ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Sika Limited
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SIK-20240171-CBA1-EN
Issue date	20/06/2024
Valid to	19/06/2029

SikaRapid®-800 ECO

Sika Limited

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

Sika Limited

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-SIK-20240171-CBA1-EN

This declaration is based on the product category rules:

Concrete admixtures, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

20/06/2024

Valid to

19/06/2029

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

SikaRapid®-800 ECO

Owner of the declaration

Sika Limited
Watchmead Site C
AL7 1BQ Welwyn Garden City
United Kingdom

Declared product / declared unit

The EPD refers to the declared unit of 1 kg of concrete admixture (hardening accelerator) with a density of 1.19 g/ml applied into the building in accordance with IBU PCR 04-2023 part B.

Scope:

This core-EPD relates to 1 kg of SikaRapid®-800 ECO, (a hardening accelerating admixture according to BS EN 934-2:2009+A1:2012), manufactured at Sika's plant in Watchmead, Welwyn Garden City, AL7 1BQ, United Kingdom and is representative for the year 2022.
The results in this core-EPD were calculated using an LCA-tool verified by IBU in 2023.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Matthias Schulz,
(Independent verifier)

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Product

Product description/Product definition

SikaRapid®-800 ECO is a liquid hardening accelerator for concrete and mortar, designed specifically for enhancing the performance of concrete with high levels of supplementary cementitious material (SCM), such as GGBS and PFA. It promotes early and late age strength development without negatively influencing final strengths.
For the purposes of this EPD, Sika's Watchmead, Welwyn Garden City, AL7 1BQ manufacturing site was selected. The product needs a declaration of performance taking into consideration BS EN 934-2:2009+A1:2012, Admixtures for concrete, mortar and grout – Part 2: Concrete admixtures – Definitions, requirements, conformity, marking and labelling and the CE- marking. For the application and use the respective national provisions apply.

Application

SikaRapid®-800 ECO is used as a constituent material to produce concrete. It can be used in combination with other Sika admixtures and can be successfully used in mix designs utilizing supplementary cementitious materials.

Technical Data

SikaRapid®-800 ECO meets the requirements of BS EN 934-2:2009+A1:2012, Table 7.

Constructional data

Name	Value	Unit
Chloride content (EN 480-10)	0.1	M.-%
Alkali content (EN 480-12)	10	M.-%
Corrosion behavior (EN 934-1 / EN 480-14)	Contains the following components from EN 934-1 Annex A.2: Thiocyanates, nitrates	µ A/cm^2
Air content of fresh concrete (EN 12350-7)	Test mix ≤ 2 % by volume above control mix	Vol.-%
Compressive strength (EN 12390-3)	At 20° C and 24 h: test mix ≥ 120 % of control mix; at 20° C and 28 days: test mix ≥ 90 % of control mix; at 5° C and 48 h: test mix ≥ 130 % of control mix	N/mm^2

Additional technical data are not relevant for this product.

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to BS EN 934-2:2009+A1:2012, Admixtures for concrete, mortar and grout – Part 2: Concrete admixtures – Definitions, requirements, conformity, marking and labelling.

Base materials/Ancillary materials

The raw materials and additives of SikaRapid®-800 ECO can be given as follows:

Name	Value	Unit
Water	40-60	%
Sodium Nitrate	10-20	%
Sodium Thiocyanate	10-20	%
Lactic Acid	3-5	%
2,2'-iminodiethanol	0.1-0.5	%
2-octyl-2H-isothiazole-3-one (OIT)	0.0002-0.0015	%
Additives	5-15	%

This product contains substances listed in the candidate list (date: 20.04.2023) exceeding 0.1 percentage by mass: No
This product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: No
Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products Number 528/2012): Yes

Please refer to most recent Safety Datasheet for further details.

Reference service life

The durability of concreate admixtures is normally at least as long as the lifetime of the building in which it is used. The documentation of the RSL is not required for the EPDs calculated using the EPD tool from Sika since the entire life cycle is not declared. Only modules A1-A3, A4, A5, C1, C2, C4 and D are considered.

