

Statement of Verification

BREG EN EPD No.: 000492

Issue 01

This is to verify that the
Environmental Product Declaration
provided by:
Forest Industries Ireland



is in accordance with the requirements of:
EN 15804:2012+A1:2013
and
BRE Global Scheme Document SD207

This declaration is for:
1m³ of Kiln Dried Timber

Company Address

Forest Industries Ireland,
84/86 Lower Baggot Street,
Dublin 2,
D02 H720,
Ireland



**Forest Industries
Ireland**
ibec

Signed for BRE Global Ltd

Emma Baker
Operator

23 May 2023
Date of this Issue

23 May 2023
Date of First Issue

22 May 2028
Expiry Date



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Environmental Product Declaration

EPD Number: 000492

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	LCA consultant/Tool
Forest Industries Ireland, 84/86 Lower Baggot Street, Dublin 2, D02 H720, Ireland	BRE LINA 2.0 Bala Subramanian
Declared/Functional Unit	Applicability/Coverage
1 m ³ of Kiln Dried Timber	Product Average.
EPD Type	Background database
Cradle to Gate	ecoinvent
Demonstration of Verification	
CEN standard EN 15804 serves as the core PCR ^a	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate ^b)Third party verifier: Roger Connick	
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)	
Comparability	
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance	

Information modules covered

Product			Construction		Use stage							End-of-life				Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, Recovery and/or Recycling potential
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Data for this EPD was provided through Forest Industries Ireland from the following manufacturers:

Balcas Timber Ltd, 75 Killadeas Road, Enniskillen, Co. Fermanagh, BT94 2ES, Northern Ireland	Murray Timber Group, Ballygar, Co Galway, Ireland
ECC Timber Products, Corr na Mona, Co. Galway, F12 F406, Ireland	Glennon Brothers Cork Ltd, Farren South, Fermoy, Co. Cork, P61 Y448, Ireland
GP Wood Limited, Main Street, Enniskeane, Co. Cork, P47 HH74, Ireland.	

Construction Product:

Product Description

This Environmental Product Declaration (EPD) covers Irish and Scottish sourced and produced kiln dried timber produced by Balcas, ECC Timber Products, GP Wood, Glennon Brothers Timber and Murray Timber Group. The kiln dried timber covered by this EPD is produced from four softwood species – Spruce, Pine, Larch, and Douglas fir. Timber products produced by the sawmills are sold to the construction, fencing and the pallets and packaging markets. Timber products include construction joists, rafters, studs and truss components, windows and doors, decking, fencing, post and rail, flooring, laths, timber frame components, roof, and tile battens. For this EPD, the use phase has been modelled on the timber product being used as structural timber, in the form of a beam, joist, stud or batten. The declared unit is 1m³ of Kiln dried timber.

Technical Information

Property	Class	C16	C18	C22	C24	C30
Strength properties in N/mm²						
Bending strength	$f_{m,k}$	16	18	22	24	30
Tension Parallel	$f_{t,0,k}$	8.5	10	13	14.5	19
Tension Perpendicular	$f_{t,90,k}$	0.4	0.4	0.4	0.4	0.4
Compression Parallel	$f_{c,0,k}$	17	18	20	21	24
Compression Perpendicular	$f_{c,90,k}$	2.2	2.2	2.4	2.5	2.7
Shear	$f_{v,k}$	3.2	3.4	3.8	4.0	4.0
Stiffness properties in kN/mm²						
Mean modulus of elasticity parallel bending	$E_{m,0,mean}$	8.0	9	10.0	11	12
5 percentile modulus of elasticity parallel bending	$E_{m,0,k}$	5.4	6	6.7	7.4	8
Mean modulus of elasticity perpendicular	$E_{m,90,mean}$	0.27	0.30	0.33	0.37	0.40
Mean shear modulus	G_{mean}	0.50	0.56	0.63	0.69	0.75
Density in kg/m³						
5 percentile density	ρ_k	310	320	340	350	380
	ρ_{mean}	370	380	410	420	460

NOTE 1: Values given above for tension strength, compression strength, shear strength, char. modulus of elasticity in bending, mean modulus of elasticity perpendicular to grain and mean shear modulus have been calculated using the equations given in EN 384.

