

ENVIRONMENTAL PRODUCT DECLARATION

EPD of multiple products based on the average results of the product group in accordance with ISO 14025 and EN 15804+A2:2019 for



CHEMFIX 100 (PURE EPOXY RESIN)

Manufactured by Chemfix Products Ltd



Programme: The International EPD® System
Programme operator: EPD International AB
EPD registration number: EPD-IES-00194-22:001
Version Date: 2025-02-10
Validity Date: 2030-02-09
Geographical Scope: UK, EU, Global

An EPD may be updated or de-published if conditions change. To find the latest version of the EPD and confirm its validity, see www.environdec.com.



CHEMFIX 100 (PURE EPOXY RESIN)

Company Information

Chemfix Products Ltd is a private label manufacturer providing goods and services to our customers all over the world. Chemfix has specialised in manufacturing chemical anchoring solutions for over three decades, to become one of the largest OEM suppliers in the world.

At Chemfix, sustainability is more than just a goal—it's our responsibility. As a leader in chemical solutions, we are dedicated to minimizing our environmental impact while maximizing the value we deliver to our customers. Our commitment to sustainability drives every aspect of our operations, from sourcing eco-friendly materials to innovating greener product formulations.

Chemfix is a member of Briolf Group; an industrial group focused on the specialty chemicals sector, comprising of 8 companies, with a team of +1100 members and present in more than 120 countries.



CHEMFIX 100 (PURE EPOXY RESIN)

About the product

The declared product Chemfix 100 is a solvent free two component pure epoxy resin based chemical anchoring injection system. The epoxy resin and the hardener are in a 1:1 volume ratio. The mixing ratio between the resin component and the hardener component is set automatically as the product is pushed out of the cartridge. Curing begins immediately after the components are mixed. The product is dispensed from a plastic cartridge through a static mixer using a manual, battery-operated or pneumatic extrusion tool. It was developed principally to anchor threaded rods and rebar into cracked and uncracked concrete and in dynamic applications such as Seismic. Suitable for Post Install Rebar applications for concrete connections. Used widely for heavy duty professional applications.

The product UN CPC code is 354. Chemical products n.e.c.

The declared product Chemfix 100 can be in the following pack sizes (by volume): 400ml, 600ml, 1500ml. These are the Chemfix 100 products that are included in this EPD.

Characteristics

- Suitable for heavy duty applications featuring large diameter and deep embedments.
- Longer working times make it suitable for large holes and high temperatures.
- No shrinkage, good for large diameter fixings.
- Use in dry/wet environments and flooded holes, or underwater.
- High durability, resistance to chemicals.
- Used for diamond drilled holes.
- Solvent free resin.
- Fixings in concrete (suitable for Seismic C1 and C2), wood, stone or other high strength materials.



The following technical data are relevant for the declared product Chemfix 100 as delivered.

Storage

- Storage temperatures should be between +5°C to +25°C.
- Avoid direct sunlight.

Shelf life

- 24 months from the date of manufacture.

Further technical details are provided in the additional information section below.





CHEMFIX 100 (PURE EPOXY RESIN)

General Information

This EPD provides current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

The programme operator is the International EPD® System EPD International AB, Box 210 60, SE-100 31 Stockholm.

Product category rules

CEN standard EN 15804 serves as the Core Product Category Rules (PCR). Product Category Rules (PCR): 2019:14 Version 1.3.4, Construction Products, EN 15804:2012 + A2:2019 Sustainability of Construction Works. PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile.

LCA Accountability: Valpak Sustainability Consulting



Third-party Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

- ✓ EPD verification by individual verifier

Third-party verifier: Dr Callum Hill, JCH Industrial Ecology Ltd.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Chemfix Products Ltd is the owner of this EPD and has the sole ownership, liability and responsibility of the EPD. Contact: Mr Freddie Marris, f.marris@chemfix.co.uk

The production site is located at Chemfix Products Ltd, Mill Street East, Dewsbury, West Yorkshire WF12 9BQ UK.



Life Cycle Assessment Methodology

Declared unit

1 kg of packaged Chemfix 100 which can be in the following pack sizes (by volume): 400ml, 600ml, 1500ml.

Reference service life

See additional information

Time representativeness

2023

Database and LCA software

GreenDelta's EN15804 Add-on version 2¹ and OpenLCA Version 2.2.0. CFs are EF 3.1 EN15804 method as implemented by Ecoinvent.

