material platform

GBCe
green building council españa

INTERIOR PAINTS

KEIM

Product family

OPTIL, INNOTOP, INNOSTAR, ECOSIL-ME

Interior silicate paints

COATINGS

INTERIOR PAINTS

KEIM

Interior silicate paints

Product family representative

KEIM INTERIOR

Description

Interior silicate paints.
The use of potassium silicate as a binder makes possible to renounce completely to the use of solvents, plasticizers and preservatives.

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Emission Date: August 2019

Summary table: Environmental parameters in which the material has a specific contribution. Detailed in the sheets of the respective environmental certifications VERDE, LEED and BREEAM

Suport documents ***Cartificates :*** *EPD, CSR, REACH* ***Self-declarations*** ***Potential***

Plot Movility	Solar Reflection Index SRI	Rainfall management	Exterior light control	…					
Energy Atmosphere	Embeded energy	Global warming gases	Energy demand reduction	Equipment efficiency	Other polluting gases	Renewable energy	Energy management	…	
Materials	Credited location	Pre-consumen recycling	Post-consumer recycling	Reuse potential	Certified wood	Work waste	Chemical composition	…	
Water	Consumption < reference	Water management	…						
Indoor quality	Low VOC emission	Low formaldehyde emmision	Confort control	Lighting control	Acustic control	Air quality	…		
Innovatin	Innovative Design	…							

NOTES:

1. The information contained in this document according to the compliment of the credits of the selected environmental certification systems (VERDE, LEED or BREEAM) is based on the information provided by the company. To ensure the possibility of each credit compliment during any of the seal processes it will be necessary to verify the validity of the information provided.
2. This document doesn´t neither constitute a product certification nor guarantee the compliment of current local regulations.
3. The conclusions of this analysis are only applied to the products mentioned on this report and depend on the invariability of the technical conditions of the product.
4. The validity of this document is subject to the expiration of the support files or the variation of the regulation and versions of each environmental certification seal.
5. This document informs about the possible contribution of the studied products to obtain VERDE, LEED or BREEAM certifications. However, the final decision on whether a product meets or not the requirements of LEED certification is exclusive to the GBCI (Green Business Certification Inc.)

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CREDIT SUMMARY
VERDE

NATURAL RESOURCES

- NR 06, Use of materials obtained from sustainable resources
- NR 09, Construction waste management
- NR 10, Construction materials impact
- NR 11, Product eco-labelling

INDOOR ENVIRONMENTAL QUALITY

- IEQ 01, Limit on VOC emissions

Environmental categories VERDE

Plot and Site | Energy and Atmosphere | Natural Resources | Interior environmental quality | Quality concept | Social and Economic Aspects | Innovation

Certification standards VERDE

Ω Residential	Omega Residential	DU P	Urban polygon development
Ω Equipment	Omega Equipment		

CREDIT SHEET
VERDE

CATEGORY
NATURAL RESOURCES

NR06, Use of materials obtained from sustainable resources (VERDE Ω EQUIPMENT - VERDE Ω RES)

Aim

Encourage the use of materials obtained from recognized social and environmental standards. The objective is to protect forests, avoid childhood exploitation and respect the environment in the extraction of natural stone.

Comply Data

KEIM offers a Corporate Mission Statement affirming to be world leading specialist in mineral architectural protection systems providing sustainable solutions, paying particular attention to the cost-effectiveness, environmental compatibility and social responsibility of products and services.
This document affirms that the company's aim is to provide integrated solutions, focusing on environmental matters, developing processes which save raw materials, make efficent use of energy and so are also economically efficient.
Besides, the company provides a document, signed by the high directive confirming that all the mineral raw materials contained in the paints are extracted in Germany in a sustainable way by an open-cast mining process, adopting recultivation measures, reutilizating water, using efficient transportation and other relevant aspects.
Facing a possible building certification in which these paints are used, a 95% of the paint mass should be used for the fulfilment of this credit, corresponding to its mineral raw material and water content. The other 5% corresponds to additives and does not contribute to compliance.

Therefore, SOLDALIT interior paints OPTIL and INOSTAR has a NATUREPLUS seal, which confirms the compliance of a rigid evaluation process regarding the sustainability of its raw material.

Test Process

The test process of the building through this credit is established by the calculation of the mass percentage of woods and materials containing woods used in the project that provide a chain custody control certification, either PEFC or FCS. All woods used during the construction must be considered, including those used provisionally such as concrete formworks and pallets.
Percentage might be between 20% and 50% over the total mass of woods used in the project to be well valued.

Besides, this credit tests the calculation of the mass percentage of materials that have a document that justifies that the origin of the raw materials guarantees basic sustainable requirements.
This percentage might be between 5% and 50% of the total material mass to be well valued.
The following documents are accepted to justify the origin of the raw materials:

- Global Reporting Initiative (GRI) Sustainable Report.
- Self-declaration of the manufacturer including: Place of extraction of raw materials used in the product and responsible environmental

procedures during extraction and processing.

- Corporate mission statement approved by the senior manager, including requirements for distributors of raw materials that complies with the basic rights of workers, child labour and environmental respect for protected areas and areas of high ecological value

Analysis example	*NA*
Support Files	***Keim-mission-statement.pdf*** ***Manufacturer's Confirmation Sustainable Mineral Raw Materials_interior.pdf*** ***FT-Innostar.pdf*** ***FT-Optil.pdf*** ***Natureplus Interior Wall Paints.pdf***
Baseline	*NA*

CATEGORY
NATURAL RESOURCES

NR 09, Construction waste management (VERDE Ω EQUIPMENT - VERDE Ω RES)

Aim

Reduce construction waste by using prefabricated and industrial materials and using controlled work processes that minimize waste production. Only waste produced during construction or rehabilitation phase is considered.
Mass of the revalued waste might be between 50% and 75% of total construction waste to be well valued.

