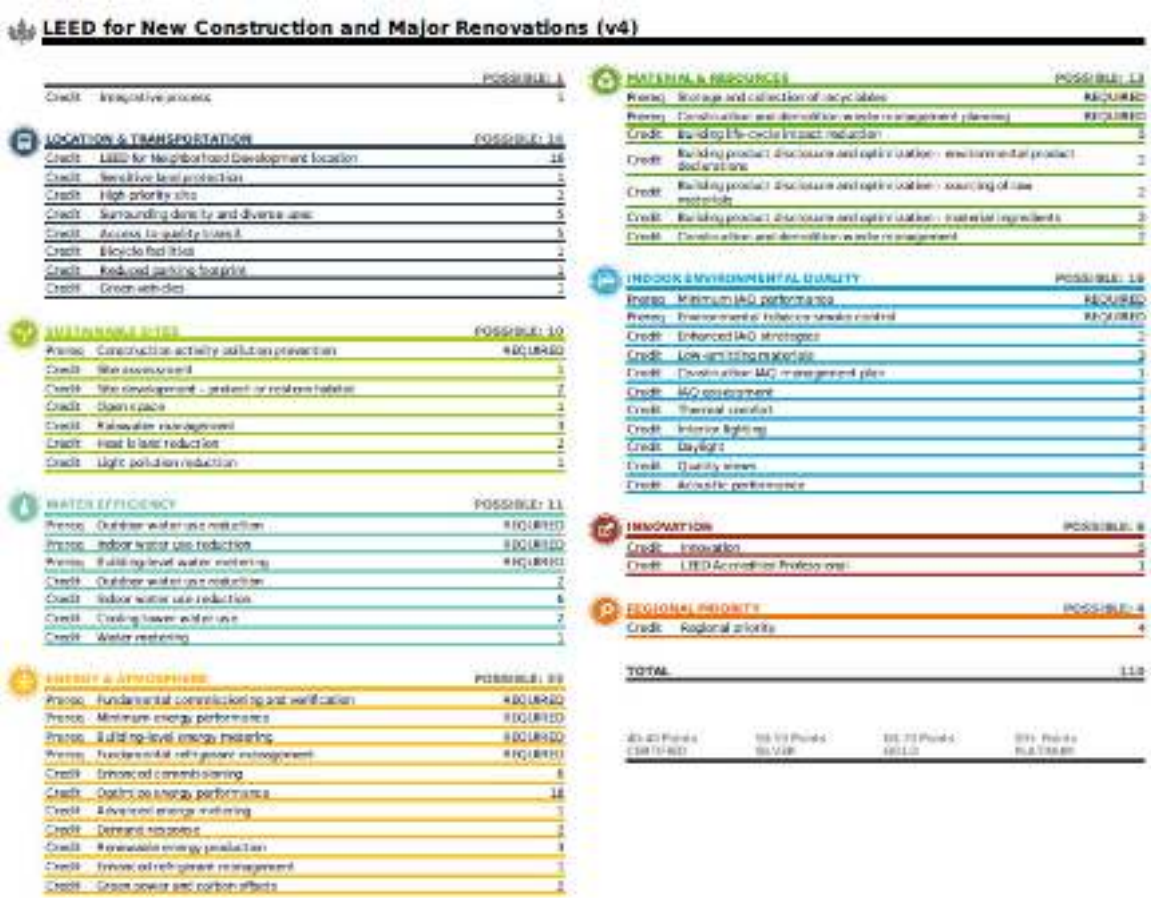

CREDIT MR c 4 – Recycled content

The purpose of this credit is to increase the demand for materials and construction products with recycled content, thus reducing the impacts arising from the extraction and processing of virgin materials..

All the products considered are wholly or partly composed of a polyester fiber. Such polyester fiber is produced with recycled content from plastic bottles. Here are a few percentages, based on information provided by our suppliers.

