aalberts integrated piping systems

VSH XPress Copper Gas

15 - 28 mm

Environmental Product Declaration

in accordance with
ISO 14044, ISO 14040 and EN 15804

EN EPD

1 general information

1.1 note on this document

The original document was written in English, all other versions are a translation of the original document.

1.2 declaration holder

Aalberts integrated piping systems B.V.
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Aalberts integrated piping systems develops the most advanced integrated piping systems for distribution and control of liquids and gases. These systems are used in various markets such as industry, utility and residential construction. We offer fully integrated piping systems in valve, connection, fastening and piping technology.
In close cooperation with our customers, we build the perfect integrated piping system that meets all their requirements. Our piping systems are easy to specify, install, check and maintain, saving you considerable time on preparation and installation. We meet the highest quality and industry standards required in our markets.

1.3 declared Product

This document applies to the VSH XPress Copper Gas fittings listed in the appendix -chapter 6- of this document. Articles with brass components are not covered in this declaration. A VSH XPress Copper Gas bend 90° FF 22, article number: 4803854, has been used as a reference article.

1.4 LCA standards

This EPD is generated according to the following standards and requirements of: NEN-EN ISO 14040 [1], NEN-EN ISO 14044 [2], NEN-EN ISO 14025 [3] and EN15804+A2:2019 [4]

1.5 calculation method

LCA standard:	EN15804+A2 (2019)
Database:	Worldwide - Ecoinvent v 3.8 Cut-Off
PCR:	CEN standard 15804 serves as the Core PCR

1.6 statement comparability EPD

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with the requirements in EN15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN15804 and if the background systems are not based on the same database.

1.7 verification statement

This EPD is a preliminary self-declared version and is in the process of getting externally verified.

1.8 EPD details

Version:	1.0
Date of issue:	01/01/2025
Author of LCA:	Fabian Bruns
Production data:	2023
EPD created with:	LCA software Ecochain Helix | version 4.3.1

Hilversum, february 2025
Aalberts integrated piping systems B.V.

Roland Voermans
COO

2 product

2.1 description and application purpose

VSH XPress Copper Gas is a complete piping system suitable for a wide variety of applications, from drinking water, heating and solar installations to cooling water and compressed air systems. The VSH XPress Copper Gas range consists of press fittings and pressing tools. The VSH XPress Copper Gas fittings are pressed with jaws and slings with M-profile and are available from 15 up to and including 28 mm.

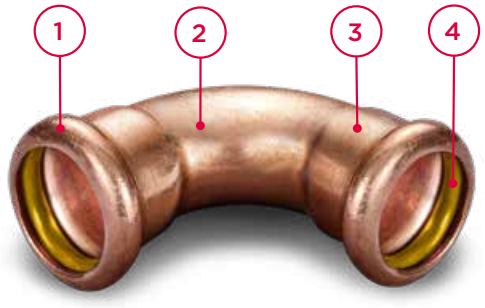
- VSH XPress Copper Gas fittings are made of CU-DHP copper, bronze CC499K (Rg5) or brass (CW024A).
- VSH XPress Copper can be used with copper pipes in accordance with EN 1057 R220/R250/R290.

The o-ring has decisive influence on the performance:

- HNBR (Hydrogenated Nitrile Butadiene Rubber), yellow coloured

2.2 VSH XPress Copper Gas fittings

VSH XPress Copper Gas fittings are produced in our modern, automated factories in France and Hungary. The VSH XPress Copper Gas product range includes fittings and tools. VSH XPress fittings are compatible with various press tool brands. Use our online tool selector to find the right tool for the right material. During the pressing process, bead, socket and tube are deformed to form a leak-tight and mechanically strong, permanent connection.



1. fitting bead
2. fitting body
3. insertion socket
4. o-ring

2.3 product composition

The reference article, VSH XPress Copper Gas 90° bend FF 22, article number 4803854, consists of the following raw materials:

copper:	88 gram
elastomers:	1.5 gram
Total circa:	90 gram

2.4 range and conversion factors

The life cycle assessment results in chapter 4 can be converted to other articles listed in the appendix of this document. This can be done by multiplying the results with the conversion factor for a specific product. For products and their corresponding conversion factors, see the appendix -chapter 6-.

