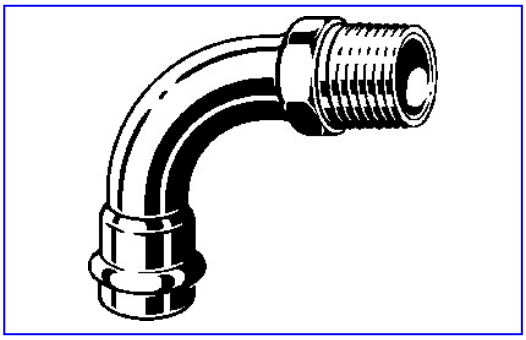
Environmental Product Declaration (EPD)

Declaration code EPD-VTN-GB-67.0



Viega GmbH & Co. KG

connecting technology

Temponox press connectors and pipes made of stainless steel

Basis:

DIN EN ISO 14025
EN 15804 + A2

Company EPD
Environmental
Product **D**eclaration

Publication date:
14.12.2023

Valid until:
14.12.2028

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EN ISO/IEC 17065

Environmental Product Declaration (EPD)

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Declaration holder	Viega GmbH & Co. KG Viega Platz 1 57439 Attendorn, Germany www.viega.de		
Declaration code	EPD-VTN-GB-67.0		
Designation of declared product	Temponox press connectors and pipes made of stainless steel		
Scope	Transportation of media inside/outside buildings.		
Basis	This EPD was prepared on the basis of EN ISO 14025:2011 and DIN EN 15804:2012+A2:2019. In addition, the "Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen" (General guideline for preparation of Type III Environmental Product Declarations) applies. The declaration is based on the PCR documents “PCR Part A” PCR-A-0.3:2018 and “Piping systems including connecting and fitting technology” PCR-RS-1.0:2022.		
Validity	Publication date: 14.12.2023	Last revision: 21.11.2025	Valid until: 14.12.2028
	This verified Company Environmental Product Declaration (company EPD) applies solely to the specified products and is valid for a period of five years from the date of publication in accordance with DIN EN 15804.		
LCA Basis	The LCA was prepared in accordance with DIN EN ISO 14040 and DIN EN ISO 14044. The base data includes the data collected at one production plant of Viega GmbH & Co. KG, and the generic data derived from the Ecoinvent 3 data base (v3.8 with aggregated inputs) and Ecoinvent EN 15804. LCA calculations were carried out for the included “cradle to grave” including all upstream chains (e.g. raw material extraction, etc.).		
Notes	The ift-Guidance Sheet “Conditions and Guidance for the Use of ift Test Documents” applies. The declaration holder assumes full liability for the underlying data, certificates and verifications.		

Christoph Seehauser Deputy Head of Sustainability	Dr. Torsten Mielecke Chairman of Expert Committee ift-EPD and PCR	Prof. Dr. Eric Brehm External verifier

1 General Product Information

Product definition

The EPD relates to the product group connecting technology and applies to:

1 kg Temponox press connector or 1 linear metre Temponox pipe of company Viega GmbH & Co. KG

These are divided into the following product groups

Product group (PG)		Weight
PG1	Temponox press connector	0.022 - 4.270 kg/pcs.
PG2	Temponox pipe	0.323 - 5.126 kg/m

*The respective conversion values can be found in Annex B.

Table 1 Product groups*

The declared unit is obtained by summing up:

PG	Assessed product	Unit weight	Declared unit
1	Cap with SC (Item no. 811952)	18.34 g/pcs.[1]	1 kg
2	Temponox XL pipe (Item no. 807290)	3,750.00 g/m[1]	1 linear metre

[1]A conversion for different unit weights/length weights is possible by dividing the results by the balanced unit weight/length weight and multiplying them by the respective unit weight/length weight from Annex B.

Table 2 Functional unit per reference product

The average unit is declared as follows:
Directly used material flows are determined by means of manufactured masses (kg) and allocated to the declared unit. All other inputs and outputs in the production were scaled to the declared unit in their entirety since there is no typical functional unit due to the high number of variants. The reference period is the year 2022.

The validity of the EPD is restricted to the systems listed in Table 1.

Product description

Flow-optimized press connector system with press connectors made of stainless steel 1.4301 and pipes made of stainless steel 1.4520. The press connector features a cylindrical pipe guide to protect the sealing element. Press connector sizes ranging from d76.1 diameter with stainless steel cutting ring to ensure the mechanical strength of the connection. Pipes are fitted with pipe plugs for protection. The pressing force is applied in front and behind the sealing element seat. Suitable for wall mounting and concealed applications of risers and storey installations.

For a detailed product description refer to the manufacturer specifications or the product specifications of the respective offer/quotation.

Product manufacture

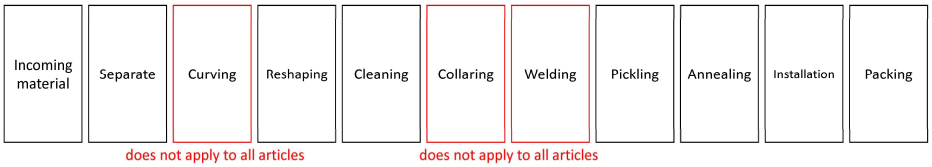


Illustration 1 Manufacturing process

Application

- Closed cooling and heating systems
- Compressed air systems
- Solar systems with flat-plate collectors
- Solar systems with vacuum collectors (only with FKM sealing element)
- Industrial applications

Test evidence / reports

For information on updated verifications (incl. other national approvals) refer to Temponox | viega.de.

Management systems

The following management systems are held:

- Quality management system as per DIN EN ISO 9001:2015
- Energy management system as per DIN EN ISO 50001:2018
- Environmental management system as per DIN EN ISO 14001:2015
- Occupational health and safety management system as per DIN EN ISO 45001:2018

Additional information

For additional verifications of applicability or conformity refer to the CE marking and the documents accompanying the product, if applicable.

2 Materials used

Primary materials

The raw materials used can be found in chapter 6.2 Inventory analysis (Inputs).
The raw materials used can be found in chapter 6 Life Cycle Assessment.

Declarable substances

Products may contain a substance in accordance with Article 57 of the REACH Regulation ('SVHC – Substance of Very High Concern') >0.1 mass percent (w/w).

Detailed information on the SVHC and the associated SCIP registration number is available from the manufacturer on request.
All relevant safety data sheets can be obtained from Viega GmbH & Co. KG.

3 Construction process stage

Processing recommendations, installation

Observe the instructions for assembly/installation, operation, maintenance and disassembly, provided by the manufacturer. For this, see www.viega.de

4 Use stage

Emissions to the environment

No emissions to indoor air, water and soil are known. There may be VOC emissions. There is no contact with the indoor/outdoor air.

Reference service life (RSL)

The RSL information was provided by the manufacturer. The RSL must be established under specified reference conditions of use and relate to the declared technical and functional performance of the product within the building. It must be determined according to all specific rules given in European product standards or, if none are available, according to a c-PCR. It must also take into account ISO 15686-1, -2, -7 and -8. If there is guidance on deriving RSLs from European Product Standards or a c-PCR, then such guidance must take precedence.
If it is not possible to determine the service life as the RSL in accordance with ISO 15686, the BBSR table “Nutzungsdauer von Bauteilen zur Lebenszyklusanalyse nach BNB” (service life of building components for life cycle assessment in accordance with the sustainable construction evaluation system) can be used. For further information and explanations refer to www.nachhaltigesbauen.de.

For this EPD the following applies:
A reference service life (RSL) must be stated for the “cradle to grave” EPD and module D (A + B + C + D).
The service life for Temponox press connectors and pipes made of stainless steel of company Viega GmbH & Co. KG is specified as 50 years according to the manufacturer.

The service life is dependent on the characteristics of the product and in-use conditions. The conditions and characteristics described in the EPD are applicable, in particular the characteristics listed below:

- Outdoor environment: Climatic influences may have a negative impact on the service life.
- Indoor environment: No impacts known that have a negative effect on the service life

The service life solely applies to the characteristics specified in this EPD or the corresponding references.

The RSL does not reflect the actual life time, which is usually determined by the service life and the redevelopment of a building. It does not give any information on the useful life, warranty referring to performance characteristics or guarantees.

5 End-of-life stage

Possible end-of-life stages

Temponox press connectors and pipes made of stainless steel are sent to central collection points. There the products are usually shredded and sorted into their constituents. The end-of-life stage depends on the site where the products are used and is therefore subject to the local regulations. Observe the locally applicable regulatory requirements.

In this EPD, the modules of after-use are presented according to the market situation.
Metals and plastics are recycled to a certain extent. Residual fractions are sent to landfill or, in part, thermally recycled.

Disposal routes

The LCA includes the average disposal routes.

All life cycle scenarios are detailed in the Annex.

6 Life Cycle Assessment (LCA)

Environmental product declarations are based on life cycle assessments (LCAs) which use material and energy flows for the calculation and subsequent representation of environmental impacts.

As a basis for this, life cycle assessments were prepared for Temponox press connectors and pipes made of stainless steel. These LCAs are in conformity with the requirements set out in DIN EN 15804 and the international standards DIN EN ISO 14040, DIN EN ISO 14044, ISO 21930 and EN ISO 14025.

The LCA is representative of the products presented in the Declaration and the specified reference period.

6.1 Definition of goal and scope

Aim

The goal of the LCA is to demonstrate the environmental impacts of the products. In accordance with DIN EN 15804, the environmental impacts covered by this Environmental Product Declaration are presented for the entire product life cycle in the form of basic information.

Data quality, data availability and geographical and time-related system boundaries

The specific data originate exclusively from the 2022 fiscal year. They were collected on-site at the plant located in Großhering and originate in parts from company records and partly from values directly obtained by measurement. Validity of the data was checked by the ift Rosenheim.

The generic data originate from the Ecoinvent 3 data base (v3.9.1 with aggregated inputs from 2022) and Ecoinvent EN 15804. The last update of both databases was in 2023. Data from before this date originate also from these databases and are not more than ten years old. No other generic data were used for the calculation.

Generic data are selected as accurately as possible in terms of geographic reference. If no country-specific data sets are available or if the regional reference cannot be determined, European or globally valid data sets are used. Data gaps were either filled with comparable data or conservative assumptions, or the data were cut off in compliance with the 1% rule.

The life cycle was modelled using the sustainability software tool “Umberto 11” for the development of life cycle assessments.
The data quality complies with the requirements of prEN 15941:2022.

Scope / system boundaries

The system boundaries refer to the supply of raw materials and purchased parts, manufacture/production, use and end-of-life stage of the Temponox press connectors and pipes made of stainless steel.
No additional data from pre-suppliers/subcontractors or other sites were taken into consideration.

Cut-off criteria

All company data collected, i.e. all commodities/input and raw materials used, the thermal energy and electricity consumption, were taken into consideration.

The boundaries cover only the product-relevant data. Building sections/parts of facilities that are not relevant to the manufacture of the products, were excluded.

The transport distances of the pre-products used were taken into consideration as a function of 100% of the mass of the products. The following means of transportation was adopted.

- >32 t truck/semitrailer, Euro 6, diesel, 53 % capacity utilization

Other transport distances of the pre-products were not taken into consideration.

The criteria for the exclusion of inputs and outputs as set out in DIN EN 15804 are fulfilled. From the data analysis it can be assumed that the total of negligible processes per life cycle stage does not exceed 1% of the mass/primary energy. This way the total of negligible processes does not exceed 5% of the energy and mass input. The life cycle calculation also includes material and energy flows that account for less than 1%.

