# Statement of Verification

BREG EN EPD No.: 000440 Issue 01

This is to verify that the

**Environmental Product Declaration**

provided by:

Hempel A/S

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 kilogram of Hemucryl 48191 paint

## Company Address

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| | | |
|---|---|---|
| Signed for BRE Global Ltd | Emma Baker<br>Operator | 16 August 2022<br>Date of this Issue |
| 16 August 2022<br>Date of First Issue | | 15 August 2027<br>Expiry Date |



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# Environmental Product Declaration

## EPD Number: 000440

## General Information

| EPD Programme Operator | Applicable Product Category Rules |
|---|---|
| BRE Global<br>Watford, Herts<br>WD25 9XX<br>United Kingdom | BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.0 |
| **Commissioner of LCA study** | **LCA consultant/Tool** |
| HEMPEL A/S<br>Lundtoftegårdsvej 91<br>DK-2800 Kgs. Lyngby<br>Denmark | ITeC - The Catalonia Institute of Construction Technology<br>Wellington 19 - ES08018 Barcelona - Tel 933 093 404<br>www.itec.cat<br><br>SimaPro Version 9.1.1 by PRé Sustainability BV. |
| **Declared/Functional Unit** | **Applicability/Coverage** |
| 1 kilogram of Hemucryl 48191 paint | Product Specific |
| **EPD Type** | **Background database** |
| Cradle to Gate with Modules C and D | Ecoinvent v3.6 (2019) database<br>CEPE Raw Material database v3.0 |
| **Demonstration of Verification** | |
| CEN standard EN 15804 serves as the core PCR [a] | |
| Independent verification of the declaration and data according to EN ISO 14025:2010<br>☐Internal ☒ External | |
| (Where appropriate [b])Third party verifier:<br>Pat Hermon | |
| a: Product category rules<br>b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4) | |
| **Comparability** | |
| Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance | |

## Information modules covered

| Product | | | Construction | | Use stage | | | | | | | End-of-life | | | | Benefits and loads beyond the system boundary |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Related to the building fabric | | | | | Related to the building | | | | | | |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Raw materials supply | Transport | Manufacturing | Transport to site | Construction – Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction demolition | Transport | Waste processing | Disposal | Reuse, Recovery and/or Recycling potential |
| ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☑ | ☑ | ☑ | ☑ | ☑ |

Note: Ticks indicate the Information Modules declared.

## Manufacturing site(s)

The transport distances were adapted to the factory, specific transport distances for each provider were used for raw material transport. The manufacturing site included in this EPD is:

Hempel (Portugal) S.A.
Vale de Cantadores, 2954-002
Palmela, Portugal

# Construction Product:

## Product Description

This EPD is representative for Hemucryl 48191.

The product is a waterborne paint based on acrylic dispersion with excellent anticorrosive properties. The product contains anticorrosive pigments. Especially suited for application in shops by airless spray, but also suited for roller and brush application.

Hemucryl 48191 is recommended as self-primed coating system for new steel and repair and maintenance of old steel-work in moderate corrosive environments up to ISO 12944 C3 high.

The product is recommended for infrastructure, civil structures, transmission towers, freight containers, cranes, rail cargo, mining equipment, heavy duty equipment, mechanical and plant engineering.

## Technical Information

| Property | Value, Unit |
|---|---|
| Relative density | 1.3 kg/l |
| Solids by volume | 52 ± 2% |
| Dry film thickness | 75 – 150 µm |
| Wet film thickness | 150 – 290 µm |
| Theoretical spreading rate | 6.9 – 3.5 m²/l |
| Coverage | 0.19 – 0.38 kg/m² |

## Product Contents

The material composition of the declared product:

| Material/Chemical Input | % |
|---|---|
| Filler | < 25 |
| Binder | 25 - 50 |
| Pigments | < 25 |
| Solvents | 25 - 50 |
| Additives | < 15 |

## Manufacturing Process

The manufacturing process for coatings involves combining and mixing multiple chemicals and materials into a homogenous product, which is then packaged and distributed.

