BUILDING TRUST

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

SikaSeal®-105 H

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-12141
Publication date:	2024-01-10
Valid until:	2029-01-09
UN CPC:	375 Articles of concrete, cement and plaster

An EPD should provide 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.

EPD information

The EPD was developed according to the requirements of EN 15804:2012+A2:2019/AC:2021 and EN ISO 14025. Also, the EPD was developed taking into account the principles of Product Category Rules (PCR) 2019:14 "Construction products" (Version 1.3.1) and c-PCR-017 Technical-chemical products (for construction sector).

- The EPD owner has sole ownership, liability, and responsibility for the EPD
- EPDs within the same product category but from different programmes may not be comparable
- EPD of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Programme	**The International EPD® System** Valhallavägen 81, SE 11427 Stockholm, Sweden www.environdec.com
Programme Operator	**EPD International AB** Box 210 60, SE-100 31 Stockholm, Sweden info@environdec.com
Owner of the EPD/ Location of the production site	**Sika Hellas ABEE** Protomagias 15 14568 Kryoneri Attiki, Greece +30 210 81 60 600 info@gr.sika.com www.grc.sika.com
LCA Practitioner	Terra Neutral PC Terra Nova Ltd Kaisareias 39, 11527, Athens www.terraneutral.gr
Product Category Rules (PCR)	CEN standard EN 15804 serves as the Core Product Category Rules (PCR), PCR 2019:14 (Version 1.3.1), c-PCR-017 Technical-chemical products (for construction sector)
PCR review was conducted by	The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com.The review panel may be contacted via info@environdec.com.
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:	☒ EPD verification by accredited certification body Third-party verification: Eurocert S.A.
EURO CERT	89 Chlois St. & Likovriseos, 14452, Greece email: info@eurocert.gr www.eurocert.gr
Eurocert S.A. is an approved certification body accountable for the third-party verification. The certification body is accredited by: Hellenic Accreditation System SA (E.S.Y.D), Accreditation number 21-8	
Procedure for follow-up of data during EPD validity involves third party verifier:	☒ Yes ☐ No

General Information

Scope

The goal of this report is the development of a specific Environmental Product Declaration (EPD) presenting the environmental performance of SikaSeal®-105 H manufactured by Sika Hellas S.A. located in Krioneri during the reporting year 2022.

The intended use of this report as well as EPDs aims to inform construction companies, builders, engineers, concrete users, and end users.

Manufacturer Information

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing, and protecting in the building sector and motor vehicle industry. Sika has subsidiaries in 101 countries around the world and manufactures in over 300 factories.

Sika Hellas was founded in 1995 and it has production facilities in Athens and Thessaloniki. Sika Hellas is mainly active in the production, distribution, and marketing of construction products, as well as in the marketing of sealing and welding materials for industry. The introduction to the market of innovative materials, the guaranteed quality of its products, and the perfect technical support are the main characteristics of its corporate identity. The high-performance chemicals supplied to the construction industry include many types of waterproofing, cementitious, mortars for tiles, roofs, and wall surfaces.

Sika Hellas has developed and implemented an Integrated Management System:

- for the Quality of products and services according to the principles of EN ISO 9001: 2015
- for Occupational Health & Safety in the whole range of our activity according to EN ISO 45001: 2018
- for the Management of the Environment based on the environmental aspects of all our activity, according to the principles of EN ISO 14001: 2015.

Product information

Product Name	**SikaSeal®-105 H**
Description	**Two-component polymer modified waterproofing mortar**
Packaging	**25 kg units (20 kg bag and 5 kg pail)**

Description

SikaSeal®-105 H is a multi-purpose two component polymer modified, pore blocking cementitious mortar for internal or external waterproofing applications. The two components are mixed before application.

Uses

- Interior and exterior waterproofing and damp-proofing of concrete, brickwork and blockwork
- Waterproofing of basement, cellars, ground facing walls, tanks, basement walls etc.

