ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 AND EN 15804

ACCESS FLOOR PEDESTAL H-RANGE

Declaration number: S-P-01186

Issued on March 12th 2018;

valid until February 13th 2023

ECO EPD registration number: 00000662

The environmental impacts of this product have been assessed from cradle to factory gate.

This Environmental Product Declaration has been verified by an independent third party.

The International EPD® System

INTRODUCTION

This EPD provides environmental performance indicators for an access floor pedestal manufactured by Isaac H. Grainger & Son Ltd in the UK. This is a cradle-to-gate EPD in accordance with the requirements of EN 15804, and thus covers the modules A1 - A3 defined in that standard.

The EPD is based on a life cycle assessment (LCA) study which used production data for 2016 from Isaac H. Grainger & Son Ltd 's manufacturing facility in Cradley Heath, West Midlands, UK. Background data were taken from the ecoinvent database (v3.3).

The EPD presents details of the LCA, a description of the product life cycle it covers, values for the environmental indicators specified by EN 15804 and a brief explanation of those results.

The declared unit is 1kg of access floor pedestal.

Access Floor Pedestal EPD	
EPD programme:	The International EPD® System
EPD programme operator:	EPD International AB - Stockholm - Sweden www.environdec.com
EPD owner:	Isaac H. Grainger & Son Ltd, 8 Gawne Lane, Cradley Heath, West Midlands, B64 5QY - UK http://www.isaacgrainger.co.uk
Product name:	Access floor pedestal
CPC code:	4219
Declared unit:	1kg
System boundaries:	Cradle to factory gate
Declaration No:	S-P-01186
ECO EPD registration No:	00000662
Date of publication:	March 12th 2018
EPD valid until:	February 13th 2023
EPD geographical scope:	Europe
EPD based on Product Category Rules:	The CEN standard EN 15804 serves as the core PCR
	The International EPD® System's PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30
PCR review conducted by:	The Technical Committee of the International EPD® System Chair: Filippo Sessa; contact via info@environdec.com
Verification:	Independent verification of this EPD and data, according to ISO 14025/2006: ☐ internal certification ■ external verification
Third party verifier:	Ugo Pretato - Recognized Individual Verifier
Accredited or approved by:	The International EPD® System
LCA conducted by:	EuGeos Limited, UK - +44 (0)1625 434423 www.eugeos.co.uk

EPDs within the same product category but from different programmes may not be comparable.
EPDs of construction products may not be comparable if they do not comply with EN 15804.

COMPANY PROFILE

Isaac H. Grainger & Son Ltd is a family business based in the West Midlands, founded in 1864 and incorporated in 1956 and still owned today by the fifth generation of the Grainger family. It is the UK's largest manufacturer of access flooring pedestals and supplies a comprehensive range of products used in access flooring systems. Our access floor pedestals and some other accessories are made at our factory in Cradley Heath.

Isaac H. Grainger & Son Ltd operates both a quality and an environmental management system, certified to ISO 9001:2015 and ISO 14001:2015 respectively. All of our H range pedestals are fully compliant and independently-tested by a UKAS accredited body to conform with PSA (MOB PF2 PS/SPU) and BS EN: 12825 specifications.

As an environmentally-conscious company we rigorously monitor our processes and have put in place measures to minimise emissions, resource use and waste:

- we installed one of the largest photovoltaic solar farm in the West Midlands in 2015: this supplies the majority of the plant's power throughout the summer months and drastically reduces reliance on grid-supplied energy during winter. This reduction in fossil fuel is projected to reduce our carbon footprint by 37 tonnes over the next 20 years.
- we are using inverter welding technology with a reduced energy consumption of 30% when compared to previous, conventional welding techniques, significantly decreasing our fuel consumption.
- we have cut packaging by moving components around the works in re-useable metal stillages, thus eliminating plastic wrapping for work in progress, and by packing finished products for despatch in degradable sacks
- we are using second-hand reconditioned wooden dispatch pallets, which can also eventually be used as biofuel after fulfilling their primary purpose
- we are delivering our products with a new low emissions Euro5 vehicle