1. Silsonic: composed of 70% -85% of reclaimed green (processing waste, pre-consumer recycled) or in the case of very low density, 55% -70% of reclaimed green (processing waste, pre consumer recycled) and 15% 20% reprocessed (polyester staple obtained from PET bottles, post consumer recycled);

2. MAPPYSIL CR400: Consisting of two layers of Silsonic, polyester fiber with recycled content as described in the preceding paragraph "1. Silsonic" and a mass. The two fiber plates weigh about 1.2 kg / m2 on about 3.6 kg / m2 of total product weight;

3. MAPPYSIL CR404: Consisting of a layer of Silsonic, polyester fiber with recycled content as described in the preceding paragraph "1. Silsonic "and a mass coated with aluminum film. The fiber board weighs about 0.75 kg / m2 on about 3 kg / m2 of total product weight;

4. Mappyfiber Trevira: The percentage of post-consumer recycled content (PET bottles, post-consumer recycled) varies according to the product and can be classified as follows:

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4.1. BL White L1: 70% recycled content (49% post consumer, 21% pre consumer);
4.2. BL White TF L1 + L2: 50% recycled content (35% post consumer, 15% pre consumer);
4.3. BL Black L1: 75% recycled content (52.5% post consumer, 22.5% pre consumer);
4.4. BL Black TF L1 + L2: 50% recycled content (35% post consumer, 15% pre consumer).
The percentage of polyester fiber recycled content is constant, but by its nature this fiber may have a variable weight depending on the density of the product and its thickness. For example, Silsonic may have the following weights:
- Thickness 40mm, density 20 kg/m3, weight approx. 0.80 kg/m2;
- Thickness 60mm, density 20 kg/m3, weight approx. 1.20 kg/m2;
- Thickness 40mm, density 40 kg/m3, weight approx. 1.60 kg/m2.
Refer to the technical data sheets for the specific weight of the product.

CREDIT EA c 1 Optimize energy performance
The purpose of this prerequisite and credit is to reach an increasing level of energy performance for buildings and project facilities, superior to the minimum values defined by current legislation and legislation, in order to reduce the economic and environmental impacts associated with excessive consumption of energy.
The EAp2 Minimum Energy Performance Prerequisite provides the minimum energy performance requirements required for the building.
Credit EAc1 Energy Performance Optimization instead enhances the energy efficiency of the building, in particular it allocates a score of 1 to 19 based on the efficiency percentage of the building relative to the base building. The percentage is calculated by dynamically modeling the building, which takes into consideration all building components (wrapping, plants, etc.) and site conditions (day, night, summer, winter, etc.).
The products of Mappy Italia can play an important role in this credit, thanks to their nature of thermal insulators. Below you will find some product reference values in terms of thermal conductivity.

Product	Thermal conductivity
SILSONIC	λ = 0.0321 W/mK
MAPPYSIL CR 400	λ = 0,0328 W/mK
MAPPYSIL CR 404	λ = 0.0330 W/mK
MAPPYFIBER® TREVIRA	λ = 0.0321 W/mK

CREDIT LEED BD+C V4 IEQ C 2 – LOW EMITTING MATERIAL
Intent: To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.
The products considered in this document comply with the requirements of this credit: the laboratory tests carried out and shown below show low levels of emissivity.
The tests performed are as follows:
- SILSONIC: Report Test 20518SILA which attests conformity with CDPH/ EHLB / Standard Method v1.2 (January 2017)
- MAPPYSIL CR 404: Report Test 1800154916 which attests conformity with CDPH/ EHLB / Standard Method v1.2 (January 2017)
- MAPPYFIBER® TREVIRA: Report Test 17518MFIBFP which attests conformity with CDPH/ EHLB / Standard Method v1.2 (January 2017) and Report test 17518MFIBFP121118 which attests conformity with: French VOC

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regulation (Classe A+); French CMR components; AgBB/ABG; Belgian Regulation; Emicode (EC1 Plus); Indoor Air Comfort®; Indoor Air Comfort GOLD®; EN717.1 (E1); BREEAM International; LEED V4 (outside U.S.); Breeam® Nor.