System boundaries

Cradle to gate with modules C1-C4 and module D. Excluded options are modules A4,A5 and modules B1-B7. Capital goods/infrastructure are excluded from the system boundary in line with the LCA report. Disclaimer: The results of A1-A3 shall not be used without considering the results of module C.

LCA modelling

There is no allocation of co-products in the LCA modelling underpinning this EPD. No cut-offs are applied to either the inventory data or the calculated environmental impacts. As per the requirements of the International EPD® system, the EPD results are shown in the results tables.

Audience

The intended application for this EPD is to provide comprehensive information on the environmental impacts of the range of Chemfix Ltd's chemical anchors. The intended audience is B2B.

Content declaration

The products included in this EPD contain the following component volumes:

Product Components	Weight %	% post-consumer recycled material – weight % of product	Biogenic material weight - % of product	Biogenic material weight – kg C per product
Part A: Epoxy Resin	75 - 85	0%	0%	0
Part A: Filler	5 - 20	0%	0%	0
Part A: Other	5 - 10	0%	0%	0
Part B: Hardener	25 - 35	0%	0%	0
Part B: Filler	55 - 75	0%	0%	0
Part B: Other	< 5	0%	0%	0

The products in this EPD include packaging materials in the following amounts (weighted average across all pack sizes):

Packaging materials	Weight (kg)	Weight - % (versus the product)	Biogenic material weight – kg C per product
Paper	0.00596	0.6%	0.00209
Plastic	0.181	18.1%	0
Total	0.187	18.7%	0.00209

¹ Contains LCI datasets from Ecoinvent 3.9.1.



CHEMFIX 100 (PURE EPOXY RESIN)

Dangerous substances

The products/articles, or any components **do not** contain:

- 1) Substances from the ECHA Candidate List of Substances of Very High Concern (SVHC) (as of June 10, 2022) in concentrations exceeding 0.1% by mass.
- 2) Biocidal products, nor has it been treated with biocidal products, as defined by the (EU) Regulation on Biocidal Products No. 528/2012.
- 3) The products/articles or any components **do contain** Category 1A or 1B CMR substances exceeding 0.1% by mass that are not on the candidate list as follows:

CMR substance category 1A or 1B, not on ECHA candidate list exceeding 0.1% mass	EC No.	CAS No.	Weight-% per declared unit
1,6-HEXANDIOLDIGLYCIDYLETHER	618-939-5	933999-84-9	10 – 20



CHEMFIX 100 (PURE EPOXY RESIN)