LCA: Calculation rules

Declared Unit

The EPD refers to the declared unit of 1kg of concrete admixture (hardening accelerator) applied into the building with a density of 1.19 g/ml in accordance with IBU PCR 04-2023 part B.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	kg
Gross density	1191	kg/m^3

Other declared units are allowed if the conversion is shown transparently.

LCA values take into account 12 months of detailed production site data from 2022 and are presented with a high degree of confidence.

System boundary

Declaration type with respect to life cycle stages covered according to clause 5.2 EN 15804+A2 is cradle to gate with modules C1–C4 and module D (A1–A3, A4, A5, C and D).
Modules taken into account:

- A1 Production of preliminary products
- A2 Transport to the plant
- A3 Production including provision of energy, production of auxiliaries and consumables and waste treatment
- A4 Transport from the construction site to the installation site (weighted average distance calculated on deliveries of this product from 2022-23)
- A5 Installation, admixtures applied into the building during A5 phase operations. At this stage, an impact of the production and treatment of installation residue equal to 1% of the product is considered.

- C1-C2-C4-D
  The building deconstruction (demolition process) takes place in C1 module which considers energy production and consumption in terms of diesel and all the emissions connected with the fuel-burning process. After the demolition, the admixture is transported to the end-of-life processing (C2 module) where all the impacts related to the transport processes are considered.
- One scenario is considered for the final treatment of the waste:
  100% disposal (C4), modelled by landfill process where admixtures end their life cycle.
  Module D accounts for benefits that are beyond the defined system boundaries. Credits are generated during the incineration of the wooden pallets in module A5.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: United Kingdom

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. *Sphera LCA for Expert* software (version 10) and *Managed LCA Content* (2022.2) have been used.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

No biogenic carbon is contained in the product.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.0076	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Transport from the gate to the site (A4)

Name	Value	Unit
Transport distance weighted average	176.3	km

Assembly (A5)

Name	Value	Unit
Other resources	-	kg
Material loss	0.01	kg

End of life (C1-C4)

C1: This module considers the use of machinery (7.5E-5 kg of diesel for kg handled) to dismantle the product to enable its subsequent transport.
C2: The concrete demolition waste is transported from the building site to a treatment plant or disposal site by truck and an average distance of 50 km is considered.
C4: The results for the end-of-life are declared for one scenario:

Name	Value	Unit
Landfill percentage	100	%
Material to landfill	1	kg

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LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	X	X	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg SikaRapid-800 ECO

Parameter	Unit	A1-A3	A4	A5	C1	C2	C4	D
GWP-total	kg CO_2 eq	1.06E+00	9.11E-03	9.29E-02	2.83E-04	6.27E-03	1.45E-02	-3.28E-02
GWP-fossil	kg CO_2 eq	1.14E+00	8.71E-03	5.7E-02	2.7E-04	6E-03	1.49E-02	-3.26E-02
GWP-biogenic	kg CO_2 eq	-8.62E-02	3.94E-04	3.59E-02	1.23E-05	2.71E-04	-4.42E-04	-1.66E-04
GWP-luluc	kg CO_2 eq	2.38E-04	3.96E-07	2.45E-06	1.25E-08	2.72E-07	2.75E-05	-3.56E-06
ODP	kg CFC11 eq	2.02E-12	8.95E-16	2.59E-14	2.82E-17	6.15E-16	3.51E-14	-2.19E-13
AP	mol H^+ eq	2.53E-03	2.54E-05	4.11E-05	3.62E-06	1.91E-05	1.06E-04	-4.27E-05
EP-freshwater	kg P eq	1.8E-05	2.04E-09	1.81E-07	6.41E-11	1.4E-09	2.53E-08	-4.45E-08
EP-marine	kg N eq	8.21E-04	1.17E-05	1.27E-05	1.65E-06	8.89E-06	2.71E-05	-1.16E-05
EP-terrestrial	mol N eq	8.26E-03	1.29E-04	1.51E-04	1.81E-05	9.78E-05	2.97E-04	-1.24E-04
POCP	kg NMVOC eq	1.63E-03	2.36E-05	2.85E-05	4.95E-06	1.77E-05	8.22E-05	-3.25E-05
ADPE	kg Sb eq	3.09E-07	4.57E-10	3.03E-09	1.44E-11	3.14E-10	1.53E-09	-4.89E-09
ADPF	MJ	2.13E+01	1.22E-01	2.33E-01	3.84E-03	8.39E-02	1.95E-01	-5.54E-01
WDP	m^3 world eq deprived	3.38E-01	2.36E-05	1.2E-02	7.43E-07	1.62E-05	1.64E-03	-3.44E-03