## Process flow diagram


## End of Life

Coatings are typically disposed of with the substrate they are painted on. This can be through recycling, incineration or landfill, but the coating itself is unlikely to be separated from the substrate during the disposal process.

# Life Cycle Assessment Calculation Rules

## Declared / Functional unit description

1 kilogram of Hemucryl 48191 paint.

## System boundary

The chosen system has been Cradle to Gate with Modules C and D, which means that the Life Cycle Assessment is contemplated from the manufacturing of the paints until they leave the factory, considering the end-of-life stage and the benefits and loads beyond the system boundary.

## Data sources, quality and allocation

To carry out this study, 2021 (January 1, 2021 - December 31, 2021) has been considered as the reference year.

The background databases are Ecoinvent v3.6 (2019) Database for the general model and CEPE Raw Material database v3.0 for raw materials.

The quality of the data and the uncertainties associated with the inventories of each input are also analysed in accordance to Table E.1 of Annex E - Schemes to be applied for data quality assessment of generic and specific data of the EN 15804:2012+A2:2019 standard.

## Cut-off criteria

For the present analysis, more than 99% of the mass and energy inputs and outputs of the system have been considered, leaving out diffuse emissions in the factory and the production of manufacturing infrastructure such as industrial machinery and equipment. On the other hand, those suppliers or manufacturers of raw materials that supply less than 5% of the total raw material consumption have been omitted. The remaining suppliers have been adjusted proportionally to 100% to balance this deficit.

## LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | GWP-total | GWP-fossil | GWP-biogenic | GWP-luluc | ODP | AP | EP-freshwater |
| | | | kg $CO_2$ eq | kg $CO_2$ eq | kg $CO_2$ eq | kg $CO_2$ eq | kg CFC11 eq | mol $H^+$ eq | kg $(PO_4)^{3-}$ eq |
| Product stage | Raw material supply | A1 | AGG | AGG | AGG | AGG | AGG | AGG | AGG |
| | Transport | A2 | AGG | AGG | AGG | AGG | AGG | AGG | AGG |
| | Manufacturing | A3 | AGG | AGG | AGG | AGG | AGG | AGG | AGG |
| | Total (of product stage) | A1-3 | 2.32E+00 | 2.26E+00 | 5.93E-02 | 4.28E-04 | 1.51E-07 | 1.55E-02 | 7.53E-04 |
| Construction process stage | Transport | A4 | MND | MND | MND | MND | MND | MND | MND |
| | Construction | A5 | MND | MND | MND | MND | MND | MND | MND |
| Use stage | Use | B1 | MND | MND | MND | MND | MND | MND | MND |
| | Maintenance | B2 | MND | MND | MND | MND | MND | MND | MND |
| | Repair | B3 | MND | MND | MND | MND | MND | MND | MND |
| | Replacement | B4 | MND | MND | MND | MND | MND | MND | MND |
| | Refurbishment | B5 | MND | MND | MND | MND | MND | MND | MND |
| | Operational energy use | B6 | MND | MND | MND | MND | MND | MND | MND |
| | Operational water use | B7 | MND | MND | MND | MND | MND | MND | MND |
| End of life | Deconstruction, demolition | C1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Transport | C2 | 4.05E-03 | 4.05E-03 | 1.66E-06 | 3.21E-08 | 9.40E-10 | 8.01E-06 | 2.03E-08 |
| | Waste processing | C3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disposal | C4 | 1.14E-01 | 1.14E-01 | 9.03E-05 | 2.03E-06 | 9.56E-10 | 4.97E-05 | 6.58E-07 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
GWP-biogenic = Global warming potential, biogenic;
GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;
AP = Acidification potential, accumulated exceedance; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | EP-marine | EP-terrestrial | POCP | ADP-mineral& metals | ADP-fossil | WDP | PM |
| | | | kg N eq | mol N eq | kg NMVOC eq | kg Sb eq | MJ, net calorific value | $m^3$ world eq deprived | disease incidence |
| Product stage | Raw material supply | A1 | AGG | AGG | AGG | AGG | AGG | AGG | AGG |
| | Transport | A2 | AGG | AGG | AGG | AGG | AGG | AGG | AGG |
| | Manufacturing | A3 | AGG | AGG | AGG | AGG | AGG | AGG | AGG |
| | Total (of product stage) | A1-3 | 2.50E-03 | 2.45E-02 | 8.30E-03 | 7.55E-04 | 3.86E+01 | 2.03E+01 | 2.28E-07 |
| Construction process stage | Transport | A4 | MND | MND | MND | MND | MND | MND | MND |
| | Construction | A5 | MND | MND | MND | MND | MND | MND | MND |
| Use stage | Use | B1 | MND | MND | MND | MND | MND | MND | MND |
| | Maintenance | B2 | MND | MND | MND | MND | MND | MND | MND |
| | Repair | B3 | MND | MND | MND | MND | MND | MND | MND |
| | Replacement | B4 | MND | MND | MND | MND | MND | MND | MND |
| | Refurbishment | B5 | MND | MND | MND | MND | MND | MND | MND |
| | Operational energy use | B6 | MND | MND | MND | MND | MND | MND | MND |
| | Operational water use | B7 | MND | MND | MND | MND | MND | MND | MND |
| End of life | Deconstruction, demolition | C1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Transport | C2 | 1.33E-06 | 1.48E-05 | 5.25E-06 | 2.39E-10 | 5.74E-02 | -1.26E-05 | 2.33E-10 |
| | Waste processing | C3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disposal | C4 | 2.06E-05 | 2.24E-04 | 8.72E-05 | 2.53E-09 | 7.16E-02 | 1.85E-04 | 1.22E-09 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

## LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | IRP | ETP-fw | HTP-c | HTP-nc | SQP |
| | | | kBq $U^{235}$ eq | CTUe | CTUh | CTUh | dimensionless |
| Product stage | Raw material supply | A1 | AGG | AGG | AGG | AGG | AGG |
| | Transport | A2 | AGG | AGG | AGG | AGG | AGG |
| | Manufacturing | A3 | AGG | AGG | AGG | AGG | AGG |
| | Total (of product stage) | A1-3 | 3.71E-01 | 3.10E+02 | 3.39E-09 | 1.26E-07 | 8.81E+00 |
| Construction process stage | Transport | A4 | MND | MND | MND | MND | MND |
| | Construction | A5 | MND | MND | MND | MND | MND |
| Use stage | Use | B1 | MND | MND | MND | MND | MND |
| | Maintenance | B2 | MND | MND | MND | MND | MND |
| | Repair | B3 | MND | MND | MND | MND | MND |
| | Replacement | B4 | MND | MND | MND | MND | MND |
| | Refurbishment | B5 | MND | MND | MND | MND | MND |
| | Operational energy use | B6 | MND | MND | MND | MND | MND |
| | Operational water use | B7 | MND | MND | MND | MND | MND |
| End of life | Deconstruction, demolition | C1 | 0 | 0 | 0 | 0 | 0 |
| | Transport | C2 | 2.58E-04 | 2.31E-02 | 3.01E-13 | 3.61E-11 | 1.43E-04 |
| | Waste processing | C3 | 0 | 0 | 0 | 0 | 0 |
| | Disposal | C4 | 4.38E-04 | 6.52E-02 | 7.12E-12 | 8.43E-11 | 1.76E-01 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0 | 0 | 0 | 0 | 0 |