Product Life Cycle Overview

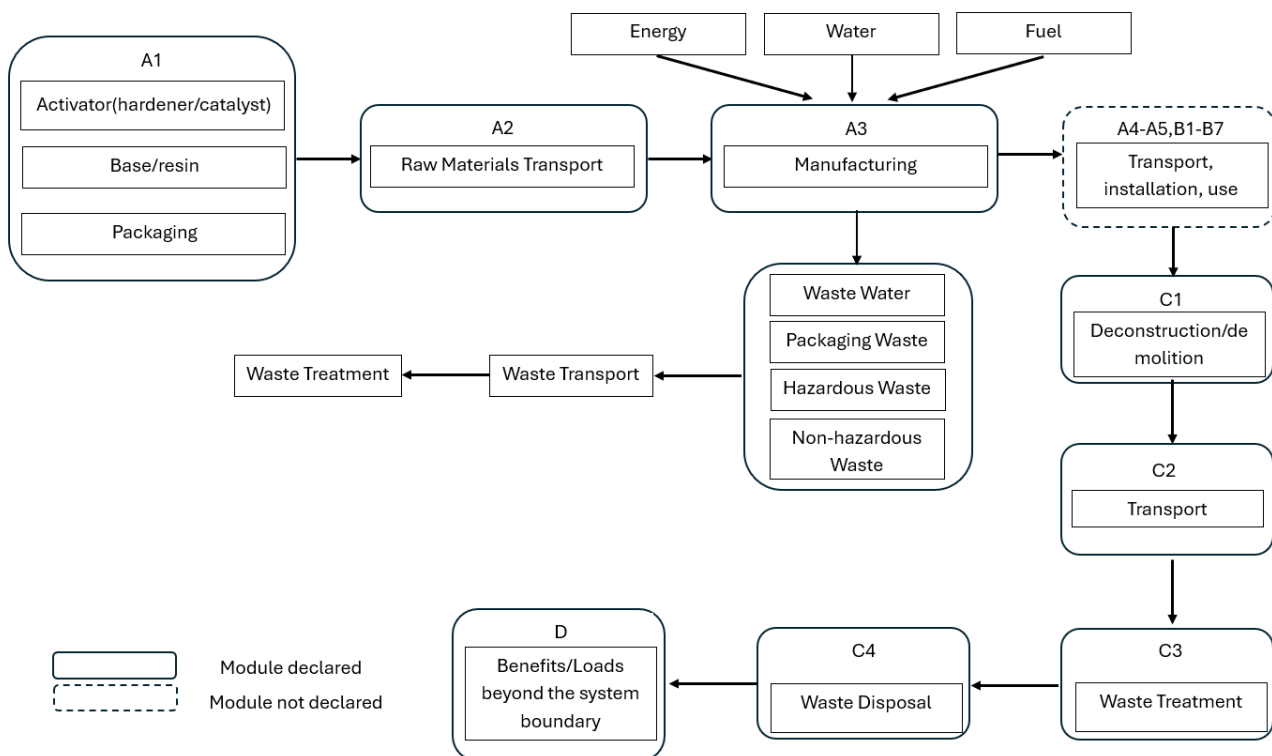
Modules declared in the EPD

Module	Product stage			Construction		Use stage							End of Life stage				Benefits / loads beyond the system boundary
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
Module declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU, GLO	EU, GLO	UK	-	-	-	-	-	-	-	-	-	UK	UK	UK	UK	UK
Specific data used	10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation* – products	-5% to +1%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation* – sites	n/a			-	-	-	-	-	-	-	-	-	-	-	-	-	-

*GWP-GHG A1-A3 relative to average product.

A1 = Raw materials supply, A2 = Transport, A3 = Manufacturing, A4 = Transport, A5 = Construction/installation, B1 = Use, B2 = Maintenance, B3 = Repair, B4 = replacement, B5 = Refurbishment, B6 = Operational energy use, B7 = Operational water use, C1 = De-construction/demolition, C2 = Transport, C3 = Waste treatment, C4 = Waste disposal
 D = Benefits/loads beyond the system boundary
 X = Module declared, ND = Module not declared

System diagram





CHEMFIX 100 (PURE EPOXY RESIN)

Raw materials supply (A1)

The extraction and processing of raw materials used to manufacture the resin and hardener at the production site in the UK, and the product's packaging

Transport (A2)

Transport of materials and packaging from supplier locations to the production site in the UK. Supplier locations and transport modes are provided by Chemfix Ltd and include the below.

Mode	Vehicle type	Fuel type
Road	Lorry, 16 – 32 tonnes, EURO6	Diesel
Sea	Container ship	Heavy fuel oil
	Ferry	Heavy fuel oil

Manufacturing (A3)

Usage amounts of energy, fuels and water etc are allocated according to 2023 production data supplied by Chemfix Ltd. The climate change GWP impact of electricity used in manufacturing is 0.295 kg CO₂eq per kWh, based on the UK grid supply mix in 2020.

De-construction/demolition (C1)

There are no environmental impacts associated with the removal of the chemical anchor products at EoL included in this EPD.

Waste transport (C2)

On average, the transport by road to local waste sites from the installation site is assumed to be a journey of 100 km by diesel lorry, 16-32 tonnes, EURO6.

Waste disposal (C4)

100% of EoL materials are sent to incineration (with energy recovery) in the UK.

Benefits (D)

The main benefit beyond the system boundary arises from the heat recovered from incineration of EoL materials (1 MJ heat is assumed to avoid 0.077 kgCO₂eq).

Excluded from the system boundary

The environmental impacts of buildings and infrastructure, plant, machinery and equipment, and repair/maintenance at the two production sites are excluded, as are impacts from business travel and staff commuting.