Comply Data

All the packaging in which KEIM paints are delivered can be recycled.
At the following table, can's weights are specified according to the product and the available size for each of them.

PRODUCT	Format (lt)	Can weight (kg)
ECOSIL-ME	5lt	0.271 kg
	15lt	0.649 kg
OPTIL	5lt	0.271 kg
	15lt	0.649 kg
	1lt	0.075 kg
INNOSTAR	5lt	0.271 kg
	12.5lt	0.662 kg
INNOTOP	5lt	0.271 kg
	12.5lt	0662 kg

Test Process

Test process of the building through this credit is specified by the existence, in project instance, of a Construction Waste Management Plan according to current regulations. This plan must be written during the previous phase of the intervention according to the previous study.
All the waste produced is considered for rehabilitation works, including possible demolitions.

Analysis example

NA

Support Files

DAP_interior_EN.pdf / FT_Ecosil-ME.pdf / FT_Optil.pdf / FT_Innostar.pdf / FT_Innotop.pdf / Peso envases.pdf

Baseline

NA

CATEGORY
NATURAL RESOURCES

NR 10, Construction materials impact (VERDE Ω EQUIPMENT - VERDE Ω RES)

Aim

Reduce impacts associated to material production by using low impact materials during product stage together with reused and recycled materials.

Comply Data

KEIM provides a EPD for their exterior silicate paints.
Impacts associated to the production of the products, which can be used for the calculation of the LCA of the building, are reflected in the following table. Results respond to a unit of 1kg of paint.

IIMPACT FROM CRADLE TO GATE	Total use of non-renewable primary energy	Global warming potential	Hazardous waste disposed	Non-hazardous waste disposed
Material (A1-A3)	MJ/uf	Kg CFC11-Eq/uf	Kg/uf	Kg/uf
Pinturas interiores de silicato KEIM	2.67E+1	2.34E-10	1.99E-3	6.07E-3

To be able to compare with VERDE's baseline, values are transfered to m2 painted according to the following performance data based of two paint layers over a smooth surface.

Paint	Density (kg/m2)
Optil	0.36
Innotop	0.44
Innostar	0.19 (una capa)
Ecosil-ME	0.39

In this way, LCA of the products presented at the EPD delivers the following results:

IMPACT FROM CRADLE TO GATE	Total use of non-renewable primary energy	Global warming potential	Hazardous waste disposed	Non-hazardous waste disposed
	Mj/m2	Kg Co2/m2	Kg/m2	Kg/m2
Optil	0.36	2.87	5.97E-3	1.82E-2
Innotop	11.75	0.42	8.76E-4	2.67E-3
Innostar	5.07	0.18	3.78E-4	1.15E-3
Ecosil-ME	10.41	0.37	7.76E-4	2.37E-3

Test process

Test process of the building through this credit is established by the comparison of impacts associated to construction materials with an established baseline.

The scope of study of this credit is limited to materials used for the enclosure and interior partitions considering as such the following constructive elements: roof, facade, interior, horizontal and vertical partitions, floors in contact with the ground, basement walls and dividing walls.

It has been decided not to include the structure for the credit calculation, however, it could be included if the definition of a baseline structure for the particular case is justified.

Analysis Example

NA

Support Files

DAP_interior_EN.pdf

Baseline

Reference building based on BEDEC

IMPACT FROM CRADLE TO GATE	Total use of energy	C02 emissions	Non-Hazardous waste disposed
Indicator	MJ/m2	Kg/m2	Kg/m2
Interior Paints	6.12	0.90	0.03

Edificio de referencia en base CYPE

IMPACT FROM CRADLE TO GATE	Total use of energy	C02 emissions	Non-hazardous waste disposal	Non-hazardous waste disposal	Kg material
Indicator	kWh/m2	Kg/m2	Kg/m2	M3	kg
Interior Paints	12.11	3.098	0.045	0.000045	80.9

CATEGORY
NATURAL RESOURCES

NR 11, Product Eco-labelling (VERDE Ω EQUIPMENT - VERDE Ω RES)

Aim

Encourage the use of products with eco-labels Type I or Type III.

Comply Data

KEIM provides an EPD for their silicate interior paints.
This EPD applies to all the products analyzed on this sheet: KEIM Optil, KEIM Innotop, KEIM Innostar and KEIM Ecosil-ME.

Test process

The test process of the building through this credit is established by a list of materials that have an eco-label type I or Type III (EPD)
To obtain the maximum score:

- Mass percentage of materials with eco-label type I should range between 10% and 20%.
- Mass percentage of materials with EDP should range between 10% and 20% and include at least the following families: Structural elements, insulation and coatings.

Analysis Example

NA

Support Files

DAP_interior_EN.pdf

Baseline

NA

CATEGORY
INDOOR ENVIRONMENTAL QUALITY

CAI 01, Limit on VOC emissions (VERDE Ω EQUIPMENT - VERDE Ω RES)

Aim

Reduce the concentration of VOCs in the indoor air.

Comply data

KEIM made the required tests for the product qualification according to the directive 2004/42/EG.
The calculations based on the product ingredients and the product verification analysis according to DIN ISO 11890-2 delivered the following results:

PRODUCT	VOC content	Category
KEIM Optil	0-1 g/l	A/a
KEIM Innostar	0-1 g/l	A/a
KEIM Ecosil-ME	0-1 g/l	A/a
KEIM Innotop	0-1 g/l	A/a

Besides, the company KEIM determined the emission of volatile organic compound of their products according to the emission test chamber method DIN EN ISO 16000-9. After 7 days in the test chamber, the KEIM interior paints have a T-VOC-Value of <150 µg/m³.
These results determine that the use of KEIM interior paints can contribute to obtain good results on the measurement of VOC of indoor air.
Interior paints OPTIL and INOSTAR have the NATUREPLUS seal which means that in these cases, results from the table above are supported by an external regulatory entity.
However, as this measurement must be realized no more than 28 days after finishing all the works on the building, not only the emission of paints will be taken into account but all the materials used.
Besides, products KEIM Optil, KEIM Innostar, KEIM Ecosil-ME and KEIM Innotop are resistant to mould and algae attacks as it is detailed at the self-declaration “Confirmation Anti-Mould-Algae Interior paints (en) 08042019.pdf”

