Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

EPD type: Multiple products (average of products: A-component: DIPUR 106-1 A, DIPUR 106-1 S A, DIPUR 106P-1 A, DIPUR 106P-4 A, DIPUR 107R A; B-component: DIPUR 100 B)

DIPUR two-component adhesives

from

Polychem Systems sp. z o.o.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0016885
Publication date:	2024-10-04
Revision date (version 1.1):	2024-10-09
Valid until:	2029-10-04

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

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): EPD International Product Category Rules (PCR) for construction products (PCR 2019:14 v1.3.4). The product group classification for the assessed products is UN CPC 3511.
PCR review was conducted by: The Technical Committee of the International EPD System. See https://www.environdec.com/about-us/the-international-epd-system-about-the-system for a list of members. Review chair: Claudia Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat https://www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: Zuzanna Gondek, JW_A Sp. z o.o., z.gondek@jw-a.pl
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: Agnieszka Pikus, Agnieszka Pikus Greenwise, agnieszkapikus@greenwise.com.pl Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

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.

Company information

Owner of the EPD: Polychem Systems sp. z o.o.

Contact: Łukasz Brembor, Environmental Specialist, brembor@polychem-systems.com.pl

Description of the organisation:

The company's history dates back to 1982, when the Polychem Foreign Polyurethanes Company was established in Swarzędz, producing basic polyurethane products. Since 1991, as Polychem Systems Sp. z o.o., the company has been consistently implementing new production technologies, which are the foundation of polyurethane processing.

Their offer includes adhesives for all possible building materials, assembly foams, systems for polyurethane foams and polyurea coatings, laggings, thermal insulation boards of various densities and fittings for many industries. The company also regularly assists customers with the best matching of products to their individual needs.

Product-related or management system-related certifications: ISO 9001:2015 and 14001:2015 certificates

Name and location of production site(s): Polychem Systems production site, Wołczyńska 43 Street, Poznań, Poland

Product information

Product name: DIPUR two-component adhesives

Product description:

DIPUR is a group of two-component adhesives, consisting of an A-component and a B-component, combined together in the appropriate proportions, according to the information contained in the technical sheets.

Components included in the declaration:

A-component:

- DIPUR 106-1 A
- DIPUR 106-1 S A
- DIPUR 106P-1 A
- DIPUR 106P-4 A
- DIPUR 107R A

B-component:

- DIPUR 100 B

DIPUR two-component polyurethane adhesives are products that consist of polyol chains (triols) with additives (A-component); cross-linked with polyisocyanates (B-component). The occurring reaction between the hydroxy groups and the isocyanate groups leads to a polymerisation reaction and cross-links the adhesive layers. The A-component consists of polyethers, fillers, gelling catalysts and ancillary agents that impede the sedimentation of solid particles and improve wettability of the filler, demineralised water. B-component contains MDI prepolymers.

	Component A					Component B
	DIPUR 106-1 A	**DIPUR 106-1 S A**	**DIPUR 106P-1 A**	**DIPUR 106P-4 A**	**DIPUR 107R A**	**DIPUR 100 B**
Physical state	Suspension	Suspension	Suspension	Suspension	Suspension	Liquid
Colour	Beige	Beige	Beige	Beige	Beige	Brown
Viscosity at 20°C [mPas]	1400 ± 150	-	-	-	-	-
Viscosity at 25°C [mPas]	-	2500 ± 300	7500 ± 1500	7500 ± 1500	21000 ± 3000	200 ± 50
Density at 20°C [g/cm³]	1.58 ± 0.03	-	-	-	-	-
Density at 25°C [g/cm³]	-	1.5 ± 0.03	1.63 ± 0.03	1.63 ± 0.03	1.65 ± 0,10	1.23 ± 0.02

Application: DIPUR two-component adhesives can be processed both manually and by machine. DIPUR two-component adhesives find their application in bonding materials such as polystyrene, styrodur (XPS), mineral and glass wool, roofing paper, cladding. They are also used for bonding filters in the automotive and industrial sectors and for bonding sandwich panels.