CHEMIFIX 100 (PURE EPOXY RESIN)

Mandatory Impact Category Indicators According to EN15804

Environmental Indicators (per kg of CHEMIFIX 100)

Environmental Indicators	Units	Raw Materials supply transport and production	End of life				Benefits/ loads beyond the system boundary
			A1-A3	C1	C2	C3	
GWP-Total	kg CO₂ eq.	3.50E+00	0.00E+00	2.19E-02	0.00E+00	6.17E-01	-6.45E-01
GWP-fossil	kg CO ₂ eq.	3.51E+00	0.00E+00	2.19E-02	0.00E+00	6.17E-01	-6.45E-01
GWP- biogenic	kg CO ₂ eq.	-7.65E-03	0.00E+00	0.00E+00	0.00E+00	7.65E-03	0.00E+00
GWP-LULUC	kg CO ₂ eq.	3.08E-03	0.00E+00	1.08E-05	0.00E+00	1.18E-05	-9.75E-05
ODP	kg CFC11 eq.	3.01E-07	0.00E+00	4.77E-10	0.00E+00	1.77E-09	-2.83E-08
AP	molc H ⁺ eq.	1.75E-02	0.00E+00	4.79E-05	0.00E+00	3.47E-04	-5.28E-04
EP - freshwater	kg P eq.	9.81E-04	0.00E+00	1.56E-06	0.00E+00	4.52E-05	-2.30E-05
EP - marine	kg N eq.	2.92E-03	0.00E+00	1.21E-05	0.00E+00	1.89E-04	-1.62E-04
EP - terrestrial	molc N eq.	3.21E-02	0.00E+00	1.23E-04	0.00E+00	1.61E-03	-1.74E-03
POCP	kg NMVOC eq.	1.24E-02	0.00E+00	7.44E-05	0.00E+00	4.21E-04	-1.12E-03
ADP - minerals and metals*	kg Sb eq.	3.77E-05	0.00E+00	7.33E-08	0.00E+00	8.73E-08	-6.70E-07
ADP - fossil*	MJ	7.33E+01	0.00E+00	3.14E-01	0.00E+00	3.89E-01	-9.61E+00
WDP*	m ³	2.10E+00	0.00E+00	1.56E-03	0.00E+00	8.23E-02	-2.23E-02

GWP-biogenic = Global warming potential biogenic, GWP-fossil = Global warming potential fossil fuels, GWP-LULUC= Global warming potential land use and land use change, GWP - Total = Total global warming potential, ODP = Ozone layer depletion potential, AP = Acidification potential, EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment, EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment, EP-terrestrial = Eutrophication potential terrestrial, POCP = Formation potential of tropospheric ozone, ADP - minerals and metals = Abiotic depletion potential for non-fossil resources, ADP - fossil = Abiotic depletion for fossil resources potential, WDP = Water use deprivation potential.

Disclaimer – 1: The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

*Disclaimer – 2: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.



CHEMFIX 100 (PURE EPOXY RESIN)

Additional Mandatory Indicators Results

GWP-GHG (per kg of CHEMFIX 100)

Environmental Indicators	Units	Raw Materials supply transport and production	End of life				Benefits/ loads beyond the system boundary
			A1-A3	C1	C2	C3	
GWP-GHG ¹	Kg CO ₂ eq.	3.52E+00	0.00E+00	2.19E-02	0.00E+00	6.17E-01	-6.45E-01

¹This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Resource Use Indicators (per kg of CHEMFIX 100)

Environmental Indicators	Units	Raw Materials supply transport and production	End of life				Benefits/ loads beyond the system boundary
			A1-A3	C1	C2	C3	
PERE	MJ	3.82E+00	0.00E+00	4.89E-03	0.00E+00	1.24E-02	-9.18E-02
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.82E+00	0.00E+00	4.89E-03	0.00E+00	1.24E-02	-9.18E-02
PENRE	MJ	6.76E+01	0.00E+00	2.87E-01	0.00E+00	3.66E-01	-9.15E+00
PENRM	MJ	5.67E+00	0.00E+00	2.72E-02	0.00E+00	2.25E-02	-4.58E-01
PENRT	MJ	7.33E+01	0.00E+00	3.14E-01	0.00E+00	3.89E-01	-9.61E+00
SM	kg	1.58E-01	0.00E+00	3.44E-04	0.00E+00	-1.13E-02	-5.98E-03
RSF	MJ	5.93E-02	0.00E+00	9.27E-05	0.00E+00	2.07E-04	-2.35E-03
NRSF	MJ	1.36E-01	0.00E+00	1.82E-04	0.00E+00	5.51E-04	-3.00E-03
FW	m ³	4.93E-02	0.00E+00	3.79E-05	0.00E+00	1.32E-03	-5.62E-04

PENRT = Total use of non-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,
 PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials,
 PERM = Use of renewable primary energy resources used as raw materials
 PERT = Total use of renewable primary energy resources FW = Use of net fresh water, SM = Use of secondary materials,
 NRSF = Use of non-renewable secondary fuels, RSF = Use of renewable secondary fuels.



