Statement of Verification

BREG EN EPD No.: 000535 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

MiTek Industries Limited

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

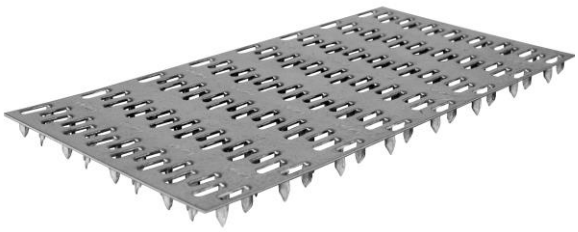
BRE Global Scheme Document SD207

This declaration is for:

1 kg of Punched Metal Plate Fasteners (PMPF)

Company Address

MiTek Industries Limited
Grazebrook Industrial Park
Peartree Lane
Dudley
DY2 0XW
United Kingdom



Signed for BRE Global Ltd	Emma Baker Operator	06 November 2023 Date of this Issue
06 November 2023 Date of First Issue		05 November 2028 Expiry Date

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Environmental Product Declaration

EPD Number: 000535

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE 2023 Product Category Rules (PN 514 Rev 3.1) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019.
Commissioner of LCA study	**LCA consultant/Tool**
MiTek Industries Limited Grazebrook Industrial Park Peartree Lane Dudley DY2 0XW United Kingdom	LCA consultant: Roger Connick Tool: BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1 kg of Punched Metal Plate Fasteners (PMPF)	Product Average
EPD Type	**Background database**
Cradle to Gate with options	Ecoinvent 3.8

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 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Francis Yu
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+A2:2019. 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+A2:2019 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
☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

MiTek Industries AB, Sweden
Fredriksbergsgatan 1
573 92 Tranås
Sweden

Construction Product:

Product Description

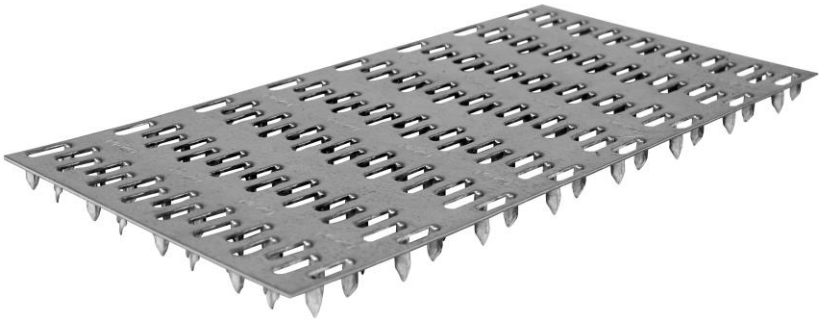
Punched Metal Plate Fasteners (PMPF)

A connector formed from metal plate having integral projections punched out in one direction perpendicular to the base of the plate and used to join two or more pieces of timber of the same thickness in the same plane.

Technical Information (Punched Metal Plate Fasteners)

Property	Value, Unit
Plate types	GNT100S, GNT150S, GNT150SK (LFSP) & TopW
Steel	S350GD + Z275 (EN 10346:2015)
Thickness	1.0 – 1.5 mm (EN 14545:2008)
Characteristic plate anchorage capacity / Solid and glued laminated timber with characteristic density of ρ_k = 350 kg/m^3	$f_{a,0,0}$ = 2.63 – 3.65 N/mm^2, $f_{a,90,90}$ = 1.52 – 1.96 N/mm^2, k_1 = -0.012 – 0.006, k_2 = -0.025 – -0.006, α_0 = 27 – 42° (EN 14545:2008)
Characteristic plate tension, compression and shear capacity	$f_{1,0}$ = 211 – 335 N/mm; $f_{t,90}$ = 131 – 181 N/mm; $f_{c,0}$ = 77 – 130 N/mm; $f_{c,90}$ = 75 – 131 N/mm; $f_{v,0}$ = 75 – 116 N/mm; $f_{v,90}$ = 56 – 92 N/mm; γ_0 = 2.5 – 17°; k_v = 0.53 – 0.80 (EN 14545:2008)
Slip modulus with mean timber density ρ_k = 420 kg/m^3	$K_{ser,mean}$ = 5 – 11.1 N/mm^3 (EN 14545:2008)
Nail root ductility	Passed