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

## LCA Results (continued)

| Parameters describing resource use, primary energy | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | PERE | PERM | PERT | PENRE | PENRM | PENRT |
| | | | MJ | MJ | MJ | MJ | MJ | MJ |
| Product stage | Raw material supply | A1 | AGG | AGG | AGG | AGG | AGG | AGG |
| | Transport | A2 | AGG | AGG | AGG | AGG | AGG | AGG |
| | Manufacturing | A3 | AGG | AGG | AGG | AGG | AGG | AGG |
| | Total (of product stage) | A1-3 | 2.81E+00 | 7.04E-01 | 3.51E+00 | 4.13E+01 | 3.82E-01 | 4.17E+01 |
| Construction process stage | Transport | A4 | MND | MND | MND | MND | MND | MND |
| | Construction | A5 | MND | MND | MND | MND | MND | MND |
| Use stage | Use | B1 | MND | MND | MND | MND | MND | MND |
| | Maintenance | B2 | MND | MND | MND | MND | MND | MND |
| | Repair | B3 | MND | MND | MND | MND | MND | MND |
| | Replacement | B4 | MND | MND | MND | MND | MND | MND |
| | Refurbishment | B5 | MND | MND | MND | MND | MND | MND |
| | Operational energy use | B6 | MND | MND | MND | MND | MND | MND |
| | Operational water use | B7 | MND | MND | MND | MND | MND | MND |
| End of life | Deconstruction, demolition | C1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Transport | C2 | 8.03E-05 | 0 | 8.03E-05 | 6.10E-02 | 0 | 6.10E-02 |
| | Waste processing | C3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disposal | C4 | 1.84E-03 | 0 | 1.84E-03 | 7.60E-02 | 0 | 7.60E-02 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0 | 0 | 0 | 0 | 0 | 0 |

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

## LCA Results (continued)

| Parameters describing resource use, secondary materials and fuels, use of water | | | | | | |
|---|---|---|---|---|---|---|
| | | | SM | RSF | NRSF | FW |
| | | | kg | MJ net calorific value | MJ net calorific value | $m^3$ |
| Product stage | Raw material supply | A1 | AGG | AGG | AGG | AGG |
| | Transport | A2 | AGG | AGG | AGG | AGG |
| | Manufacturing | A3 | AGG | AGG | AGG | AGG |
| | Total (of product stage) | A1-3 | 0 | 0 | 0 | 4.73E-01 |
| Construction process stage | Transport | A4 | MND | MND | MND | MND |
| | Construction | A5 | MND | MND | MND | MND |
| Use stage | Use | B1 | MND | MND | MND | MND |
| | Maintenance | B2 | MND | MND | MND | MND |
| | Repair | B3 | MND | MND | MND | MND |
| | Replacement | B4 | MND | MND | MND | MND |
| | Refurbishment | B5 | MND | MND | MND | MND |
| | Operational energy use | B6 | MND | MND | MND | MND |
| | Operational water use | B7 | MND | MND | MND | MND |
| End of life | Deconstruction, demolition | C1 | 0 | 0 | 0 | 0 |
| | Transport | C2 | 0 | 0 | 0 | 8.60E-08 |
| | Waste processing | C3 | 0 | 0 | 0 | 0 |
| | Disposal | C4 | 0 | 0 | 0 | 9.51E-06 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0 | 0 | 0 | 0 |

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

## LCA Results (continued)

| Other environmental information describing waste categories | | | | | |
|---|---|---|---|---|---|
| | | | HWD | NHWD | RWD |
| | | | kg | kg | kg |
| Product stage | Raw material supply | A1 | AGG | AGG | AGG |
| | Transport | A2 | AGG | AGG | AGG |
| | Manufacturing | A3 | AGG | AGG | AGG |
| | Total (of product stage) | A1-3 | 4.61E-02 | 1.57E-01 | 5.31E-05 |
| Construction process stage | Transport | A4 | MND | MND | MND |
| | Construction | A5 | MND | MND | MND |
| Use stage | Use | B1 | MND | MND | MND |
| | Maintenance | B2 | MND | MND | MND |
| | Repair | B3 | MND | MND | MND |
| | Replacement | B4 | MND | MND | MND |
| | Refurbishment | B5 | MND | MND | MND |
| | Operational energy use | B6 | MND | MND | MND |
| | Operational water use | B7 | MND | MND | MND |
| End of life | Deconstruction, demolition | C1 | 0 | 0 | 0 |
| | Transport | C2 | 1.52E-07 | 3.06E-06 | 4.16E-07 |
| | Waste processing | C3 | 0 | 0 | 0 |
| | Disposal | C4 | 1.51E-07 | 1.00E+00 | 4.54E-07 |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D | 0 | 0 | 0 |