CHEMFIX 100 (PURE EPOXY RESIN)

Waste Indicators (per kg of CHEMFIX 100)

Environmental Indicators	Units	Raw Materials supply transport and production	End of life				Benefits/ loads beyond the system boundary
			A1-A3	C1	C2	C3	
HW	kg	1.67E-01	0.00E+00	2.94E-04	0.00E+00	5.53E-02	-4.05E-03
NHW	kg	3.31E-01	0.00E+00	1.52E-02	0.00E+00	2.71E-01	-1.15E-02
RW	kg	7.60E-05	0.00E+00	1.02E-07	0.00E+00	2.33E-07	-2.45E-06

HW = Hazardous waste, NHW = Non-hazardous waste, RW = Radioactive waste.

Output Flow Indicators (per kg of CHEMFIX 100)

Environmental Indicators	Units	Raw Materials supply transport and production	End of life				Benefits/ loads beyond the system boundary
			A1-A3	C1	C2	C3	
CRU	Kg	3.08E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	1.12E-01	0.00E+00	3.12E-04	0.00E+00	1.39E-02	-5.44E-03
MER	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for re-use. MFR=Materials for recycling. MFE = Materials for energy recovery, EEE = Exported electrical energy, EET = Exported thermal energy

Additional voluntary indicator results

Environmental Indicators (per kg of CHEMFIX 100)

Environmental Indicators	Units	Raw Materials supply transport and production	End of life				Benefits/ loads beyond the system boundary
			A1-A3	C1	C2	C3	
PM	Disease inc.	1.64E-07	0.00E+00	1.63E-09	0.00E+00	3.03E-09	-3.07E-09
IRP	kBq U-235eq	3.02E-01	0.00E+00	4.21E-04	0.00E+00	9.31E-04	-9.64E-03
ETP-fw	CTUe	7.93E+01	0.00E+00	1.54E-01	0.00E+00	2.52E+00	-4.84E-01
HTP-c	CTUh	3.32E-09	0.00E+00	1.00E-11	0.00E+00	1.68E-10	-1.50E-10
HTP-nc	CTUh	4.36E-08	0.00E+00	2.23E-10	0.00E+00	5.93E-09	-1.35E-09
SQP	Pt	1.31E+01	0.00E+00	1.88E-01	0.00E+00	1.90E-01	-2.21E-01

PM = Particulate matter emissions, IRP = Ionising radiation, ETP-fw = Eco-toxicity – freshwater, HTP-c = Human toxicity, cancer effect . HTP-nc = Human toxicity, non-cancer effects, SQP = Land use



CHEMFIX 100 (PURE EPOXY RESIN)

Data quality

Module	Stage	Type of Data
A1	Materials acquisition	Supplier/site product specific, generic database
A2	Materials transport	Supplier/site product specific, generic database
A3	Manufacturing	Supplier/site product specific, generic database
C1	De-construction /demolition	Scenario
C2	EoL waste transport	Scenario, site/product specific data, generic database
C3	EoL waste treatment	Scenario, site/product specific data, generic database
C4	EoL waste disposal	Scenario, site/product specific data, generic database
D	Benefits	Scenario, product specific data, generic database

Comprehensive process specific input data of high quality, accuracy and granularity have been provided by Chemfix Ltd regarding the manufacturing and supply chain processes for the assessed chemical anchors.

The product specific datasets are for 2023, therefore recent and representative of the geography and technology used. The quality levels for all are therefore Very Good.

Generic LCI datasets are from Ecoinvent 3.9.1, released in 2022, therefore the quality of time representativeness is Very Good (<3years). Specific European and UK datasets (supplier locations, materials/packaging and transport modes etc) have been selected from the LCI for the LCA and the quality level for geographical and technical representativeness is Very Good.