Property	Value, Unit
Minimum timber thickness	35 mm
Durability, corrosion protection	Z275 hot-dip zinc coating
Service class	2 (EN1995-1-1)
TopW only (EN 14374 laminated veneer lumber):	
Characteristic plate anchorage capacity / Kerto-S LVL	$f_{a,0,0}$ = 3.55 N/mm^2, $f_{a,90,90}$ = 1.97 N/mm^2, k1 = 0.015, k2 = -0.028, α_{0} = 50° (EN 14545:2008)
Slip modulus Kerto-S, LVL	$K_{ser,mean}$ = 10.2 N/mm^3 (EN 14545:2008)



Main Product Contents

Material/Chemical Input	%
Galvanised Steel	100

Manufacturing Process

The manufacturing process for Nail Plates commences with the issue of an electronically generated internal Works Order to the shopfloor, stating the production requirements. Pre-purchased externally sourced zinc coated, mild steel slit coil of the correct grade and specification, is released from our stock and taken to the designated Press-Line.

The Works Order also indicates to the Box Maker which cardboard cartons are required for construction and printing, and the quantity required to satisfy the order. When assembled, the boxes are transferred to the designated Press-Line.

Press-Lines are made up of a range of Power Presses of varying tonnage capacity, and ancillary equipment such as a de-coiler and straightener. Press selection is dependent upon the plate type and size required. The machinery will be started, and the slit steel coil loaded onto the automatic de-coiler, fed through the straightener and into the press tooling by the Press Setter. The Setter operates the Press to produce a First-

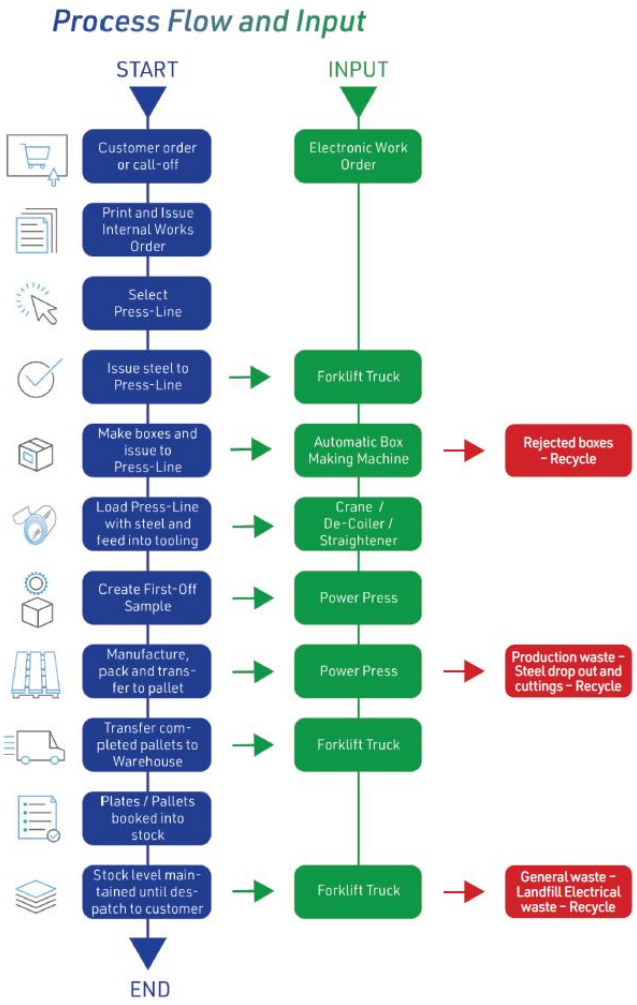
Off sample, to confirm that the product is compliant to specification and the production run can proceed. A Press Operator is assigned to commence production.