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

## LCA Results (continued)

| Other environmental information describing output flows – at end of life | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | CRU | MFR | MER | EE | Biogenic carbon (product) | Biogenic carbon (packaging) |
| | | | kg | kg | kg | MJ per energy carrier | kg C | kg C |
| Product stage | Raw material supply | A1 | AGG | AGG | AGG | AGG | AGG | AGG |
| | Transport | A2 | AGG | AGG | AGG | AGG | AGG | AGG |
| | Manufacturing | A3 | AGG | AGG | AGG | AGG | AGG | AGG |
| | Total (of product stage) | A1 -3 | 0 | 8.17E-02 | 0 | 0 | 0 | 0 |
| Construction process stage | Transport | A4 | MND | MND | MND | MND | MND | MND |
| | Construction | A5 | MND | MND | MND | MND | MND | MND |
| Use stage | Use | B1 | MND | MND | MND | MND | MND | MND |
| | Maintenance | B2 | MND | MND | MND | MND | MND | MND |
| | Repair | B3 | MND | MND | MND | MND | MND | MND |
| | Replacement | B4 | MND | MND | MND | MND | MND | MND |
| | Refurbishment | B5 | MND | MND | MND | MND | MND | MND |
| | Operational energy use | B6 | MND | MND | MND | MND | MND | MND |
| | Operational water use | B7 | MND | MND | MND | MND | MND | MND |
| End of life | Deconstruction, demolition | C1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Transport | C2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Waste processing | C3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Disposal | C4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Potential benefits and loads beyond the system | Reuse, recovery, recycling potential | D | 0 | 0 | 0 | 0 | 0 | 0 |

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

## Scenarios and additional technical information

| Scenarios and additional technical information | | | |
|---|---|---|---|
| Scenario | Parameter | Units | Results |
| A4 – Transport to the building site | Module not declared | | |
| A5 – Installation in the building | Module not declared | | |
| B2 – Maintenance | Module not declared | | |
| B3 – Repair | Module not declared | | |
| B4 – Replacement | Module not declared | | |
| B5 – Refurbishment | Module not declared | | |
| Reference service life | Module not declared | | |
| B6 – Use of energy; B7 – Use of water | Module not declared | | |
| C1 to C4 End of life, | Waste for final disposal: Landfill | % | 100 |
| | Transport to waste processing: Truck, fuel consumption | kgkm | 3.66E-05 |
| | Transport to waste processing: Distance | km | 30 |
| | Transport to waste processing: Capacity utilisation | % | 85 |
| Module D | Module declared | | |

## Interpretation

The results displayed in Figure 1 apply to 1 kilogram of Hemucryl 48191 paint. It illustrates the relative contributions of the different modules assessed to various environmental impact categories and to primary energy use. Most impacts relate to the raw materials that compose the paint (included in Module A1-A3).

