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Environmental Product Declaration Type III (EPD) ITB number 514/2023

>B<MaxiPro press fittings

IBP Instalfittings Sp. z o.o. ul. Stanisława Zwierzchowskiego 29 61 - 249 Poznań, Poland www.ibpgroup.com.pl Programme owner: Instytut Techniki Budowlanej (ITB) ul. Filtrowa 1 00 - 611 Warszawa, Poland e-mail: energia@itb.pl www.itb.pl

Issuance date: 29.08.2023 | Validity date: 29.08.2028

Basic Information

This declaration is a Type III Environmental Product Declaration (EPD) based on the EN 15804 standard and verified according to ISO 14025 by an independent auditor.

It contains information about the environmental impact of the declared construction materials. These aspects have been verified by an independent body in accordance with ISO 14025. In principle, a comparison or evaluation of EPD data is only possible if all data to be compared have been created in accordance with EN 15804 (see section 5.3 of the standard).

LCA analysis: A1 - A3, A4, C1 - C4 i D according to EN 15804 (cradle to

grave with options)

Year of EPD development: 2023

Product standards: EN 12735-1, EN 12735-2, ASTM-B280

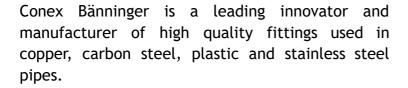
Declared product lifetime: 10 years

PCR: document ITB-PCR A (based on PN-EN 15804)

Declared unit: 1 kg of product **Reason for implementation:** B2B

Representativeness: Polish products, 2021

Manufacturer





The comprehensive offer of the company consists of: fittings and valves for plumbing systems designed for domestic, commercial and industrial applications. The company cooperates with customers from the plumbing, HVAC, refrigeration and medical sectors.

All products covered by this study are manufactured at the following production plants: IBP Instalfittings production plant in Stanisława Zwierzchowskiego 29 Street in Poznań (Poland), IBP Instalfittings production plant in Za Motelem 2A Street in Sady/Tarnowo Podgórne (Poland), IBP ATCOSA, Poligono Industrial, Quintos-Aeropuerto production plant in Cordoba (Spain), Conex Universal Limited, Global House 95 Vantage Point, Pensnett Trading Estate production plant in Kingswinford (United Kingdom).





IBP Instalfittings production plant in Stanisława Zwierzchowskiego 29 Street in Poznań (Poland).



IBP Instalfittings production plant in Za Motelem 2A Street in Sady/Tarnowo Podgórne (Poland).



IBP ATCOSA, Poligono Industrial, Quintos-Aeropuerto production plant in Cordoba (Spain).

Description of products and application

>B<MaxiPro is a robust press system that can be quickly and easily applied, achieving a secure and durable connection. Compared to traditional techniques, it significantly increases cost-effectiveness due to a significant reduction in installation time and better working flexibility. The >B<MaxiPro system can be used with all hard, semi-hard and soft copper pipes (diameters from ¼" to 1 3/8 and from 6 to 28mm ") complying with EN 12735-1 or ASTM-B280, both in air conditioning and refrigeration installations.

The >B<MaxiPro fittings are manufactured from refrigerated copper (UNS C12200 min 99.9% purity). They are mechanical joints with the great advantage of not requiring nitrogen purging during the connection process. They maintain earth continuity without the need for additional safety components.

The >B<MaxiPro series features a three-point press system, one on each side of the notch and one press on the notch with an O-ring. In the case of connectors with diameters of 1/2" and larger, the hook further increases the resistance of the connection to the high pressure achieved in the installation. In addition, the design of the connector socket facilitates pipe insertion and helps protect the O-ring from damage or displacement.

The >B<MaxiPro fittings consist, inter alia, of: bends, couplers, elbows, ends, reducers and tees. They are available in many different sizes - from 6 to 28 mm or from 1/4" to 1 3/8".