Specifications

Product declaration	Surface Protection Product - Coating according to EN 1504-2:2004, Principle 2 (Moisture Control) - Method 2.3 and Principle 8 (Increasing Resistivity) - Method 8.3 according to EN1504-9:2008, Certificate of Compliance for contact with potable water
Appearance and color	Part A: white liquid Part B: grey powder
Density	(Mix A+B): ~ 1.9 kg/l (fresh mortar density)
Compressive Strength	≥ 30.0 N/mm2 (EN 196-1)
Tensile Strength in Flexure	≥ 6.0 N/mm2 (EN 196-1
Mixing ratio	Used as mortar: A:B = 1 : 4.5 - 5 (parts by weight)

Content Information

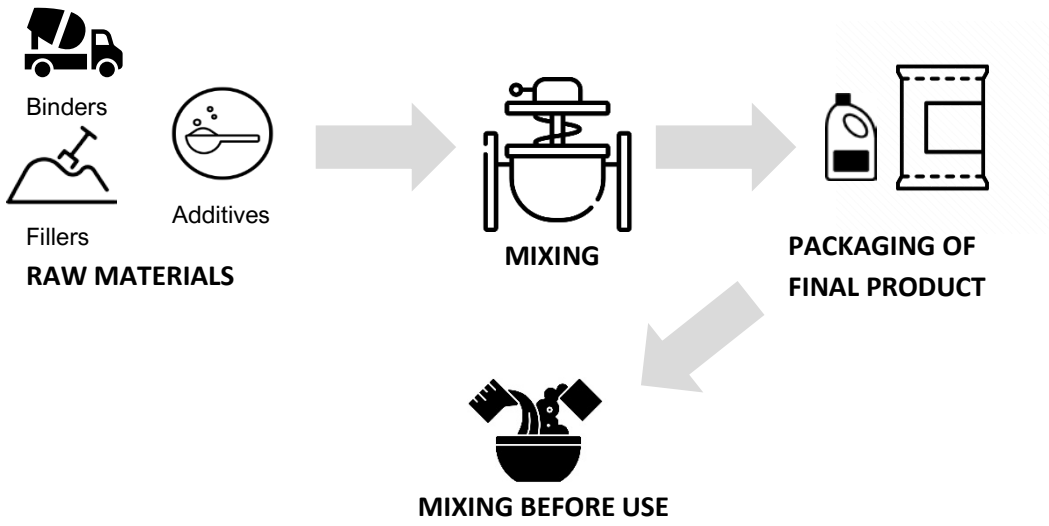
Components	Content (%)
Fillers	50-60
Binders	30-40
Additives	10-20
Water	<15
Minors	<1

The packaging of the products includes wooden pallets that are reusable, stretch film, paper bags and plastic bottles (HDPE). All packaging used is recyclable. Biogenic carbon in both packaging and products is less than 5% of the mass of products and packaging, and it is not included in the calculations. For more information about the product please visit:
https://grc.sika.com/el/construction/waterproofing/below-grade-systems/cementitious-coatings/sikaseal-105-h.html

No substances included in the Candidate List of Substances of Very High Concern for authorization under REACH Regulations are present in the products above the threshold for registration with the European Chemicals Agency (< 0,1% wt/wt).

Manufacturing Process

The manufacturing process includes mixing all the raw materials into mixers and packaging of final products.