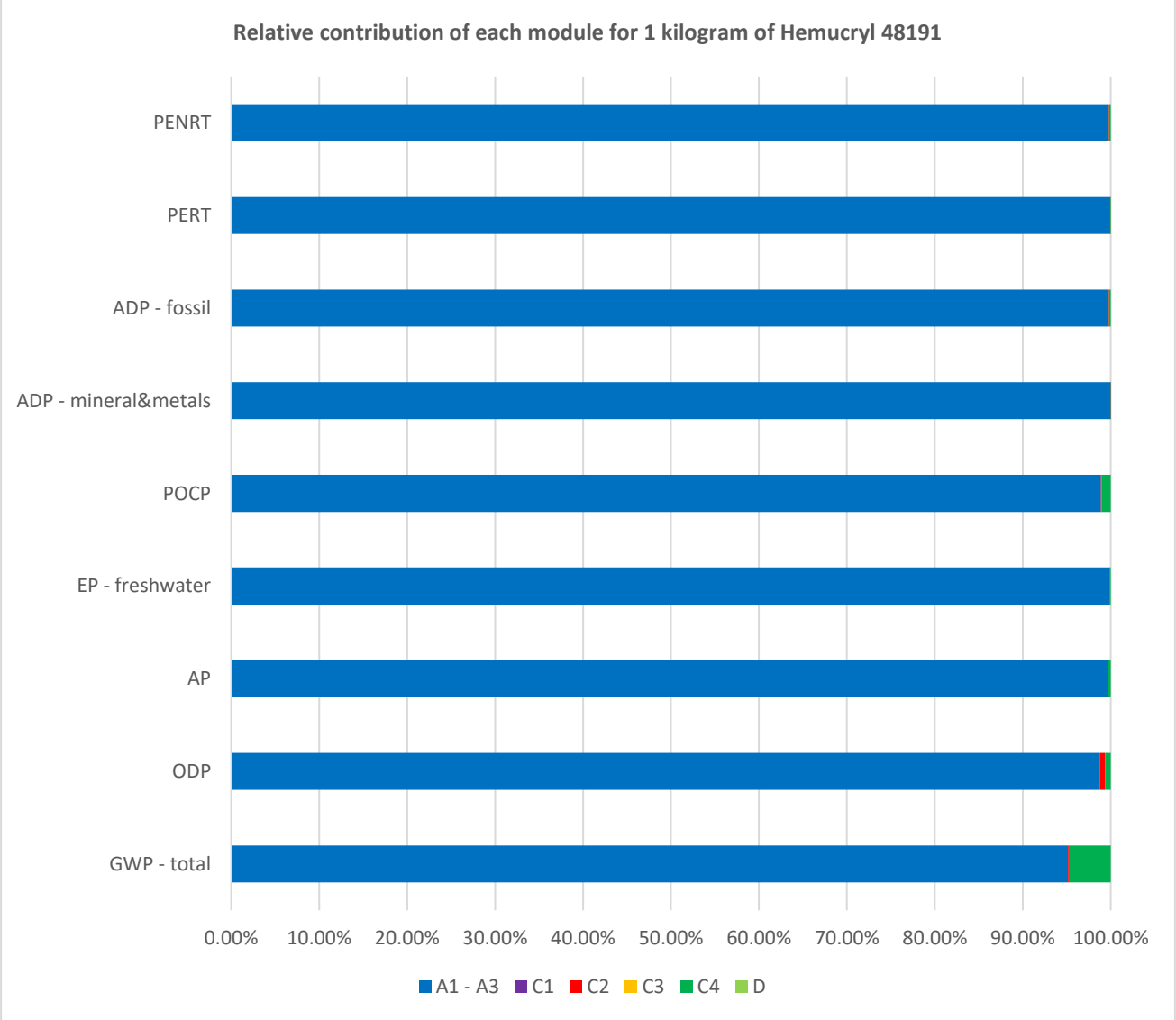


Figure 1*: Relative contribution of each module for 1 kilogram of Hemucryl 48191 paint.*

Raw material manufacturing and transport (53%), packaging (40%) and consumption (7%) account for the total of the use of renewable primary energy resources (PERT). The manufacturing of raw materials and its transport (89%) has the greatest impact on the use of non-renewable primary energy resources (PENRT), while the impact of the production process (due to fuel consumption and product packaging) measures 11%.
The pre-product manufacturing (raw materials and its distribution) is the main contributor in all impact categories for Module A1-A3 with an average of 74%.

## References


BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

Ecoinvent Version 3.6: Database for Life Cycle Assessment. Swiss Centre for Life Cycle Inventories (ecoinvent Centre), 2019.

CEPE Raw Material database v3.0: Raw materials LCI database for the European coatings and printing ink industries. The European Council of the Paint, Printing Ink, and Artist's Colours Industry (CEPE), 2016.

Life Cycle Assessment: Hempadur Speed-Dry ZP 600 & Hemucryl 48191. LCA report by The Catalonia Institute of Construction Technology (ITeC), 2022.