Test process

The test process of the building through this credit is established based on the selection of finishing materials with low VOC emissions.
To obtain a good score in this credit, the following aspects must be checked:

- Use paints and varnishes with low or no VOC content (VERDE Ω Equipment values that the content is one third of the required on the RD 227/2006)
- Select, if possible, natural woods. In case of composite woods, select those without formaldehyde on its constitution or at least with classification E1 according to the UNE standard.
- Use sealants and adhesives with EMICODE EC 1 label or demonstrate the requirements of the qualification.

VERDE Ω Equipment also tests the measurement of VOC content in the indoor air no more than 28 days after finishing all the works (including finishings) and before installing the furniture.
Concentration of VOC must be under the following limits:

- TCOVs máx: 3.000 µg/m3
- Formaldehydes máx: 120 µg/m3

Test results will be lineal giving 0 points to the previous limits and 100 point to the best practice, 0µg/m3.

Analysis example *NA*

Support files ***Interior_VOC+emisiones.pdf Confirmation Anti-Mould-Algae Interior Paints (en) 08 04 2019.pdf***
Manufacturers confirmation.pdf
FT_OPTIL.pdf
FT-INNOSTAR.pdf
NATUREPLUS-mineral based interior paints.pdf

Baseline *Paints and coatings must have been proved according to the standard CEN/TS 16516 and comply with the limit values on phase II of maximum VOC emissions established on the Annex II of the directive 2004/42/CE about decorative paint.*
Transposition of the Directive 2004/42/CE in Spain in made by the RD 227/2006 of February 24, in which COV emissions are limited and the labelling containing information of the maximum emission values of the product and the content of VOC compared to the legal limits is obliged.

Limit values of VOC emissions in paints and varnishes:

PRODUCT SUBCATEGORY	Type*	G/L
Matt products for interiors: walls and roofs (brightness ≤ 25 at 60º)	WB/SB	30/30
Brilliant products for interiors: walls and roofs (brightness ≥ 25 at 60º)	WB/SB	100/100
Mineral subtract products for exterior walls.	WB/SB	40/430
Interior/exterior paints for wood or metal, carpentry and coatings.	WB/SB	130/300
Interior/exterior varnishes for carpentry, including opaque lasures.	WB/SB	130/400
Interior/exterior lasures of minimum thickness.	WB/SB	130/700
Primers	WB/SB	30/350
Consolidating primers	WB/SB	30/750
One component high performance coatings.	WB/SB	140/500
Two component high reactive performance for specified uses. For example: floors, etc.	WB/SB	140/500
Multicoloured coatings	WB/SB	100/100
Decorative effects coatings	WB/SB	200/200

*WB: Water-based coatings
SB: Solvent-based coatings

CREDIT SHEET
LEED v4

MATERIALS & RESOURCES (MR)

- MR p2-c5, Construction and Demolition Waste Management Planning
- MR c1, Building Life-Cycle Impact Reduction
- MR c2, Building Product Disclosure and Optimization – Environmental Product Declarations (EPD)
- MR c4, Building Product Disclosure and Optimization – Material Ingredients

INTERIOR ENVIRONMENTAL QUALITY (IEQ)

- IEQ c2, Low-emitting materials
- IEQ c3, Indoor Air Quality Assessment

INNOVATION IN DESIGN (ID)

- ID c4, Innovation

Environmental categories LEED

(LT) Locations & Transportation | (SS) Sustainable Sites | (WE) Water Efficiency | (EA) Energy and Atmosphere | (MR) Materials & Resources | (IEQ) Indoor Environmental Quality | (ID) Innovation | (RP) Regional Priority

LEED certification standards (v4)

EB	Existing Building	**RNC**	Retail New Construction	**DCNC**	Data Center NC
NC	New Construction	**REB**	Retail Existing Building	**DCEB**	Data Center EB
CI	Commercial Interiors	**RCI**	Retail Commercial Interiors	**WNC**	Warehouse NC
CS	Core & Shell	**HC**	Healthcare	**WEB**	Warehouse EB
SNC	School New Construction	**HNC**	Hospitality-New Constr.	**NDP**	Neighborhood Devel. Plan
SEB	School Existing Building	**HEB**	Hospitality-Existing Building	**ND**	Neighborhood Develop.
MRB	Mid Rise Buildings	**HCI**	Hospitality-Commercial Int.	**HO**	Homes

CREDIT SHEET
LEED v4

CATEGORY
MATERIALS & RESOURCES (MR)

MRp2 y MRc5, Construction & Demolition waste management planning (NC, CS, SNC, RNC, HC, HNC, DCNC, WNC, CI, RCI, HCI, EB, SEB, REB, HEB, WEB, HO, MRB)

Aim

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing and recycling materials.

Comply data

All the packaging in which KEIM paints are delivered can be recycled.
At the following table, can's weights are specified according to the product and the available size for each of them.

PRODUCT	Format (lt)	Can weight (kg)
ECOSIL-ME	5lt	0.271 kg
	15lt	0.649 kg
OPTIL	5lt	0.271 kg
	15lt	0.649 kg
	1lt	0.075 kg
INNOSTAR	5lt	0.271 kg
	12.5lt	0.662 kg
INNOTOP	5lt	0.271 kg
	12.5lt	0662 kg

Test process

Implement and follow up a Waste Management Plan where % recovery and / or recycling are incorporated.
Detail the place and procedure of management and revaluation of each material.

Option 1. (BDC, CI)
Divert at least 50% or 75% of the total construction and demolition material (at least 3 and 4 material streams).