CONTACT

Liz Anson, Administrator

Isaac H. Grainger & Son Ltd, 8 Gawne Lane, Cradley Heath, West Midlands, B64 5QY - UK

http://www.isaacgrainger.co.uk

tel: +44 (0)1384 637 777

email: sales@isaacgrainger.co.uk

PRODUCT INFORMATION

ACCESS FLOOR PEDESTALS

Access flooring systems are raised floors that allow electrical and mechanical services to be installed beneath their surface. Access floor pedestals are vertical adjustable structures that support the panels that constitute the access floor above the substrate floor. Pedestals are fabricated steel items, zinc-plated and passivated. They are available in a range of dimensions, to allow different heights of the underfloor void and to accommodate different loadings on the installed access floor.

Isaac H. Grainger & Son offer four ranges of pedestals (H, M, E and X). All are produced in the same way using materials of identical composition but different dimensions (e.g. tube diameter, top & base plate thickness). All four pedestal ranges have been thoroughly tested in accordance with standard tests for access flooring such as T5, T8, T11, T15 and T16, coupled with a variety of panels.

This EPD applies to pedestals from Isaac H. Grainger & Son's most popular 'H' range. H range pedestals meet the PSA MOB PF2 PS/SPU: March 1992 specification; the range includes 21 models to cater for different void heights. The sizes of the different models are shown in the table below.

Pedestal Size	Void Range (mm)	Nipple Length (mm)	Head Length (mm)	Bag Quantity	Pallet Quantity	Unit Weight (Kg)	Pallet Weight (Kg)
H0S	26/35	15	18	50	1600	0.361	577
H00	30/40	21	18	50	1600	0.361	577
H0	40/50	30	18	50	1600	0.377	603
H1	50/70	40	30	40	1600	0.41	676
H2	60/90	50	43	40	1600	0.428	705
H3	75/115	65	60	40	1400	0.479	691
H3E	90/140	80	60	40	1400	0.484	698
H4	110/185	100	95	30	900	0.56	524
H4E	135/210	125	95	30	900	0.593	554
H5	150/225	140	95	30	750	0.619	484
H5E	185/260	175	95	30	625	0.637	498
H6	200/275	190	95	25	625	0.671	439
H6E	235/310	225	95	25	500	0.711	466
H7	250/325	240	95	20	500	0.738	481
H8	300/375	290	95	20	500	0.77	501
H9	350/425	340	95	15	500	0.82	430
H10	400/475	390	95	15	500	0.875	457
H11	450/525	440	95	15	500	0.934	487
H12	500/575	490	95	15	500	1.033	537
H13	550/625	540	95	15	500	1.067	553
H14	600/675	590	95	15	500	1.166	603

H RANGE PEDESTALS

This EPD provides environmental indicator values for the H7 model as the representative product (see picture on next page). The zinc:steel ratio changes slightly as the pedestal height changes. Therefore indicator values are also declared for the H0S (highest impacts per kg of pedestal) and H14 (lowest impacts per kg of pedestal) models.

When installed, a polymer "cap" may be fitted to the top of the pedestal for the access floor panel to rest on. The effect on indicator values of adding such a cap is discussed later in this EPD (see Additional Environmental Information on p11).

Access floor pedestals produced by Isaac H. Grainger & Son Ltd are classified CPC 4219 under the UN CPC classification system v2.1.

PEDESTAL H7

MANUFACTURING

Access floor pedestals are made in a steel fabrication process starting from stock mild steel forms such as sheet and tube. These are worked, cut to size and welded to form the main pedestal elements. These are zinc-plated and passivated (chromium III passivation is used) by a specialist electroplating sub-contractor, then finished pedestals assembled.

Metal waste generated during the manufacturing stage is segregated and recycled. Metal-working lubricants are purchased from an oil recycling business located near Isaac H. Grainger & Son's factory and returned to the same company when used.

PACKAGING

Within the factory components are kept and moved in re-useable metal stillages, avoiding the need for plastic wrapping.

Goods are packed for despatch in woven polyethylene sacks, then secured on re-conditioned wooden pallets using polyethylene stretch-wrap for transport to the construction site. This packaging can be reused or recycled from the construction site.

