

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Integra – LCC, LCP and LKP Lindab AB

EPD HUB, HUB-0671

Publishing date 1st September 2023, last updated on 1st September 2023, valid until 1st September 2028





GENERAL INFORMATION

MANUFACTURER

Manufacturer	Lindab s.r.o.
Address	Na Hurce 1081/6, Prague, Czech Republic
Contact details	lindab@lindab.com
Website	https:/www.lindab.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Tomas Martinak and Axel Jar Torm Andersen
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.









PRODUCT

Product name	Ceiling diffuser – Integra: LCC, LCP and LKP
Additional labels	-
Product reference	LCC125, LCC160, LCC200, LCC250, LCC315 LCP125, LCP160, LCP200, LCP250, LCP315 LKP125, LKP160, LKP200, LKP250, LKP315
Place of production	Prague, Czech Republic
Period for data	Calendar year 2021
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	< 10%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of Integra ceiling diffuser
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	4,72
GWP-total, A1-A3 (kgCO2e)	3,67
Secondary material, inputs (%)	3,42
Secondary material, outputs (%)	93,7
Total energy use, A1-A3 (kWh)	18,2
Total water use, A1-A3 (m3e)	0,038







MANUFACTURER

ABOUT LINDAB

Lindab is a leading ventilation company in Europe, offering solutions for energy-efficient ventilation and a healthy indoor climate. The products are characterised by high quality, ease of installation and environmental thinking. In northern Europe, Lindab also offers an extensive range of roof, wall and rainwater systems.

FOR A BETTER CLIMATE

We want to create a better climate. Most of us spend a majority of our time indoors. The air we breathe, in our homes, at our workplaces and at school, affects our well-being. Since air is not visible, we do not always think about it. However, the indoor climate is crucial for how we feel, for our energy levels and whether we stay healthy. Lindab wants to contribute to the architecture and indoor climate of tomorrow. We also want a better climate for our planet.



That is why we develop energy-efficient solutions for healthy indoor environments

OUR VISION

We want to be the leading player in the area in which we are strongest – ventilation in Europe. We focus on air distribution and air diffusion. Since we offer high-quality products, we focus on Europe where demand for good ventilation is high, and we can offer superior availability. We specialise in those parts of the ventilation system where we are the strongest. We adapt our offering to the local market, with our core ventilation offering as the clear common denominator in all markets.

THE IMPORTANCE OF VENTILATION

About 90 percent of the global population breathes poor air every day. A common misconception is that outdoor air is more polluted due to emissions, smog, and harmful chemicals. In fact, indoor air in homes, schools, offices, and factories can be as much as five times more polluted. People nonetheless spend most of their life indoors. The most common causes of indoor air pollution are mould, chemicals in, for example, furniture and building materials, dust, radon, and cigarette smoke but, above all, airborne particles from combustion and industrial processes, which are so small they can enter the human bloodstream via the respiratory system. Today, air pollution is a risk factor in several of the world's most common causes of death, including heart disease, pneumonia, stroke, diabetes, and lung cancer. Ventilation is an efficient and convenient method to remove those indoor air pollutants.







SUSTAINABILITY PLAN

For us, sustainability is a way of thinking and working. This affects how we work with Lindab's strategy in all areas. Everything from the purchases we make, to the deliveries and the service we offer our customers. Lindab has three long-term, non-financial targets for the business, one that focuses on increasing our attractiveness as an employer, one for reducing our own carbon dioxide emissions, and one for a better working environment.

Read more about Lindab Groups sustainability work and non-financial targets on www.lindabgroup.com.



STEEL - A SUSTAINABLE MATERIAL

Steel provides products with a long service life. Steel has many advantages over other materials – it has a very long service life, is non-combustible and meets hygiene requirements. Steel is a fully recyclable material and scrap steel has a strong market position: steel recovered from structures and end products at the end of their lifecycle is efficiently recycled and re-used. We prioritise cooperation with steel suppliers driving development towards fossil-free steel and whose carbon dioxide intensity values are good. The steel we use must be free of particularly hazardous substances.