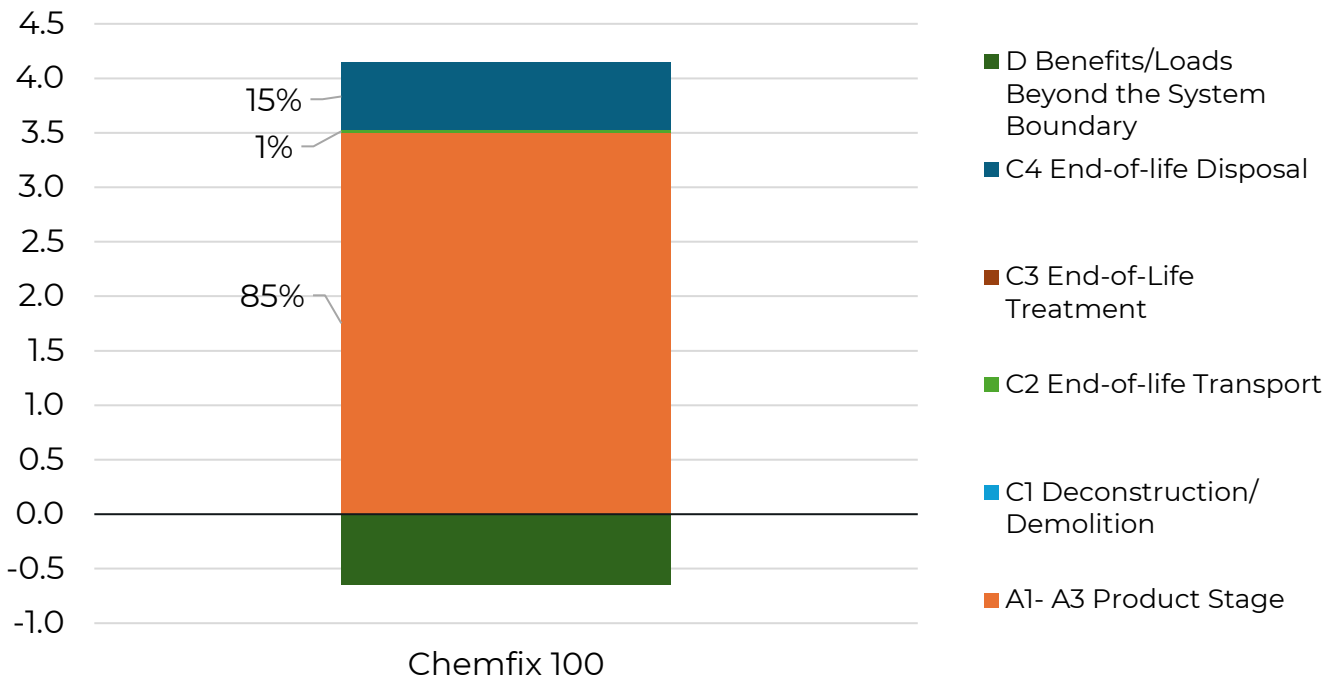


CHEMFIX 100 (PURE EPOXY RESIN)

Interpretation

The average carbon footprint of the Chemfix 100 products included in this EPD is 4.14 kg CO₂eq per kg, ranging from 3.98 to 4.18 kg CO₂eq per kg. The chart below shows the contribution to the overall carbon footprint of each of the included stages of the life cycle.

Chemfix 100 - Global Warming Potential (GWP-Total) kg CO₂eq.



The production stage (A1-A3) and end-of-life disposal (C4) are the biggest contributors to Chemfix 100's carbon footprint, accounting for 85% and 15% respectively.



CHEMFIX 100 (PURE EPOXY RESIN)

General Information

Reference service life

The Chemfix 100 product may encounter various environmental conditions throughout its use phase. Its anticipated service life depends on the specific installation context and the level of exposure it experiences. Key factors affecting its longevity include weather conditions, as well as mechanical and chemical stresses. For more details check ETA certificates for Chemfix 100.

Approvals/Certifications/Testing

- 19/0705 ETA for Option 1 and 7 cracked and uncracked concrete.
- 18/1157 ETA TR023 Post Installed Rebar Installations with Seismic.
- C1 and C2 Seismic Approval.
- Federal Office for Civil Protection FOCP Shock Test Approval BZS D 22-60.
- 100 Year Anchor Service Life.
- Fire Approval in ETA.
- CE Certified 1404-CPR-3135/3267 - ZAG, Slovenia.
- LEED tested 2021 EQ c4.1 SCAQMD rule 1168 (2017), plus indoor air comfort Gold compliance.
- VOC A+ Rating (Volatile Organic Content).
- WRAS Approved for use with Potable drinking water.