6.2 Inventory analysis

Aim

All material and energy flows are described below. The processes covered are presented as input and output parameters and refer to the declared units.

Life cycle stages

The complete life cycle of Temponox press connectors and pipes made of stainless steel is shown in the annex. The product stage "A1 – A3", construction process stage "A4 – A5", use stage "B1 – B7", end-of-life stage "C1 – C4" and the benefits and loads beyond the system boundaries "D" are considered.

Benefits

The below benefits have been defined as per DIN EN 15804:

- Benefits from recycling
- Benefits (thermal and electrical) from incineration

Allocation of co-products

Allocations occur during production.
Allocation was based on the masses (units) of products produced.

Allocations for re-use, recycling and recovery

If the products are reused/recycled and recovered during the product stage (rejects), the elements are shredded, if necessary and then sorted

into their constituents. This is done by various process plants, e.g. magnetic separators.
The system boundaries were set following their disposal, reaching the end-of-waste status.

Allocations beyond life cycle boundaries

The use of recycled materials in the manufacturing process was based on the current market-specific situation. In parallel to this, a recycling potential was taken into consideration that reflects the economic value of the product after recycling (recyclate).
The system boundary set for the recycled material refers to collection.

Secondary material

The use of secondary material in module A3 by Viega GmbH & Co. KG was considered. Secondary material is not used.

Inputs

The following manufacturing-related inputs were included in the LCA per 1 kg Temponox press connector and 1 linear metre Temponox pipe:

Energy
For the input material natural gas, "natural gas, high pressure (GER), domestic supply with seasonal storage" was assumed. For the electricity mix, "electricity, high voltage, production mix (GER)" was assumed.

A portion of the process heat is used for space heating. This can, however, not be quantified, hence a “worst case” figure was taken into account for the product.

Water
There is no water consumption in the individual process steps for production.
The consumption of fresh water specified in Section 6.3 originates (among others) from the process chain of the pre-products and the process water for cooling.

Raw material/Pre-products
The chart below shows the share of raw materials/pre-products in percent.

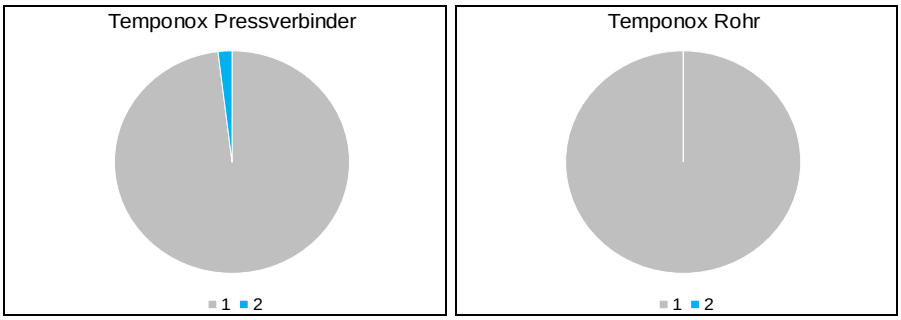


Illustration 2 Percentage of individual materials per declared unit

No.	Material	Mass in %	
		Temponox press connector	Temponox pipe
1	Stainless steel	98.1	100.0
2	EPDM	1.9	0.0

Table 3 Percentage of individual materials per declared unit

Ancillary materials and consumables
There are 20 g (Temponox press connector) and 0 g (Temponox pipe) of ancillary materials and consumables.

Product packaging
The amounts used for product packaging are as follows:

No.	Packaging	Mass in g	
		Temponox press connector	Temponox pipe
1	PE	159	0
2	Paper/cardboard	0	0

Table 4 Weight in kg of packaging per declared unit

Biogenic carbon content
The biogenic carbon content is neglected and not reported, as the total mass of biogenic carbon-containing materials is less than 5% of the total mass of the product and associated packaging and the mass of biogenic carbon-containing materials in the packaging is less than 5 % of the total mass of the packaging.

Outputs

The following manufacturing-related outputs were included in the LCA per 1 kg Temponox press connector or 1 linear metre Temponox pipe:

Waste
Secondary raw materials were included in the benefits.
See Section 6.3 Impact assessment.

Waste water
No waste water is produced during the manufacturing process.

6.3 Impact assessment

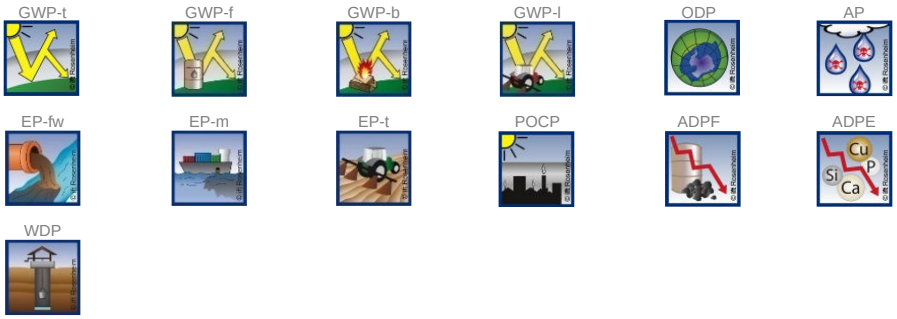
Aim

The impact assessment covers both inputs and outputs. The impact categories applied are stated below:

Core indicators

The models for impact assessment were applied as described in DIN EN 15804-A2.
The impact categories presented for the core indicators in the EPD are as follows:

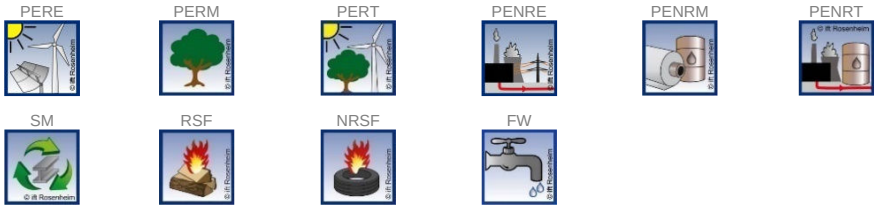
- Climate change - total (GWP-t)
- Climate change - fossil (GWP-f)
- Climate change - biogenic (GWP-b)
- Climate change - land use & land use change (GWP-l)
- Ozone depletion (ODP)
- Acidification (AP)
- Eutrophication freshwater (EP-fw)
- Eutrophication salt water (EP-m)
- Eutrophication land (EP-t)
- Photochemical ozone creation (POCP)
- Depletion of abiotic resources - fossil fuels (ADPF)
- Depletion of abiotic resources - minerals and metals (ADPE)
- Water use (WDP)



Resource management

The models for impact assessment were applied as described in DIN EN 15804-A2.
The following resource use indicators are presented in the EPD:

- Renewable primary energy as energy source (PERE)
- Renewable primary energy for material use (PERM)
- Total use of renewable primary energy (PERT)
- Non-renewable primary energy as energy source (PENRE)
- Non-renewable primary energy for material use (PENRM)
- Total use of non-renewable primary energy (PENRT)
- Use of secondary materials (SM)
- Use of renewable secondary fuels (RSF)
- Use of non-renewable secondary fuels (NRSF)
- Net use of freshwater resources (FW)

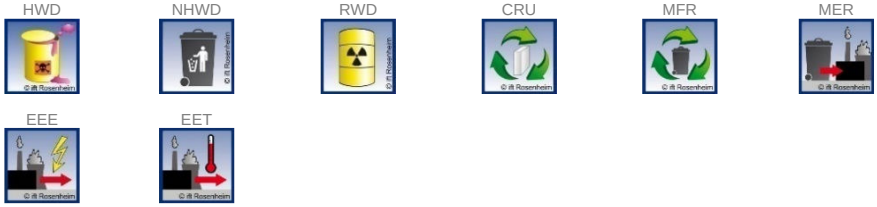


Waste

The waste generated during the production of 1 kg Temponox press connector or 1 linear metre of Temponox is evaluated and shown separately for the fractions trade wastes, special wastes and radioactive wastes. Since waste handling is modelled within the system boundaries, the amounts shown refer to the deposited wastes. A portion of the waste indicated is generated during the manufacture of the pre-products.

The models for impact assessment were applied as described in DIN EN 15804-A2.
The waste categories and indicators for output material flows presented in the EPD are as follows:

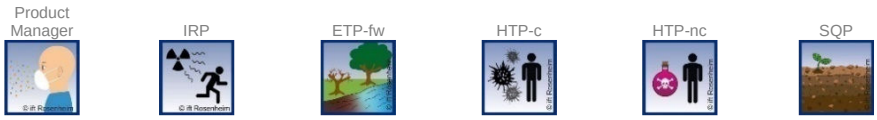
- Disposed hazardous waste (HWD)
- Non-hazardous waste disposed (NHWD)
- Radioactive waste disposed (RWD)
- Components for re-use (CRU)
- Materials for recycling (MFR)
- Materials for energy recovery (MER)
- Exported electrical energy (EEE)
- Exported thermal energy (EET)



Additional environmental impact indicators

The models for impact assessment were applied as described in DIN EN 15804-A2.
The additional impact categories presented in the EPD are as follows:

- Particulate matter emissions (PM)
- Ionizing radiation, human health (IRP)
- Ecotoxicity – freshwater (ETP-fw)
- Human toxicity, carcinogenic effects (HTP-c)
- Human toxicity, non-carcinogenic effects (HTP-nc)
- Impacts associated with land use/soil quality (SQP)



	Results per 1 kg Temponox press connector														
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 equivalent	8.66E+00	7.27E-02	9.72E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05E-02	9.28E-02	3.47E-04	-6.03E+00
GWP-f	kg CO_2 equivalent	8.60E+00	7.26E-02	9.72E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05E-02	5.60E-02	3.45E-04	-5.97E+00
GWP-b	kg CO_2 equivalent	5.61E-02	2.53E-05	4.57E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.47E-06	3.66E-02	2.10E-06	-5.12E-02
GWP-l	kg CO_2 equivalent	6.34E-03	3.72E-05	1.20E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.21E-06	1.38E-04	2.51E-07	-5.77E-03
ODP	kg CFC-11-eq.	6.52E-05	1.23E-09	7.54E-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72E-10	7.25E-10	8.14E-12	-1.55E-05
AP	mol H^+-eq.	3.34E-02	1.98E-04	1.28E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.59E-05	3.78E-04	2.45E-06	-2.96E-02
EP-fw	kg P-eq.	2.08E-03	6.08E-06	3.89E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.52E-07	1.23E-05	9.03E-08	-1.83E-03
EP-m	kg N-eq.	6.03E-03	5.18E-05	2.98E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.68E-05	1.50E-04	9.18E-07	-5.38E-03
EP-t	mol N-eq.	6.36E-02	5.36E-04	7.13E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80E-04	1.32E-03	9.82E-06	-5.69E-02
POCP	kg NMVOC-eq.	2.27E-02	2.84E-04	2.20E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.47E-05	4.22E-04	3.32E-06	-1.98E-02
ADPF*[2]	MJ	7.87E+01	1.10E+00	3.56E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54E-01	6.59E-01	7.53E-03	-6.15E+01
ADPE*[2]	kg Sb equivalent	1.38E-04	0.00E+00	8.95E-09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.91E-08	4.77E-07	7.22E-10	-1.24E-04
WDP*[2]	m^3 world-eq. deprived	2.14E+00	5.49E-03	2.42E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.74E-04	8.08E-03	4.16E-05	-1.70E+00
Resource management																
PERE	MJ	1.38E+01	1.38E-02	1.32E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.94E-03	3.09E-02	1.28E-04	-1.32E+01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.38E+01	1.38E-02	1.32E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.94E-03	3.09E-02	1.28E-04	-1.32E+01
PENRE	MJ	7.50E+01	1.10E+00	3.30E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54E-01	1.04E+00	1.92E-02	-6.15E+01
PENRM	MJ	3.65E+00	0.00E+00	-3.26E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	-3.78E-01	-1.17E-02	0.00E+00
PENRT	MJ	7.87E+01	1.10E+00	3.56E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54E-01	6.60E-01	7.53E-03	-6.15E+01
SM	kg	5.70E-01	4.61E-04	1.77E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.48E-05	5.94E-04	2.88E-06	-5.65E-01
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	5.61E-02	1.51E-04	6.58E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13E-05	1.85E-04	7.56E-06	-4.79E-02
Categories of waste																
HWD	kg	1.60E+00	8.07E-04	2.08E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13E-04	1.22E-03	6.47E-06	-1.57E+00
NHWD	kg	9.65E+00	2.58E-02	1.75E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.62E-03	4.17E-02	1.93E-04	-8.54E+00
RWD	kg	1.02E-04	0.00E+00	1.83E-08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.34E-08	3.59E-07	2.37E-09	-8.59E-05
Output material flows																
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	5.98E-03	0.00E+00	8.76E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20E-06	9.21E-01	5.25E-08	-1.38E-03
MER	kg	7.28E-05	0.00E+00	2.05E-09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.52E-09	6.99E-08	2.36E-10	-7.12E-05
EE	MJ	1.18E-01	0.00E+00	7.17E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76E-05	2.80E-04	1.30E-06	-1.08E-01