Option 1. (EB)
Divert at least 50% or 75% of the total construction and demolition material (at least 3 and 4 material streams).

Option 2.
Reduce the total amount of waste generated in the construction work, below 12,2 kg/m2.
(HO-Homes, MRB-Mid Rise Buildings)

To reduce total construction waste or prevent waste from ending up in landfill or incinerators.

The baseline of generated waste (in Kg) is determined according to table 1 (number of rooms and conditioned surface).

In multi-family buildings, use the waste / surface table and add the associated waste to spaces not considered as housing.

Project construction waste = Total waste - (recycled waste * 0.25)

Analysis example *NA*

Support Files
DAP_interior_EN.pdf
FT_Optil.pdf
FT_Innostar.pdf
FT_Innotop.pdf
Peso envases.pdf

Baseline *NA*

CATEGORY
MATERIALS & RESOURCES (MR)

MRc1, Building Life-Cycle Impact Reduction
(NC, CS, SNC, RNC, HC, HNC, DCNC, WNC, CI, RCI, HCI, EB, SEB, REB, HEB, WEB)

Aim

To encourage adaptive reuse and optimize the environmental performance of products and materials.
Extend the lifespan of the building, preserve resources and cultural heritage.
Reduce waste and environmental impacts of the construction process.

Comply data

KEIM provides a EPD for their interior silicate paints.
The same EPD is used to justifiy the following products: *KEIM Optil, KEIM Innotop, KEIM Innostar y KEIM Ecosil-ME.*

The impacts associated with the production of these products that can be used to calculate the building's LCA are reflected below.
The ACV includes the stages A1-A3 (Product Phase), A4 (Transport) and A5 (Assembly) and D (Benefits and loads beyond the useful life).

Below are the values of phases A1-A3, A4 and A5, which can be used in the overall analysis of the building.

	Exterior silicate paints – KEIM EPD exp. 09.10.2017 – valid till 03.04.2019		
IMPACT	**A1-A3**	**A4**	**A5**
Global warming potential (*kg CO_2)*	1,20E+0	2,46E-2	1,59E-1
Depletion of the stratospheric ozone layer (*kg CFC 11)*	4,30E-10	5,14E-13	1,00E-12
Acidification (*kg SO_2)*	1,25E-2	1,62E-4	1,68E-5
Eutrophication (*kg $(PO_4)^{3-}$)*	4,04E-4	4,03E-5	3,44E-6
Use of non-renewable primary energy (*MJ/UF)*	2,25E+1	3,37E-1	2,87E-2

Test Process

Option 4. Analysis of the life cycle of the building

Carry out an analysis of the life cycle of the building (structure and envelope) that demonstrates a minimum of 10% reduction in the impact of the life cycle with respect to the reference building. Any category can't have an impact greater than 5% of the baseline.
The baseline and the project must consider a life cycle of 60 years, with the same use.

Select at least three of the following impact categories for reduction:
- global warming potential (greenhouse gases) en CO2 e
- depletion of the stratospheric ozone layer, in kg CFC-11
- acidification of land and water sources, in moles H+ o kg SO2
- eutrophication, in kg nitrogen or kg phosphate
- formation of tropospheric ozone, in kg NOx, kg O3 eq, or kg ethene
- depletion of nonrenewable energy resources, in MJ

Analysis example

NA

Support files

DAP_interior_EN.pdf

Baseline

LEED allows you to use local reference standards.
The most widespread are:

- *Database of the BEDEC (ITEC)*
- *CYPE database*

Both databases do not include all of the impacts required by LEED, so they should be complemented with additional and contrasted information.

CATEGORY
MATERIALS & RESOURCES (MR)

MRc2, Building Product Disclosure and Optimization – Environmental Product Declarations (EPD)
(NC, CS, SNC, RNC, HC, HNC, DCNC, WNC, CI, RCI, HCI, EB, SEB, REB, HEB, WEB)

Aim

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts.

Comply data

KEIM provides a EPD for their interior silicate paints:

KEIM Optil, KEIM Innotop, KEIM Innostar and KEIM Ecosil-ME.

Test process

Option 1: Environmental Product Declaration (EPD)

Provide Environmental Product Declarations (EPD) of a minimum of 20 products, from that meet any of the following criteria:

- Products with a publicly available, critically reviewed life-cycle assessment conforming have at least a cradle to gate scope (Valued ¼)
- EPD which conform to ISO 14025, 14040, 14044 y EN 15804 o ISO 21930, and have at l scope.
  - EPD, industry-wide (generic) (Valued ½)
  - EPD, product-specific Type III (Valued 1)

Analysis example

NA

Support files

DAP_interior_EN.pdf

Baseline

- *International Standard ISO 14021–1999, Environmental labels and declarations—Self Declared Claims (Type II Environmental Labeling): iso.org*
- *International Standard ISO 14025–2006, Environmental labels and declarations (Type III Environmental Declarations—Principles and Procedures): iso.org*
- *International Standard ISO 14040–2006, Environmental management, Life cycle assessment principles, and frameworks: iso.org*
- *International Standard ISO 14044–2006, Environmental management, Life cycle assessment requirements, and guidelines: iso.org*
- *CEN Comité Européen de Normalisation (European Committee for Standardization) EN 15804—2012 Sustainability of construction works, Environmental product declarations, Core rules for the product category of construction products: cen.eu*
- *International Standard ISO 21930–2007 Sustainability in building construction—Environmental declaration of building products: iso.org*
- *Federal Trade Commission, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e): ftc.gov/bcp/grnrule/guides980427.htm*

CATEGORY
INDOOR ENVIRONMENTAL QUALITY (IEQ)

IEQ c2, Low-emitting materials
(NC, CS, SNC, RNC, HC, HNC, DCNC, WNC, CI, RCI, HCI, EB, SEB, REB, HEB, WEB, HO, MRB)

Aim

To reduce the concentrations of chemical pollutants that can damage the air quality, health and productivity of the occupants, as well as the environment.