More information about the product can be found on the manufacturer's website: www.polychem-systems.com.pl

UN CPC code: The product group classification for the assessed product is UN CPC 3511 (Paints and varnishes and related products).

Geographical scope: Global (A1-A2), Poland (A3), Europe (A4)

LCA information

Declared unit: 1 kg of DIPUR two-component adhesive (average product)

Reference service life: n/a

Time representativeness: The primary data used were obtained from Polychem System sp. z o.o. own production facility for the year 2023 and are representative of the product and the production process.

Database(s) and LCA software used:

Databases: Ecoinvent 3.6, Ecoinvent 3.8, Ecoinvent 3.9.1, Plastics Europe

Software: One Click LCA version: 0.30.2, Flexible EPD Tool (EN 15804 reference package based on EF 3.0 version)

Description of system boundaries: Cradle to gate with options (A1-A4). End of life stage (C1-C4, D) has been excluded as it fulfils the criteria below:

- the product is physically integrated with other products in subsequent life-cycle process so they cannot be physically separated from them at end of life,
- the product or material is no longer identifiable at end-of-life because of a physical or chemical transformation process,
- the product or material does not contain biogenic carbon.

Reasoning: the DIPUR products are mainly used for bonding sandwich panels, so they become an integral part of a different product and are no longer identifiable.

Cut-off criteria:

No capital goods or infrastructure are included within the system boundaries. Less than 1% of the raw material input mass has been neglected. 100% of inputs for production process (energy, fuels, produced waste, emissions) as well as for packaging materials and transportation have been included. This is in line with EN 15804 (LCI data shall include a minimum of 95% of total inflows (mass and energy) per module). The operation of the office operations and people activities have been excluded.

Data quality:

Data for raw material supply, transport to the manufacturing plant, production and transport to the customer (A1-A4) are based on specific consumption data for the specific production process taking place at the production site in Polychem Systems production plant in Poznań for the reference year 2023. For electricity, the exact electricity mix of the electricity retailer (ENEA) has been modelled, resulting in GWP-GHG indicator of 0.758 kg CO_2eq/kWh. All the datasets used for calculations cover either the area of Poland, Europe or the Rest of the World. The best available datasets are picked each time, as far as geography and date are concerned.

Assumptions:

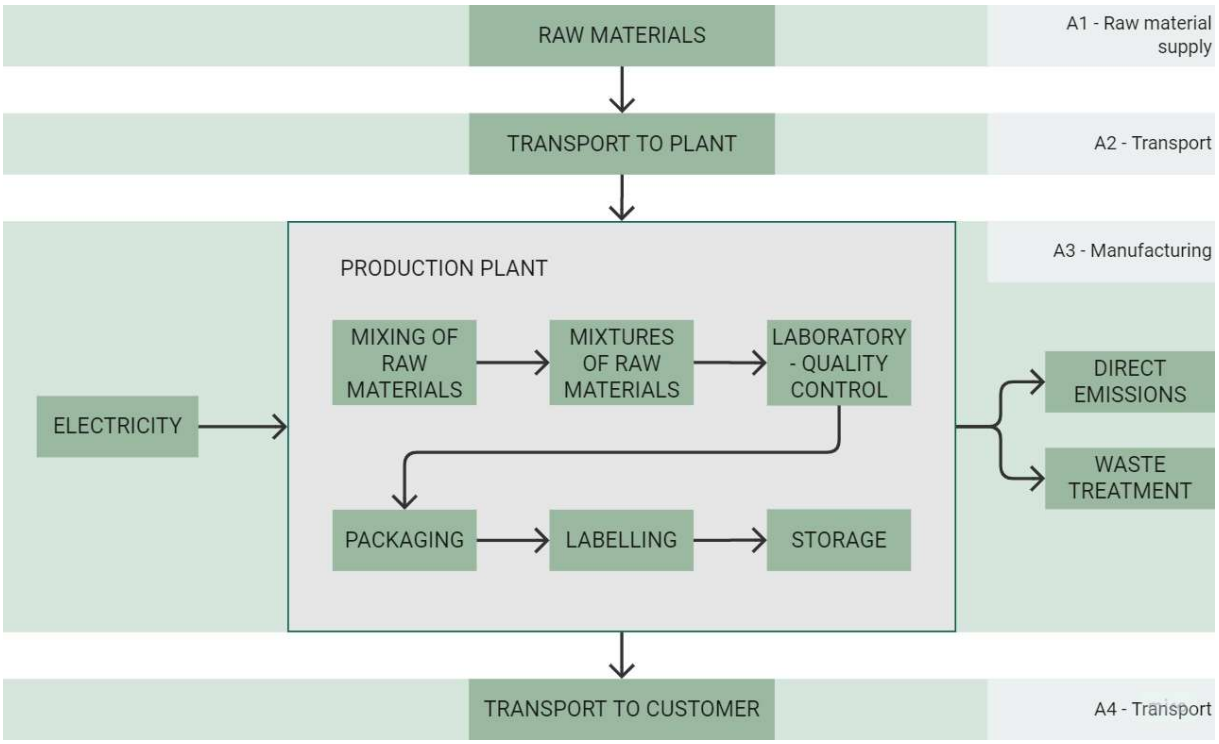
This is an EPD of multiple products, based on the average results of the product group. The results have been calculated as weighted average, based on the share of production in the year 2023. For each indicator in the environmental performance, the weighted average results of the included products are declared.

