

MARCOTHERM COLOR

EXTERNAL THERMAL INSULATION COMPOSITE SYSTEM

Colorificio San Marco SpA gives priority to environmental protection and safety in the workplace. For this reason Colorificio San Marco constantly seeks to improve the quality of its products and their production cycles in order to reduce the overall impact on the environment and ensure quality and safety for customers.

This environmental data sheet shows the environmental information of MARCOTHERM COLOR: LCA, LEED and other information.

MARCOTHERM COLOR is an external thermal insulation composite system suitable for both new and old walls. MARCOTHERM COLOR uses expanded polystyrene with graphite as insulating material.

LIFE CYCLE ASSESSMENT

Life Cycle Assessment (LCA) is a tool to quantify the environmental impact of a product or service throughout its entire life cycle. The LCA methodology, as defined by ISO 14040/44 [1-2], consists of four phases:

- goal and scope definition
- inventory analysis
- impact assessment
- interpretation

Goal and scope

The **goal** of this LCA [3] is to provide transparency about the environmental performance of MARCOTHERM COLOR, to create improvement options and support environmental communication. The functional unit is 1 m² of a 48 m² (6x8 m) wall, with an external thermal insulation composite system having a thermal transmittance of 0.29 W/m² K, for a period of 50 years. The **system boundaries** include raw materials, their transportation, manufacturing of semifinished products and components, distribution, installation of the insulation system and end of life phase. The use phase of the insulation system has been excluded.

Inventory analysis

Primary data are used for the most significant processes. Data refer to 2010 and are collected at the Colorificio San Marco's factory located in Marcon (VE). Secondary data originate from the ecoinvent v2 database [4]. The LCA calculations are performed with the LCA software SimaPro 7.3 [5].

The life cycle impact assessment has been performed using a method consisting of different environmental indicators, for instance Carbon Footprint, energy content, material resource consumption, water consumption and waste. Table 1 shows the LCA results.



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Table 1: LCA results.

		Unit	Total	Upstream	Core	Downstream
Impact categories	Global Warming (100 yr)	kg CO ₂ eq	22.6	19.8	-	2.8
	Ozone layer depletion (20 yr)	mg CFC-11 eq	32.0	31.7	-	0.4
	Photochemical oxidation	g C ₂ H ₄ eq	29.6	26.5	-	3.1
	Acidification	g SO ₂ eq	70.5	58.4	-	12.1
	Eutrophication	g PO ₄ ³⁻ eq	30.6	15.3	-	15.3
	Human toxicity infinite	kg 1,4-DB eq	12.5	10.7	-	1.8
	Fresh water aquatic ecotox.	kg 1,4-DB eq	5.98	2.87	-	3.11
	Freshwater sediment ecotox.	kg 1,4-DB eq	13.5	6.4	-	7.1
	Marine aquatic ecotox.	kg 1,4-DB eq	8512	4888	-	3624
	Marine sediment ecotox.	kg 1,4-DB eq	6121	3306	-	2816
		Unit	Total	Upstream	Core	Downstream
Energy content	Non-renewable	MJ eq	386	343	-	43
	Renewable	MJ eq	11.7	11.2	-	0.5
Material resource consumption	Non-renewable	kg	16.8	12.9	-	3.9
	Renewable	kg	238	225	-	12
Other	Material to recycling	kg	0.160	0.118	-	0.043
	Water consumption	kg	238	225	-	12
Waste	Non hazardous waste	kg	4.53	2.22	-	2.31
	Hazardous waste	g	19.9	17.6	-	2.3

Interpretation

The LCA results indicate that the largest contributions come from upstream processes. The Carbon Footprint of MARCOTHERM COLOR is 22.6 kg CO₂ eq and its water consumption is 238 litres.

LEED

LEED means Leadership in Energy and Environmental Design. It is a voluntary program that provides third-party verification of green buildings. It provides building owners and operators a tool to understand their building's environmental performance and to create healthy indoor spaces.

In order to obtain LEED certification, projects must satisfy prerequisites and earn points (there is a threshold). The number of points the project earns determines its level of LEED certification.

LEED is a certification system that deals with the environmental performance of buildings based on overall characteristics of the project. Although LEED does not certify products and services of individual companies, products and services do play a role and can help projects with credit achievement.

The table below shows MARCOTHERM COLOR potential contribution to the different **LEED credits** of the LEED 2009 Rating System for New Construction and Major Renovations [6]. Table 1 shows the possible contribution of the thermal insulating system to potential credits, if used properly.

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Table 2: Potential LEED credits.

LEED Credits	Description	Possible points	Notes
EA credit 1	Optimize Energy Performance	1-19 points	More information are available on request
EA credit 2	Enhanced Refrigerant Management	2 points	Minimization of the emissions that contribute to ozone depletion and climate change
MR credit 5	Regional Materials	1-2 points	According to the percentage of products locally extracted and manufactured

Colorificio San Marco does not guarantee that credits will be obtained by projects pursuing LEED certification. The designer or engineer will need to evaluate and verify if the project complies with the LEED requirements.

OTHER INFORMATION

Dossier Protocollo Itaca

ESIt [8] <http://www.es-it.net/>
 Edilizia Sostenibile Italia - Sustainable Building Italy
 Registration No: DPI.Z.1.002.2012
 Registration date: 2012

ECODESIGN INDEX

Counter of ecodesign activities affecting the coating, accomplished by the company.

N°	Activity item	Date
1	first issue	mar-2013

References

- [1] ISO 14040, 2006: Environmental management, Life cycle assessment, Principles and framework. CEN, EN ISO 14040:2006 (www.iso.org).
- [2] ISO 14044, 2006: Environmental management, Life cycle assessment, Requirements and guidelines. CEN, EN ISO 14044:2006 (www.iso.org).
- [3] Colorificio San Marco e 2B Srl, LCA project, 2013.
- [4] Ecoinvent, 2011: Database ecoinvent v2.2. Swiss Centre for Life Cycle Assessment, (www.ecoinvent.ch).
- [5] PRé, 2011: LCA software SimaPro 7.3.3. PRé Consultants, the Netherlands (www.pre-sustainability.com).
- [6] PCR 2010:18. Paints and varnishes and related products. Product Category Rules (PCR) for preparing an environmental product declaration (EPD) for paints and varnishes and related products, the Swedish Environmental Management Council (www.environdec.com).
- [7] USGBC, LEED 2009 Rating System for New Construction and Major Renovations (new.usgbc.org/leed)
- [8] ITACA, 2009. Progetto Banca Dati LCA ITACA. Regione Marche, ITACA, ITC-CNR, 2B, iiSBE, Environment Park, Università Politecnica delle Marche.

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