Key:
GWP-t – global warming potential - total **GWP-f** – global warming potential fossil fuels **GWP-b** – global warming potential - biogenic **GWP-l** – global warming potential - land use and land use change **ODP** – ozone depletion potential **AP** - acidification potential **EP-fw** - eutrophication potential - aquatic freshwater **EP-m** - eutrophication potential - aquatic marine **EP-t** - feutrophication potential - terrestrial **POCP** - photochemical ozone formation potential **ADPF*[2]** - abiotic depletion potential – fossil resources **ADPE*[2]** - abiotic depletion potential - minerals&metals **WDP*[2]** - Water (user) deprivation potential **PERE** - Use of renewable primary energy **PERM** - use of renewable primary energy resources **PERT** - total use of renewable primary energy resources **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources **PENRT** - total use of non-renewable primary energy resources **SM** - use of secondary material **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of fresh water **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for re-use **MFR** - materials for recycling **MER** - materials for energy recovery **EE** - exported energy

Results per 1 kg Temponox press connector															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	4.53E-07	7.05E-09	9.09E-08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08E-09	1.68E-08	5.29E-11	-4.18E-07
IRP*[1]	kBq U235-eq.	4.04E-01	9.99E-04	8.24E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41E-04	1.48E-03	9.85E-06	-3.45E-01
ETP-fw*[2]	CTUe	2.58E+01	5.81E-01	9.53E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.13E-02	9.80E-01	3.27E-03	-2.13E+01
HTP-c*[2]	CTUh	3.55E-08	0.00E+00	5.60E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.57E-12	1.50E-10	1.93E-13	-3.31E-08
HTP-nc*[2]	CTUh	1.37E-07	3.22E-11	1.93E-09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12E-10	1.52E-09	2.19E-12	-1.19E-07
SQP*[2]	dimensionless	2.99E+01	1.08E+00	5.66E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55E-01	1.17E+00	1.71E-02	-2.68E+01

Key:
PM – particulate matter emissions potential **IRP*[1]** – ionizing radiation potential – human health **ETP-fw*[2]** - Eco-toxicity potential – freshwater **HTP-c*[2]** - Human toxicity potential – cancer effects **HTP-nc*[2]** - Human toxicity potential – non-cancer effects **SQP*[2]** – soil quality potential

Disclaimers:

*1 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some building materials is also not measured by this indicator.

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

	Results per 1 linear metre of Temponox pipe															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 equivalent	1.98E+01	2.35E-01	1.70E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.92E-02	3.50E-01	1.32E-03	-1.97E+01
GWP-f	kg CO_2 equivalent	1.96E+01	2.35E-01	1.70E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.92E-02	2.09E-01	1.31E-03	-1.95E+01
GWP-b	kg CO_2 equivalent	1.92E-01	8.19E-05	4.98E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30E-05	1.40E-01	7.96E-06	-1.92E-01
GWP-l	kg CO_2 equivalent	2.08E-02	1.20E-04	1.79E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95E-05	5.24E-04	9.53E-07	-2.07E-02
ODP	kg CFC-11-eq.	2.01E-07	3.97E-09	3.85E-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.47E-10	2.75E-09	3.09E-11	-1.99E-07
AP	mol H^+-eq.	1.09E-01	6.40E-04	1.03E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72E-04	1.44E-03	9.31E-06	-1.09E-01
EP-fw	kg P-eq.	6.68E-03	1.97E-05	2.80E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.19E-06	4.66E-05	3.43E-07	-6.68E-03
EP-m	kg N-eq.	1.99E-02	1.68E-04	3.28E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.30E-05	5.68E-04	3.48E-06	-1.98E-02
EP-t	mol N-eq.	2.10E-01	1.73E-03	3.49E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.74E-04	5.04E-03	3.73E-05	-2.10E-01
POCP	kg NMVOC-eq.	7.31E-02	9.18E-04	1.21E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.42E-04	1.61E-03	1.26E-05	-7.27E-02
ADPF*[2]	MJ	2.21E+02	3.56E+00	3.17E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.79E-01	2.50E+00	2.86E-02	-2.20E+02
ADPE*[2]	kg Sb equivalent	4.70E-04	0.00E+00	5.92E-09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09E-07	1.81E-06	2.74E-09	-4.69E-04
WDP*[2]	m^3 world-eq. deprived	6.26E+00	1.78E-02	1.89E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90E-03	3.03E-02	1.58E-04	-6.26E+00
Resource management																
PERE	MJ	4.93E+01	4.48E-02	1.03E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.27E-03	1.16E-01	4.87E-04	-4.93E+01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	4.93E+01	4.48E-02	1.03E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.27E-03	1.16E-01	4.87E-04	-4.93E+01
PENRE	MJ	2.21E+02	3.56E+00	3.18E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.79E-01	2.51E+00	2.86E-02	-2.20E+02
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.21E+02	3.56E+00	3.18E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.79E-01	2.51E+00	2.86E-02	-2.20E+02
SM	kg	2.15E+00	1.49E-03	1.12E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.43E-04	2.18E-03	1.09E-05	-2.15E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.77E-01	4.87E-04	2.00E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.98E-05	6.97E-04	2.87E-05	-1.77E-01
Categories of waste																
HWD	kg	5.95E+00	2.61E-03	2.44E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24E-04	4.55E-03	2.46E-05	-5.95E+00
NHWD	kg	3.12E+01	8.35E-02	1.22E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36E-02	1.57E-01	7.31E-04	-3.12E+01
RWD	kg	3.03E-04	0.00E+00	1.48E-08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25E-07	1.34E-06	9.01E-09	-3.02E-04
Output material flows																
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	5.00E-03	0.00E+00	3.32E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50E-06	3.49E+00	1.99E-07	-4.99E-03
MER	kg	2.71E-04	0.00E+00	8.20E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44E-08	2.57E-07	8.96E-10	-2.71E-04
EE	MJ	4.08E-01	0.00E+00	2.45E-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03E-04	1.05E-03	4.92E-06	-4.08E-01

Key:
GWP-t – global warming potential - total **GWP-f** – global warming potential fossil fuels **GWP-b** – global warming potential - biogenic **GWP-l** – global warming potential - land use and land use change **ODP** – ozone depletion potential **AP** - acidification potential **EP-fw** - eutrophication potential - aquatic freshwater **EP-m** - eutrophication potential - aquatic marine **EP-t** - feutrophication potential - terrestrial **POCP** - photochemical ozone formation potential **ADPF*[2]** - abiotic depletion potential – fossil resources **ADPE*[2]** - abiotic depletion potential - minerals&metals **WDP*[2]** - Water (user) deprivation potential **PERE** - Use of renewable primary energy **PERM** - use of renewable primary energy resources **PERT** - total use of renewable primary energy resources **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources **PENRT** - total use of non-renewable primary energy resources **SM** - use of secondary material **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of fresh water **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for re-use **MFR** - materials for recycling **MER** - materials for energy recovery **EE** - exported energy

	Results per 1 linear metre of Temponox pipe														
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	1.57E-06	2.28E-08	1.71E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.04E-09	6.39E-08	2.01E-10	-1.57E-06
IRP*[1]	kBq U235-eq.	1.22E+00	3.23E-03	6.88E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.27E-04	5.53E-03	3.74E-05	-1.22E+00
ETP-fw*[2]	CTUe	7.90E+01	1.88E+00	1.40E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.05E-01	3.73E+00	1.24E-02	-7.83E+01
HTP-c*[2]	CTUh	1.24E-07	0.00E+00	7.30E-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71E-11	5.67E-10	7.34E-13	-1.24E-07
HTP-nc*[2]	CTUh	4.46E-07	1.04E-10	1.38E-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.21E-10	5.76E-09	8.31E-12	-4.45E-07
SQP*[2]	dimensionless	1.02E+02	3.50E+00	3.88E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.82E-01	4.45E+00	6.48E-02	-1.01E+02

Key:
PM – particulate matter emissions potential **IRP*[1]** – ionizing radiation potential – human health **ETP-fw*[2]** - Eco-toxicity potential – freshwater **HTP-c*[2]** - Human toxicity potential – cancer effects **HTP-nc*[2]** - Human toxicity potential – non-cancer effects **SQP*[2]** – soil quality potential

Disclaimers:

*1 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionising radiation from the soil, from radon and from some building materials is also not measured by this indicator.

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

6.4 Interpretation, LCA presentation and critical review

Evaluation

The environmental impacts of

- Temponox press connector
- Temponox pipes

differ considerably from each other. The differences in the environmental impact of the products lie in the various pre-products and raw materials used and in the mass of the pre-products and raw materials used in each case. Differences due to the different declared unit must be taken into account. Increasing the proportion of recycling can reduce environmental impacts.

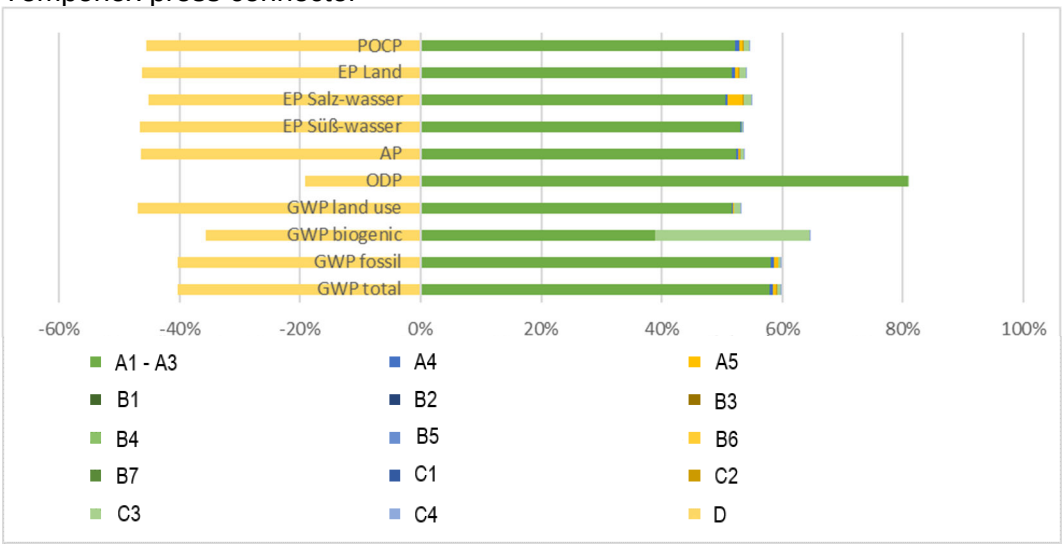
The main environmental impact of production is caused by the raw material stainless steel. This is to be expected, as the main proportion of stainless steel is up to 100 percent depending on the product (pipes) and the high LCIA values associated with the raw material are the main source of emissions.