As the steel passes through the tooling automatically, the press cycles, and the tooling strikes the steel to produce the finished component. The finished component is collected at the front of the press by the Press Operator, who manually packs the product into the pre-assembled boxes. Labels (thermo printer) with identification and details of the box contents are printed and manually attached to the boxes. When filled, the completed boxes are manually loaded onto a pallet by the Linesman, until the pallet is packed with the required quantity of boxed product. After that the pallets are transported on a conveyor system, passing the wrapping machine on the way to the warehouse.

On arrival in the Warehouse, the goods are booked onto the ERP system. The goods are stored on racking until being called-off or picked upon receipt of a Customer's Order, in which case, the order will be manually built from stock to the customers requirement, palletised and shrunk wrapped for protection and security. The despatch documentation will be raised electronically, and the goods are now ready for despatch.

MiTek Industries AB, Sweden does not operate its own transport vehicles. Therefore, transporting of goods will be via haulier, carrier, or in certain instances, the customer will collect.

Process flow diagram



Construction Process Stage

A4 – Transport to site:
MiTek sell their Punched Metal Plate Fasteners (PMPF) to clients across Europe. The finished products are transported to construction sites directly from the Tranås site or via MiTek's distribution centre in Riga, Latvia. No data was available for the average transport distance from the warehouses to construction sites, and since every journey will be different, a distance and mode of 100km by truck has been modelled. This will allow end-users of the EPD to calculate their own bespoke impacts for module A4 based on the specific route and distance their product has taken.

End of Life

C1 – Deconstruction:
Punched Metal Plate Fasteners (PMPF) are disassembled on the demolition site. No power tools are used, only a crowbar or similar tool. Therefore no impacts are associated with this module.

C2 – Transport to waste processing facility or landill:
No data was available for the average transport distance from demolition sites to recycling centres, and since every journey will be different, a distance and mode of 100km by truck has been modelled. This will allow end-users of the EPD to calculate their own bespoke impacts for module C2 based on the predicted route and distance their disassembled product will take.

C3 – Waste processing:
It is assumed that 96% of the product per declared unit will go to recycling and 4% to landfill according to the UK default metal recovery rates listed in RICS whole life carbon assessment for the built environment. These rates can also be used as a proxy for western Europe. The impacts associated with recycling are covered in this module. MiTek have confirmed that there is no pre-processing associated with the Punched Metal Plate Fasteners (PMPF) prior to recycling.

C4 – Disposal:
This scenario assumes that 4% of the product per declared unit will be un-recyclable and sent to landfill in accordance with the UK default metal recovery rates listed in RICS whole life carbon assessment for the built environment.

D – Re-use, recovery and/or recycling potential:
This scenario assumes that 96% of the product per declared unit is recyclable, in accordance with the UK default metal recovery rates listed in RICS whole life carbon assessment for the built environment. The pre-existing recycled content in the Punched Metal Plate Fasteners (PMPF) has been declared as 16.74%. Therefore, 79.26% of the product will be available for use in a future system to offset the impacts of virgin steel. The Ecoinvent 3.8 dataset used to analyse these avoided impacts was ‘Pig iron {RER}| pig iron production | EN15804, S’.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 kg of Punched Metal Plate Fasteners (PMPF)

System boundary

This is a cradle-to-gate with options EPD, reporting all production life cycle stages (modules A1 to A3), construction process stage (module A4), end-of-life stages (C1-C4) and benefits and loads beyond the system boundary (D) in accordance with EN 15804:2012+A2:2019 and BRE 2021 Product Category Rules (PN 514 Rev 3.0).

Data sources, quality and allocation

Specific primary data derived from the Punched Metal Plate Fasteners (PMPF) production process in Tranås, Sweden have been modelled using the BRE LINA A2 tool. In accordance with the requirements of EN15804, the most current available data has been used. The manufacturer-specific data from MiTek Industries AB covers a period of nine months (01/05/22 – 31/01/23). Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent v3.8 database (2021). All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN15804. The MiTek Industries AB, Sweden Tranås site only produces galvanised steel Punched Metal Plate Fastener products. There are no other products produced at this site, therefore no allocation of processes to the Punched Metal Plate Fasteners (PMPF) products was required. This EPD is applicable to MiTek Industries AB, Sweden's GNT100S, GNT150S, GNT150SK (LFSP & TopW PMPF products. No representative product has been modelled, instead, the impacts of 1kg of processed steel have been calculated, and a multiplication table listed on page 14 for the mass per m^2 of each product. This enables the end-user of the EPD to calculate the bespoke impacts for each product.

Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
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
Very Good	n/a	n/a	There is approximately 1-2 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European datasets have been selected from the ecoinvent v3.8 LCI for this LCA. The energy dataset used in this EPD was 'Electricity, medium voltage {SE}| market for electricity, medium voltage | EN15804, S'. The quality level of geographical and technical representativeness is therefore Very Good. The quality level of time representativeness is Very Good as the background LCI datasets are based on ecoinvent v3.8 which was released in 2021. Therefore, there is approximately 1-2 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

All raw materials, packaging materials, transportation, process energy, general energy, water use, production and non-production waste have been included where appropriate. Only direct emissions to air, water and soil, which are not measured, have been excluded.

LCA Results

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

Parameters describing environmental impacts									
			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg $(PO_4)^{3-}$ eq
Product stage	Raw material supply	A1	2.52e+0	2.51e+0	9.95e-3	2.38e-3	1.42e-7	3.30e-2	1.22e-3
	Transport	A2	4.27e-2	4.27e-2	3.64e-5	1.68e-5	9.88e-9	1.73e-4	2.75e-6
	Manufacturing	A3	6.05e-2	5.67e-2	-2.40e-4	3.76e-3	3.18e-9	2.73e-4	9.18e-5
	Total	A1-3	2.62e+0	2.61e+0	9.75e-3	6.16e-3	1.56e-7	3.34e-2	1.31e-3
Construction process stage	Transport	A4	1.66e-2	1.66e-2	1.42e-5	6.53e-6	3.85e-9	6.75e-5	1.07e-6
End of life	Deconstruction, demolition	C1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	C2	1.66e-2	1.66e-2	1.42e-5	6.53e-6	3.85e-9	6.75e-5	1.07e-6
	Waste processing	C3	5.53e-2	5.53e-2	1.95e-5	5.51e-6	1.18e-8	5.74e-4	1.71e-6
	Disposal	C4	2.11e-4	2.11e-4	2.09e-7	1.99e-7	8.52e-11	1.98e-6	1.93e-8
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.34e+0	-1.34e+0	4.20e-3	-3.79e-4	-5.35e-8	-4.86e-3	-5.29e-4

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
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; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

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

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived	disease incidence
Product stage	Raw material supply	A1	3.39e-3	1.22e-1	1.12e-2	9.50e-5	2.79e+1	1.25e+0	4.06e-7
	Transport	A2	5.22e-5	5.70e-4	1.75e-4	1.48e-7	6.45e-1	2.90e-3	3.68e-9
	Manufacturing	A3	1.13e-4	6.69e-4	1.58e-4	2.03e-7	1.05e+0	6.73e-2	2.36e-9
	Total	A1-3	3.56e-3	1.23e-1	1.16e-2	9.53e-5	2.96e+1	1.32e+0	4.12e-7
Construction process stage	Transport	A4	2.03e-5	2.22e-4	6.80e-5	5.78e-8	2.51e-1	1.13e-3	1.43e-9
End of life	Deconstruction, demolition	C1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	C2	2.03e-5	2.22e-4	6.80e-5	5.78e-8	2.51e-1	1.13e-3	1.43e-9
	Waste processing	C3	2.54e-4	2.79e-3	7.66e-4	2.84e-8	7.58e-1	1.75e-3	1.54e-8
	Disposal	C4	6.89e-7	7.54e-6	2.19e-6	4.80e-10	5.88e-3	2.70e-4	3.99e-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.15e-3	-1.22e-2	-6.73e-3	-1.01e-6	-1.35e+1	-9.60e-2	-8.96e-8

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

LCA Results (continued)