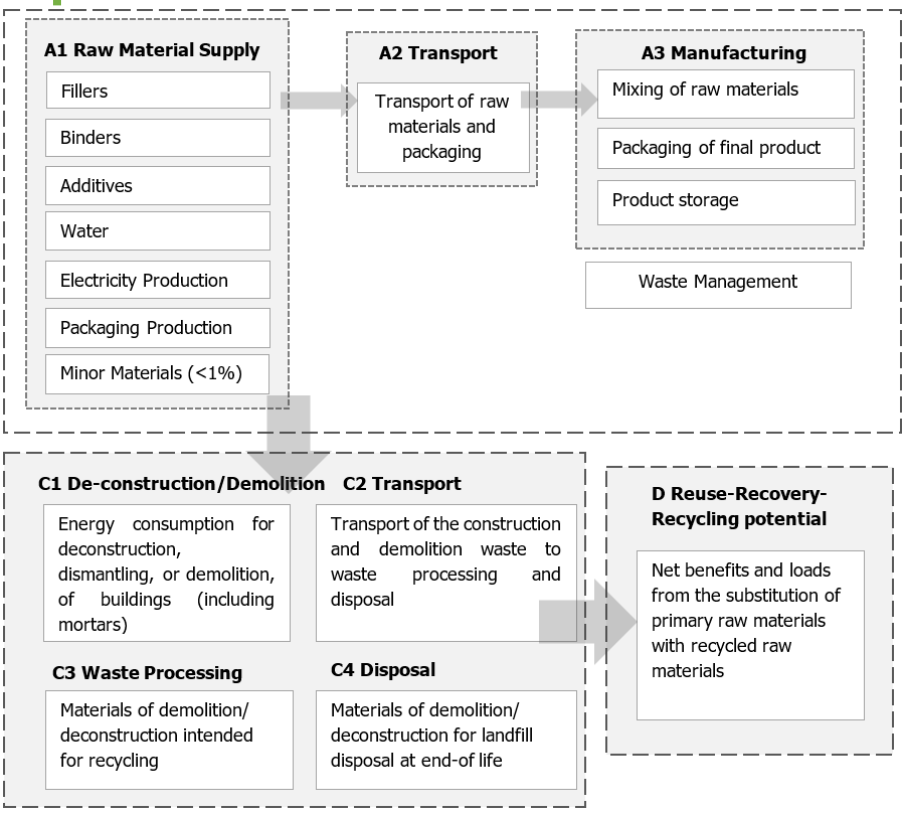
System Boundaries

The approach followed is “Cradle to gate with modules C1–C4 and module D (A1-A3, C and D)”, covering the Product stage which is mandatory, the End-of-life stage and the Benefits and loads beyond the system boundary. The following modules were considered:
A1: Raw material extraction and processing, processing of secondary material input (includes electricity and packaging production);
A2: Transportation of all raw materials to the manufacturing plant;
A3: Manufacturing process (includes the waste management of the production);
C1: De-construction, demolition;
C2: Transport to waste processing;
C3: Waste processing for reuse, recovery and/or recycling;
C4: Disposal;
D: Reuse, recovery and/or recycling potentials, expressed as net impacts and benefits.

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	GR	ND	ND	ND							GLO			GLO	GLO
Specific data	>95%			-	-	-							-			-	-
Variation – products	None			-	-	-							-			-	-
Variation sites	Manufactured in onesite			-	-	-							-			-	-

The life cycle stages A4, A5 and B, which are optional, were not included in the LCA study due to the fact that there is significant uncertainty in the construction process stage as well as the use stage.

Description of the modules



A1: Production of all raw materials including electricity and packaging required for the manufacture of the products. Sika Hellas has issued GOs for electricity consumption during 2022 and is purchasing 100% green electricity from its electricity supplier. More specifically, the electricity mix was reported by the electricity supplier as 61% photovoltaic and 39% wind power. Therefore, the climate impact of used electricity mix is 0.058 kg CO_2 eq/kWh (using the GWP-GHG indicator).

A2: Transportation of raw materials from other industrial units to the industrial unit in Krioneri (A2).

A3: Manufacturing process (energy demand) and waste management of the production.

C1: Mortars and are not removed from the applied material during the deconstruction. Thus, the impacts of deconstruction/demolition of mortars are assumed to be zero.

C2: A distance of 100km and EURO 4 truck is assumed for the transportation of mortars that are included into debris, to waste processing after deconstruction.