The LCA covers the complete life cycle. As the products do not generate any emissions in the use stage, here the value is 0.00. The replacement was balanced separately in B4 for 1 year as a scenario. Otherwise, there is no environmental impact during the use phase.
The more stainless steel in the product, the greater the environmental impact.
Due to the main material stainless steel, there are correspondingly high credits at the end of life (depending on the environmental indicator).
The charts below show the allocation of the main environmental impacts.

The values obtained from the LCA calculation are suitable for the certification of buildings.

Diagrams

Temponox press connector



Temponox pipes

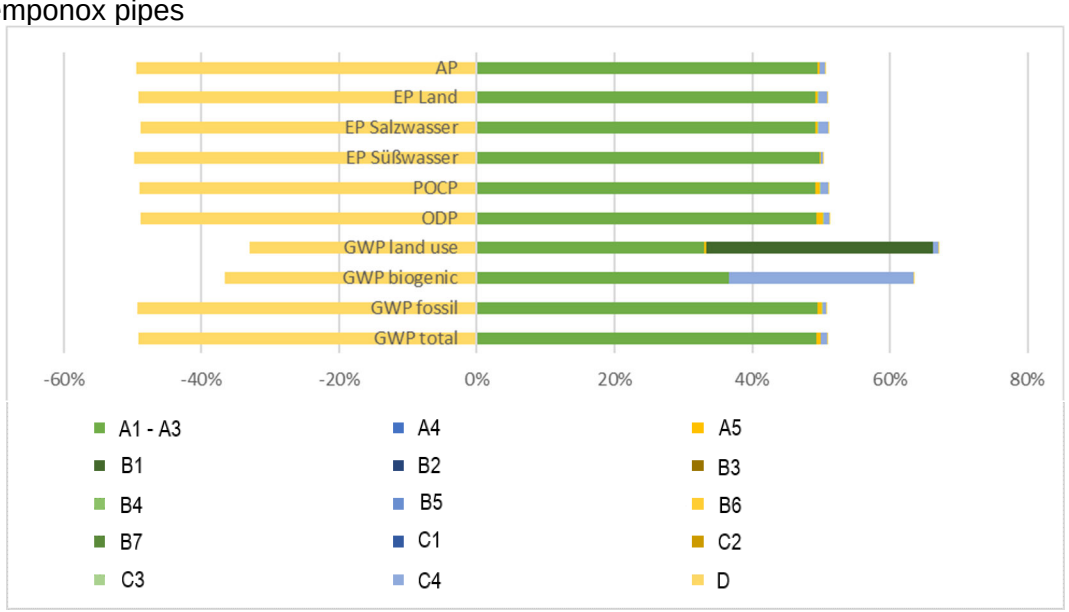


Illustration 3 Percentage of the modules in selected environmental impact indicators

Report

The LCA report underlying this EPD was developed according to the requirements of DIN EN ISO 14040 and DIN EN ISO 14044 as well as DIN EN 15804 and DIN EN ISO 14025. It is deposited with ift Rosenheim. The results and conclusions reported to the target group are complete, correct, without bias and transparent. The results of the study are not designed to be used for comparative statements intended for publication.

Critical review

The critical review of the LCA and of the report took place in the course of verification of the EPD and was carried out by the external auditor Prof. Dr. Eric Brehm.

7 General information regarding the EP

Comparability

This EPD was prepared in accordance with DIN EN 15804 and is therefore only comparable to those EPDs that also comply with the requirements set out in DIN EN 15804.
Any comparison must refer to the building context and the same boundary conditions of the various life cycle stages.
For comparing EPDs of construction products, the rules set out in DIN EN 15804, Clause 5.3, apply.

The detailed individual results of the products were summarised on the basis of conservative assumptions and differ from the average results. Identification of the product groups and the resulting variations are documented in the background report.

Communication

The communications format of this EPD meets the requirements of EN 15942:2012 and is therefore the basis for B2B communication. Only the nomenclature has been changed according to DIN EN 15804.

Verification

Verification of the Environmental Product Declaration is documented in accordance with the ift "Richtlinie zur Erstellung von Typ III Umweltproduktdeklarationen" (Guidance on preparing Type III Environmental Product Declarations) in accordance with the requirements set out in DIN EN ISO 14025.

This declaration is based on the PCR documents “PCR Part A” PCR-A-0.3:2018 and “Piping systems including connecting and fitting technology” PCR-RS-1.0:2022.

The European standard EN 15804 serves as the core PCR [a)]
Independent verification of the declaration and statement according to EN ISO 14025:2010
Independent third party verifier: [b)] Eric Brehm
[a)] Product category rules [b)] Optional for business-to-business communication Mandatory for business-to-consumer communication (see EN ISO 14025:2010. 9.4).

Revisions of this document

No.	Date	Note	Person in charge	Testing personnel
1	11.12.2023	External verification	Pscherer	Brehm
2	15.10.2025	Adjustment Conversion factors	Ludwig	--
3	21.11.2025	Adjustment REACH-declaration	Brechleiter	--

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9 Annex A

Description of life cycle scenarios for Temponox press connectors and pipes made of stainless steel

Product stage			Con-struction process stage		Use stage*							End-of-life stage				Benefits and loads beyond system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	production	Transport	Construction/installation process	Use	maintenance	Repair	replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling potential
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* For declared B-modules, the calculation of the results is performed taking into account the specified RSL related to one year

Table 5 Overview of applied life cycle stages

The scenarios were calculated taking into account the defined RSL (see 4 Use stage).

The scenarios were furthermore based on the research project “EPDs for transparent building components”. (1)

Note: The standard scenarios selected are presented in bold type. They were also used for calculating the indicators in the summary table.

✓ Included in the LCA
— Not included in the LCA

A4 Transport to construction site

No.	Scenario	Description
A4.1	**National**	**Transport mix 35-53% capacity used[1], approx. 600 km**
A4.2	International/EU country	Transport mix 35-53% capacity used[1], approx. 2,000 km
A4.3	International/Non-EU	Transport mix 35-53% capacity used[1], approx. 15,000 km

[1] Capacity used: utilized loading capacity of the truck

The transport distances shown represent a transport average with the following transport mix. The scenarios include the return transport, if applicable.

Shipping method	Network fleet structure	Share in %		
		A4.1	A4.2	A4.3
Parcel service provider (CEP - Courier-Express- Parcel service)	Van 7.5 – 16 t (Euro 6), diesel, 35% capacity utilization	2	0	0.5
Forwarding agency and own truck fleet	32 - 40 t truck/semitrailer (Euro 6), diesel, 53% capacity utilization	98	90	85
Air freights	Cargo and passenger aircrafts, kerosene	0	9	11
Seagoing vessels/containers	Seagoing/container vessels to receiving port, heavy oil	0	1	3.5

A4 Transport to construction site	Transport weight [kg] per declared unit	Density [kg/m³]	Capacity load factor[2]
Temponox press connector	1.16	7.90	0.80
Temponox pipe	3.75	7.90	0.80

[2] Capacity load factor:
= 1 Product completely fills the packaging (without air inclusion)
< 1 Packaging contains unused volume (e.g.: air, filling material)
> 1 Product is packed in compressed form

The scenarios were calculated per kg and can be scaled to the product group using the above masses.

A4 Transport to construction site	Unit	A4.1	A4.2	A4.3
Core indicators				
GWP-t	kg CO_2 equivalent	**6.27E-05**	3.33E-04	2.81E-03
GWP-f	kg CO_2 equivalent	**6.26E-05**	3.33E-04	2.81E-03
GWP-b	kg CO_2 equivalent	**2.18E-08**	8.84E-08	7.09E-07
GWP-l	kg CO_2 equivalent	**3.21E-08**	1.06E-07	7.96E-07
ODP	kg CFC-11-eq.	**1.06E-12**	5.45E-12	4.58E-11
AP	mol H^+-eq.	**1.71E-07**	1.16E-06	1.03E-05
EP-fw	kg P-eq.	**5.24E-09**	1.74E-08	1.31E-07
EP-m	kg N-eq.	**4.47E-08**	3.98E-07	3.63E-06
EP-t	mol N-eq.	**2.45E-07**	1.62E-06	1.42E-05
POCP	kg NMVOC-eq.	**4.62E-07**	4.21E-06	3.85E-05
ADPF	MJ	**9.49E-04**	4.78E-03	4.00E-02
ADPE	kg Sb equivalent	**1.81E-10**	5.55E-10	4.09E-09
WDP	m^3 world-eq. deprived	**4.74E-06**	1.66E-05	1.27E-04
Resource management				
PERE	MJ	**1.19E-05**	4.13E-05	3.15E-04
PERM	MJ	**0.00**	0.00	0.00
PERT	MJ	**1.19E-05**	4.13E-05	3.15E-04
PENRE	MJ	**9.49E-04**	4.78E-03	4.00E-02
PENRM	MJ	**0.00**	0.00	0.00
PENRT	MJ	**9.49E-04**	4.78E-03	4.00E-02
SM	kg	**3.98E-07**	1.33E-06	1.00E-05

RSF	MJ	**0.00**	0.00	0.00
NRSF	MJ	**0.00**	0.00	0.00
FW	m³	**1.30E-07**	4.63E-07	3.54E-06
Categories of waste				
HWD	kg	**6.96E-07**	2.36E-06	1.78E-05
NHWD	kg	**2.23E-05**	7.40E-05	5.57E-04
RWD	kg	**2.05E-10**	7.39E-10	5.69E-09
Output material flows				
CRU	kg	**0.00**	0.00	0.00
MFR	kg	**7.38E-09**	2.84E-08	2.27E-07
MER	kg	**4.16E-11**	1.35E-10	1.02E-09
EE	MJ	**1.68E-07**	5.81E-07	4.41E-06
Additional environmental impact indicators				
PM	Disease incidence	**6.08E-12**	1.94E-11	1.43E-10
IRP	kBq U235-eq.	**8.61E-07**	3.15E-06	2.44E-05
ETPfw	CTUe	**5.01E-04**	2.44E-03	2.02E-02
HTPc	CTUh	**2.78E-14**	9.74E-14	7.45E-13
HTPnc	CTUh	**6.85E-13**	3.61E-12	3.04E-11
SQP	dimensionless	**9.33E-04**	2.92E-03	2.12E-02

A5 Construction/Installation

No.	Scenario	Description
A5.1	**Manual**	**According to the manufacturer. the products are installed with battery-operated pressing pliers (0.0009 kWh/kg, electricity mix (GLO)).**

In case of deviating consumption during installation/assembly of the products which forms part of the site management, they are covered at the building level.

The following quantities of waste materials are produced during installation.

Product group	Waste materials in kg	of which quantities collected for waste recycling (output materials) in kg
Temponox press connector	0.159	0.000
Temponox pipe	0.029	0.113

Ancillary materials, consumables, use of water, use of other resources, material losses as well as direct emissions during installation are negligible.