Overview of >B<MaxiPro press fittings - product range inch

Photo	Туре	Code	Dimensions
	90° Street Bend	MPA5001	from 3/8" to 1 3/8"
	90° Bend	MPA5002	from 1/4" to 1 3/8"
	45° Obtuse Elbow	MPA5041	from 1/4" to 1 3/8"
	Reducing Coupler	MPA5240	from 3/8" x 1/4" to 1 3/8" x 1 1/8"
	Long Reducing Coupler	MPA5240L	from 3/8" x 1/4" to 1 3/8"
	Fitting Reducer	MPA5243	from 3/8" x 1/4" to 1 3/8" x 1 1/8"
	Straight Coupler	MPA5270	from 1/4" to 1 3/8"
	Long Coupler	MPA5270L	from 1/4" to 1 1/8"
	Long Repair Coupler	MPA5275L	from 1/4" to 1 3/8"
	SAE Copper Flare - Brass Nut	MPA5285G	from 1/4" x 1/4" to 3/4" x 3/4"



	SAE Stainless Flare - Brass Nut - Copper Washer	MPA5286G	from 1/4" x 1/4" to 3/4" x 3/4"
000	Flare Copper Washer	MPA5287	from 1/4" to 3/4"
	SAE Stainless Flare - Stainless Nut - Copper Washer	MPA5289G	from 1/4" x 1/4" to 3/4" x 3/4"
	Stop end	MPA5301	from 1/4" to 1 3/8"
	Equal Tee	MPA5T	from 1/4" to 1 3/8"
	P-Trap	MPA5698	from 5/8" to 1 1/8"



Overview of >B<MaxiPro press fittings - product range metric

Photo	Туре	Code	Dimensions
	90° Street Bend	MPM5001	from 6 mm to 28 mm
	90° Bend	MPM5002	from 6 mm to 28 mm
	45° Obtuse Elbow	MPM5041	from 6 mm to 28 mm
	Reducing Coupler	MPM5240	from 8 x 6 mm to 28 x 22 mm
	Fitting Reducer	MPM5243	from 8 x 6 mm to 28 x 22 mm
	Straight Coupler	MPM5270	from 6 mm to 28 mm
	Stop end	MPM5301	from 6 mm to 28 mm
	Equal Tee	мрм5Т	from 6 mm to 28 mm

Life cycle assessment (LCA) - general principles



Declared unit

The declared unit of product is 1 kg of >B<MaxiPro press fittings, representative for the wide range of products in these groups. The figures shown are representative for the copper fittings which can be equipped with nuts made from steel or brass.

Allocation

The allocation in this study was made in accordance with the ITB PCR A guidelines. The plant in Poznań produces semi-finished and finished products, from where they are sent to the plant in Sady. Similarly, production takes place at the plant in Cordoba from where semi-finished products are sent to the plant in Sady or finished products directly to the customer. At the plant in Sady take place assembly and packaging of semi-finished products and dispatch to customers. At the Pensnett plant, storage and dispatch to the customer take place. The input data was collected for each production site. The allocation of impacts is based on the weight of >B<MaxiPro products which is a percentage of total production and transport, it accounts for: 0,0039% at the Poznań plant, 5.25% at the Sady plant, 4.42% at the Pensnett plant and 3.45% at the Cordoba plant. Allocation to a single, representative product was made on the basis of product weight. All proceeds from raw material extraction are allocated in module A1. Production is based on alloys such as copper, brass and steel, and waste from production goes into processing (chips, pieces are sold as scrap to others). Module A2 includes the transport of raw materials, semi-finished and finished products between the production plants Poznań - Sady, Cordoba - Sady. Energy, fuel and waste deliveries for the whole production process were inventoried in module A3.

System boundaries

The life cycle analysis of the declared products includes the Production Stage (modules A1 - A3) and modules A4, C2-C4+D ("from cradle to grave with options") according to EN 15804 and ITB PCR A.

System limits

A minimum of 99% of input materials and 100% of energy, water, gas and propane consumption were inventoried at the Poznań, Sady, Cordoba and Pensnett sites. All relevant parameters from the collected production data are included in the assessment, i.e. all materials used in production (including recycled raw materials), direct production waste, fuels used, electricity and gas.

Substances with a percentage of less than 1% of the total mass were excluded from the calculation. It was assumed that the total sum of the omitted processes did not exceed 0.5% of the total impact categories. All packaging products were excluded from the analysis.

Modules A1 and A2 Extraction and transport of raw

Raw materials for production, such as copper pipes, o-rings, components and packaging materials such as labels, pouches and cartons, are transported from various European countries: Poland, Czech Republic, Germany, Spain, Italy, UK, Latvia, Finland and the Netherlands, and Asian countries: China, Vietnam, Hong Kong. Module A1 shows the impact of the production of the raw materials (mainly copper pipes) further used in the production of fittings. Raw material transport data is recorded by the plants. Means of transport include trucks and ships. Global fuel averages were used for the calculation of module A2.