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg SikaRapid-800 ECO

Parameter	Unit	A1-A3	A4	A5	C1	C2	C4	D
PERE	MJ	2.97E+00	7.39E-04	2.65E-01	2.33E-05	5.08E-04	2.93E-02	-1.51E-01
PERM	MJ	2.29E-01	0	-2.29E-01	0	0	0	0
PERT	MJ	3.2E+00	7.39E-04	3.56E-02	2.33E-05	5.08E-04	2.93E-02	-1.51E-01
PENRE	MJ	1.93E+01	1.23E-01	7.93E-01	3.86E-03	8.42E-02	1.96E-01	-5.54E-01
PENRM	MJ	1.98E+00	0	-5.6E-01	0	0	0	0
PENRT	MJ	2.13E+01	1.23E-01	2.33E-01	3.86E-03	8.42E-02	1.96E-01	-5.54E-01
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m^3	1.64E-02	1E-06	3.67E-04	3.16E-08	6.9E-07	4.97E-05	-1.45E-04

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

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg SikaRapid-800 ECO

Parameter	Unit	A1-A3	A4	A5	C1	C2	C4	D
HWD	kg	2.9E-05	4.23E-13	2.9E-07	1.33E-14	2.91E-13	1.01E-11	-7.53E-11
NHWD	kg	3.71E-02	1.25E-05	1.91E-03	3.94E-07	8.6E-06	1E+00	-2.79E-04
RWD	kg	3.69E-04	2.02E-07	4.57E-06	6.36E-09	1.39E-07	2.18E-06	-4.33E-05
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0
EEE	MJ	0	0	1.45E-01	0	0	0	0
EET	MJ	0	0	2.66E-01	0	0	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 kg SikaRapid-800 ECO

Parameter	Unit	A1-A3	A4	A5	C1	C2	C4	D
PM	Disease incidence	ND	ND	ND	ND	ND	ND	ND
IR	kBq U235 eq	ND	ND	ND	ND	ND	ND	ND
ETP-fw	CTUe	ND	ND	ND	ND	ND	ND	ND
HTP-c	CTUh	ND	ND	ND	ND	ND	ND	ND
HTP-nc	CTUh	ND	ND	ND	ND	ND	ND	ND
SQP	SQP	ND	ND	ND	ND	ND	ND	ND

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

The additional and optional impact categories according to EN 15804+A2 are not declared, as the uncertainty of these indicators is to be classified as high.

Disclaimer 1 – for the indicator 'Potential Human exposure efficiency relative to U235'. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption', 'potential comparative toxic unit for ecosystems', 'potential comparative toxic unit for humans – cancerogenic', 'Potential comparative toxic unit for humans - not cancerogenic', 'potential soil quality index'. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.
This EPD was created using a software tool.

References

EN 934-2
BS EN 934-2+A1:2012. Admixtures for concrete, mortar and grout, Part2: Concrete admixtures - Definitions, requirements, conformity, marking and labelling

EN 480-10
Admixtures for concrete, mortar and grout. Test methods. Determination of water soluble chloride content

EN 15804
EN 15804:2012+A1:2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 14025
EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

IBU 2021
Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.com

LCA Calculator
LCA Calculator software (version 6). Visualize, Improve and Report on Product Sustainability. https://sphera.com/your-path-to-sustainability/

LCA for Experts
Life cycle assessment software (version 10), by Sphera Solutions GmbH, Leinfelden-Echterdingen, 2022 https://sphera.com/life-cycle-assessment-lca-software/

Managed LCA Content
Life cycle assessment database, by Sphera Solutions GmbH, Leinfelden-Echterdingen, 2022, https://sphera.com/life-cycle-assessment-lca-database/

PCR Part A
PCR - Part A: Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, version 1.3, Institut Bauen und Umwelt e.V., 08-2021.

PCR Part B
PCR – Part B:Requirements on the EPD for Concrete admixtures, Institut Bauen und Umwelt e.V., 04-2023.

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