It is assumed that the packaging material in the Module construction / installation is sent to waste handling. Waste is only thermally recycled in line with the conservative approach. Benefits from A5 are specified in module D.

- Electricity replaces electricity mix (GLO, high voltage, market group);
- Thermal energy replaces thermal energy from natural gas (district or industrial, natural gas, RoW).
- Steel recyclate from A5 replaces 100% steel.

Transport to the recycling plants is included.

Since this is a single scenario, the results are shown in the relevant summary table.

B1 Use (not relevant)

Refer to Section 4 Use stage - Emissions to the environment.
No emissions are known which may occur during the use stage of the products because press fitting is without contact to air, water and soil.
Since this is a single scenario, the results are shown in the relevant summary table.

B2 Cleaning, maintenance and repair

B2.1 Cleaning (not relevant)

No cleaning is required.

Ancillary materials, consumables, use of energy and water, material losses and waste as well as transport distances during cleaning are negligible.

Since this is a single scenario, the results are shown in the relevant summary table.

B2.2 Maintenance and repair (not relevant)

No maintenance is required.

Ancillary materials, consumables, use of energy and water, waste, material losses and transport distances during maintenance are negligible.

Since this is a single scenario, the results are shown in the relevant summary table.

B3 Repair (not relevant)

No repair of the components of the building part is required.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from Viega GmbH & Co. KG.

Ancillary materials, consumables, use of energy and water, waste, material losses and transport distances during repair are negligible.

Since this is a single scenario, the results are shown in the relevant summary table.

B4 Exchange/replacement

No.	Scenario	Description
B4.1	**No replacement**	**According to manufacturer, a replacement is not planned.**
B4.2	Normal use and heavy use	One-time replacement after 50 years (RSL)* Energy consumption 0.0009 kWh/kg.

*Assumptions for evaluation of possible environmental impacts; statements made do not constitute any guaranty or warranty of performance.

The statements made in this EPD are only informative to allow evaluation at the building level.

It is assumed that no replacement will be necessary during the 50-year reference service life and the 50-year building service life. The environmental impacts of replacement are due to the product, construction and disposal stages.
The results were based on one year, taking into account the RSL.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from Viega GmbH & Co. KG.

B4 Exchange/ replacement	Unit	B4.1	B4.2	
			Temponox press connector	Temponox pipe
Core indicators				
GWP-t	kg CO_2 equivalent	**0.00**	3.08E+00	6.27E-01
GWP-f	kg CO_2 equivalent	**0.00**	3.04E+00	4.86E-01
GWP-b	kg CO_2 equivalent	**0.00**	4.21E-02	1.40E-01
GWP-l	kg CO_2 equivalent	**0.00**	9.78E-04	6.66E-04
ODP	kg CFC-11-eq.	**0.00**	4.96E-05	7.44E-09
AP	mol H^+-eq.	**0.00**	5.09E-03	2.79E-03
EP-fw	kg P-eq.	**0.00**	3.24E-04	7.01E-05
EP-m	kg N-eq.	**0.00**	1.27E-03	8.06E-04
EP-t	mol N-eq.	**0.00**	1.06E-02	2.27E-03
POCP	kg NMVOC-eq.	**0.00**	4.30E-03	7.52E-03
ADPF	MJ	**0.00**	1.12E+00	2.60E-06
ADPE	kg Sb equivalent	**0.00**	1.53E-05	6.70E+00
WDP	m^3 world-eq. deprived	**0.00**	4.77E-01	5.13E-02
Resource management				
PERE	MJ	**0.00**	8.48E-01	1.70E-01
PERM	MJ	**0.00**	0.00E+00	0.00E+00
PERT	MJ	**0.00**	8.48E-01	1.70E-01
PENRE	MJ	**0.00**	1.06E+00	6.71E+00
PENRM	MJ	**0.00**	-3.44E-01	0.00E+00
PENRT	MJ	**0.00**	2.05E+01	6.71E+00
SM	kg	**0.00**	6.13E-03	3.94E-03
RSF	MJ	**0.00**	0.00E+00	0.00E+00
NRSF	MJ	**0.00**	0.00E+00	0.00E+00
FW	m^3	**0.00**	9.33E-03	1.31E-03
Categories of waste				
HWD	kg	**0.00**	4.23E-02	7.63E-03
NHWD	kg	**0.00**	1.42E+00	2.56E-01
RWD	kg	**0.00**	2.06E-05	2.26E-06
Output material flows				
CRU	kg	**0.00**	0.00E+00	0.00E+00
MFR	kg	**0.00**	9.19E-01	3.49E+00
MER	kg	**0.00**	1.83E-06	4.39E-07
EE	MJ	**0.00**	1.06E-02	2.03E-03
Additional environmental impact indicators				
PM	Disease incidence	**0.00**	1.53E-07	8.11E-08
IRP	kBq U235-eq.	**0.00**	7.67E-02	9.39E-03
ETPfw	CTUe	**0.00**	7.21E+00	5.94E+00
HTPc	CTUh	**0.00**	3.15E-09	6.90E-10
HTPnc	CTUh	**0.00**	2.24E-08	8.77E-09
SQP	dimensionless	**0.00**	5.40E+00	8.64E+00

B5 Improvement/modernisation (not relevant)
According to the manufacturer, the elements are not included in the improvement/modernisation activities for buildings.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from Viega GmbH & Co. KG.

Ancillary materials, consumables, use of energy and water, material losses, waste as well as transport distances during replacement are negligible.

Since this is a single scenario, the results are shown in the relevant summary table.

B6 Operational energy use (not relevant)
There is no energy used during normal use.

Ancillaries, consumables, water use, material losses, waste materials, transport distances and other scenarios are negligible.

Since this is a single scenario, the results are shown in the relevant summary table.

B7 Operational water use (not relevant)
No water consumption when used as intended. Water consumption for cleaning is specified in Module B2.1.

Ancillaries, consumables, energy use, material losses, waste materials, transport distances and other scenarios are negligible.

Since this is a single scenario, the results are shown in the relevant summary table.

C1 Deconstruction

No.	Scenario	Description
C1	**Deconstruction**	**Connecting technology 99% deconstruction.** **Further deconstruction rates are possible, give adequate reasons.**

No relevant inputs or outputs apply to the scenario selected. Energy consumption during dismantling is not required.

Since this is a single scenario, the results are shown in the relevant summary table.

In case of deviating consumption the removal of the products forms part of site management and is covered at the building level.

C2 Transport

No.	Scenario	Description
C2	**Transport**	**Transport to collection point with >32 t truck (Euro 4), diesel, 29.96 t payload, 53% capacity used, 50 km (1)**

Since this is a single scenario, the results are shown in the relevant summary table.

C3 Waste management

No.	Scenario	Description
C3	**Current market situation**	**Share for recirculation of materials:** • **(Stainless) Steel 98% in melt** (UBA, 2017) • **Plastics 60 % thermal recycling in incineration plants** (Zukunft Bauen, 2017) • **Plastics 40 % recycled** (Zukunft Bauen, 2017) • **Remainder to landfill/disposal,**

No electricity consumption for the recycling plant per declared unit was taken into account for waste treatment due to the low proportion and lack of sources.

As the products are placed on the European market, the disposal scenario is based on average European data sets.

The below table presents the disposal processes and their percentage by mass/weight. The calculation is based on the above mentioned shares in percent related to the declared unit of the product system.

C3 Disposal	Unit	Temponox press connector	Temponox pipe
Collection process, collected separately	kg	0.99	0.99
Collection process, collected as mixed construction waste	kg	0.01	0.01
Recovery system, for re-use	kg	0.00	0.00
Recovery system, for recycling	kg	0.94	0.94
Recovery system, for energy recovery	kg	0.03	0.03
Disposal	kg	0.03	0.03

The 100% scenarios differ from the current average recovery shown here (in background report C3.4). The evaluation of each scenario is described in the background report.

Since this is a single scenario, the results are shown in the summary table.

C4 Disposal

No.	Scenario	Description
C4	**Disposal**	**The non-recordable amounts and losses within the re-use/ recycling chain (C1 and C3) are modelled as “disposed” (EU-28).**

The 100% scenarios differ from the current average recovery shown here (in background report C4.4). The evaluation of each scenario is described in the background report.

The consumption in scenario C4 results from physical pre-treatment, waste recycling and management of the disposal site. The benefits obtained here from the substitution of primary material production are allocated to Module D, e.g. electricity and heat from waste incineration.

Since this is a single scenario, the results are shown in the summary table.

D Benefits and loads from beyond the system boundaries		
No.	**Scenario**	**Description**
D	**Recycling potential**	**Stainless steel scrap from C3 excluding the scrap used in A3 replaces 100% of stainless steel; Plastic recyclate from C3 excluding the plastics used in A3 replaces 60% of tetrafluoroethylene; Benefits from incineration plant: Electricity replaces electricity mix (GLO), thermal energy replaces thermal energy from natural gas (RoW).**
The values in Module D result from recycling of the packaging material in Module A5 and from deconstruction at the end of service life. The 100% scenarios differ from the current average recovery shown here (in background report D4). The evaluation of each scenario is described in the background report. Since this is a single scenario, the results are shown in the summary table.		

Annex B

Conversion table for unit weights

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
170011	1715	1715 Coupling with SC 15 E 1 9	9	Temponox	11	37	0.04
170021	1715	1715 Coupling with SC 18 E 1 9	9	Temponox	11	40.9	0.04
170031	1715	1715 Coupling with SC 22 E 1 9	9	Temponox	11	57.5	0.06
170041	1715	1715 Coupling with SC 28 E 1 9	9	Temponox	11	75	0.08
170051	1715	1715 Coupling with SC 35 E 1 9	9	Temponox	11	92.5	0.09
170061	1715	1715 Coupling with SC 42 E 1 9	9	Temponox	11	181	0.18
170071	1715	1715 Coupling with SC 54 E 1 9	9	Temponox	11	248	0.25
170091	1715XL	1715XL Coupling with SC 76,1 E 1 9	9	Temponox	11	607	0.61
170101	1715XL	1715XL Coupling with SC 88,9 E 1 9	9	Temponox	11	707.6	0.71
170111	1715XL	1715XL Coupling with SC 108,0 E 1 9	9	Temponox	11	970	0.97
170131	17155	17155 Sliding coupling with SC 15 E 1 9	9	Temponox	13	48.1	0.05
170141	17155	17155 Sliding coupling with SC 18 E 1 9	9	Temponox	13	56.5	0.06
170151	17155	17155 Sliding coupling with SC 22 E 1 9	9	Temponox	13	78.7	0.08
170161	17155	17155 Sliding coupling with SC 28 E 1 9	9	Temponox	13	110	0.11
170171	17155	17155 Sliding coupling with SC 35 E 1 9	9	Temponox	13	149	0.15
170181	17155	17155 Sliding coupling with SC 42 E 1 9	9	Temponox	13	254.2	0.25
170191	17155	17155 Sliding coupling with SC 54 E 1 9	9	Temponox	13	342	0.34
170211	17155XL	17155XLSliding coupling with SC 76,1 E 1 9	9	Temponox	13	604	0.60
170221	17155XL	17155XLSliding coupling with SC 88,9 E 1 9	9	Temponox	13	705	0.71
170231	17155XL	17155XLSliding coupling with SC 108,0 E 1 9	9	Temponox	13	970	0.97
170261	17151	17151 Reducer with SC 18x15 E 1 9	9	Temponox	12	33.03	0.03
170281	17151	17151 Reducer with SC 22x15 E 1 9	9	Temponox	12	38.6	0.04
170291	17151	17151 Reducer with SC 22x18 E 1 9	9	Temponox	12	41	0.04
170301	17151	17151 Reducer with SC 28x15 E 1 9	9	Temponox	12	52.4	0.05
170311	17151	17151 Reducer with SC 28x18 E 1 9	9	Temponox	12	51	0.05
170321	17151	17151 Reducer with SC 28x22 E 1 9	9	Temponox	12	62	0.06
170331	17151	17151 Reducer with SC 35x15 E 1 9	9	Temponox	12	74	0.07
170341	17151	17151 Reducer with SC 35x22 E 1 9	9	Temponox	12	78	0.08
170351	17151	17151 Reducer with SC 35x28 E 1 9	9	Temponox	12	82.28	0.08
170361	17151	17151 Reducer with SC 42x22 E 1 9	9	Temponox	12	115	0.12