Sample applications

The declared product Chemfix 100 is suitable for a large type of heavy duty fixings such as concrete to concrete connections for extending existing structures, fixing structural elements into concrete in Seismic zones, securing façades, canopies, wooden structures, metal structures, metal profiles, railings, crash barriers, coastal/marine applications, etc.

Working and hardening times

Base Material Temperature	5°C	15°C	25°C	30°C	40°C
Gel Working Time	70'	28'	22'	20'	18'
Curing Time Dry Concrete	48 hrs	30 hrs	17 hrs	16 hrs	12 hrs
Curing Time Wet Concrete	x 2	x 2	x 2	x 2	x 2

For further information please refer to the Technical Data Sheet in the website customer area, or by request.



CHEMFIX 100 (PURE EPOXY RESIN)

References

GPI International EPD® System (2024) General Programme Instructions for the International EPD® System. Version 5.0. www.environdec.com.

PCR 2019:14 Construction products (EN 15804:A2) (v1.3.4) prepared by IVL Swedish Environmental Research Institute, Secretariat of the International EPD® System, date 2024-04-30.

EN 15804:2012+A2:2019/ Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.

ISO 14025 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14040/44 Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006).

The International EPD® System - The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD@s as well as keeping a library of EPD@s and PCRs in accordance with ISO 14025. www.environdec.com

EN15804 Add-on version 2, <https://nexus.openlca.org/>, <https://nexus.openlca.org/ws/files/23889>

GreenDelta GmbH, <https://www.greendelta.com/>

Chemfix Products Ltd, Mill Street East, Dewsbury, West Yorkshire WF12 9BQ UK.



Attestation

LEED v4 and v4.1 BETA

On 17 September 2021, Eurofins Product Testing A/S received a sample of a chemical anchor with the product name:

Chemfix 100/Chemfix 600

supplied by

CHEMFX PRODUCTS LIMITED

The sample was supplied as being representative of the manufactured product, and it has been tested in accordance with the relevant ISO 16000, EN 16516, ISO 11890-2, and ASTM D2369 testing standards (See test report no. 392-2021-00459801_A_EN and no. 392-2021-00459803_XG_EN).

The test results of the tested sample indicate that the product qualifies for LEED v4 and LEED v4.1 BETA (February 2021) projects outside the US by showing compliance with the specifications for VOC emissions and VOC content by complying with:

VOC emissions specifications in LEED EQ credit "Low-Emitting Materials" for LEED projects outside the US:

- The requirements of LEED v4.1 BETA (February 2021) by not exceeding the LCI values mentioned in the German AgBB Testing and Evaluation Scheme (2018), showing an overall R-value below or equal to 1 and having a TVOC according to EN 16516 below or equal to 1,000 µg/m³, a sum of VOC without LCI less than 100 µg/m³ and a formaldehyde emission below or equal to 10 µg/m³; all after 28 days.
- The requirements of LEED v4 by complying with:
 - The requirements of Indoor Air Comfort Gold version 7.0 (May 2020).

VOC content specifications in LEED EQ credit "Low-Emitting Materials" for LEED projects globally:

- The requirements of LEED v4 and LEED v4.1 BETA (February 2021): South Coast Air Quality Management District (SCAQMD) Rule 1168 (2017) for Multi-Purpose Construction Adhesive having a VOC content below 70 g/L.

3 March 2022



Laura Hartung Sørensen
Analytical Service Manager



Rasmus Verdier
Analytical Service Manager

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Date
10 June 2014
Our ref.
392-2014-00095701A/Rev1



Test Report – LEED 2009 EQ c4.1, SCAQMD rule 1168 (2005)

Sample material

Sample identification	CHEMFIX PURE EPOXY RESINS
Product type	Multipurpose construction adhesives
Product data, according to manufacturer	Density: 1.34 g/ml at 20 °C ** Water content: 0 g/l** Exempt compounds: none ***
Date received	28 May 2014
Analytical period	30 May 2014 – 10 June 2014