Comply data

KEIM made the required tests for the product qualification according to the directive 2004/42/EG.
The calculations based on the product ingredients and the product verification analysis according to DIN ISO 11890-2 delivered the following results:

PRODUCT	VOCs content	Category	
KEIM Optil	0-1 g/l	A/a	
KEIM Innostar	0-1 g/l	A/a	
KEIM Ecosil-ME	0-1 g/l	A/a	
KEIM Innotop	0-1 g/l	A/a	

Besides, the company KEIM determined the emission of volatile organic compound of their products according to the emission test chamber method DIN EN ISO 16000-9 (by TÜV Süd industry services).
All requirements for AgBB construction products were met.
The EPD presents the results of KEIM Biosil. The manufacturer consider it as representative of the rest of the product range.
After 7 days in the test chamber, KEIM interior paints presents a T-VOC-Value of <150 µg/m³ (bellow the allowed 300 µg/m3).
These results determine that the use of KEIM interior paints can contribute to obtain good results on the measurement of VOC of indoor air.

These tests allow to justify compliance with the “Additional requirements for wet products (c)”.

Interior paints OPTIL and INOSTAR have the NATUREPLUS seal, which means that in these cases, results from the table above are supported by an external regulatory entity.

The manufacturer also includes a self-declaration confirming that KEIM Optil and KEIM Innostar do not exceed the formaldehyde emission limit of 10 µg / m3, after 28 days of application.

Products KEIM Optil, KEIM Innostar, KEIM Ecosil-ME and KEIM Innotop are resistant to mould and algae attacks as it is detailed at the manufacturer self-declaration “Confirmation Anti-Mould-Algae Interior paints (en) 08042019.pdf”

Test process

The objective of this credit is the use of products for the construction of the building, with very low emissions of Volatile Organic Compounds.
It is necessary that the products meet the following requirements:

a) Inherently non-emissive materials: (Stone, ceramics, untreated or anodized metals, glass, etc)
b) General emissions evaluation: Building products must be tested and determined compliant in according to:
(1) CDPH Standard Method V1.1-2010
(2) German AgBB Testing and Evaluation Scheme (2010) +

formaldehydes limit 10 µg/m3 after 28 days)
(3) ISO 16000-3:2010, ISO 16000-6:2011, ISO 1600-9:2006, ISO 16000-11:2006 (AgBB or French regulation)
(4) DIBt testing method (2010)

c) **Additional VOC content requirements for wet-applied products:** In addition to meeting the general requirements (above), on-site wet-applied products must meet the VOCs content, according to the following standards (Disclosure of VOC content must be made by the manufacturer):

Projects outside the US: all paints, coatings, adhesives, and sealants wet-applied on site, must meet the requirements of Decopaint Directive 2004/42/EG

Two options are available:

- **Option 1:** defines several product categories and awards points according to the number of categories that meet the requirements for low VOC emissions.
- **Option 2:** If any product in any category does not meet the criteria, option 2 can be used to perform a weighted calculation, and compute partial compliance of several categories..

Taking as reference the maximum values allowed by the European Directive Decopaint 2004/42 / EG:

PRODUCT SUBCATEGORY	Type	G/L
Interior matt walls and ceilings (gloss ≤ 25 to 60º)	WB/SB	30/30
Interior glossy walls and ceilings (brightness ≥ 25 to 60º)	WB/SB	100/100
Exterior walls of mineral substrate	WB/SB	40/430
Interior / Exterior trim and cladding paints for wood and metal	WB/SB	130/300
Interior / exterior trim varnishes and woodstains, including opaque woodstains	WB/SB	130/400
Interior / exterior minimal build woodstains	WB/SB	130/700
Coatings / primers	WB/SB	30/350
Binding primers	WB/SB	30/750
One-pack performance coatings	WB/SB	140/500
Two-pack reactive coating for specific end use such as floors	WB/SB	140/500
Multi-coloured coatings	WB/SB	100/100
Decorative effect coatings	WB/SB	200/200

**BA (base Agua), *BD (base Disolvente)*

Analysis example *NA*

Support files
Interior_VOC+emisiones.pdf
DAP_interior_EN.pdf
Confirmation formaldehyde
FT_OPTIL.pdf
FT-INNOSTAR.pdf
NATUREPLUS-mineral based interior paints.pdf

Baseline

- CDPH Standard Method v1.1–2010: cal-iaq.org
- ISO 17025, ISO Guide 65 e ISO 16000 partes 3, 6, 7, 11: iso.org
- AgBB-2010: umweltbundesamt.de/produkte-e/bauprodukte/agbb.htm
- South Coast Air Quality Management District (SCAQMD) Rule 1168 y Rule 1113: aqmd.gov
- European Decopaint Directive 2004/42/EG ec.europa.eu/environment/air/pollutants/stationary/paints/paints_legis.htm
- Canadian VOC Concentration Limits for Architectural Coatings: ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=117
- Hong Kong Air Pollution Control Regulation: epd.gov.hk/epd/english/environmentinhk/air/air_maincontent.html
- CARB 93120 ATCM: arb.ca.gov/toxics/compwood/compwood.htm
- ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating y ANSI/BIFMA e3–2011 Furniture Sustainability Standard: bifma.org

(HO-Homes, MRB-Mid Rise Buildings)

To use products inside the home that have been tested and comply with the California Department of Public Health Standard Method V1.1-2010, CA section 01350, Appendix B.
At least 90% of the components must meet the requirements.
Depending on the number of categories that meet the requirements, the final score will be established:

- On-site applied interior paints
- Pavements
- Insulation
- On-site applied adhesives.