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
170371	17151	17151 Reducer with SC 42x28 E 1 9	9	Temponox	12	113	0.11
170381	17151	17151 Reducer with SC 42x35 E 1 9	9	Temponox	12	115	0.12
170391	17151	17151 Reducer with SC 54x22 E 1 9	9	Temponox	12	173	0.17
170401	17151	17151 Reducer with SC 54x28 E 1 9	9	Temponox	12	178	0.18
170411	17151	17151 Reducer with SC 54x35 E 1 9	9	Temponox	12	190	0.19
170421	17151	17151 Reducer with SC 54x42 E 1 9	9	Temponox	12	222.5	0.22
170441	17151XL	17151XLReducer with SC 76,1x35 E 1 9	9	Temponox	12	370	0.37
170451	17151XL	17151XLReducer with SC 76,1x42 E 1 9	9	Temponox	12	382	0.38
170461	17151XL	17151XLReducer with SC 76,1x54 E 1 9	9	Temponox	12	409	0.41
170481	17151XL	17151XLReducer with SC 88,9x54 E 1 9	9	Temponox	12	491	0.49
170501	17151XL	17151XLReducer with SC 88,9x76,1 E 1 9	9	Temponox	12	620	0.62
170511	17151XL	17151XLReducer with SC 108,0x54 E 1 9	9	Temponox	12	641	0.64
170531	17151XL	17151XLReducer with SC 108,0x76,1E 1 9	9	Temponox	12	790	0.79
170541	17151XL	17151XLReducer with SC 108,0x88,9E 1 9	9	Temponox	12	799	0.80
170561	1716	1716 Elbow 90°with SC 15 E 1 9	9	Temponox	14	41.8	0.04
170571	1716	1716 Elbow 90°with SC 18 E 1 9	9	Temponox	14	51.04	0.05
170581	1716	1716 Elbow 90°with SC 22 E 1 9	9	Temponox	14	82	0.08
170591	1716	1716 Elbow 90°with SC 28 E 1 9	9	Temponox	14	116	0.12
170601	1716	1716 Elbow 90°with SC 35 E 1 9	9	Temponox	14	145.6	0.15
170611	1716	1716 Elbow 90°with SC 42 E 1 9	9	Temponox	14	319	0.32
170621	1716	1716 Elbow 90°with SC 54 E 1 9	9	Temponox	14	446	0.45
170641	1716XL	1716XL Elbow 90°with SC 76,1 E 1 9	9	Temponox	14	1,120	1.12
170651	1716XL	1716XL Elbow 90°with SC 88,9 E 1 9	9	Temponox	14	1,410	1.41
170661	1716XL	1716XL Elbow 90°with SC 108,0 E 1 9	9	Temponox	14	2,020	2.02
170681	17161	17161 Elbow 90°with SC 15 E 1 9	9	Temponox	15	37.7	0.04
170691	17161	17161 Elbow 90°with SC 18 E 1 9	9	Temponox	15	46.48	0.05
170701	17161	17161 Elbow 90°with SC 22 E 1 9	9	Temponox	15	74.5	0.07
170711	17161	17161 Elbow 90°with SC 28 E 1 9	9	Temponox	15	104	0.10
170721	17161	17161 Elbow 90°with SC 35 E 1 9	9	Temponox	15	140.8	0.14
170731	17161	17161 Elbow 90°with SC 42 E 1 9	9	Temponox	15	290	0.29
170741	17161	17161 Elbow 90°with SC 54 E 1 9	9	Temponox	15	434	0.43
170761	17161XL	17161XLElbow 90°with SC 76,1 E 1 9	9	Temponox	15	1,050	1.05
170771	17161XL	17161XLElbow 90°with SC 88,9 E 1 9	9	Temponox	15	1,300	1.30

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
170781	17161XL	17161XLElbow 90°with SC 108,0 E 1 9	9	Temponox	15	1,900	1.90
170801	1726	1726 Elbow 45°with SC 15 E 1 9	9	Temponox	18	35.8	0.04
170811	1726	1726 Elbow 45°with SC 18 E 1 9	9	Temponox	18	42.3	0.04
170821	1726	1726 Elbow 45°with SC 22 E 1 9	9	Temponox	18	65.8	0.07
170831	1726	1726 Elbow 45°with SC 28 E 1 9	9	Temponox	18	88	0.09
170841	1726	1726 Elbow 45°with SC 35 E 1 9	9	Temponox	18	117	0.12
170851	1726	1726 Elbow 45°with SC 42 E 1 9	9	Temponox	18	240	0.24
170861	1726	1726 Elbow 45°with SC 54 E 1 9	9	Temponox	18	331.4	0.33
170881	1726XL	1726XL Elbow 45°with SC 76,1 E 1 9	9	Temponox	18	850	0.85
170891	1726XL	1726XL Elbow 45°with SC 88,9 E 1 9	9	Temponox	18	1,040	1.04
170901	1726XL	1726XL Elbow 45°with SC 108,0 E 1 9	9	Temponox	18	1,500	1.50
170921	17261	17261 Elbow 45°with SC 15 E 1 9	9	Temponox	19	31.1	0.03
170931	17261	17261 Elbow 45°with SC 18 E 1 9	9	Temponox	19	38.46	0.04
170941	17261	17261 Elbow 45°with SC 22 E 1 9	9	Temponox	19	59.3	0.06
170951	17261	17261 Elbow 45°with SC 28 E 1 9	9	Temponox	19	83	0.08
170961	17261	17261 Elbow 45°with SC 35 E 1 9	9	Temponox	19	107.6	0.11
170971	17261	17261 Elbow 45°with SC 42 E 1 9	9	Temponox	19	225	0.23
170981	17261	17261 Elbow 45°with SC 54 E 1 9	9	Temponox	19	317.4	0.32
171001	17261XL	17261XLElbow 45°with SC 76,1 E 1 9	9	Temponox	19	800	0.80
171011	17261XL	17261XLElbow 45°with SC 88,9 E 1 9	9	Temponox	19	970	0.97
171021	17261XL	17261XLElbow 45°with SC 108,0 E 1 9	9	Temponox	19	1,360	1.36
171041	17093	17093 Crossover 15 E 1 9	9	Temponox	2	62.14	0.06
171051	17093	17093 Crossover 18 E 1 9	9	Temponox	2	82	0.08
171061	17093	17093 Crossover 22 E 1 9	9	Temponox	2	142	0.14
171081	1718	1718 Tee with SC 15 E 1 9	9	Temponox	17	67	0.07
171091	1718	1718 Tee with SC 18 E 1 9	9	Temponox	17	82.24	0.08
171101	1718	1718 Tee with SC 22 E 1 9	9	Temponox	17	121.5	0.12
171111	1718	1718 Tee with SC 28 E 1 9	9	Temponox	17	162	0.16
171121	1718	1718 Tee with SC 35 E 1 9	9	Temponox	17	194	0.19
171131	1718	1718 Tee with SC 42 E 1 9	9	Temponox	17	370	0.37
171141	1718	1718 Tee with SC 54 E 1 9	9	Temponox	17	505	0.51
171161	1718XL	1718XL Tee with SC 76,1 E 1 9	9	Temponox	17	1,160	1.16
171171	1718XL	1718XL Tee with SC 88,9 E 1 9	9	Temponox	17	1,391.3	1.39

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
171181	1718XL	1718XL Tee with SC 108,0 E 1 9	9	Temponox	17	1,960	1.96
171211	1718	1718 Tee with SC 15x18x15 E 1 9	9	Temponox	17	76	0.08
171221	1718	1718 Tee with SC 15x22x15 E 1 9	9	Temponox	17	88	0.09
171241	1718	1718 Tee with SC 18x18x15 E 1 9	9	Temponox	17	78	0.08
171251	1718	1718 Tee with SC 18x15x18 E 1 9	9	Temponox	17	82	0.08
171261	1718	1718 Tee with SC 18x22x18 E 1 9	9	Temponox	17	98.08	0.10
171281	1718	1718 Tee with SC 22x15x15 E 1 9	9	Temponox	17	99.8	0.10
171291	1718	1718 Tee with SC 22x15x22 E 1 9	9	Temponox	17	107.5	0.11
171301	1718	1718 Tee with SC 22x18x18 E 1 9	9	Temponox	17	108	0.11
171311	1718	1718 Tee with SC 22x18x22 E 1 9	9	Temponox	17	111.9	0.11
171321	1718	1718 Tee with SC 22x22x15 E 1 9	9	Temponox	17	117.6	0.12
171331	1718	1718 Tee with SC 22x28x22 E 1 9	9	Temponox	17	134	0.13
171341	1718	1718 Tee with SC 28x15x28 E 1 9	9	Temponox	17	124.8	0.12
171351	1718	1718 Tee with SC 28x18x28 E 1 9	9	Temponox	17	129	0.13
171361	1718	1718 Tee with SC 28x22x22 E 1 9	9	Temponox	17	155	0.16
171371	1718	1718 Tee with SC 28x22x28 E 1 9	9	Temponox	17	147.6	0.15
171381	1718	1718 Tee with SC 35x15x35 E 1 9	9	Temponox	17	150	0.15
171391	1718	1718 Tee with SC 35x18x35 E 1 9	9	Temponox	17	152.8	0.15
171401	1718	1718 Tee with SC 35x22x35 E 1 9	9	Temponox	17	168.2	0.17
171411	1718	1718 Tee with SC 35x28x35 E 1 9	9	Temponox	17	189.2	0.19
171421	1718	1718 Tee with SC 42x15x42 E 1 9	9	Temponox	17	255	0.26
171431	1718	1718 Tee with SC 42x18x42 E 1 9	9	Temponox	17	254	0.25
171441	1718	1718 Tee with SC 42x22x42 E 1 9	9	Temponox	17	266	0.27
171451	1718	1718 Tee with SC 42x28x42 E 1 9	9	Temponox	17	296	0.30
171461	1718	1718 Tee with SC 42x35x42 E 1 9	9	Temponox	17	310	0.31
171471	1718	1718 Tee with SC 54x15x54 E 1 9	9	Temponox	17	327	0.33
171481	1718	1718 Tee with SC 54x18x54 E 1 9	9	Temponox	17	329	0.33
171491	1718	1718 Tee with SC 54x22x54 E 1 9	9	Temponox	17	330	0.33
171501	1718	1718 Tee with SC 54x28x54 E 1 9	9	Temponox	17	352	0.35
171511	1718	1718 Tee with SC 54x35x54 E 1 9	9	Temponox	17	372	0.37
171521	1718	1718 Tee with SC 54x42x54 E 1 9	9	Temponox	17	426	0.43
171571	1718XL	1718XL Tee with SC 76,1x28x76,1 E 1 9	9	Temponox	17	740	0.74
171581	1718XL	1718XL Tee with SC 76,1x35x76,1 E 1 9	9	Temponox	17	780	0.78