Module A3 Production

The production process is illustrated in the diagrams on page 13. Once the raw materials have been delivered, processing takes place, accompanied by a by-product such as cutting. The by-product is reused and re-melted into pipes, rods, castings or sold to steel mills as feedstock. Electricity, gas, water and propane are consumed in the process. Semi-finished, finished products from Poznań and Cordoba go to Sady from where they are shipped to customers, or to Pensnett where they are stored and also sold to customers. The table below shows the composition of the different types of press fittings >B<MaxiPro.

Percentage composition of >B<MaxiPro products:

Raw materials	Material details	Copper fittings series MPA	Fittings with stop ends	Fittings with brass stop ends and seals	Fittings with steel stop ends and seals
Raw Illaterials	material details	MPA/MPM	MPA5285G	MPA5286G	MPA5289G
Body - Copper	C12200	95,00%	37,50%	26,00%	25,00%
Seal - Copper	CW024A	-	0,50%	3,00%	3,00%
Stop end	CW617N	-	62,00%	58,50%	-
Stop end	1.4301	-	-	-	60%
O-ring	HNBR	5,00%	-	0,50%	1%
Stainless Steel Tail	1.4301	-	-	12,00%	11%

Module A4 Transport

Transport of finished products to the customer is carried out from three locations: Pensnett in the UK, Sady in Poland and Cordoba in Spain. The finished products are packed in plastic bags and placed in cartons on pallets. The company uses customer-supplied wheeled transport adapted to the size of the order. The largest recipients of orders are in Western Europe (UK, France, Germany, Netherlands), USA and Australia. Road and marine transport is used for deliveries. The fuels used depend on the chosen means of transport but are mainly diesel. The average kilometers for the 10 largest transports from each site over a 12-month period are summarized below:

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Transpor	t from the plant in I	Pensnett		
Country	Address	Distance [km]		
United Kingdom	WEST MIDLANDS	29		
United Kingdom	LEEDS	203		
United Kingdom	BEDFORD	153		
United Kingdom	NORTH YORKS	241		
United Kingdom	MARDEN	354		
Ireland	COUNTY CORK	650		
United Kingdom	DERBYSHIRE	105		
United Kingdom	SALFORDS	249		
United Kingdom	KETTERING	114		
United Kingdom	MANCHESTER	137		
Average:		207		

Transp	ort from the plant i	n Sady		
Country	Address	Distance [km]		
Australia	SYDNEY	14000		
USA	WASZYNGTON	6923		
Netherlands	MJ IJSSELSTEIN	892		
USA	POTTSTOWN	6734		
USA	EDEN PRAIRIE	7324		
Netherlands	OIRSCHOT	897		
USA	ISLANDIA	6542		
Sweden	JÄRFÄLLA	1239		
Germany	BAD HERSFELD	648		
Germany	SCHWENDI	881		
Average (ships Average (lorry	9874 897			

Transpo	rt from the plant in	Cordoba
Country	Address	Distance [km]
France	GRETZ-ARMAINVILL IERS	1692
France	PLAISANCE DU TOUCH	1078
France	VAULX-EN-VELIN CEDEX	1496
France	SAINT-PRIEST	1489
France	CRETEIL	1657
France	SERRIS	1687
France	AVIGNON	1284
France	CHALON-SUR-SAON E	1614
France	SAINT-BRICE-COUR CELLES	1792
France	LE COTEAU	1586
Average:		1487

Module C1 Deconstruction and demolition

No information on the impact of deconstruction in the construction or any other sector is available for the >B<MaxiPro fittings. Therefore, no contribution to the impact categories of this module has been reported and the module is not evaluated.

Module C2 Transport

It is assumed that the end-of-life product will be transported by truck to the nearest waste treatment facility (truck, diesel) within 100 km.

Module C3 Waste treatment

It was assumed that electricity (0.02 kWh/kg) is consumed during the scrapping operation.

Module C4 Disposal

At the end of life the product is sent to scrap and from there for recycling (sale to smelters for remelting). A 98% recovery rate is assumed, with the remaining 2% of the product going to landfill.