NOTE 2 The tension strength values are conservatively estimated since grading is done for bending strength.

NOTE 3 The tabulated properties are compatible with timber at moisture content consistent with a temperature of 20 °C and a relative humidity of 65 %, which corresponds to a moisture content of 12 % for most species.

NOTE 4 Characteristic values for shear strength are given for timber without fissures, according to EN 408.

NOTE 5 These classes may also be used for hardwoods with similar strength and density profiles such as e.g. poplar or chestnut.

NOTE 6 The edgewise bending strength may also be used in the case of flatwise bending.

Note: The strength properties are taken from BS EN 338:2016: Structural timber — Strength classes



Main Product Contents

Constituted entirely of Ireland, UK, and Scotland sourced timber.

Material/Chemical Input	%
Softwood	100

Manufacturing Process

Kiln dried timber covered by this EPD is produced from four softwood species – Spruce (Sitka and Norway), Pine, Larch, and Douglas fir. The trees used to produce timber products are grown in Ireland and Scottish, sourced from sustainably managed forests which are independently certified under two forest management certification schemes, namely FSC® (Forest Stewardship Council) and PEFC® (Programme for the Endorsement of Forest Certification) whereby the forest management practices are verified as economically, socially, and environmentally responsible.

Logs are harvested, extracted, and delivered to sawmills which produce a range of sawn timber products and a series of co-products including woodchips, bark, shavings, and sawdust. Sawn timber is sold green or dried, (kiln or air dried), and treated or untreated with a preservative. Kiln dried timber products are produced in kilns fired by residue biomass from sawmill production, natural gas or fuel oils depending on the site.

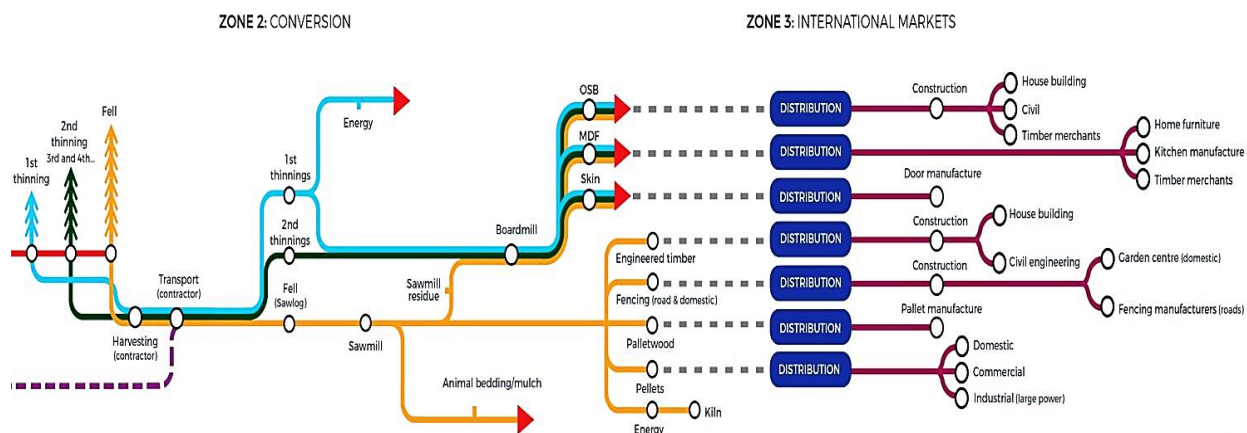
Sawn timber can be further cut, machined, or planed depending on the end product or specific client requirements. The final timber product is packaged for distribution using a mix of plastic film, paper packaging, strapping, steel banding and fixings with various timber packaging components including bearers and spacers. Each individual pack is identified by a unique I.D. tag attached at final processing stage.