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
171591	1718XL	1718XL Tee with SC 76,1x42x76,1 E 1 9	9	Temponox	17	840	0.84
171601	1718XL	1718XL Tee with SC 76,1x54x76,1 E 1 9	9	Temponox	17	912	0.91
171621	1718XL	1718XL Tee with SC 88,9x28x88,9 E 1 9	9	Temponox	17	850	0.85
171631	1718XL	1718XL Tee with SC 88,9x35x88,9 E 1 9	9	Temponox	17	900	0.90
171641	1718XL	1718XL Tee with SC 88,9x42x88,9 E 1 9	9	Temponox	17	975	0.98
171651	1718XL	1718XL Tee with SC 88,9x54x88,9 E 1 9	9	Temponox	17	1,050	1.05
171671	1718XL	1718XL Tee with SC 88,9x76,1x88,9E 1 9	9	Temponox	17	1,290	1.29
171681	1718XL	1718XL Tee with SC 108,0x28x108,0E 1 9	9	Temponox	17	1,160	1.16
171691	1718XL	1718XL Tee with SC 108,0x35x108,0E 1 9	9	Temponox	17	1,200	1.20
171701	1718XL	1718XL Tee with SC 108,0x42x108,0E 1 9	9	Temponox	17	1,290	1.29
171711	1718XL	1718XL Tee with SC 108,0x54x108,0E 1 9	9	Temponox	17	1,370	1.37
171731	1718XL	1718XL Tee with SC 108,0x76,1x108E 1 9	9	Temponox	17	1,640	1.64
171741	1718XL	1718XL Tee with SC 108,0x88,9x108E 1 9	9	Temponox	17	1,746	1.75
171761	17172	17172 Tee with SC 15x1/2x15 E 1 9	9	Temponox	16	77.8	0.08
171771	17172	17172 Tee with SC 18x1/2x18 E 1 9	9	Temponox	16	87	0.09
171781	17172	17172 Tee with SC 22x1/2x22 E 1 9	9	Temponox	16	110.2	0.11
171791	17172	17172 Tee with SC 22x3/4x22 E 1 9	9	Temponox	16	132	0.13
171801	17172	17172 Tee with SC 28x1/2x28 E 1 9	9	Temponox	16	132.8	0.13
171811	17172	17172 Tee with SC 28x3/4x28 E 1 9	9	Temponox	16	146.5	0.15
171821	17172	17172 Tee with SC 28x1x28 E 1 9	9	Temponox	16	169	0.17
171831	17172	17172 Tee with SC 35x1/2x35 E 1 9	9	Temponox	16	153	0.15
171841	17172	17172 Tee with SC 35x3/4x35 E 1 9	9	Temponox	16	168.6	0.17
171851	17172	17172 Tee with SC 42x1/2x42 E 1 9	9	Temponox	16	256	0.26
171861	17172	17172 Tee with SC 42x3/4x42 E 1 9	9	Temponox	16	271.8	0.27
171871	17172	17172 Tee with SC 54x1/2x54 E 1 9	9	Temponox	16	340	0.34
171881	17172	17172 Tee with SC 54x3/4x54 E 1 9	9	Temponox	16	335.2	0.34
171891	17172	17172 Tee with SC 54x1x54 E 1 9	9	Temponox	16	361	0.36
171911	17172XL	17172XLTee with SC 76,1x3/4x76,1 E 1 9	9	Temponox	16	740	0.74
171921	17172XL	17172XLTee with SC 88,9x3/4x88,9 E 1 9	9	Temponox	16	830	0.83
171931	17172XL	17172XLTee with SC 108,0x3/4x108,E 1 9	9	Temponox	16	1,158	1.16
171961	17141	17141 Adapter elbow 90°m SC 15x3/8 E 1 9	9	Temponox	8	60	0.06
171971	17141	17141 Adapter elbow 90°m SC 15x1/2 E 1 9	9	Temponox	8	72.2	0.07
171981	17141	17141 Adapter elbow 90°m SC 18x1/2 E 1 9	9	Temponox	8	82.3	0.08

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
171991	17141	17141 Adapter elbow 90°m SC 22x3/4 E 1 9	9	Temponox	8	115.6	0.12
172001	17141	17141 Adapter elbow 90°m SC 28x1 E 1 9	9	Temponox	8	230	0.23
172021	17142	17142 Adapter elbow 90°m SC 15x1/2 E 1 9	9	Temponox	9	75	0.08
172031	17142	17142 Adapter elbow 90°m SC 22x1/2 E 1 9	9	Temponox	9	98.4	0.10
172041	17142	17142 Adapter elbow 90°m SC 22x3/4 E 1 9	9	Temponox	9	109	0.11
172051	17142	17142 Adapter elbow 90°m SC 28x1/2 E 1 9	9	Temponox	9	131	0.13
172061	17142	17142 Adapter elbow 90°m SC 28x3/4 E 1 9	9	Temponox	9	131	0.13
172071	17142	17142 Adapter elbow 90°m SC 28x1 E 1 9	9	Temponox	9	200.6	0.20
172081	1759	1759 Flange adapter with SC 35 E 1 9	9	Temponox	22	1,746	1.75
172091	1759	1759 Flange adapter with SC 42 E 1 9	9	Temponox	22	2,080	2.08
172101	1759	1759 Flange adapter with SC 54 E 1 9	9	Temponox	22	2,510	2.51
172121	1759XL	1759XL Flange adapter with SC 76,1 E 1 9	9	Temponox	22	2,645	2.65
172131	1759XL	1759XL Flange adapter with SC 88,9 E 1 9	9	Temponox	22	3,525	3.53
172141	1759XL	1759XL Flange adapter with SC 108,0 E 1 9	9	Temponox	22	4,270	4.27
172151	17591	17591 Flange adapter with SC 35 E 1 9	9	Temponox	23	1,115	1.12
172161	17591	17591 Flange adapter with SC 42 E 1 9	9	Temponox	23	1,205	1.21
172171	17591	17591 Flange adapter with SC 54 E 1 9	9	Temponox	23	1,360	1.36
172201	17591XL	17591XLFlange adapter with SC 76,1 E 1 9	9	Temponox	23	1,840	1.84
172211	17591XL	17591XLFlange adapter with SC 88,9 E 1 9	9	Temponox	23	2,863	2.86
172221	17591XL	17591XLFlange adapter with SC 108,0 E 1 9	9	Temponox	23	3,380	3.38
172231	1763	1763 Union with SC 15x1/2 E 1 9	9	Temponox	26	49.6	0.05
172241	1763	1763 Union with SC 15x3/4 E 1 9	9	Temponox	26	66.8	0.07
172251	1763	1763 Union with SC 15x1 E 1 9	9	Temponox	26	93.6	0.09
172261	1763	1763 Union with SC 18x3/4 E 1 9	9	Temponox	26	67.8	0.07
172271	1763	1763 Union with SC 18x1 E 1 9	9	Temponox	26	96	0.10
172281	1763	1763 Union with SC 22x3/4 E 1 9	9	Temponox	26	79.6	0.08
172291	1763	1763 Union with SC 22x1 E 1 9	9	Temponox	26	102	0.10
172301	1763	1763 Union with SC 22x11/4 E 1 9	9	Temponox	26	140.8	0.14
172311	1763	1763 Union with SC 22x11/2 E 1 9	9	Temponox	26	183.6	0.18
172321	1763	1763 Union with SC 28x1 E 1 9	9	Temponox	26	120.8	0.12
172331	1763	1763 Union with SC 28x11/4 E 1 9	9	Temponox	26	147.2	0.15
172341	1763	1763 Union with SC 28x11/2 E 1 9	9	Temponox	26	181.76	0.18
172351	1763	1763 Union with SC 35x11/2 E 1 9	9	Temponox	26	193.6	0.19

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
172361	1763	1763 Union with SC 35x2 E 1 9	9	Temponox	26	286.4	0.29
172371	1763	1763 Union with SC 42x13/4 E 1 9	9	Temponox	26	304	0.30
172381	1763	1763 Union with SC 42x2 E 1 9	9	Temponox	26	346	0.35
172391	1763	1763 Union with SC 54x23/8 E 1 9	9	Temponox	26	532	0.53
172401	1763	1763 Union with SC 54x21/2 E 1 9	9	Temponox	26	656	0.66
172431	1711	1711 Adapter with SC 15x1/2 E 1 9	9	Temponox	3	47.8	0.05
172441	1711	1711 Adapter with SC 15x3/4 E 1 9	9	Temponox	3	60	0.06
172451	1711	1711 Adapter with SC 15x3/8 E 1 9	9	Temponox	3	40	0.04
172461	1711	1711 Adapter with SC 18x1/2 E 1 9	9	Temponox	3	52	0.05
172471	1711	1711 Adapter with SC 18x3/4 E 1 9	9	Temponox	3	67.4	0.07
172481	1711	1711 Adapter with SC 22x1/2 E 1 9	9	Temponox	3	57.6	0.06
172491	1711	1711 Adapter with SC 22x3/4 E 1 9	9	Temponox	3	68.6	0.07
172501	1711	1711 Adapter with SC 22x1 E 1 9	9	Temponox	3	104	0.10
172511	1711	1711 Adapter with SC 28x1/2 E 1 9	9	Temponox	3	80.6	0.08
172521	1711	1711 Adapter with SC 28x3/4 E 1 9	9	Temponox	3	83.2	0.08
172531	1711	1711 Adapter with SC 28x1 E 1 9	9	Temponox	3	104	0.10
172541	1711	1711 Adapter with SC 28x11/4 E 1 9	9	Temponox	3	176	0.18
172551	1711	1711 Adapter with SC 35x1 E 1 9	9	Temponox	3	111.9	0.11
172561	1711	1711 Adapter with SC 35x11/4 E 1 9	9	Temponox	3	185	0.19
172571	1711	1711 Adapter with SC 35x11/2 E 1 9	9	Temponox	3	243.3	0.24
172581	1711	1711 Adapter with SC 42x11/4 E 1 9	9	Temponox	3	229	0.23
172591	1711	1711 Adapter with SC 42x11/2 E 1 9	9	Temponox	3	283	0.28
172601	1711	1711 Adapter with SC 54x2 E 1 9	9	Temponox	3	395	0.40
172631	1711XL	1711XL Adapter with SC 76,1x21/2 E 1 9	9	Temponox	3	885	0.89
172641	1711XL	1711XL Adapter with SC 88,9x3 E 1 9	9	Temponox	3	1,140	1.14
172651	1711XL	1711XL Adapter with SC 108,0x4 E 1 9	9	Temponox	3	1,610	1.61
172681	1712	1712 Adapter with SC 15x3/8 E 1 9	9	Temponox	5	42.72	0.04
172691	1712	1712 Adapter with SC 15x1/2 E 1 9	9	Temponox	5	47.8	0.05
172701	1712	1712 Adapter with SC 15x3/4 E 1 9	9	Temponox	5	61	0.06
172711	1712	1712 Adapter with SC 18x1/2 E 1 9	9	Temponox	5	47.6	0.05
172721	1712	1712 Adapter with SC 18x3/4 E 1 9	9	Temponox	5	67	0.07
172731	1712	1712 Adapter with SC 22x1/2 E 1 9	9	Temponox	5	55	0.06
172741	1712	1712 Adapter with SC 22x3/4 E 1 9	9	Temponox	5	70.8	0.07