Module D External impacts beyond system boundaries

To obtain a net post-consumer scrap result from the product system, the contribution of post-consumer scrap present in the product being assessed is subtracted from the post-consumer scrap to be recycled at the end of life. Module D shows the burdens and benefits of recycling this net residual scrap. Benefits are assessed at the point of

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functional equivalence, i.e. where there is a substitution of virgin raw material.

Data collection period

The input data of the declared products concern the period from January to December 2021. The life cycle assessment has been prepared for Poland as a reference area.

Data quality

The data for the LCA calculation of modules A1-A4 came from verified LCI inventory data from each plant. In accordance with Annex E of EN 15804 + A2, a data quality carried assessment For technical was out. representativeness, processes with a quality level of 'very good' represent 99% of the values for the climate change indicators. geographical For and representativeness, a process evaluation level of "very good" was obtained.

Assumptions and estimates

The impacts of the representative products were aggregated using a weighted average. The results obtained for the representative products can be applied proportionally to all >B<MaxiPro press fittings.

Calculation principles

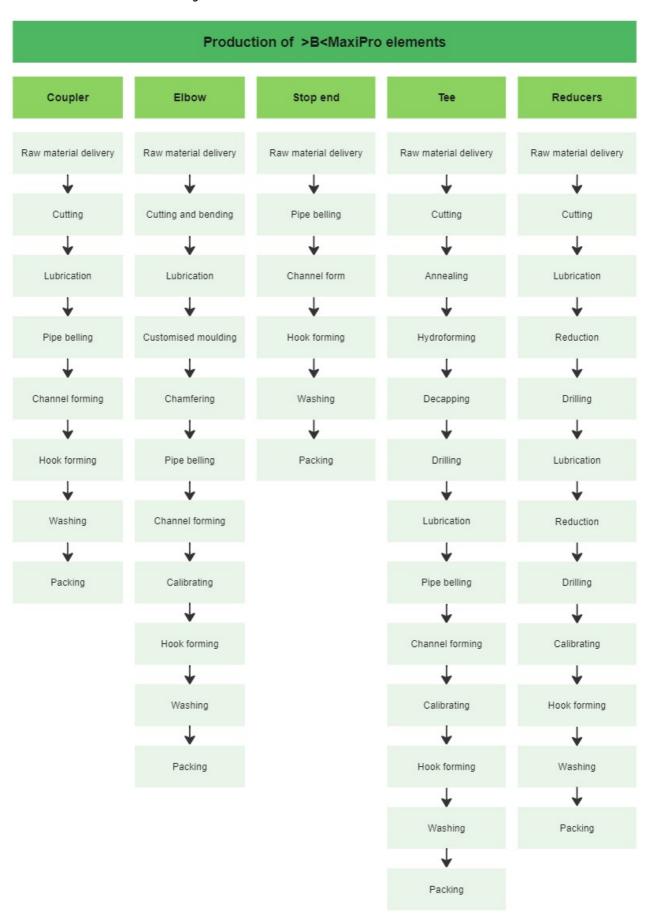
The LCA was performed in accordance with the PN-EN 15805 standard and the ITB PCR A document.

Databases

The data for the calculations came from Ecoinvent v. 3.6, Ecoinvent v. 3.8 and from databases available in Bionova's OneClickLCA software. The characterisation factors are CML ver. 4.2 based on EN 15804+A2.



Production scheme of >B<MaxiPro fittings:



Life cycle assessment (LCA) - results

Declared unit

The declared unit is 1 kg of >B< MaxiPro press fittings made of copper manufactured by IBP Instalfittings Sp. z o.o..

The following indicates which LCA assessment modules were included in the assessment:

	Information on system boundaries (MA = module assessed, MNA = module not assessed)															
Pro	oduct sta	age		ruction age		Use stage							End of life			Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction and installation process	Use	Maintenance	Repair	Replacement	Refurbishmentt	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Potential for reuse, recovery or recycling
A1	A2	А3	A4	A5	В1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
MA	MA	MA	MA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MA	MA	MA	MA	MA

As the raw materials in the production stage provide the main contribution to the environmental balance results, there is a linear relationship between the weight of the raw materials and the environmental impact. For further results for other dimensions and types of >B<MaxiPro press fittings, please use the following formula:

P(x) = [P(x1)/x1]*x

P(x): indicator for new declared product,

P(x1): the indicator obtained for the product representing the product type, (e.g. global warming potential (GWP))

x: mass of the new declared product

x1: weight of the product representing the product type



Results for >B<MaxiPro press fittings

Environmental impacts

Wskaźnik	Jednostka	A1	A2	А3	A4	C1	C2	С3	C4	D
Global warming potential- total	kg CO2 eq.	4,25E+00	1,767E-1	6,17E-1	6,905E-1	0,00E+00	9,097E-3	3,097E-2	1,114E-2	-1,442E0
Global warming potential- fossil	kg CO2 eq.	4,23E+00	1,766E-1	5,852E-1	6,901E-1	0,00E+00	9,088E-3	1,982E-2	1,114E-2	-1,428E0
Global warming potential- biogenic	kg CO2 eq.	1,639E-2	5,38E-5	3,172E-2	0,00E+00	0,00E+00	6,6E-6	1,113E-2	9,166E-7	-8,178E-3
Global warming potential- LULAC	kg CO2 eq.	1,099E-2	7,519E-5	1,391E-4	3,21E-4	0,00E+00	2,735E-6	2,188E-5	1,864E-6	-6,09E-3
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	2,884E-7	5,651E-8	6,213E-8	1,473E-7	0,00E+00	2,137E-9	8,814E-10	1,392E-10	-1,292E-7
Acidification potential	mol H+ eq.	2,405E-1	2,449E-3	3,286E-3	9,1E-3	0,00E+00	3,817E-5	1,292E-4	9,267E-5	-1,135E-1
Eutrophication aquatic freshwater	kg Pe	8,945E-4	1,285E-6	1,206E-5	5,707E-6	0,00E+00	7,393E-8	1,66E-6	1,134E-8	-3,188E-4
Eutrophication aquatic marine	kg N eq.	1,139E-2	6,095E-4	6,246E-4	2,455E-3	0,00E+00	1,15E-5	4,472E-5	5,4E-5	-4,379E-3
Eutrophication terrestrial	kg N eq.	1,547E-1	6,764E-3	7,458E-3	2,722E-2	0,00E+00	1,27E-4	3,652E-4	5,223E-4	-5,738E-2
Formation potential of tropospheric ozone	kg NMVOC eq.	4,516E-2	1,877E-3	1,995E-3	7,286E-3	0,00E+00	4,085E-5	1,182E-4	1,296E-4	-1,791E-2
Abiotic depletion potential for non-fossil resources	kg Sb eq.	6,116E-3	2,326E-6	6,662E-6	1,441E-5	0,00E+00	1,551E-7	6,777E-7	2,654E-9	-3,093E-3
Abiotic depletion potential for fossil resources	MJ	5,69E+01	3,62E+00	1,34E+01	9,83E+00	0,00E+00	1,414E-1	1,585E-1	1,135E-2	-2,278E1
Water use	m³	1,01E+01	8,106E-3	8,568E-1	3,324E-2	0,00E+00	5,259E-4	3,72E-3	2,619E-4	-8,196E0

Environmental aspects related to resource use

Indicator	Unit	A1	A2	А3	Α4	C1	C2	С3	C4	D
Renewable primary energy as an energy carrier	MJ	3,21E+01	2,894E-2	1,31E+01	9,829E-2	0,00E+00	1,779E-3	2,151E-2	2,851E-4	-2,388E1
Renewable primary energy for material use	MJ	0,00E+00								
Completely renewable primary energy	MJ	3,21E+01	2,894E-2	1,31E+01	9,829E-2	0,00E+00	1,779E-3	2,151E-2	2,851E-4	-2,388E1
Non-renewable primary energy as an energy source	MJ	5,64E+01	3,62E+00	1,34E+01	9,83E+00	0,00E+00	1,414E-1	1,586E-1	1,136E-2	-2,279E1
Non-renewable primary energy for material use	MJ	5,284E-1	0,00E+00							
Completely non-renewable primary energy	MJ	5,69E+01	3,62E+00	1,34E+01	9,83E+00	0,00E+00	1,414E-1	1,586E-1	1,136E-2	-2,279E1
Use of secondary raw materials	kg	2,113E-1	6,678E-5	2,259E-3	0,00E+00	0,00E+00	0,00E+00	2,848E-4	4,959E-6	-1,577E-2
Renewable secondary fuels	MJ	1,318E-3	0,00E+00	5,865E-6	0,00E+00	0,00E+00	0,00E+00	2,361E-5	6,518E-8	-3,415E-4
Non-renewable secondary fuels	MJ	0,00E+00								
Use of fresh water resources	m^3	2,604E-1	4,964E-4	1,191E-2	1,494E-3	0,00E+00	2,943E-5	9,097E-5	9,723E-6	-1,983E-1