The use of steel in Lindab's products is what contributes most to Lindab's CO2 emissions. The transition to decarbonised steel is Lindab's most significant individual action in terms of its effect on the environment. Through our collaboration with SSAB and H2 Green Steel, we will also be among the first in Europe to have access to near-zero and fossil free steel in 2026.







PRODUCT



PRODUCT DESCRIPTION

Integra diffusers type LCP, LKP and LCC are a series of flush mounted ceiling diffusers suitable for installation in suspended ceilings. The diffusers have a smooth over part and a closed front plate, which gives a nice design an aesthetic appearance in modern buildings. The design and shape of the diffuser make it particularly suitable for supply of cooled air and for maintaining the coanda effect in a large dynamic working area. This means that the diffusers can handle both high airflows and low airflows without the risk of drafts in the room. This makes the Integra diffusers perfect for use in VAV applications, with varying airflows according to the actual need in the room. The diffusers can also be used for extract air, so that the aesthetic appearance is maintained in all parts of the ceiling.

Square diffusers LCP and LKP can be adapted to fit into different ceiling systems, Lindab offers 14 different ceiling adaptions as standard. Circular diffusers LCC can be installed directly in a ceiling panel or in fixed plasterboard ceilings.

Installing Integra diffusers in combination with a plenum box type MB or CB can contribute to achieving a stable airflow to the diffuser, as well as realizing the potential for individual adjustment.

All assumptions and results in this EPD are based on LCP-200, which is a high runner and represents the Integra diffuser well. The EPD is representing also the LCC and LKP versions where the overall GWP fossil variation is less than 10%.

Conversion table: Weight of product under this EPD, see appendix A

Further information can be found at www.lindab.com

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	97	EU
Minerals	-	-
Fossil materials	3	EU
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-	
Biogenic carbon content in packaging, kg C	0,25	







FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1kg of Ceiling Diffuser
Mass per declared unit	1kg
Functional unit	-
Reference service life	> 50 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm). More detailed information about the products material content can be found in the Building Product Declaration available online.

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Pro	duct s	tage		embly		Use stage End of life stage				Beyond the system boundaries								
A1	A2	A3	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	C3	C4		D	
X	х	х	х	х	MND	MND	MND	MND	MND	MND	MND	x	х	х	х		х	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.







MANUFACTURING AND PACKAGING (A1-A3)



The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste generated in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The steel raw material is received by Lindab Group's own steel service centre, Lindab Steel AB and afterwards transported to Production unit. Together with all other components the material is quality inspected at arrival to the manufacturing facility. The product parts are cut with a laser cut and punching machine (Waste from these processes is pure steel scrap, steel scrap is sold for recycling.) Parts are formed by pressing and bending (Some metal scrap may come from pressing.) Some parts must be welded (Front plate and welding stud) Front plate and Over part are painted (In this process wastewater comes out, this is treated by the subdivider.) The manufactured and purchased parts are assembled. For protection and transport, the units are protected with a mixture of paper, cardboard and wooden pallets. Lubricating oil is used for the above machines.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Installation spills and handling of packaging material is considered. Material loss during installation is estimated to be zero.

Transport from production site to customer is calculated as an average of the 5 largest consumer countries weighted by revenue.

Country	Distance 1 (Km)	Distance 2 Ferry (Km)	Distance 3 (Km)	Weighting by turnover %
Denmark	1043	-	300	36,5
Sweden	883	116	300	34,6
Hungary	524	-	300	12,9
Finland	1932	85	300	8
Germany	291	-	300	8







Distance1: From production place to Distribution centre (>32 ton lorry, Euro 5, Diesel truck)

Distance2: Ferry (Transport, freight sea)

Distance3: From Distribution centre to customer is set to 300 Km.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. These life cycle stages are dependent on how the product is used and should be developed and included as part of a holistic assessment of specific construction works.