Allocations:

The input of raw materials was based on the composition of each specific product included in the declaration. The share of A-component and B-component in the final product was calculated based on technical data sheets.

Electricity was calculated by mass allocation of the total electricity consumption of the production plant for the reference year, divided by the annual production mass in the manufacturing plant. Total waste produced in the production plant was divided by the annual production of products.

System diagram:



Product stage:

A1-A2: Extraction and transport of raw materials

Module A1 shows the impact of the production and extraction of raw materials further used in the production of the DIPUR adhesive. The country of origin of all the raw materials and packaging materials is recorded by the manufacturer. An average distance from a supplier to the manufacturing plant has been calculated for each material (A2 module). Land and sea transport is used. For land transport, the >32 metric ton, euro 5 lorry has been assumed. For sea transport, a container ship has been assumed. For each means of transport, fuel average use was assumed.

A3: Manufacturing process

The production of component A takes place in both vats and mixers. The dosing method depends on the machine. In the vats, raw materials are only dosed from above, while in the mixer it is possible to dose liquid raw materials from below using a pump. Production takes place in a batch process. No heating is necessary. Only the temperature and mixing time specified in the production order need to be controlled. The products are packaged into many types of packaging, depending on tonnage/application, and these include cartridges, hobos, drums and IBC containers. Mixer/cartridge cleaning only takes place in certain production processes, 'glue-by-glue' production is possible. If cleaning is required, the polyol with the highest % content in the pre-mix is used to rinse the production unit. The residue is wiped with pieces of cotton cloth and washed under running water. Electricity and water are used in the production process. Internal transport includes LPG and electric forklifts.

Construction process stage:

A4: Transport to the customer

Finished products are transported to customers in Europe. Exact transportation distances are inventoried by the manufacturer. A weighted average transportation distance, based on the production volume of each product under study, is 1328 km. The land transport with >32 metric ton, euro 5 lorry has been assumed and the average fuel usage for selected means of transport has been used in the calculation. The scenarios included are currently in use and are representative for one of the most probable alternatives.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport to construction site	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishmentt	Operational energy use	Operational water use	Deconstruction / 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	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	GLO	GLO	PL	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-
Share of specific data	>90% GWP-GHG			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	One manufacturing site: 0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

The life cycle stages 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. End of life stage (C1-C4, D) has been excluded as the product fulfils the criteria below:

- the product is physically integrated with other products in subsequent life-cycle process so they cannot be physically separated from them at end of life,
- the product or material is no longer identifiable at end-of-life because of a physical or chemical transformation process,
- the product or material does not contain biogenic carbon,