C3: The recovery rate of mortars (as mixed construction waste) at the end-of-life, is 46.2 %. Carbonation may occur in this life stage, during the storage of the product. Carbonation is calculated according to c-PCR-017. The service life for this stage is assumed to be ¼ year, in “exposed to rain” conditions.

C4: 53.8% of mortar waste is assumed to end in landfill. Carbonation takes place also in this stage, and the calculation was according to C3. The service life assumed to be 100 years, and the exposure conditions “in ground”.

D: The recycled content in mortar is assumed to be zero. The recovery rate of C&D waste is 46.2%. The waste aggregates that are produced from this recovery process are used in the production of cement and several other projects of the construction sector.

LCA information

Declared unit	The declared unit is 1kg of finished product SikaSeal®-105 H
Time representativeness	All primary data used in this study is for the reporting year 2022
Databases used	The databases that were used were the following: Ecoinvent v.3.9.1 and EN15804 add-on for Ecoinvent. The impact assessment method used was the EN15804+A2
Geographical Scope	Worldwide
Cut-off rules and exceptions	All inputs and outputs were included in the calculation of the unit process of the production stage. The cut-off criteria were 1% for the total mass input and 1% for the renewable and non-renewable primary energy usage for each process, where the maximum was 5% for energy usage and mass that was included for all processes, according to EN 15804 and PCR 2019:14. The materials that were <1% for the total mass and excluded were minor materials. Wooden pallets are reusable. There was no biogenic carbon in the products. Biogenic carbon was less than 5% of the total mass of packaging and therefore it is not reported separately according to PCR 2019:14. It is assumed that energy usage for the deconstruction and demolition of mortars at the End-of-life stage (module C1) was <5% because they are not removed from the applying surface during deconstruction and so, were not included in LCA calculations. The manufacturing processes of the capital goods or spare parts, infrastructure for general management, office and headquarters operations as well as people activities (common activities, travel for work, etc.), and waste streams relating to maintenance of equipment have been exempted. Also, the construction process stage (A4-A5) and use stage (B1-B7) were excluded
Data Quality	All the data used to model the manufacturing process for the specific products covered by this EPD, are specific data and there are no data gaps. Data for raw material supply and transport to the manufacturing plant and production (A1-A3) are based on specific consumption data for the specific production process taking place at the production site in Krioneri, for the reference year 2022. Generic datasets were used for the upstream processes (production of raw material and transportation) as well as for the End-of-Life stage calculations. For this reason, the European life cycle inventory database EN15804 add-on for Ecoinvent has been used, as this database contains the most extensive and updated information and its scope coincides with the geographical, technological, and temporal area of the project. All the datasets used for calculations cover either the area of Greece, Europe, or the Rest of the World. Regarding electricity, a data set was modified according electricity mix reported on the GOs. The best available datasets are picked each time, as far as geography and date are concerned. Technological coverage is specific or average. The LCA was modelled with OpenLCA 2.0.2
Assumptions	The following assumptions have been made in this EPD: • LCA study does not include the manufacturing processes of the capital goods or spare parts • It does not include equipment maintenance