- Structural timber used in buildings and bridges should be strength graded in accordance with I.S. EN 14081-1; the grading can be carried out visually by a trained operative or by machine.
- Timber graded in accordance with I.S. EN 14081-1 must be CE marked and have a Declaration of Performance (DoP). Timber for other uses (i.e., not used in buildings or bridges) should conform to the relevant product standard for example timber fencing used in farms should comply with I.S. 436.
- Timber used in battens should conform to S.R. 82.
- When timber is treated with a preservative the treater should provide information on the treatment process in accordance with I.S. EN 15228.
- The timber characteristic properties have been developed through testing and can be taken from I.S. EN 338 for the relevant strength class.
- The values from I.S. EN 338 can be used in structural design to I.S. EN 1995 (all parts).

Process Flow Description

- Logs are harvested and extracted to roadside storage in forest
- Logs are collected in the forest and delivered to the sawmill
- Logs are sorted into various size categories in the sawmill storage yard
- Logs are loaded into the sawmill to be processed into wood products; some sawmill process waste residues (saw dust, chip, bark) from the production process in their on-site biomass plant.
- Butt reducer removes tapered end (chips collected for further use e.g., renewable biomass fuel of horticultural etc.)
- Debarking line removes outer bark (bark collected for further use e.g., renewable biomass fuel of horticultural etc.)
- Sawing line produces planks of various sizes (co-products produced are sawdust and wood chip which are collected for further use e.g., renewable biomass fuel, wood pellet manufacturing, horticultural, panel mills etc.)
- Product Output 1 = green timber
- Planks from output 1 are loaded into the kiln for drying
- Product Output 2 = kiln dried timber
- Planks from output 1 are loaded into the vacuum treatment vessel
- Product Output 3 = green treated timber

Process flow diagram



Life Cycle Assessment Calculation Rules

Declared / Functional unit description

The declared unit is 1 m³ of Kiln dried timber used as structural timber.

System boundary

This is a cradle-to-gate LCA study that follows the modular design defined in EN 15804:2012+A1:2013 and BS EN 16485:2014. The datasets are derived from Ecoinvent v3.2 (2015), and the LCA tool used was BRE LINA v2.0. The LCA models and reports the production stage modules, A1 to A3.

Data sources, quality and allocation

Specific primary data has been modelled, which was provided by five sawmills and covers the Irish and Scottish wood data. The quantity used in the data collection for this EPD is therefore an average value based on the total quantity of kiln dried timber produced during the data collection period (01/01/21-31/12/21) and one of the sawmills uses the data collection period (01/12/2020 – 30/11/2021). Secondary data has been used for upstream and downstream processes that are beyond the control of the manufacturer, such as raw material production.

Sawmills produce other products in addition to kiln-dried timber; therefore, an allocation of fuel consumption, water consumption and discharge, and waste emissions was required. So, the allocation has been made based on the total production output of Kiln-dried timber. All the consumables, such as electricity, water usage, transportation, ancillary materials, and packaging, have been reported by all the mills. The only exceptions are direct emissions to water, soil and air which are not measured in some of the mills, but two of those mills have monitored and reported the emissions to water and air.

Two of those mills have their own biomass CHP plant, which is fuelled by residue from the saw logs and supplies electricity to the sawmill site and exports electricity to the grid. Two of those mills have their own biomass CHP plant, which is fuelled by residue from the saw logs and supplies electricity to the sawmill site and exports electricity to the grid. There is no waste; all production waste is consumed on site to produce heat and electricity, and some residues, such as bark, chips, sawdust, shavings, etc., have been sold to external customers. So, in order to split the impacts, the physical allocation has been used. As a result of LCA modelling, the impact of five sawmills has around a 5 to 10% variance from the average result, so the average result table is represented in the EPD.