PRODUCT USE AND MAINTENANCE

All pedestals are of steel construction with zinc plating to BS EN ISO 2081:2008; once installed, no specific maintenance is required in normal use.

END-OF-LIFE

At the end of its life the access flooring system can be removed and pedestals can be recycled.

As wastes removed from a building, pedestals fall under European Waste Catalogue (EWC) code 17-04-05.

REFERENCE SERVICE LIFE

No reference service life is specified in this cradle-to-gate EPD.

FURTHER PRODUCT INFORMATION

Detailed product information and datasheets can be found

- on our website http://www.isaacgrainger.co.uk
- or by contacting us by telephone: +44 (0)1384 637 777
- or by email: sales@isaacgrainger.co.uk

CONTENT DECLARATION

The material composition of H range pedestals is shown below:

Material	% of mass per declared functional unit
Steel	>99
Zinc	0.5 - 0.8

No substances included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations are present in the pedestal, either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

TECHNICAL DATA

H range pedestals meet the PSA MOB PF2 PS/PU: March 1992 specification. Their technical characteristics are summarised below.

The masses of individual pedestals are provided in the H-range Table on p4.

Name (test)	Value	Unit
Free play in pedestal (T5)	passed	N/A
Deflection centre of edge (T8)	≤ 2.4	mm
Pedestal strength horizontal load (T15)	passed	N/A
Pedestal strength vertical load (T16a)	18	kn
Pedestal strength quadrant load (T16b)	13.5	kn

RESIDUAL RISKS AND EMERGENCIES

There are no residual risks associated with the normal day-to-day use of access floor pedestals. Care must be taken that pedestals are not subjected to loadings in excess of those indicated on the applicable technical data sheet.

ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION

LCA INFORMATION

This section of the EPD records key features of the LCA on which it is based.

SCOPE

This cradle-to-gate EPD covers the production stage (modules A1 -A3; see below), as permitted by EN 15804; modules A1-A3 are declared in aggregated form.

Product stage			Construction process stage		Use stage							End of life stage				Benefits & loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste disposal	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X: included in LCA; MND: module not declared or NR for not relevant

DECLARED UNIT

The declared unit is 1kg of access floor pedestal.