Other environmental information describing the waste categories

Indicator	Unit	A1	A2	А3	Α4	C1	C2	С3	C4	D
Hazardous waste destined for landfill	kg	2,16E+00	2,784E-3	2,25E-2	1,249E-2	0,00E+00	1,374E-4	0,00E+00	9,02E-5	-6,258E-1
Non-hazardous waste destined for disposal	kg	7,26E+01	1,959E-1	1,31E+00	5,652E-1	0,00E+00	1,52E-2	0,00E+00	2,097E-3	-3,604E1
Radioactive waste for disposal	kg	2,727E-4	2,543E-5	1,077E-4	6,605E-5	0,00E+00	9,704E-7	0,00E+00	5,919E-8	-1,603E-4
Components to be reused	kg	0,00E+00								
Materials to be recycled	kg	0,00E+00	0,00E+00	7,27E-1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials destined for energy recovery	kg	0,00E+00								
Electricity exported	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,2E-2	0,00E+00	0,00E+00



Interpretation of LCA results for >B<MaxiPro press fittings

The following life-cycle phases are responsible for the largest CO₂ emissions:

- A1 Raw material supply 73,9%
- A4 Transport to construction site 12,1%
- A3 Manufacturing 10,2%
- A2 Transport (to facility) 3,1%

Of the input materials, due to the largest share of the total weight of the final product, the largest contribution CO_2 emissions in the A1-A3 phase are:

- brass 40,2% of total CO2 emissions
- copper 33,92% of total CO2 emissions
- steel 24,49% of total CO2 emissions

During the production phase, electricity accounts for the largest share of CO₂ emissions - 94,18%.

An end-of-life scenario with a recovery rate of 98% results in a reduced carbon footprint for the products covered by this declaration, thereby minimizing the environmental impact.



Verification

The verification process for this EPD is in accordance with ISO 14025 and ISO 21930. Once verified, this EPD is valid for a period of 5 years. There is no need to recalculate after 5 years if the inputs have not changed significantly.

EN 15804 serves as the basis for ITB PCR-A

Independent verification according to ISO 14025 (subsection 8.1.3.)

[] internal [X] external

External verification of EPDs: Michał Piasecki, Professor ITB, m.piasecki@itb.pl
Input data verification, LCI audit, LCA: Agnieszka Kaczmarek, JW+A, a.kaczmarek@jw-a.pl
LCA verification: Michał Piasecki, ITB professor, m.piasecki@itb.pl

The declaration owner has the sole ownership, liability, and responsibility for the declaration. Declarations within the same product category but from different programmes may not be comparable. Declarations of products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- ISO 14025:2006 Environmental labels and declarations Type III environmental declarations Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management Life cycle assessment Requirements and guidelines 1057
- EN 15804 +A2 Sustainability of construction works Environmental product declarations Core rules for the product category of construction products
- EN 12735-1 Copper and copper alloys -- Seamless, round copper tubes for air conditioning and refrigeration -- Part 1: Tubes for piping systems
- EN 12735-2 Copper and copper alloys -- Seamless, round copper tubes for air conditioning and refrigeration -- Part 2: Tubes for instrumentation
- ASTM-B280 Air conditioning and refrigeration (ACR) copper tube dimensions and working pressures



Thermal Physics, Acoustics and Environment Department

CERTIFICATE № 514/2023 of TYPE III ENVIRONMENTAL DECLARATION

Products:

>B<MaxiPro press fittings

Manufacturer:

IBP Instalfittings Sp. z o.o.

ul. Stanisława Zwierzchowskiego 29, 61-249 Poznań, Poland

confirms the correctness of the data included in the development of Type III Environmental Declaration and accordance with the requirements of the standard

EN 15804+A2

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued on 29th August 2023 is valid for 5 years or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics

Agnieszka Winkler-Skalna, PhD

TOTAL TOTAL

Deputy Director for Research and Innovation

Kezueztof Kuczwieki BhD

Warsaw, August 2023