	• The environmental impact of infrastructure for general management, office and headquarters operations is not included • The impact caused by people (common activities, travel for work, office activities, water use) was not considered • The environmental impact of external transport has been calculated using lorries from the Ecoinvent 3.9.1 database, EURO 4. These lorries have been selected to reflect the most realistic scenario possible • The scenarios included are currently in use and are representative for one of the most probable alternatives • The calculations were made to the mix of component A and component B which is referred as the finished product. • Modules C1-C4 were based on scenarios • Mortars at the End-of-Life stage are assumed to be collected as mixed construction and demolition waste (C&D waste) • Concerning module C1, mortars and are not removed from the applied material during the deconstruction. Thus, the impacts of deconstruction/demolition of mortars are assumed to be zero • For module C2 a distance of 100km and EURO 4 truck is assumed for the transportation of mortars as C&D waste, to waste processing after deconstruction • Regarding module C3, the recovery rate of mortars (as mixed construction waste) at the End-of-life, is 46.2% based on ELSTAT report of 2020. The process losses of the waste treatment plant are assumed to be negligible. The remaining 53.8% of mortar waste is assumed to end in landfill (C4). For the carbonation of waste during storage, before the recycling process, a service life of ¼ year under "exposed to rain" exposure conditions was assumed. Also, the carbonation of waste in landfill assumed for a service life of 100 years under "in ground" exposure conditions • Module D calculates the potential environmental benefits of the recycling or reuse of materials. The recycled content in mortar is assumed to be zero. The recovery rate of C&D waste is 46.2% The waste aggregates that are producing from this recovery process are used in the production of cement and several other projects of the construction sector
Allocations	Taking into account that all the products are produced implementing the same production procedure, there is no allocation in different production subsystems (sub-processes). There are no co-products produced using other production procedures. Regarding the input of raw materials, it was based on the composition of each specific product taking into account the BoM for each product. The material losses from manufacture were lower than 1%. Waste has been divided by the total quantity of products. Therefore, no economic or physical for electricity or raw materials was used

Environmental Performance

The environmental indicators for SikaSeal®-105 H are presented in the following tables.
The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

1 kg of SikaSeal®-105 H

Potential environmental impact – Results per declared unit

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
ADPE	kg Sb eq	2,44E-06	0,00E+00	6,19E-08	-1,24E-08	-4,63E-09	-3,07E-08
ADPF	MJ (net calorific)	7,20E+00	0,00E+00	2,69E-01	-7,22E-02	-8,20E-02	-8,47E-02
AP	mol H+ eq	2,28E-03	0,00E+00	7,74E-05	-3,33E-05	-2,46E-05	-3,74E-05
EPF	kg P eq	9,59E-05	0,00E+00	1,32E-06	-9,76E-07	-2,72E-07	-1,73E-06
EPM	kg N eq	9,28E-04	0,00E+00	2,95E-05	-1,35E-05	-9,45E-06	-1,02E-05
EPT	mol N eq	7,16E-03	0,00E+00	3,15E-04	-1,45E-04	-1,01E-04	-1,18E-04
GWPB	kg CO2 eq	1,05E-03	0,00E+00	5,44E-06	-6,06E-06	-1,29E-06	-6,43E-06
GWPF	kg CO2 eq	5,31E-01	0,00E+00	1,87E-02	-4,87E-02	-1,66E-01	-6,49E-03
GWPL	kg CO2 eq	2,01E-02	0,00E+00	9,28E-06	-2,91E-06	-2,01E-06	-5,64E-06
GWPT	kg CO2 eq	4,70E-01	0,00E+00	1,87E-02	-4,87E-02	-1,66E-01	-6,51E-03
GWP - GHG	kg CO2 eq	4,69E-01	0,00E+00	1,87E-02	-4,87E-02	-1,66E-01	-6,50E-03
ODP	kg CFC-11 eq	5,60E-09	0,00E+00	4,09E-10	-8,22E-11	-9,46E-11	-8,28E-11
POCP	kg NMVOC eq	2,36E-03	0,00E+00	1,13E-04	-4,49E-05	-3,53E-05	-3,56E-05
WDP	m3 world eq	7,13E-01	0,00E+00	1,32E-03	-5,90E-04	-2,55E-04	-7,23E-03