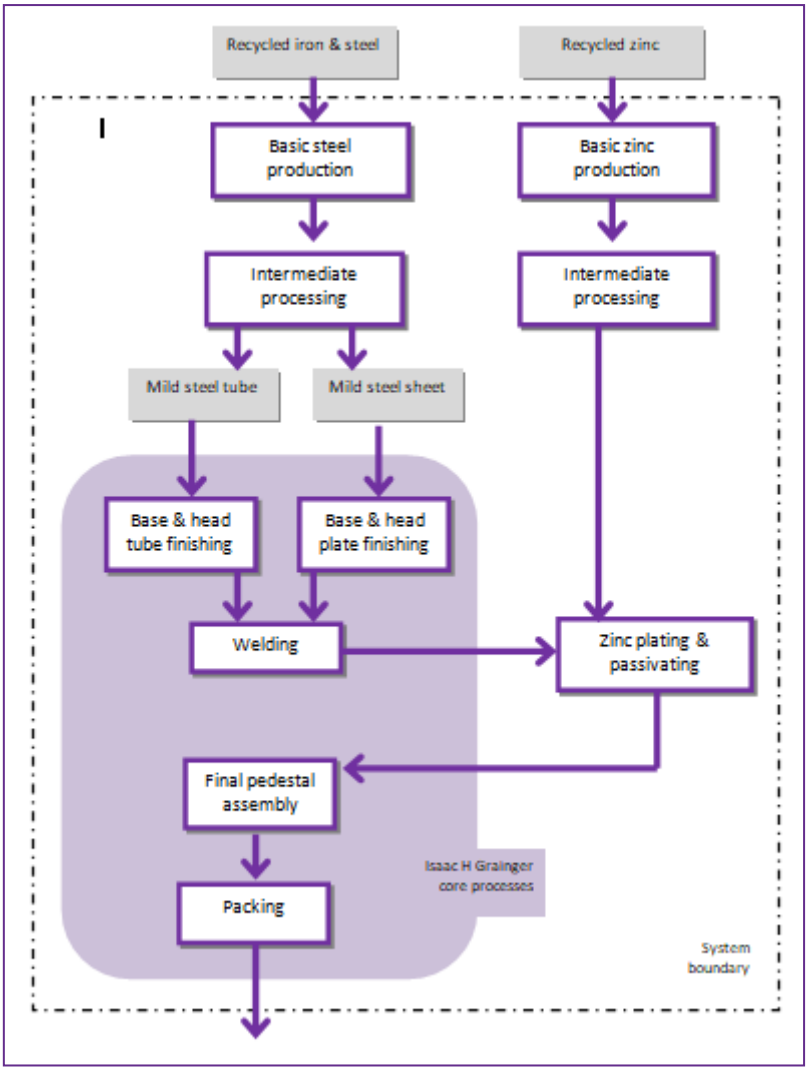
SYSTEM BOUNDARIES

The system boundary of the EPD is defined using the modular approach set out in EN 15804.

As well as the core processes which cover manufacture of the pedestal at Isaac H. Grainger & Son's factory, the system therefore includes production of all raw materials and components from basic resources; transport of those materials at all stages up to Graingers' manufacturing facility in Cradley Heath; transport to the plating facility and the plating activity, the production of fuels and energy carriers and their delivery to manufacturing sites; the treatment of all wastes.

The upstream processing of recycled material inputs that have passed the end-of-waste state is outside the system boundary.

The product life cycle covered by this EPD is illustrated below.



PEDESTAL LIFE CYCLE (CRADLE-TO-GATE)

CUT-OFF CRITERIA

The collected data covered all raw materials, consumables and packaging materials; associated transport to the manufacturing site; process energy and water use; direct production wastes; emissions to air and water. According to EN 15804 and the PCR, flows can be omitted (cut-off) from a core process in the LCA up to a maximum of 1% of the total mass of material inputs or 1% of the total energy content of fuels and energy carriers; consumables for metal-working machines meet these cut-off criteria and were omitted from the LCA underpinning this EPD.

DATA SOURCES AND DATA QUALITY

Data collected for the core processes (pedestal production) cover the period Jan 01 to Dec 31, 2016. The producer-specific data used in LCA calculations are therefore based on 1 year averaged data and have been updated within the last 5 years. These data were checked to ensure that sufficient materials and water are included within the inputs to account for all products, wastes and emissions.

BACKGROUND DATA

Background (generic) data were taken from the ecoinvent database (v3.3); this fulfils the EN 15804 requirement that generic data used in the LCA have been updated within the last 10 years.

Data quality has been reviewed for processes that contribute significantly to the overall LCA. Processes representing the zinc coating of steel were adjusted to ensure that the proportions of steel and zinc are

representative of the product. Data representing production of metal-working lubricants were adjusted to reflect the actual composition and recycled content of the material used by Isaac H. Grainger & Son Ltd. Other data were judged fit for purpose. No environmental impact potential stemming from proxy data exceeds 10% for any impact category.

ALLOCATION

Pedestal production is a straightforward steel fabrication process. Common inputs (fuels, lubricants, welding consumables) were allocated between H range pedestals and other products of Isaac H. Grainger & Son's factory on the basis of production volume.

In the background data, the ecoinvent default allocation is applied to all processes except those in which secondary materials are used, where the "cut-off" allocation is applied. This ensures that secondary materials are free of upstream burdens that arise prior to their reaching the "end of waste" state, in accordance with Section 6.3.4.2 of EN 15804.

ASSUMPTIONS AND ESTIMATES

The passivation process was omitted from the LCA. Given the very small quantities of chromium present in passivated zinc coatings on steel (Grasso 2005), this is not considered significant. The burdens of zinc electroplating were estimated using data for batch galvanising, adjusted to allow for the reportedly lower deposition efficiency of electroplating.

Inputs to and outputs from the system are accounted for over a 100-year time period; long-term emissions are therefore omitted from the impact assessment part of the LCA.

The "primary energy used as material (PERM; PENRM)" indicators are calculated using - as characterisation factors - published values for constituent materials which can yield energy on combustion, where available, and from published calorific values where PEM values are not available. The energy content of wood in pallets used for product packaging is excluded from these calculations. Access floor pedestals are metal, therefore do not yield energy on combustion. Thus PERM and PENRM values are zero in this EPD.