CATEGORY
INDOOR ENVIRONMENTAL QUALITY (IEQ)

IEQ c3, Indoor Air Quality Assessment
(NC, CS, SNC, RNC, HC, HNC, DCNC, WNC, CI, RCI, HCI, EB, SEB, REB, HEB, WEB)

Aim

To establish better quality indoor air in the building after construction and during occupancy.

Comply data

KEIM silicate interior paints contribute to the building's indoor air quality due to its low emission of Volatile Organic Complexes (VOCs).

However, the test result will depend on the other materials involved and their level of VOC emissions.

Test process

Option 2: Air Testing

Analysis of air quality according to ASTM standards, EPA or ISO compendium accepted by LEED for each type of pollutant.

The concentration, in all regularly occupied spaces, of the following pollutants should be measured: Formaldehydes, particles PM10 and PM 2.5, ozone, VOCs considered in the list of CDPH Standard Method v1.1 (Table 4-1) and Carbon Monoxide .
The minimum concentrations established by LEED may not be exceeded in any case.

The laboratory performing the test must be accredited according to ISO / IEC 17025.

IEQ c2, Pollutant control
(HO-Homes, MRB-Mid Rise Buildings)

Option 4. Air test
Air quality análisis according to ASTM, EPA or ISO methods, accepted by LEED for each type of pollutant.
To prove that the pollutants do not exceed the concentration levels in Table 1.

Analysis example

NA

Support files

Interior_VOC+emisiones.pdf

Baseline

- CDPH Standard Method v1.1–2010: cal-iaq.org
- ISO 17025, ISO Guide 65 e ISO 16000 partes 3, 6, 7, 11: iso.org
- AgBB-2010: umweltbundesamt.de/produkte-e/bauprodukte/agbb.htm
- South Coast Air Quality Management District (SCAQMD) Rule 1168 y Rule 1113: aqmd.gov
- European Decopaint Directive: ec.europa.eu/environment/air/pollutants/stationary/paints/paints_legis.htm
- Canadian VOC Concentration Limits for Architectural Coatings: ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=117
- Hong Kong Air Pollution Control Regulation: epd.gov.hk/epd/english/environmentinhk/air/air_maincontent.html
- CARB 93120 ATCM: arb.ca.gov/toxics/compwood/compwood.htm
- ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating y ANSI/BIFMA e3–2011 Furniture Sustainability Standard: bifma.org

CATEGORY
INNOVATION IN DESIGN (ID)

ID c2, Innovation

(NC, CS, SNC, RNC, HC, HNC, DCNC, WNC, CI, RCI, HCI, EB, SEB, REB, HEB, WEB)

Aim	Reward projects that achieve exceptional or innovative performance in meeting LEED requirements.
Comply data	It is considered that KEIM Ecosil-ME photocatalytic paint could fall into this category, since it contributes to the healthiness of the interior spaces, reducing bacteria on the treated surfaces and related toxic, allergic or infectious reactions. However, acceptance of such interpretation must be confirmed by the GBCI.
Test process	**Option 1. Innovation** Achieve significant and measurable environmental benefits, using strategies not included in the LEED certification standards. Innovation credits must be approved in each case by the GBCI.
Analysis example	*NA*
Support files	***Ecosil-ME_Efecto fotocatalítico.pdf***
Baseline	*NA*

CREDIT SUMMARY
BREEAM

MANAGEMENT

- GST 3 Construction site impacts. Criteria 6, 7 and 8 (BREEAM ES New Construction 2015). Criteria 4 and item b (BREEAM ES Home 2011)

HEALTH AND WELLBEING

- SYB 2 Indoor air quality (BREEAM ES New Construction 2015).
- SYB 8 Indoor air quality (BREEAM ES Home 2011)

MATERIALS

- MAT 1 Life cycle impacts (BREEAM ES New Construction 2015)
- MAT 8 Materials of low environmental impact (BREEAM ES Home 2011)
- MAT 3 Responsible sourcing of materials (BREEAM ES New Construction 2015)
- MAT 9 Responsible sourcing of materials – basic elements of the building (BREEAM ES Home 2011)

WASTE

- RSD 1, Construction waste management (BREEAM ES New Construction 2015 and BREEAM ES Home 2011)

Environmental categories BREEAM ES

Manage-ment | Health and Wellbeing | Energy | Transport | Water | Materials | Waste | Land Use and Ecology | Pollution | Innovation

Certification Standards BREEAM ES

UR	BREEAM ES town planning	**VIV**	BREEAM ES Home	**USO**	BREEAM ES In Use
NC	BREEAM ES New Construction				

CREDIT SHEET
BREEAM ES

CATEGORY
MANAGEMENT

GST 3 Construction site impacts (BREEAM ES NEW CONSTRUCTION 2015 y BREEAM ES HOMES 2011)

Aim

To recognize and encourage construction sites managed in an environmentally sound manner in terms of resource use, energy consumption and pollution. Criteria that affect;
- Transport of construction materials and waste
- Timber procurement

Comply data

In relation to transportation, KEIM paints are manufactured in Germany, at the KEIMFARBEN GMBH factory located at Keimstrasse 16, D - 86420 Diedorf. The paintings are transported by road to the Delegation KEIM Ecopaint Ibérica S.L. located in Spain in c / Octavio Lacante, 55 E - 08100 Mollet del Vallès. The transport of merchandise, both from the factory in Germany to the Spanish Delegation, as well as from the Delegation to the customer, is always done by road.

Test process

Transport of construction materials and waste (one point)
The evaluation of the building through this criteria is established by stating in a report separately, the total fuel consumption (liters), the total carbon dioxide emissions (kgCO2 eq) associated to the transport and the total distance traveled (km) to the building.

Analysis example

The calculation of the transport criterion should be carried out in each case according to the location of the building, intermediate storage and its distribution.