LEED Final Summary

LEED V 2009 CREDIT	Points	Credit	Silsonic	MAPPYSIL CR400	MAPPYSIL CR404	Mappy Fiber Trevira
EA p 2	MANDATORY	Minimum energy performance	✓	✓	✓	✓
EA c 1	1 - 10	Optimize energy performance	✓	✓	✓	✓
MR c 2	1 - 2	Construction Waste Management	✓	✓	✓	✓
MR c 4	1 - 2	Recycled content	✓	✓	✓	✓
EQ c9	1	Acoustic Performance	✓	✓	✓	✓

LEED V 4 CREDIT	Points	Credit	Silsonic	MAPPYSIL CR400	MAPPYSIL CR404	Mappy Fiber Trevira
EA p 2	MANDATORY	Minimum energy performance	✓	✓	✓	✓
EA c 2	1 - 18	Optimize energy performance	✓	✓	✓	✓
MR c 3	1 - 2	Building product disclosure and optimization - sourcing of raw materials	✓	✓	✓	✓
MR c 5	1 - 2	Construction and demolition waste management	✓	✓	✓	✓
EQ c 2	1-3	Low Emitting Material	✓		✓	✓
EQ c 9	1	Acoustic Performance	✓	✓	✓	✓

AWARDS

MAPPY ITALIA SPA has always paid attention to the environment and for its efforts the company has received prestigious awards.

- EPRO 2019 Best Recycled Plastic Product Award – Sustainability

Mappy Italia SpA has been selected one of the 3 finalists of the prestigious prize of the European Association of Plastic Recycling & Recovery Organisation for "A thermo-acoustic composite system with low environmental impact". The purpose of this award is to integrate effort and commitment in the sector of corporate social responsibility, and to provide the consumer with a better understanding of his own actions in respect of the environment.

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- Award of the Lombardy Region in collaboration with the CNR (Italian National Center for Research) - Experimentation of innovative insulating materials and demolition costs

MAPPY ITALIA SpA was the winner with its technical proposal for the development of a thermo-acoustic composite system with low environmental impact for well-being living, offering a complete package for the renovation of properties located in noisy areas in order to increase the acoustic and thermal properties with a small thickness. The end result turned out to be an extremely technical product, but also of design because it offers maximum creative freedom to architects and interior designers. The products used for the composition of the coatings are rigorously Made in Italy and have an advanced ecological level, they are in fact made up of recycled fibers and recyclable compounds with low environmental impact.

- London Construction Awards

Following our recent submission to the London Construction Awards 2017, MAPPY ITALIA SPA has been shortlisted to the final in two chategories: "Product - Innovation of the Year" and "Sustainable Construction Award" for its innovative and sustainable coating system for the renovation of buildings situated in noisy areas.
In 2015 MAPPY ITALIA SPA had been selected to be part of the 'London Sustainability Award' category for its special Mappy Natural Line designed for green building, a range of products made from fibers with high technical performances.

- MEP Sustainability Award

Mappysil CR 404 has been selected to the MEP Awards 2016 in the Sustainable Construction category. This competition recognizes and honors the latest innovations, technologies and processes that have contributed to the greatest successes in the mechanical, electrical and hydraulic industry in the United Arab Emirates.

- Klimahouse Trend Award

The official award ceremony of the winning companies of Klimahouse Trend 2011 was held in the prestigious setting of the 4th Forum of Architecture organized by Il Sole 24 Ore. This important recognition was dedicated to the products for architecture exhibited during the fair Klimahouse 2011 that have been able to combine technology with formal solution confirming high characteristics of energy saving and efficiency. MAPPY ITALIA SPA has been awarded in the category "Insulation Systems" for the following reason: "Thermal insulation in 100% recyclable pure virgin wool."

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- Gaia Awards

During the Gaia Awards, an international event organized during the Big 5 Show in Dubai that rewards excellence in green building products, in 2016 MAPPY ITALIA SPA has presented Mappyfiber Bubble, Mappysil CR 404 and Mappyfiber Wool, three brand new products.
Back in 2011 MAPPY ITALIA SPA had already received a plaque and an honorable mention for the high quality of the products presented.

- Legambiente Innovation Award

The eleventh edition of the "Innovation Legambiente", supported by Regione Lombardia, Cariplo Foundation, Confindustria, the Chamber of Commerce of Milan and Symbola Foundation, had as its theme "Sustainability today: green cities, smart networks renewable resources." MAPPY ITALY SPA has received a certificate of participation for the 2011 edition Mappy Natural Line.

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