MIRROR
LIME-BASED GLOSSY STUCCO FINISH FOR INTERIORS

Novacolor Srl gives priority to environmental protection and safety in the workplace. For this reason Novacolor 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 MIRROR: LCA, LEED and other information.

MIRROR is a lime-based stucco finish, with special additives to improve the gloss. It is made of "grassello" lime putty, selected inerts and rheological modifiers that ensure an easy-to-apply 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 MIRROR, to create improvement options and support environmental communication. The functional unit is 1 kg of paint including packaging, with a spreading rate of 2-4 m^2/kg (per coat). The **system boundaries** include raw materials, their transportation, processing, packaging, distribution, use and packaging disposal. During the use phase the paint is hand-applied and the associated emissions are insignificant.
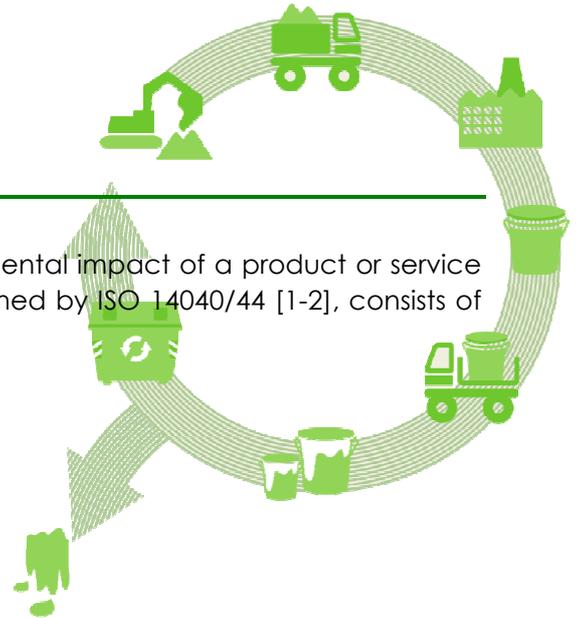
Inventory analysis

Primary data are used for the most significant processes, like the paint recipe, packaging and factory consumptions and emissions. Data refer to 2011 and are collected at the Novacolor's factory located in Forlì (FC). Secondary data originate from the ecoinvent v2 database [4]. The LCA calculations are performed with the LCA software SimaPro 7.3 [5].

Impact assessment

Life cycle impact assessment has been done with the method **PCR paint 2010:18 on paint [6]**, as indicated in the EPD programme of the International EPD Consortium. This method consists of different environmental indicators including the Carbon Footprint, energy content, material resource consumption, water consumption and waste. Table 1 shows the LCA results.

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Table1: LCA results.

		Unit	Total	Upstream	Core	Downstream
Impact categories	Global Warming (100 yr)	kg CO_2 eq	2.65	2.34	0.07	0.25
	Ozone layer depletion (20 yr)	mg CFC-11 eq	91.7	91.7	0.0	0.0
	Photochemical oxidation	g C_2H_4 eq	1.05	0.82	0.03	0.20
	Acidification	g SO_2 eq	4.08	2.88	0.30	0.89
	Eutrophication	g PO_4^{3-} eq	2.01	1.40	0.34	0.28
	Human toxicity infinite	kg 1,4-DB eq	1.21	1.11	0.03	0.07
	Fresh water aquatic ecotox.	kg 1,4-DB eq	0.328	0.195	0.016	0.116
	Freshwater sediment ecotox.	kg 1,4-DB eq	0.724	0.412	0.037	0.275
	Marine aquatic ecotox.	kg 1,4-DB eq	580	417	29	134
	Marine sediment ecotox.	kg 1,4-DB eq	383	250	19	113
Energy content	Non-renewable	MJ eq	21.5	17.5	1.0	3.1
	Renewable	MJ eq	0.863	1.351	0.087	-0.575
Material resource consumption	Non-renewable	kg	1.18	0.96	0.03	0.18
	Renewable	kg	42.3	40.7	0.9	0.7
Other	Material to recycling	kg	0.018	0.000	0.002	0.016
	Water consumption	kg	42.3	40.7	0.9	0.7
Waste	Non hazardous waste	kg	0.056	0.022	0.009	0.025
	Hazardous waste	g	1.61	0.59	0.51	0.52

Interpretation

The LCA results indicate that the largest contributions come from upstream processes (i.e. raw materials). The Carbon Footprint of MIRROR is 2.65 kg CO_2 eq and its water consumption is 42.3 litres. The negative value of renewable energy content is caused by the pallet reuse.

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.

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The table below shows MIRROR potential contribution to the different **LEED credits** of the LEED 2009 Rating System for New Construction and Major Renovations [7]. Table 1 shows the possible contribution of the paint to potential credits, if used properly.

Table 2: Potential LEED credits.

LEED Credits	Description	Possible points	Notes
MR credit 5	Regional Materials	1-2 points	According to the percentage of products locally extracted and manufactured
IEQ credit 3.2	Construction Indoor air quality management plan	1 point	More information are available on request
IEQ credit 4.2	Low-Emitting Materials Paints and Coatings	1 point	More information are available on request

Novacolor 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

VOC Dir. 2004/42/EC

Limit value EU (Dir. 2004/42/EC)   [8]
Cat . L: Decorative effect coatings (water-base): 200 g/l (2010)
MIRROR Contains max: 30 g/l VOC

European class of Reaction to fire

A1 (Gross heat of combustion - calorific value <0.2 MJ/kg according to ISO 1716:2010 Reaction to fire tests for products) [9]

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] Directive 2004/42/CE of the European Parliament and of the Council on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC (21 april 2004)

[9] based on Commission of the European Communities Decision 2006/751/EC, Table 1