Support files

Localización.pdf

Baseline

- National Inventory of Atmospheric Emissions (Netcen, 2005) based on DTI data combined with TRL factors as functions of the average speed of the vehicles, derived from data from tests carried out in real test cycles.
- UK Energy Statistics Summary DTI 2004 and carbon factors for UKPIA fuels (2004).
- Guidelines for Corporate Information on Emissions of Greenhouse Gases, DEFRA, Continuous Survey of Transportation of Goods by Road 2001.

CATEGORÍA
SALUD Y BIENESTAR

- **SyB2 – Indoor air quality (BREEAM ES NEW CONSTRUCTION 2015)**
- **SyB8 – Indoor air quality (BREEAM ES HOMES 2011)**

Aim

To recognise and encourage a healthy internal environment through the specification and installation of appropriate ventilation, equipment and finishes.

Datos de cumplimiento

KEIM made the required tests for the product qualification according to the directive 2004/42/EG concerning the limitation of emissions of volatile organic compounds (VOC). The calculations based on the ingredients of the products and the product verification analyzes according to the test standard DIN EN ISO 11890-2 gave the following results;

PRODUCT	VOC content	Category
KEIM Optil	0-1 g/l	A/a
KEIM Innostar	0-1 g/l	A/a
KEIM Ecosil-ME	0-1 g/l	A/a
KEIM Innotop	0-1 g/l	A/a

The KEIM Optil, KEIM Innostar, KEIM Ecosil-ME and KEIM Innotop products are resistant to mould infestation as detailed in the manufacturer's "Interior_Mold Resistance" declaration.

Besides, the company KEIM determined the emission of volatile organic compound of their products according to the emission test chamber method DIN EN ISO 16000-9. After 7 days in the test chamber, the KEIM interior paints have a T-VOC-Value of <150 µg/m³.
These results determine that the use of KEIM interior paints can contribute to obtain good results on the measurement of VOC of indoor air. However, as this measurement must be realized after finishing all the works on the building, not only the emission of paints will be taken into account but all the materials used.

Test process

BREEAM values, among other aspects, the choice of finishing materials with low VOC emissions. The requirements **BREEAM ES New Construction 2011** and **BREEAM ES Homes 2011** for paintings are:

- Comply with the VOC content limit established in Annex II of Directive 2004/42 / CE2 on Decorative Painting or with the UNE-EN 13300: 2002 standard. Paints and varnishes. Materials and systems of coating in aqueous phase for interior walls and ceilings. Classification.
- The test standard must comply with UNE-EN ISO 11890-2: 2013. Paints and varnishes. Determination of the VOC content. Part 2: Gas chromatographic Method. (ISO 11890-2: 2013).
- Paint must be fungal and algal resistant in wet areas e.g. bathrooms, kitchens, utility rooms

Analysis example

NA

Support files

VOC_interiores.pdf
FT_Optil.pdf
FT_Innostar.pdf
FT_Ecosil-ME.pdf
FT_Innotop.pdf
Interior_Resistencia a Moho.pdf

Baseline

- EU Directive 2004/42 / CE21, 21 April 2004, related to the limitation of emissions of volatile organic compounds (VOC) due to the use of organic solvents in certain paints and varnishes and in vehicle refinishing products, for which amending Directive 1999/13 / EC.
- UNE-EN 13300: 2002 standard. Paints and varnishes. Materials and systems of coating in aqueous phase for interior walls and ceilings. Classification.
- UNE EN ISO 11890-2:2013 – Paints and varnishes – Determination of VOC content, Part 2 – Gas Chromatographic method

CATEGORY
MATERIALS

- **MAT1 – Life cycle impacts (BREEAM ES NEW CONSTRUCTION 2015)**
- **MAT8 – Materials of low environmental impact (BREEAM ES HOME 2011)**

Aim

To recognize and encourage the use of robust and adequate tools for the Life Cycle Analysis and, therefore, the specification of construction materials with a low environmental impact (also in terms of carbon incorporated) throughout the life cycle of the building

Comply data

Environmental labels Type I, II and III:
KEIM provides Environmental Product Declaration (EPD), for his interior silicate paints (Label Type III), valid until 03.04.2019.

This EDP is applicable for all the products analyzed in this file: KEIM Optil, KEIM Innotop, KEIM Innostar and KEIM Ecosil-ME. All the data of the DAPs comply with the UNE EN ISO 14025 and are verified according to the UNE EN 15804.

Life Cycle Analysis:
Impacts reflected in the EDP can be used for the LCA, contributing to the fulfillment of option 2. The impacts reflected in the EDPs of each product that can be used to calculate the LCA of the building are reflected below.
Results respond to a unit of 1kg of paint.

IIMPACT FROM CRADLE TO GATE	Total use of non-renewable primary energy resources	Global warming potential	Hazardous waste disposed	Non-hazardous waste disposed
Material (A1-A3)	MJ/uf	Kg CFC11-Eq/uf	Kg/uf	Kg/uf
Interior Paints KEIM	2.67E+1	2.34E-10	1.99E-3	6.07E-3

Test process

Environmental labels Type I, II and III:

- BREEAM ES Home: specify products with ecological labels Type I, II or III.
- BREEAM ES New Construction: specify products with Environmental Product Declarations (EDP) (Type III Label).

Life Cycle Analysis (LCA):
The project uses a life cycle analysis (LCA) tool that complies with the BREEAM specifications, to measure the environmental impact of the life cycle of the building elements.

Exemplary level criteria (1 extra point):

- BREEAM ES Home: as a result of the LCA, materials with less environmental impacts have been chosen in at least 6 elements of the building.

- BREEAM ES New Construction: rigorous LCAs have been carried out in which most of the elements of the building are included.

