

ROXIDAN

INTERIOR DECORATIVE FINISH WITH OXIDIZED EFFECT

series 391

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 ROXIDAN: LCA, LEED and other information.

ROXIDAN creates a metalized decorative patina that reproduces the typical oxidized effect of substrates that have been aged due to weathering.

Any wall or wood surface decorated with ROXIDAN obtains a lively iron-like appearance having the "Corten steel" effect, with particular chromatic shading and pleasant irregularities to the touch.

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

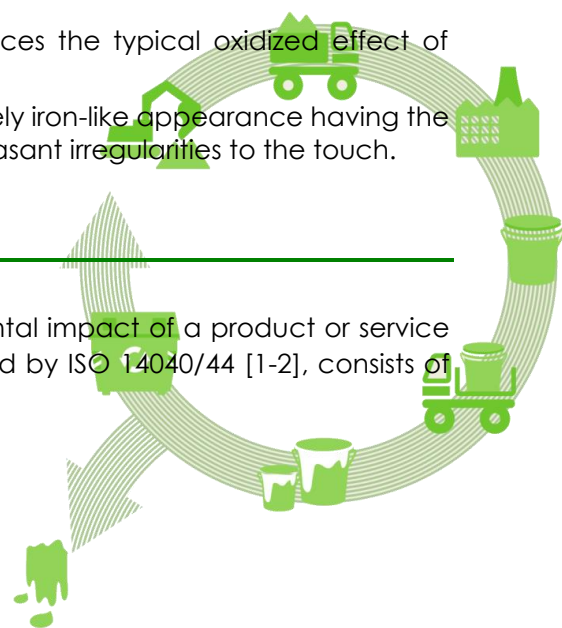
The **goal** of this LCA [3] is to provide transparency about the environmental performance of ROXIDAN, to create improvement options and support environmental communication. The functional unit is 1 kg of paint including packaging, with a spreading rate of 0.126 kg /sqm (average). The **system boundaries** 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 to the most significant processes, like the paint recipe, packaging and factory consumptions and emissions. Data refer to 2012 and are collected at the Colorificio San Marco's factory located in Marcon (VE). Secondary data originate from the ecoinvent v3 database [4]. The LCA calculations are performed with the LCA software SimaPro 8.0.3 [5].

Impact assessment

Life cycle impact assessment has been done with the method **PCR product group: UN CPC 3511 2014:5 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, human toxicity, ecotoxicity, air emissions, water consumption and waste. Table 1 shows the LCA results.



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Life cycle assessment verification

The LCA calculation system of Colorificio San Marco is verified by a third party in conformity with UNI EN ISO 11044:2006 and UNI EN ISO 11040:2006 [7]

Table 1: LCA results.

		Unit	Total	Upstream	Core	Downstream
Impact categories	Global Warming (100 yr)	kg CO ₂ eq	1,397	0,954	0,177	0,265
	Ozone layer depletion (ODPr)	mg CFC-11 eq	0,087	0,059	0,014	0,012
	Photochemical oxidation	g C ₂ H ₄ eq	0,451	0,415	0,027	0,009
	Acidification	g SO ₂ eq	5,5	4,17	0,72	0,61
	Eutrophication	g PO ₄ ⁻⁻⁻ eq	1,471	1,077	0,179	0,213
	Human toxicity, non-cancer	CTUh * 10 ⁻⁹	0,124	0,102	0,012	0,009
	Human toxicity, cancer	CTUh * 10 ⁻⁹	0,074	0,077	0,004	-0,007
	Ecotoxicity	CTUe * 10 ⁻³	21,77	28,94	1,347	-8,513
Waste	Hazardous waste	kg	0,004	0,003	0,000	0,001
	Non hazardous waste	kg	0,099	0,029	0,029	0,039
Air Emissions	VOC	g	0,491	0,47	0,014	0,006
	NMVOG	g	1,509	1,159	0,171	0,177
	SO ₂	g	3,153	2,712	0,298	0,142
	CO ₂ (fossil)	kg	1,255	0,831	0,165	0,258
	Methane (fossil)	g	5,065	4,529	0,319	0,216
	methane (biogenic)	g	0,084	0,082	0,003	-0,001
	NO _x	g	3,277	1,695	0,706	0,875
Other	Material subjected to recycling	g	31,89	0,51	6,56	24,81
	Blue virtual water	kg	8,17	6,7	1,1	0,36

Interpretation

The LCA results indicate that the largest contributions come from upstream processes (i.e. raw materials). The Carbon Footprint of ROXIDAN is 1.397 kg CO₂ eq.

The negative values are 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.

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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 ROXIDAN potential contribution to the different **LEED credits** of the LEED 2009 and LEED v4 (Leadership in Energy and Environmental Design) [8]. Table 2 shows the possible contribution of the paint to potential credits, if used properly.

Table 2: Potential LEED credits.

LEED 2009 Credits		Description	Possible points
MR credit 5	Regional Materials		1-2 points
IEQ credit 3.2	Construction Indoor air quality management plan		1 point
IEQ credit 4.2	Low-Emitting Materials Paints and Coatings		1 point
LEED V4 Credits		Description	Possible points
MR credit	Building Life-Cycle Impact Reduction		1-5 points
MR credit	Building product disclosure and optimization — Environmental Product Declarations		1-2 points
IEQ credit	Low-Emitting Materials		1–3 points)
IEQ credit	Interior Lighting		1-2 points

More information are available on request

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

Label VOC Dir. EU 2004/42/EU [9]

Limit value EU (Dir. 2004/42/EC)

Cat. L: Decorative effect coatings (water-base): 200 g/l (2010)

ROXIDAN Contains max: 200 g/l VOC

VOC Dir. 2004/42/EC : Content [9]

The actual content of VOC substances is less than 10 g/l

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ECODESIGN INDEX

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

N°	Activity item	Date
1	first issue	Mar 2013
2	update	aug 2014

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, LCA project, "Environmental Data Sheet" 2014.
- [4] Ecoinvent, 2013: Database ecoinvent v3. Swiss Centre for Life Cycle Assessment, (www.ecoinvent.ch).
- [5] PRé, 2014: LCA software SimaPro 8.0.3. PRé Consultants, the Netherlands (www.pre-sustainability.com).
- [6] PCR 2014:5. 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] Verify n. 37585 30 april 2014 – CSQA Certificazioni Srl – Thiene (VI) Italy
- [8] USGBC, LEED 2009 and LEED v4: Rating System for New Construction and Major Renovations (new.usgbc.org/leed)
- [9] 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)

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