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

Parameters describing environmental impacts							
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.47e-1	1.00e+2	1.81e-8	9.78e-8	9.03e+0
	Transport	A2	3.32e-3	5.04e-1	1.63e-11	5.28e-10	4.43e-1
	Manufacturing	A3	3.41e-2	9.26e-1	2.57e-11	5.86e-10	1.16e+0
	Total	A1-3	1.84e-1	1.02e+2	1.82e-8	9.89e-8	1.06e+1
Construction process stage	Transport	A4	1.29e-3	1.96e-1	6.35e-12	2.06e-10	1.73e-1
End of life	Deconstruction, demolition	C1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	C2	1.29e-3	1.96e-1	6.35e-12	2.06e-10	1.73e-1
	Waste processing	C3	3.42e-3	4.43e-1	1.72e-11	3.22e-10	9.65e-2
	Disposal	C4	2.61e-5	3.72e-3	9.43e-14	2.44e-12	1.23e-2
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.40e-2	-4.01e+1	-7.16e-9	-2.75e-8	-2.64e+0

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

LCA Results (continued)

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

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	2.46e+0	0.00e+0	2.46e+0	2.76e+1	0.00e+0	2.76e+1
	Transport	A2	9.09e-3	0.00e+0	9.09e-3	6.34e-1	0.00e+0	6.34e-1
	Manufacturing	A3	5.60e-2	3.24e-1	3.80e-1	1.06e+0	4.34e-3	1.06e+0
	Total	A1-3	2.53e+0	3.24e-1	2.85e+0	2.93e+1	4.34e-3	2.93e+1
Construction process stage	Transport	A4	3.54e-3	0.00e+0	3.54e-3	2.47e-1	0.00e+0	2.47e-1
End of life	Deconstruction, demolition	C1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	C2	3.54e-3	0.00e+0	3.54e-3	2.47e-1	0.00e+0	2.47e-1
	Waste processing	C3	4.25e-3	0.00e+0	4.25e-3	7.43e-1	0.00e+0	7.43e-1
	Disposal	C4	5.02e-5	0.00e+0	5.02e-5	5.78e-3	0.00e+0	5.78e-3
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.37e+1	0.00e+0	-1.37e+1	0.00e+0	0.00e+0	0.00e+0

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

LCA Results (continued)

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

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+0	0.00e+0	0.00e+0	3.07e-2
	Transport	A2	0.00e+0	0.00e+0	0.00e+0	7.19e-5
	Manufacturing	A3	3.97e-5	0.00e+0	0.00e+0	1.67e-3
	Total	A1-3	3.97e-5	0.00e+0	0.00e+0	3.25e-2
Construction process stage	Transport	A4	0.00e+0	0.00e+0	0.00e+0	2.80e-5
End of life	Deconstruction, demolition	C1	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	C2	0.00e+0	0.00e+0	0.00e+0	2.80e-5
	Waste processing	C3	0.00e+0	0.00e+0	0.00e+0	4.32e-5
	Disposal	C4	0.00e+0	0.00e+0	0.00e+0	6.31e-6
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00e+0	0.00e+0	0.00e+0	-2.33e-3

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)

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

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	8.92e-1	4.47e+0	6.39e-5
	Transport	A2	7.11e-4	1.26e-2	4.37e-6
	Manufacturing	A3	2.65e-3	3.07e-1	8.03e-6
	Total	A1-3	8.95e-1	4.79e+0	7.63e-5
Construction process stage	Transport	A4	2.77e-4	4.92e-3	1.70e-6
End of life	Deconstruction, demolition	C1	0.00e+0	0.00e+0	0.00e+0
	Transport	C2	2.77e-4	4.92e-3	1.70e-6
	Waste processing	C3	9.98e-4	6.99e-3	5.23e-6
	Disposal	C4	6.12e-6	8.64e-5	3.86e-8
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.24e-1	-2.54e+0	-1.44e-5

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

LCA Results (continued)

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

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	A2	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Manufacturing	A3	0.00e+0	3.31e-6	3.41e-9	1.72e-3	-6.61e-4	-8.89e-3
	Total	A1-3	0.00e+0	3.31e-6	3.41e-9	1.72e-3	-6.61e-4	-8.89e-3
Construction process stage	Transport	A4	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
End of life	Deconstruction, demolition	C1	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	C2	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Waste processing	C3	0.00e+0	9.60e-1	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Disposal	C4	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0	0.00e+0