PRODUCT END OF LIFE (C1-C4, D)

Energy (0,1kWh) for deconstruction is included in C1, and activities related to steel recycling is included in C3. A recycling rate of 95% (according to World Steel Association, 2017) and landfill rate of 5% has been assumed for the steel. That is to be seen as the proportion of the material in the product that will be recycled in a subsequent system. External scrap in the raw material is also deducted and accounts for 20%. Hence the net flow to be credited in module D is 76%. See below tables for scenarios used in Modules C and D, based on EU statistics.

Transport to waste processing scenario (C2)

Туре	Distance
Lorry	40 km

End of Life Scenarios based on Eurostat. (A5, C1-C4, D)

Name	%
Steel to recycling	95*
Steel to landfill	5*
Paper to recycling	81,5**
Paper to incineration	18,5**
Cardboard to recycling	81,5**
Cardboard to incineration	18,5**
Plastic to recycling	37***
Plastic to incineration	54***
Plastic to landfill	9***
Rubber recovered energy (incineration)	50**
Rubber without recovered energy (incineration)	25**
Rubber to landfill	25**
Wood reused	66**





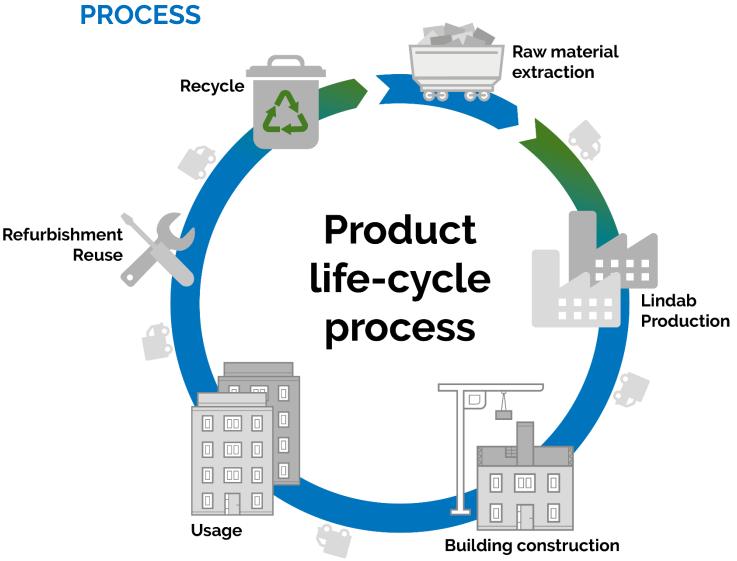


Wood recovered energy (incineration)	33**
Wood to landfill	1**

According to:

- *: Wold Steel Association 2017
- **: EUROSTAT Europan statestics and Lindab sales 2021
- ***: Plastic Europe statistics and Lindab sales 2021

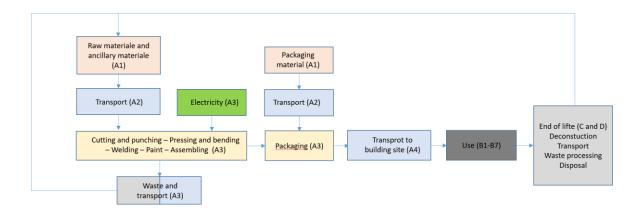
LIFE-CYCLE PROCESS AND MANUFACTURING PROCESS











LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. While cut-off criteria according to the PCR were employed, much data which would have fallen within that scope were included regardless, if available, resulting in a data set which is robust and captures all significant contributors to the LCA results.

There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or energy consumption

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	-
Variation in GWP-fossil for A1-A3	< 10%

This EPD is represented by LCP-200, the LCP-200 is a high runner and represents Integra well for parameter in this EPD. The products in the scope vary only in sizes and shapes.

Production process, transportation, installation, demolition and waste treatment are the same for all products.

Integra is only produced in Lindab s.r.o. Prague.







LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044, Data from World Steel Association and available supplier EPDs. For other inputs Ecoinvent 3.8 and One Click LCA databases were used as sources of environmental data.







ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, PEF

IMPACT CATEGORY	UNIT	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO₂e	3,76E0	1,1E-1	-1,99E-1	3,67E0	2,26E-1	1,11E0	MND	4,38E-2	3,76E-3	4,17E-2	9,3E-3	-2,73E0						
GWP – fossil	kg CO₂e	3,76E0	1,1E-1	8,52E-1	4,72E0	2,26E-1	5,16E-2	MND	4,37E-2	3,75E-3	3,75E-2	9,15E-3	-1,99E0						
GWP – biogenic	kg CO₂e	-3,43E-3	1,58E-6	-1,05E0	-1,06E0	0E0	1,06E0	MND	0E0	0E0	4,12E-3	1,51E-4	-7,34E-1						
GWP - LULUC	kg CO₂e	1,31E-3	4,26E-5	2,31E-3	3,66E-3	1,04E-4	1,84E-5	MND	6,43E-5	1,39E-6	2,7E-5	3,63E-7	-5,24E-3						
Ozone depletion pot.	kg CFC-11e	4,09E-8	2,5E-8	6,65E-8	1,32E-7	5,12E-8	7,84E-9	MND	2,1E-9	8,64E-10	2,57E-9	1,44E-10	-1,09E-7						
Acidification potential	mol H ⁺ e	1,08E-2	6,06E-4	3,9E-3	1,53E-2	1,14E-3	1,32E-4	MND	2,36E-4	1,59E-5	2,63E-4	4,25E-6	-1,03E-2						
EP-freshwater ²⁾	kg Pe	2,72E-5	8,58E-7	1,03E-4	1,31E-4	1,9E-6	4,7E-7	MND	5,43E-6	3,07E-8	1,1E-6	5,69E-9	-1,22E-4						
EP-marine	kg Ne	2,19E-3	1,72E-4	9,05E-4	3,27E-3	3,2E-4	3,18E-5	MND	3,01E-5	4,72E-6	5,6E-5	1,83E-6	-2,15E-3						
EP-terrestrial	mol Ne	2,34E-2	1,9E-3	8,92E-3	3,42E-2	3,54E-3	3,35E-4	MND	3,41E-4	5,21E-5	6,47E-4	1,66E-5	-2,24E-2						
POCP ("smog") ³⁾	kg NMVOCe	7,51E-3	5,76E-4	2,72E-3	1,08E-2	1,08E-3	1,14E-4	MND	9,38E-5	1,67E-5	1,78E-4	4,67E-6	-9,18E-3						
ADP-minerals & metals ⁴⁾	kg Sbe	1,08E-4	2,79E-7	3,63E-6	1,12E-4	8,51E-7	1,98E-7	MND	9,58E-8	8,8E-9	2,76E-6	1,55E-9	-2,53E-5						
ADP-fossil resources	MJ	4,16E1	1,63E0	1,32E1	5,65E1	3,36E0	5,43E-1	MND	8,76E-1	5,64E-2	2,8E-1	9,93E-3	-2,04E1						
Water use ⁵⁾	m³e depr.	1,08E0	7,23E-3	5,79E-1	1,67E0	1,7E-2	7,35E-3	MND	1,93E-2	2,52E-4	5,87E-3	4,02E-4	-3,5E-1						

¹⁾ GWP = Global Warming Potential; ²⁾ EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e; ³⁾ POCP = Photochemical ozone formation; ⁴⁾ ADP = Abiotic depletion potential; ⁵⁾ EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and lonizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.