Methods applied

Method	Principle	Parameter	Detection limit	Uncertainty, U _m (%)
LEED 2009 EQ c4.1 (Modified)	Gravimetric	Total Volatiles, SCAQMD rule 304	1 g/l	10 %

20 cm sample was dispensed and discarded. Further sample was dispensed in a preweighed dish and allowed to sit for 1 hour (durometer reading > 80). Volatile content of the sample was determined gravimetrically by heating up to 110 °C for 60 minutes. The result is the average of double testing. The result was calculated as:

$$([g \text{ all volatiles}] - [g \text{ water}] - [g \text{ exempt compounds}]) / ([l \text{ material}] - [l \text{ water}] - [l \text{ exempt compounds}])$$

U_m (%): The expanded uncertainty U_m is equal to 2 x RSD%, see also www.eurofins.dk/uncertainty.

Analytical results

Solid content, % mass	Water content, % mass	Exempt compounds, % mass	VOC less water less exempt compounds, g/l	VOC limit g/l
99.9	0 % **	0 %***	1.2	70 *

* VOC limit for "Multipurpose construction adhesives"

** Given by the client

*** No information about exempt compounds. Set to zero.

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Date
 17 July 2013

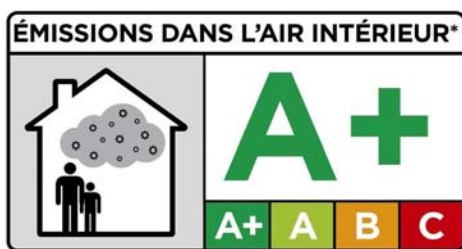
Testing Report emission rate of VOC (volatile organic compounds)

1. 1. Information on the sample

Identification of the sample	Chemfix Epoxy Resin
Product type	Joint, adhesive
Batch Number	-
Date of production	-
Date of receipt	11/03/2013
Testing period (start-end)	14/03/2013 - 11/04/2013

2. Conclusion regarding the classification of the labeling of emission rate of VOC

This recommendation is based on the French regulations of 23rd March 2011 (prescription DEVL1101903D) and of 19th April 2011 (regulation DEVL1104875A). For further information kindly visit our homepage www.eurofins.com/france-voc.



*Information sur le niveau d'émission de substances volatiles dans l'air intérieur, présentant un risque de toxicité par inhalation, sur une échelle de classe allant de A+ (très faibles émissions) à C (fortes émissions).

The classification of the emission rate of VOC of the product has been indicated without explicitly considering the uncertainty linked to the result. According to the regulation No. 2011-321 of 23rd March 2011, the indication of the classification of the emission rate of VOC is the sole responsibility of the person – natural person or juristic person – placing the product at the disposal of the French market.

The results do only concern the sample or the samples which has/have been tested.

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3. Testing procedure

Procedure	Principle	Parameters	Quantification Limit	Incertitude	
ISO 16000 parts -3, -6, -9, -11 Internal procedures used: 9810, 9811, 9812, 2808, 8400	GC/MS HPLC/UV	VOC Aldehydes Volatiles	2 µg/m ³ 3 µg/m ³	22% (RSD) Um = 2 x RSD = 45 %	
Parameters of testing in the room of emission					
Volume of the room, L	119	Temperature, °C	23±1	Relative humidity, %	50±5
Rate of regeneration of the air, 1/h	0,5	Consumption factor, m ² /m ³	0,007		
Testing conditions: The sample remains in the emission room during the whole 28 days of the testing period.					
Preparation of the sample					
Thickness in mm:	3				

4. Results

	Concentration After 28 days $\mu\text{g}/\text{m}^3$	C	B	A	A+
VOC Rate	<2	>2000	<2000	<1500	<1000
Formaldehyde	<3	>120	<120	<60	<10
Acetaldehyde	<3	>400	<400	<300	<200
Toluol	<2	>600	<600	<450	<300
Tetrachloroethylene	<2	>500	<500	<350	<250
Methylbenzene	<2	>1500	<1500	<1000	<750
Xylene	<2	>400	<400	<300	<200
Styrene	<2	>500	<500	<350	<250
2-Butoxyethanole	<2	>2000	<2000	<1500	<1000
1,2,4- Trimethylbenzene	<2	>2000	<2000	<1500	<1000
1,4-Dichlorobenzene	<2	>120	<120	<90	<60

< Means below
> Means above



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