ISO14044 guidance.	Geographical representativeness	Technical representativeness	Time representativeness
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Quality Level			
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e., identical technology).	n/a
Fair	n/a	n/a	There is approximately 5-6 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European, Irish electricity, and Biomass electricity (MJ), Ireland datasets have been selected from the Ecoinvent LCI for this LCA. Wood data has been modelled in Ecoinvent 3.6, and other background LCI datasets are based on Ecoinvent v3.2, (2015) which was used for all other material energy and waste data requirements. The quality level of geographical and technical representativeness is therefore Very Good. The quality level of time representativeness is Fair as the background LCI datasets are based on ecoinvent v3.2 which was compiled in 2015. Therefore, there are approximately 5–6 years between the Ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

All raw materials and energy input to the manufacturing process have been included. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items, and the associated transport to the manufacturing site. Process energy, water use, and general waste are included. Only exemptions are Emission to water, soil, and air was not monitored in the some of the mills.

LCA Results – Average result

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO ₂ equiv.	kg CFC 11 equiv.	kg SO ₂ equiv.	kg (PO ₄) ³⁻ equiv.	kg C ₂ H ₄ equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	-6.72E+02	2.74E-06	1.17E-01	4.51E-02	3.31E-02	4.80E-04	3.37E+02
	Transport	A2	1.52E+01	2.79E-06	6.56E-02	1.46E-02	9.87E-03	3.60E-05	2.29E+02
	Manufacturing	A3	1.22E+01	9.98E-06	6.96E-02	2.28E-02	9.99E-03	4.21E-05	1.89E+02
	Total (of product stage)	A1-3	-6.44E+02	1.55E-05	2.52E-01	8.26E-02	5.30E-02	5.58E-04	7.56E+02

GWP = Global Warming Potential;
 ODP = Ozone Depletion Potential;
 AP = Acidification Potential for Soil and Water;
 EP = Eutrophication Potential;

POCP = Formation potential of tropospheric Ozone;
 ADPE = Abiotic Depletion Potential – Elements;
 ADPF = Abiotic Depletion Potential – Fossil Fuels;

Parameters describing resource use, primary energy			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	7.84E+03	5.40E+03	1.32E+04	3.52E+02	0.00E+00	3.52E+02
	Transport	A2	3.26E+00	1.07E-05	3.26E+00	2.29E+02	0.00E+00	2.29E+02
	Manufacturing	A3	2.23E+02	4.10E-05	2.23E+02	1.81E+02	0.00E+00	1.81E+02
	Total (of product stage)	A1-3	8.06E+03	5.40E+03	1.35E+04	7.62E+02	0.00E+00	7.62E+02

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

Parameters describing resource use, secondary materials and fuels, use of water			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	1.05E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	5.07E-02
	Manufacturing	A3	0.00E+00	0.00E+00	0.00E+00	2.33E+00
	Total (of product stage)	A1-3	0.00E+00	0.00E+00	0.00E+00	2.49E+00

SM = Use of secondary material;
 RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
 FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	Kg	kg
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	9.50E-02	1.16E+01	1.58E-03
	Manufacturing	A3	1.55E-01	6.02E-01	5.74E-04
	Total (of product stage)	A1-3	2.49E-01	1.22E+01	2.16E-03

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	3.22E+02	6.18E-01	1.56E-03	0.00E+00
	Total (of product stage)	A1-3	3.22E+02	6.18E-01	1.56E-03	0.00E+00

CRU = Components for reuse;
 MFR = Materials for recycling

MER = Materials for energy recovery;
 EE = Exported Energy

Interpretation of results:

The results presented in this EPD are a mass-weighted average (relating to production output) of individual results from five sawmills which produce Kiln-dry timber.

The bulk of the environmental impacts are attributed to the extraction and processing of Kiln-dry timber, covered by information modules A1-A3 of EN15804:2012+A1:2013. The most significant contributions to production phase impacts are the upstream production of raw materials used in the wood processing process, generation/supply of electricity and the production/use of fuels on site.

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

EN 16485 (2014) EN 16485: Round and sawn timber. Environmental Product Declarations. Product category rules for wood and wood-based products for use in construction.

BS EN 338:2016: Structural timber — Strength classes.