Content information

Raw materials and packaging materials

Product components	Average content, -%	Post-consumer material, weight -%	Biogenic material, weight -%
Mineral filler	42	0	0
MDI (Diphenymethane-isocyanate)	29	0	0
Polyether polyol	26	0	0
Water	1	0	0
Additives	2	0	0
TOTAL	**100**	**0**	**0**
Packaging materials	**Weight, kg**	**Weight -% (versus the product)**	**Weight biogenic carbon, kg C/kg of product**
Plastic (HDPE)	0.007	0.7	0
Wood (euro-pallet)	0.006	0.6	0.0023
Metal	0.006	0.6	0
TOTAL	**0.018**	**0.18**	**0.0023**

Dangerous substances from the candidate list of SVHC for Authorisation

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 (more than 0.1% of the weight of the product).

Results of the environmental performance indicators

The environmental indicators for 1kg of DIPUR two-component adhesive (average product) 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. This EPD covers multiple products, based on average result (included products are: DIPUR 106-1 A, DIPUR 106-1 S A, DIPUR 106P-1 A, DIPUR 106P-4 A, DIPUR 107R A (A-component) and DIPUR 100 B (B-component).

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**Variation**
GWP-fossil	kg CO_2 eq.	1.88E+00	1.25E-01	8.59%
GWP-biogenic	kg CO_2 eq.	0.00E+00	0.00E+00	0.00%
GWP-luluc	kg CO_2 eq.	1.63E-04	3.77E-05	25.28%
GWP-total	kg CO_2 eq.	1.88E+00	1.26E-01	8.59%
ODP	kg CFC 11 eq.	2.35E-06	2.95E-08	29.95%
AP	mol H^+ eq.	5.48E-03	5.27E-04	6.45%
EP-freshwater	kg P eq.	1.91E-05	3.13E-06	4.38%
EP-marine	kg N eq.	1.20E-03	1.59E-04	8.21%
EP-terrestrial	mol N eq.	1.35E-02	1.75E-03	6.94%
POCP	kg NMVOC eq.	4.52E-03	5.64E-04	7.69%
ADP-minerals&metals*	kg Sb eq.	1.10E-05	2.14E-06	3.18%
ADP-fossil*	MJ	4.78E+01	1.95E+00	8.85%
WDP*	m^3	4.88E-01	7.26E-03	8.74%
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; 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; 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, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption			

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**Variation**
GWP-GHG[1]	kg CO_2 eq.	1.88E+00	1.25E-01	8.59%

Resource use indicators

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**Variation**
PERE	MJ	1.25E+00	2.46E-02	7.77%
PERM	MJ	0.00E+00	0.00E+00	0.00%
PERT	MJ	1.25E+00	2.46E-02	7.77%
PENRE	MJ	3.04E+01	1.95E+00	11.68%
PENRM	MJ	1.72E+01	0.00E+00	15.05%
PENRT	MJ	4.77E+01	1.95E+00	8.86%
SM	kg	1.60E-03	0.00E+00	18.63%
RSF	MJ	2.56E-03	0.00E+00	0.00%
NRSF	MJ	0,00E+00	0.00E+00	0.00%
FW	m^3	2.12E+01	4.06E-04	15.68%
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water			

[1] This 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 CO_2 is set to zero.