Use of resources – Results per declared unit

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PENRE	MJ	6,72E+00	0,00E+00	2,45E-01	-6,70E-02	-7,46E-02	-8,05E-02
PENRM	MJ	5,59E-01	0,00E+00	2,33E-02	-5,28E-03	-7,40E-03	-4,20E-03
PENRT	MJ	7,28E+00	0,00E+00	2,69E-01	-7,23E-02	-8,20E-02	-8,47E-02
PERE	MJ	2,44E+00	0,00E+00	4,14E-03	-3,82E-03	-6,89E-04	-6,11E-03
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,44E+00	0,00E+00	4,14E-03	-3,82E-03	-6,89E-04	-6,11E-03
FW	m^3	1,74E-02	0,00E+00	3,21E-05	-3,48E-05	-8,47E-05	-1,70E-04
NRSF	MJ	5,72E-02	0,00E+00	1,54E-04	-1,33E-04	-1,81E-05	-1,86E-04
RSF	MJ	3,67E-02	0,00E+00	7,85E-05	-1,16E-04	-7,05E-06	-6,84E-05
SM	Kg	6,21E-02	0,00E+00	2,91E-04	-2,34E-04	-3,62E-05	-2,17E-04

Output flows – Results per declared unit

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
CRU	kg	5,09E-22	0,00E+00	-1,04E-23	6,77E-24	-6,40E-24	4,15E-24
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
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	5,00E-02	0,00E+00	2,64E-04	-2,18E-04	-2,97E-05	-1,76E-04

Waste production – Results per declared unit

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	-1,45E-02	0,00E+00	-2,49E-04	7,98E-05	5,63E-05	-2,16E-04
NHWD	kg	-2,43E-02	0,00E+00	-1,28E-02	8,12E-02	5,37E-01	8,41E-04
RWD	kg	-5,02E-06	0,00E+00	-8,67E-08	1,16E-07	1,20E-08	-1,05E-07

Disclaimer 1: The indicator GWP-GHG includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013).
Disclaimer 2: The results of the environmental impact indicators ADPE, ADPF and WDP shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

References

1. General Programme Instructions of the International EPD® System Version 4.0
2. ISO 14040:2006 Environmental management Life cycle assessment. Principles and framework
3. ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines
4. ISO 14020:2000 Environmental labels and declarations – General principles
5. ISO 14025:2010 Environmental labels and declarations – Type III Environmental Declarations– Principles and procedures
6. PCR – "2019:14 Construction products" (Version 1.3.1)
7. PCR 2019:14-c-PCR-017 Technical-chemical products (for construction sector) (c-PCR to PCR 2019:14) (adopted from EPD Norway 2022-07-08, NPCR 009 – Part B for Technical – Chemical products for building and construction industry (Version 2.0))
8. EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
9. ELSTAT (2020) https://www.statistics.gr/

Abbreviations

ADPE	Environment: Abiotic depletion potential (elements)
ADPF	Environment: Abiotic depletion potential (fossils)
AP	Environment: Acidification potential
EPF	Environment: Eutrophication potential (freshwater)
EPM	Environment: Eutrophication potential (marine)
EPT	Environment: Eutrophication potential (terrestrial)
GWPB	Environment: Global warming potential (biogenic)
GWPF	Environment: Global warming potential (fossil)
GWPL	Environment: Global warming potential (land use)
GWPT	Environment: Global warming potential (total)
GWP - GHG	Environment: Global warming potential (greenhouse gas emissions)
ODP	Environment: Ozone depletion potential
POCP	Environment: Photochemical ozone creation potential
WDP	Environment: Water deprivation potential
PENRE	Primary energy: Non-renewable (energy use)
PENRM	Primary energy: Non-renewable (material use)
PENRT	Primary energy: Non-renewable (total)
PERE	Primary energy: Renewable (energy use)
PERM	Primary energy: Renewable (material use)
PERT	Primary energy: Renewable (total)
FW	Resource: Net use of fresh water
NRSF	Resource: Non-renewable secondary fuels
RSF	Resource: Renewable secondary fuels
SM	Resource: Secondary materials
CRU	Output: Components for reuse
EEE	Output: Exported energy (electrical)
EET	Output: Exported energy (thermal)
MER	Output: Materials for energy recovery
MFR	Output: Materials for recycling
HWD	Waste: Hazardous waste disposed
NHWD	Waste: Non-hazardous waste disposed
RWD	Waste: Radioactive waste disposed