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Additional information

Individual product calculations

The LCA results listed in the tables above are for MiTek Industries AB's processing of 1 kg of galvanised steel. The end-user of this EPD can therefore use these results to calculate bespoke impact profiles for each MiTek Industries AB product listed in the tables below. The LCA results for each EN15804 indicator will need to be multiplied by the mass per unit of the respective product:

Punched Metal Plate Fasteners (PMPF)

Plate Type	Weight (multiplier) per m^2 of plate
GNT100S	7.85
GNT150S	11.77
GNT150SK (LFSP)	11.77
TopW	10.20

Transport to site scenario

MiTek sell their Punched Metal Plate Fasteners (PMPF) to clients across Europe. The finished products are transported to construction sites directly from the Tranås site or via MiTek's distribution centre in Riga, Latvia.

This EPD contains a set of results for module A4 based on a distance and mode of 100km by lorry. This is designed to allow flexibility for end-users of the EPD to calculate bespoke results for the specific route and distance their product has taken from the manufacturing site in Tranås, Sweden.

Transport to waste processing facility or landfill scenario

MiTek's Punched Metal Plate Fasteners (PMPF) are installed within buildings across Europe. On building demolition at end-of-life, the Punched Metal Plate Fasteners (PMPF) are disassembled and transported to local waste processing facilities (recycling) or landfill sites.

This EPD contains a set of results for module C2 based on a distance and mode of 100km by lorry. This is designed to allow flexibility for end-users of the EPD to calculate bespoke results for the specific route and distance their product has taken from the demolition site to the specific waste processing facility (recycling) or landfill site.

Interpretation

The bulk of the environmental impacts and primary energy demand are attributed to the upstream manufacturing process of the galvanised steel, covered by information modules A1-A3, A4, C1-C4 and D of EN15804:2012+A2:2019.

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	MiTek transport the finished products to construction sites directly from the Tranås site or via MiTeks distribution centre in Riga, Latvia. No data was available for the average transport distance from the warehouses to construction sites, and since every journey will be different, a distance and mode of 100km by lorry has been modelled. This will allow end-users of the EPD to calculate their own bespoke impacts for module A4 based on the specific route and distance their product has taken.		
	Fuel type / Vehicle type	Litre of diesel per km	0.227
	Distance:	km	100
	Capacity utilisation (incl. empty returns)	%	26
	Bulk density of transported products	kg/m^3	600
C1 - Deconstruction	Punched Metal Plate Fasteners (PMPF) are disassembled on the demolition site. No power tools are used, only a crowbar or similar tool. Therefore no impacts are associated with this module.		
C2 - Transport	No data was available for the average transport distance from demolition sites to recycling centres, and since every journey will be different, a distance and mode of 100km by truck has been modelled. This will allow end-users of the EPD to calculate their own bespoke impacts for module C2 based on the predicted route and distance their disassembled product will take.		
	Fuel type / Vehicle type	Litre of diesel per km	0.227
	Distance:	km	100
C3 – Waste processing & C4 - Disposal	It is assumed that 96% of the product will go to recycling and 4% to landfill according to the UK default metal recovery rates listed in RICS whole life carbon assessment for the built environment. These rates can also be used as a proxy for western Europe. The impacts associated with recycling are covered in this module. MiTek have confirmed that there is no pre-processing associated with the Punched Metal Plate Fasteners (PMPF) prior to recycling.		
	Recovered for recycling	Kg	0.96
	Landfilled	Kg	0.04
Module D	This scenario assumes that 96% of the product per declared unit is recyclable, in accordance with the UK default metal recovery rates listed in RICS whole life carbon assessment for the built environment. The pre-existing recycled content in the Punched Metal Plate Fasteners (PMPF) has been declared as 16.74%. Therefore, 79.26% of the product will be available for use in a future system to offset the impacts of virgin steel. The Ecoinvent 3.8 dataset used to analyse these avoided impacts was 'Pig iron {RER}| pig iron production | EN15804, S'.		
	Products Recycled Content (post consumer)	Kg	0.17
	Recovered for recycling	Kg	0.96
	Recovered for re-use	Kg	0
	Recovered for energy	Kg	0

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