Waste indicators

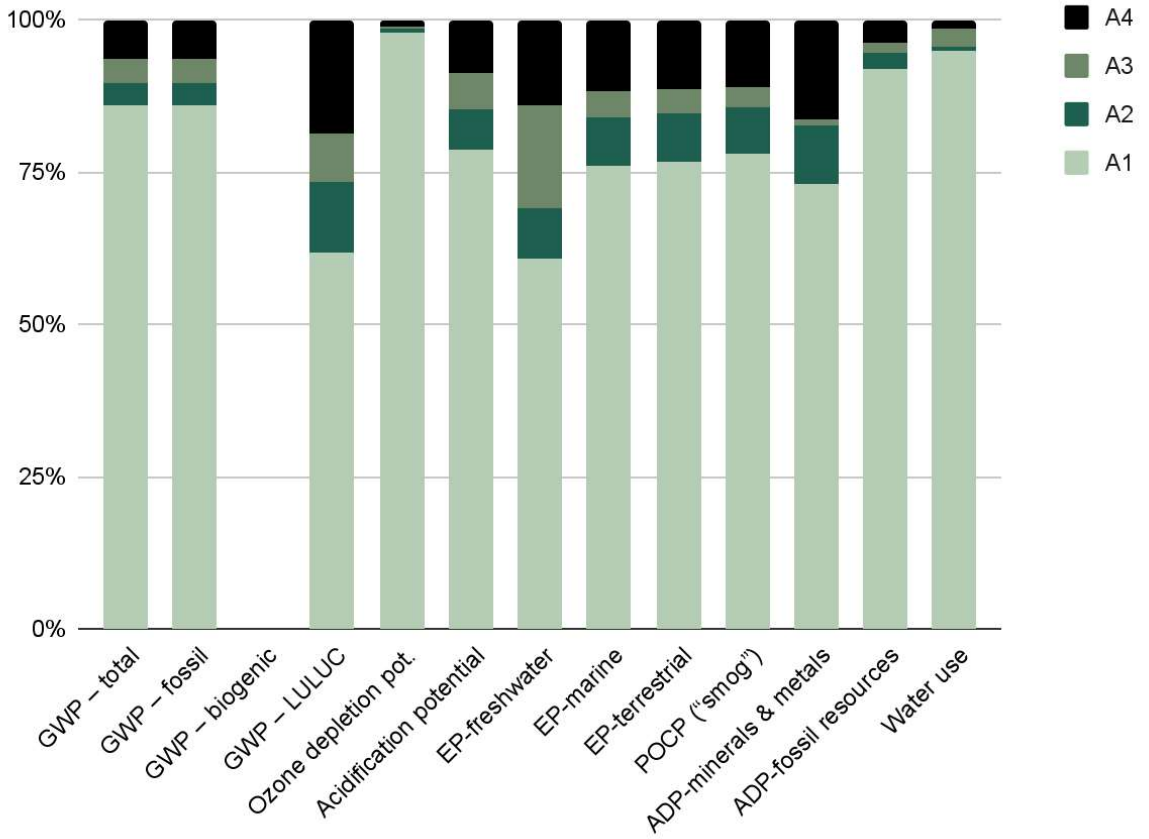
Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**Variation**
Hazardous waste disposed	kg	1.79E-02	1.90E-03	20.82%
Non-hazardous waste disposed	kg	5.99E-01	2.10E-01	11.00%
Radioactive waste disposed	kg	3.67E-05	1.34E-05	5.40%

Output flow indicators

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**Variation**
Components for re-use	kg	0.00E+00	0.00E+00	0.00%
Material for recycling	kg	1.52E-03	0.00E+00	1.00%
Materials for energy recovery	kg	1.70E-03	0.00E+00	0.00%
Exported energy, electrical	MJ	1.72E-03	0.00E+00	66.48%
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00%

Interpretation of the environmental performance results

The life cycle stage with the highest environmental burden is the raw material supply stage (A1). This stage contributes to 86% of the impacts in the Global Warming Potential - total. Transport (A2) contributes to 4%, manufacturing (A3) to 4% and transport to customer (A4) to 6% of the GWP - total.



Differences versus previous versions

2024-10-04 Version 1

2024-10-09 Version 1.1
Editorial changes: The photograph on the cover page has been modified.

References

- General Programme Instructions of the International EPD® System. Version 5.0.0.
- EPD International Product Category Rules (PCR) for construction products (PCR 2019:14 v1.3.4).
- ISO 14025:2006 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.
- ISO 14040:2006 Environmental management. Life cycle assessment. Principles and framework.
- ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, 2014.

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