USE OF NATURAL RESOURCES

IMPACT CATEGORY	UNIT	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	С3	C4	D
Renew. PER as energy ⁸⁾	MJ	2,68E0	1,89E-2	6,47E0	9,17E0	5,11E-2	1,41E-2	MND	1,27E-1	6,35E-4	4,94E-2	1,52E-4	-1,04E1						
Renew. PER as material	MJ	1,02E-1	0E0	9,8E0	9,9E0	0E0	-9,83E0	MND	0E0	0E0	-6,96E-2	-3,66E-3	9,87E-1						
Total use of renew. PER	MJ	2,79E0	1,89E-2	1,63E1	1,91E1	5,11E-2	-9,82E0	MND	1,27E-1	6,35E-4	-2,02E-2	-3,51E-3	-9,44E0						
Non-re. PER as energy	MJ	4,18E1	1,63E0	1,26E1	5,6E1	3,36E0	5,43E-1	MND	8,77E-1	5,64E-2	2,81E-1	9,94E-3	-2,02E1						
Non-re. PER as material	MJ	4,71E-1	0E0	6,37E-1	1,11E0	0E0	-6,28E-1	MND	0E0	0E0	-3,26E-1	-1,43E-1	-1,68E-1						
Total use of non-re. PER	MJ	4,23E1	1,63E0	1,32E1	5,71E1	3,36E0	-8,53E-2	MND	8,77E-1	5,64E-2	-4,56E-2	-1,33E-1	-2,04E1						
Secondary materials	kg	3,42E-2	4,81E-4	1,3E-1	1,64E-1	1,25E-3	3E-4	MND	6,63E-5	1,57E-5	3,12E-4	4,24E-6	5,97E-1						
Renew. secondary fuels	MJ	6E-4	4,8E-6	1,92E-1	1,93E-1	1,32E-5	2,59E-6	MND	3,73E-7	1,58E-7	1,62E-5	1,18E-7	-1,29E-1						
Non-ren. secondary fuels	MJ	3,51E- 22	0E0	0E0	3,51E- 22	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0						
Use of net fresh water	m³	2,19E-2	2,05E-4	1,58E-2	3,79E-2	4,73E-4	1,6E-4	MND	6,78E-4	7,3E-6	1,85E-4	1,87E-5	-8,15E-3						

⁸⁾ PER = Primary energy resources.

END OF LIFE - WASTE

IMPACT CATEGORY	UNIT	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	9,13E-2	2,12E-3	3,63E-2	1,3E-1	4,56E-3	1,22E-3	MND	3,13E-3	7,48E-5	1,89E-3	0E0	-4,74E-1						
Non-hazardous waste	kg	1,51E0	3,45E-2	4,15E0	5,7E0	7,86E-2	7,49E-2	MND	2,49E-1	1,23E-3	6,57E-2	5,83E-2	-4,83E0						
Radioactive waste	kg	2,92E-4	1,09E-5	5,47E-5	3,58E-4	2,27E-5	3,57E-6	MND	6E-6	3,77E-7	1,63E-6	0E0	-3,79E-5						





END OF LIFE - OUTPUT FLOWS

IMPACT CATEGORY	UNIT	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
Components for re-use	kg	2,34E-6	0E0	0E0	2,34E-6	0E0	1,43E-1	MND	0E0	0E0	0E0	0E0	0E0						
Materials for recycling	kg	1,42E-2	0E0	3,74E-1	3,88E-1	0E0	2,1E-1	MND	0E0	0E0	9,37E-1	0E0	0E0						
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0						
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	4,77E0	MND	0E0	0E0	1,04E-1	0E0	0E0						





VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- · The digital background data for this EPD

Why does verification transparency matter? Read more online

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited 01.09.2023









APPENDIX A

Representative standard size

All sizes can have different colours, with or without blue foil, when mounted in the ceiling, the weight will be the same.

Name:	Кд
LCC-125	2,8
LCC-160	2,7
LCC-200	2,7
LCC-250	2,6
LCC-315	2,5
LCP-125	3,2
LCP-160	3,2
LCP-200	3,3
LCP-250	3,4
LCP-315	3,4
LKP-125	3,2
LKP-160	3,2
LKP-200	3,3
LKP-250	3,4
LKP-315	3,4

In case of further questions, please go to www.lindab.com