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
172751	1712	1712 Adapter with SC 22x1 E 1 9	9	Temponox	5	85	0.09
172761	1712	1712 Adapter with SC 28x3/4 E 1 9	9	Temponox	5	75.4	0.08
172771	1712	1712 Adapter with SC 28x1 E 1 9	9	Temponox	5	92.6	0.09
172781	1712	1712 Adapter with SC 35x3/4 E 1 9	9	Temponox	5	89	0.09
172791	1712	1712 Adapter with SC 35x1 E 1 9	9	Temponox	5	101.2	0.10
172801	1712	1712 Adapter with SC 35x11/4 E 1 9	9	Temponox	5	146	0.15
172811	1712	1712 Adapter with SC 42x11/4 E 1 9	9	Temponox	5	199	0.20
172821	1712	1712 Adapter with SC 42x11/2 E 1 9	9	Temponox	5	250	0.25
172831	1712	1712 Adapter with SC 54x2 E 1 9	9	Temponox	5	361	0.36
172861	1712XL	1712XL Adapter with SC 76,1x21/2 E 1 9	9	Temponox	5	700	0.70
172871	1712XL	1712XL Adapter with SC 88,9x3 E 1 9	9	Temponox	5	1,240	1.24
172881	1712XL	1712XL Adapter with SC 108,0x4 E 1 9	9	Temponox	5	1,550	1.55
172901	1756	1756 Cap with SC 15 E 1 9	9	Temponox	21	21.6	0.02
172911	1756	1756 Cap with SC 18 E 1 9	9	Temponox	21	26.2	0.03
172921	1756	1756 Cap with SC 22 E 1 9	9	Temponox	21	36.2	0.04
172931	1756	1756 Cap with SC 28 E 1 9	9	Temponox	21	47.2	0.05
172941	1756	1756 Cap with SC 35 E 1 9	9	Temponox	21	57	0.06
172951	1756	1756 Cap with SC 42 E 1 9	9	Temponox	21	122.5	0.12
172961	1756	1756 Cap with SC 54 E 1 9	9	Temponox	21	166	0.17
172981	1756XL	1756XL Cap with SC 76,1x3/4 E 1 9	9	Temponox	21	470	0.47
172991	1756XL	1756XL Cap with SC 88,9x3/4 E 1 9	9	Temponox	21	552.6	0.55
173001	1756XL	1756XL Cap with SC 108,0x3/4 E 1 9	9	Temponox	21	749	0.75
173011	1765	1765 Union with SC 15x1/2 E 1 9	9	Temponox	27	121.6	0.12
173021	1765	1765 Union with SC 18x3/4 E 1 9	9	Temponox	27	130.4	0.13
173031	1765	1765 Union with SC 22x3/4 E 1 9	9	Temponox	27	143.2	0.14
173041	1765	1765 Union with SC 22x1 E 1 9	9	Temponox	27	224.8	0.22
173051	1765	1765 Union with SC 28x1 E 1 9	9	Temponox	27	246	0.25
173061	1765	1765 Union with SC 35x11/4 E 1 9	9	Temponox	27	425.4	0.43
173071	1765	1765 Union with SC 42x11/2 E 1 9	9	Temponox	27	580	0.58
173081	1765	1765 Union with SC 54x2 E 1 9	9	Temponox	27	1,025	1.03
173091	1762	1762 Union with SC 15x1/2 E 1 9	9	Temponox	25	126	0.13
173101	1762	1762 Union with SC 18x1/2 E 1 9	9	Temponox	25	126.4	0.13
173111	1762	1762 Union with SC 22x3/4 E 1 9	9	Temponox	25	148.8	0.15

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
173121	1762	1762 Union with SC 22x1 E 1 9	9	Temponox	25	244.6	0.24
173131	1762	1762 Union with SC 28x1 E 1 9	9	Temponox	25	276.4	0.28
173141	1762	1762 Union with SC 35x11/4 E 1 9	9	Temponox	25	396	0.40
173151	1762	1762 Union with SC 42x11/2 E 1 9	9	Temponox	25	518	0.52
173161	1762	1762 Union with SC 54x2 E 1 9	9	Temponox	25	782	0.78
173181	1760	1760 Union with SC 15 E 1 9	9	Temponox	24	152.8	0.15
173191	1760	1760 Union with SC 18 E 1 9	9	Temponox	24	142	0.14
173201	1760	1760 Union with SC 22 E 1 9	9	Temponox	24	242.4	0.24
173211	1760	1760 Union with SC 28 E 1 9	9	Temponox	24	384	0.38
173221	1760	1760 Union with SC 35 E 1 9	9	Temponox	24	468.4	0.47
173231	1760	1760 Union with SC 42 E 1 9	9	Temponox	24	640	0.64
173241	1760	1760 Union with SC 54 E 1 9	9	Temponox	24	1,112	1.11
173271	17111	17111 Plug-in piece 15x1/2 E 1 9	9	Temponox	4	41.2	0.04
173281	17111	17111 Plug-in piece 18x1/2 E 1 9	9	Temponox	4	43	0.04
173291	17111	17111 Plug-in piece 22x3/4 E 1 9	9	Temponox	4	61.2	0.06
173301	17111	17111 Plug-in piece 28x1 E 1 9	9	Temponox	4	95.4	0.10
173331	1714	1714 Elbow 90°with SC 15x3/8 E 1 9	9	Temponox	7	47.4	0.05
173341	1714	1714 Elbow 90°with SC 15x1/2 E 1 9	9	Temponox	7	58.8	0.06
173351	1714	1714 Elbow 90°with SC 18x1/2 E 1 9	9	Temponox	7	64.3	0.06
173361	1714	1714 Elbow 90°with SC 22x1/2 E 1 9	9	Temponox	7	90.8	0.09
173371	1714	1714 Elbow 90°with SC 22x3/4 E 1 9	9	Temponox	7	103	0.10
173381	1714	1714 Elbow 90°with SC 28x1 E 1 9	9	Temponox	7	165	0.17
173391	1714	1714 Elbow 90°with SC 35x11/4 E 1 9	9	Temponox	7	249.8	0.25
173401	1714	1714 Elbow 90°with SC 42x11/2 E 1 9	9	Temponox	7	435	0.44
173411	1714	1714 Elbow 90°with SC 54x2 E 1 9	9	Temponox	7	629	0.63
173441	17145	17145 Elbow 90°with SC 15x1/2 E 1 9	9	Temponox	10	56.8	0.06
173451	17145	17145 Elbow 90°with SC 18x1/2 E 1 9	9	Temponox	10	62	0.06
173461	17145	17145 Elbow 90°with SC 22x1/2 E 1 9	9	Temponox	10	87.3	0.09
173471	17145	17145 Elbow 90°with SC 22x3/4 E 1 9	9	Temponox	10	104	0.10
173481	17145	17145 Elbow 90°with SC 28x1 E 1 9	9	Temponox	10	148.6	0.15
173491	1748	1748 Cross piece with SC 18x15 E 1 9	9	Temponox	20	118	0.12
173501	1748	1748 Cross piece with SC 22x15 E 1 9	9	Temponox	20	128	0.13
173511	1748	1748 Cross piece with SC 28x15 E 1 9	9	Temponox	20	154	0.15

Material no.	Model no.	Material short text	Disposition level	System	Selection of item	Mass in g	Mass in kg
173601	17121	17121 Plug-in piece 15x1/2 E 1 9	9	Temponox	6	39	0.04
173611	17121	17121 Plug-in piece 18x1/2 E 1 9	9	Temponox	6	41.6	0.04
173621	17121	17121 Plug-in piece 18x3/4 E 1 9	9	Temponox	6	55.8	0.06
173631	17121	17121 Plug-in piece 22x1/2 E 1 9	9	Temponox	6	46.2	0.05
173641	17121	17121 Plug-in piece 22x3/4 E 1 9	9	Temponox	6	67	0.07
173651	17121	17121 Plug-in piece 28x1 E 1 9	9	Temponox	6	83.7	0.08

Conversion table for length weights

Material no.	Model no.	Material short text	System	Item-No.	Mass in g	Mass in kg/m	Conversion factor
421821	1703	1703 TEMPONOX-PIPE 15X1.0(600) E 1 9	Temponox	591175	323	0.32	0.09
421826	1703	1703 TEMPONOX-PIPE 15X1.0(120) E 1 9	Temponox	807221	339	0.34	0.09
421831	1703	1703 TEMPONOX-PIPE 18X1.0(240) E 1 9	Temponox	591182	401	0.40	0.11
421836	1703	1703 TEMPONOX-PIPE 18X1.0(60) E 1 9	Temponox	807238	411	0.41	0.11
421841	1703	1703 TEMPONOX-PIPE 22X1.2(420) E 1 9	Temponox	591199	604	0.60	0.16
421846	1703	1703 TEMPONOX-PIPE 22X1.2(60) E 1 9	Temponox	807245	604	0.60	0.16
421851	1703	1703 TEMPONOX-PIPE 28X1.2(240) E 1 9	Temponox	591205	757	0.76	0.20
421856	1703	1703 TEMPONOX-PIPE 28X1.2(60) E 1 9	Temponox	807252	778	0.78	0.21
421861	1703	1703 TEMPONOX-PIPE 35X1.5(180) E 1 9	Temponox	591212	1180	1.18	0.31
421866	1703	1703 TEMPONOX-PIPE 35X1.5(30) E 1 9	Temponox	807269	1216	1.22	0.32
421871	1703	1703 TEMPONOX-PIPE 42X1.5(120) E 1 9	Temponox	591229	1416	1.42	0.38
421876	1703	1703 TEMPONOX-PIPE 42X1.5(30) E 1 9	Temponox	807276	1469	1.47	0.39
421881	1703	1703 TEMPONOX-PIPE 54X1.5(60) E 1 9	Temponox	591236	1905	1.91	0.51
421886	1703	1703 TEMPONOX-PIPE 54X1.5(30) E 1 9	Temponox	807283	1905	1.91	0.51
421891	1703XL	1703XL TEMPONOX XL-PIPE 76.1X2(30) E 1 9	Temponox	591243	3585	3.59	0.96
421906	1703XL	1703XL TEMPONOX XL-PIPE 88.9X1.5(6)E 1 9	Temponox	807337	3103	3.10	0.83
421916	1703XL	1703XL TEMPONOX XL-PIPE 108.0X1.5(6E 1 9	Temponox	807290	3750	3.75	1.00
422086	1703XL	1703XL TEMPONOX XL-PIPE 64.0X1.5(6)E 1 9	Temponox	807306	2200	2.20	0.59
426533	1703XL	1703XL TEMPONOX XL-PIPE 64.0X1.5(60E 1 9	Temponox	792381	2240	2.24	0.60
426543	1703XL	1703XL TEMPONOX XL-PIPE 76.1X1.5(30E 1 9	Temponox	792398	2707	2.71	0.72
426546	1703XL	1703XL TEMPONOX XL-PIPE 76.1X1.5(6)E 1 9	Temponox	807313	2707	2.71	0.72
426553	1703XL	1703XL TEMPONOX XL-PIPE 88.9X1.5(30E 1 9	Temponox	792404	3103	3.10	0.83
426563	1703XL	1703XL TEMPONOX XL-PIPE 108.0X1.5(3E 1 9	Temponox	792411	3820	3.82	1.02

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Notes
This EPD is mainly based on the work and findings of Institut für Fenstertechnik e.V., Rosenheim (ift Rosenheim) and specifically on ift-Guideline NA-01/3 “Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen” (Guidance on preparing Type III Environmental Product Declarations).
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Layout
ift Rosenheim GmbH – 2021

Photographs (front page)
Viega GmbH & Co. KG

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