Analysis example *NA*

Support files ***DAP_interior_EN.pdf***

Baseline

- *UNE-EN ISO 14025:2010. Environmental labels and declarations. Environmental declarations type III. Principles and procedures. (ISO 14025: 2006)*
- *UNE-EN 15804:2012. Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.*
- *UNE-EN 15978:2012. Sustainability of the construction. Evaluation of the environmental behavior of buildings. Calculation methods.*

CATEGORY
MATERIALS

- **MAT3 – Responsible sourcing of materials (BREEAM ES NEW CONSTRUCTION 2015)**
- **MAT9 – Responsible sourcing of materials – basic elements of the building (BREEAM ES HOME 2011)**

Aim

To recognize and encourage the specification of responsibly sourced materials for key building elements, whose provisioning has been made responsibly.

Comply data

The production plant of all KEIM paints is located in Germany, in the KEIMFARBEN GMBH factory, located in Keimstrasse 16, D - 86420 Diedorf and has an environmental management system (EMS) certified by a third party for the manufacture of the products (Environmental Management System certified for the key process phase).

In **BREEAM EN New Construction 2015** the Environmental Management System certificate (EMS) for the key process phase corresponds to 3rd level of responsible procurement certification.

In **BREEAM ES Home 2011** the Environmental Management System certificate (EMS) for the key process phase corresponds to 4th level certification of responsible procurement certification.

Test process

Pre-requirement only in BREEAM ES New Construction:
Confirmation that all timber used on the project is "legally harvested and commercialized timber".

Requirement:
The number of BREEAM points achieved is determined with compliance with the requirements of responsible procurement by the main construction elements. To justify compliance, each product must be certified in accordance with any of the responsible supply systems approved by BREEAM.

Each of the materials is assigned to the level of certification of responsible provisioning with its corresponding score. The certification level is determined based on the rigor of the responsible supply that has been made to the suppliers / suppliers of each material / element (through the responsible supply certification systems). The responsible supply certification systems are those that are detailed below;

- BRE Global, BES6001 Product certification (or equivalent)
- Canadian Standards Association (CSA) Chain of Custody Schema (CoC) (endorsed by the PEFC) for chain of custody (CoC) certification
- Environmental management system (EMS) (certified) for the key process and supply chain extraction process
- Environmental management system (EMS) (certified) for the key process
- Wood with FLEGT license
- Forest Stewardship Council (FSC)

- Recycled materials with Certified EMS for key process.
- Re-used materials
- Malaysian Timber Certification Council (MTCC) with chain of custody certification (CoC)
- Program for the Endorsement of Forest Certification (PEFC) with chain of custody certification (CoC)
- Sustainable Forest Initiative (SFI) (endorsed by the PEFC) with chain of custody certification (CoC) with a declaration of 70% certified material.

Exemplary level criteria only in en BREEAM ES New Construction:
Where 70% of the available responsible sourcing points have been achieved.

Analysis example

NA

Support files

ISO_9001+14001.pdf

Baseline

- To consult a list of products approved under the BES6001 standard, as well as for additional information, visit: www.greenbooklive.com/
- Document to determine the validity of the FSC and PEFC certificates. http://www.pefc.org/index.php/certification-services/find-certified
- Databases to search certificate holders obtained in accordance with individual certification systems: http://info.fsc.org/ http://www.pefc.es
- UNE-EN ISO 14006: 2011. Environmental management systems. Guidelines for the incorporation of eco-design.
- ISO 14001 standard

CATEGORY
WASTE

RSD1 Construction waste management
(BREEAM ES NEW CONSTRUCTION 2015 and BREEAM ES HOME 2011)

Aim

To promote resource efficiency via the effective management and reduction of construction waste.

Comply data

All the packaging in which KEIM paints are delivered can be recycled.
At the following table, can's weights are specified according to the product and the available size for each of them.

PRODUCT	Format	Can weight (kg)
ECOSIL-ME	5lt	0.271 kg
	15lt	0.649 kg
OPTIL	5lt	0.271 kg
	15lt	0.649 kg
	1lt	0.075 kg
INNOSTAR	5lt	0.271 kg
	12.5lt	0.662 kg
INNOTOP	5lt	0.271 kg
	12.5lt	0662 kg

Test process

Compliance with this criterion is justified by means of a Site Waste Management of Construction or Demolition Study (SWMS) that meets certain requirements that ensure the minimization of hazardous and non-hazardous waste produced and complies with current regulations.
Prior to the execution of the work, a Site Waste Management Plan for Construction or Demolition (SWMP) must be rawn up in accordance with the previous Study carried out. Obtaining points is based on the% of waste diverted from landfill.

Exemplary level criteria (1 extra point):
• BREEAM ES Home: when you have achieved the 3 points, in addition, 95% of the waste has been diverted from landfill.
• BREEAM ES New Construction: when the other criteria have been met, 95% of the waste has been diverted from landfill (a 25% improvement from the national rate).

Analysis example

NA

Support files

DAP_interior_EN.pdf
FT_Ecosil-ME.pdf
FT_Optil.pdf

FT_Innostar.pdf
FT_Innotop.pdf
Peso envases.pdf

Baseline *NA*

CATEGORY
INNOVATION

INNOVATION
(BREEAM ES NEW CONSTRUCTION 2015, BREEAM ES HOME 2011)

Aim

To support innovation within the construction industry through the recognition of sustainability related benefits which are not rewarded by standard BREEAM issues.

Comply data

KEIM interior paints can contribute to the fulfillment criteria of exemplary performance in the next requirements:

- SYB8, Indoor air quality
- SYB2, Indoor air quality
- MAT1, Life cycle impacts
- MAT3, Responsible sourcing of materials
- MAT8, Materials of low environmental impact
- RSD1, Construction waste management

Test process

Up to 10 innovation points can be obtained by a combination of the following options:

Exemplary performance in existing Requirements
Some BREEAM credits give the option to obtain extra score for demonstrating an exemplary efficiency through the achievement of the exemplary performance criteria defined there.

Approved innovations
An extraordinary point may be obtained for each Request for Innovation Approved by BREEAM ES provided that the criteria defined in an approved innovation application form are met.

Analysis example

NA

Support files

See corresponding requirements

Baseline

See corresponding requirements