"Primary energy as fuel" indicators (PENRE, PERE) are calculated as the total primary energy demand minus primary energy used as material.

Output flows are calculated for module A3 only, thus the reported values represent a conservative estimate of materials recovery from the product stage.

ENVIRONMENTAL INDICATORS AND INTERPRETATION

Environmental indicator results for the A1 - A3 modules on an aggregated basis are shown in the 4 following tables for the declared unit of 1kg access floor pedestal.

Parameter – Environmental Impacts	Unit	Modules A1 - A3		
		Pedestal H7 (representative)	Pedestal H0S (smallest)	Pedestal H14 (tallest)
Global warming potential (GWP)	kg CO_2-eq	3.47E+00	3.50E+00	3.45E+00
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11-eq	2.32E-07	2.36E-07	2.30E-07
Acidification potential of land and water (AP)	kg SO_2-eq	1.49E-02	1.52E-02	1.48E-02
Eutrophication potential (EP)	kg PO_4^{3-}-eq	1.72E-03	1.75E-03	1.71E-03
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg ethene-eq	1.85E-03	1.86E-03	1.85E-03
Abiotic depletion potential for non-fossil resources (ADPE)	kg Sb-eq	2.00E-04	2.40E-04	1.90E-04
Abiotic depletion potential for fossil resources (ADPFF)	MJ	4.72E+01	4.77E+01	4.70E+01

Parameter – Resource Use	Unit	Modules A1 - A3		
		Pedestal H7 (representative)	Pedestal H0S (smallest)	Pedestal H14 (tallest)
Renewable primary energy as energy carrier (PERE)	MJ	5.18E+00	5.25E+00	5.15E+00
Renewable primary energy resources as material utilization (PERM)	MJ	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	5.18E+00	5.25E+00	5.15E+00
Non-renewable primary energy as energy carrier (PENRE)	MJ	5.22E+01	5.28E+01	5.20E+01
Non-renewable primary energy as material utilization (PENRM)	MJ	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	5.22E+01	5.28E+01	5.20E+01
Use of secondary material (SM)	kg	2.60E-01	2.60E-01	2.60E-01
Use of renewable secondary fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW)	m^3	4.18E-02	4.22E-02	4.17E-02

Parameter – Waste	Unit	Modules A1 - A3		
		Pedestal H7 (representative)	Pedestal H0S (smallest)	Pedestal H14 (tallest)
Hazardous waste disposed (HW)	kg	3.46E-01	3.49E-01	3.44E-01
Non-hazardous waste disposed (NHW)	kg	6.02E+00	6.07E+00	5.99E+00
Radioactive waste disposed (RW)	kg	1.40E-04	1.40E-04	1.40E-04

Parameter – Output Flows	Unit	Modules A1 - A3		
		Pedestal H7 (representative)	Pedestal H0S (smallest)	Pedestal H14 (tallest)
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	3.80E-02	3.80E-02	3.80E-02
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00

INTERPRETATION

Steel production and its processing upstream of Isaac H. Grainger & Son account for the majority of all indicator totals except for ADPE. For example, these parts of the product system are responsible for almost 90% of the total GWP (the carbon footprint). The ADPE indicator is driven strongly by the amount of zinc used in the electroplating process. Thus this indicator is the only one which changes significantly between the representative H7 pedestal and the smallest and tallest pedestals.

For ODP, releases of Halon 1301, HCFC-22 and CFC-114 in generic inventory data for upstream processes in fuel chains account for almost 95% of the indicator values obtained. Some information sources underlying this generic data predate Montreal Protocol deadlines for replacement of these substances in all but essential uses. ODP indicator values should therefore be treated with caution.

The secondary materials indicator value is dominated by steel scrap used in steelmaking.

The weights of individual pedestals given in the H-range Table (p4) may be used with the indicator values reported above to calculate environmental indicators for other pedestals in Isaac H. Grainger & Son's 'H' range or for pedestal arrays.

ADDITIONAL ENVIRONMENTAL INFORMATION

Pedestal caps are polypropylene mouldings with small brass inserts weighing approximately 20g. A pedestal with cap fitted is shown on the cover of this EPD. Adding a cap adds a small amount to most indicator values for a pedestal. Approximate values for these additional amounts were calculated as part of the LCA study and those for the environmental impact categories are shown in the table below for information.

	GWP	ODP	AP	EP	POCP	ADPE	ADPF
Pedestal cap	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq	kg PO_4^{3-} eq	kg ethene eq	kg Sb eq	MJ

Indicator value per pedestal cap	7.00E-02	4.00E-09	1.90E-03	4.80E-04	7.00E-05	7.00E-05	1.60E+00

REFERENCES

BS EN ISO 2081:2008 Metallic and other inorganic coatings. Electroplated coatings of zinc with supplementary treatments on iron or steel

BS EN 12825:2001 Raised access floors (published November 2001)

ecoinvent database (v3.3) - www.ecoinvent.ch

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

General Program Instructions, Version 2.5, 2015-05-11 - The International EPD® System - EPD International AB

L. Grasso, A. Segre Fantoli, M. G. Ienco, A. Parodi, M. R. Pinasco, E. Angelini, F. Rosalbino 2005. Corrosion Resistance of Cr (III) Based Conversion Layer on Zinc Coatings in Comparison with a Traditional Cr (VI) Based Passivation Treatment. Paper presented at the 2nd International Conference Heat Treatment And Surface Engineering In Automotive Applications organised by AIM, Riva del Garda, 20-22 June 2005

ISO 9001:2015 - Quality management system. Requirements

ISO 14001:2015 - Environmental management systems – Requirements with guidance for use

ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations - Principles and procedures

LCA of Pedestals (2017) - Report for Isaac H. Grainger & Son Ltd - EuGeos Limited

PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30 - The International EPD® System - EPD International AB

PSA MOB PF2 PS/SPU: March 1992: Platform Floors (Raised Access Floors): Performance Specification. Department of the Environment, Property Services Agency

GLOSSARY

The International EPD® System: 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)

Life cycle assessment (LCA): LCA studies the environmental aspects and quantifies the potential impacts (positive or negative) of a product (or service) throughout its entire life. ISO standards ISO 14040 and ISO 14044 set out conventions for conducting LCA.

REACH Regulation: REACH is the European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals. It entered into force in 2007, replacing the former legislative framework for chemicals in the EU.

PEDESTAL - SUMMARY

This Environmental Product Declaration provides environmental performance indicators for an access floor pedestal manufactured by Isaac H. Grainger & Son Ltd in the UK.

This is an EPD in accordance with ISO 14025 and EN 15804, and is third-party verified. It is a cradle-to-gate EPD in accordance with the requirements of EN 15804, and thus covers the modules A1 - A3 defined in that standard. All other stages are dependent on the specific application of the product and should be included in a whole-of-life model.

This EPD is based on a life cycle assessment (LCA) study which used production data for 2016 from Isaac H. Grainger & Son's manufacturing facility in Cradley Heath, West Midlands, UK. Background data were taken from the ecoinvent database (v3.3).

The declared unit is 1kg of access floor pedestal.

Access Floor Pedestal EPD	
EPD programme:	The International EPD® System
EPD programme operator:	EPD International AB - Stockholm - Sweden www.environdec.com
EPD owner:	Isaac H. Grainger & Son Ltd 8 Gawne Lane, Cradley Heath, West Midlands, B64 5QY - UK http://www.isaacgrainger.co.uk
Contact:	tel: +44 (0)1384 637 777 email: sales@isaacgrainger.co.uk
Declaration No:	S-P-01186
ECO EPD registration No:	00000662
Date of publication:	March 12th 2018
EPD valid until:	February 13th 2023
EPD geographical scope:	Europe
External verifier:	Ugo Pretato - Recognized Individual Verifier
LCA conducted by:	EuGeos Limited, UK - +44 (0)1625 434423 www.eugeos.co.uk

The CEN standard EN 15804 serves as the core PCR
EPDs within the same product category but from different programmes may not be comparable
EPDs of construction products may not be comparable if they do not comply with EN 15804