3 life cycle assessment scope

3.1 system boundaries

This EPD can be regarded as a Cradle-to-Gate with options, A4-A5, C1-C4 and D. The following phases are considered not relevant for this product range: B.

3.2 process flowchart

A simplified overview of the VSH XPress Copper Gas production process flow:

3.3 data quality

For module A1, specific data for product compositions as provided by the manufacturer are used. For module A2, transportation data of the raw materials used to the production site was collected. For module A3, energy consumption and waste production data was collected for production year 2023. The used background processes are derived from Worldwide - Ecoinvent v 3.8 Cut-Off.

3.4 allocation

Allocation was carried out in accordance with the provisions of the EN15804. All manufacturing inputs (energy and auxiliary materials) were measured and assessed.

3.5 cut-off criteria

All relevant inputs and outputs - like emissions, energy and materials - have been taken into account in this LCA. In accordance with EN15804, the total neglected input flows per module does not exceed 5% of energy usage and mass.

3.6 assumptions and background information

A1-A3: For the raw material supply 100% of the materials on the bill of materials were modelled using data from suppliers when available or otherwise from the Ecoinvent database. Also included were copper waste and ancillary materials like water, lubrication oil, bags and cardboard boxes.
VSH XPress Copper Gas 15 - 28 mm products are manufactured in the factory of Aalberts integrated piping systems located in Budapest, Hungary. Specific transport distances of materials to Aalberts integrated piping systems from material suppliers were used. Class Euro5 trucks are used as the main means of transport and were used for calculation.
This factory makes use of the national electricity mix for manufacturing the VSH XPress copper Gas products. Therefore the national electricity mix Hungary was used for calculating the electricity consumption.
A4-A5: Transport from the factory in Budapest to the warehouse in Zeewolde is done by Aalberts integrated piping systems and logistical partners. The main means of transport is by Class Euro5 trucks or better performing engine. The transportation distance is calculated at 1375 km. Transportation to customers within Europe is done by logistical partners. The main means of transport in Europe is by Class Euro5 trucks or better performing engine. The average transportation distance is calculated at 662 km. The installation is done by use of a press tool which uses a considered negligible amount of energy.
B1-B7: A VSH XPress Copper Gas fitting is designed for a lifetime of 50+ years of service. It does not need any maintenance, repair, replacement or refurbishment and has no operational water or energy use during its lifetime. This module was therefore not assessed (ND).
C1-C4: The piping system is assumed to be stripped as a whole from a building in the demolition process by means of diesel powered machines. The diesel modelled for the demolition process is 0.001 L/Kg of a VSH XPress Copper Gas fitting.
The following transport distances were used; 50 km for waste separation, 100 km for recycling and 150 km for incineration or landfill by means of unspecified lorry truck.
For building materials the values from the Nationale Milieu Database were used [5] and for the cardboard packaging the confederation of European paper industries [6] value was used to calculate the amount of material that went for recycling, landfill and incineration.

material	recycling rate	incineration	landfill
copper	95%	-	5%
copper production waste	100%	-	-
EPDM o-ring	-	80%	20%
packaging foil	-	80%	20%
packaging box	70,5%	29,5%	-

D: Recycling rates described in Module C were used to calculate the benefits and loads beyond the system in module D.

4 life cycle assessment results

The table below shows the results of VSH XPress Copper Gas Elbow 90 (2 x press), diameter 22 mm according to EN15804+A2 (2019)

impact category	unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	total
climate change (EN15804+A2)	kg CO_2 eq	0.221	0.011	0.01	0.242	0.019	2.934E-4	6.043E-4	5.078E-3	0.01	-0.133	**0.145**
climate change - fossil	kg CO_2 eq	0.225	0.011	0.01	0.246	0.019	2.933E-4	6.038E-4	4.725E-3	4.874E-3	-0.138	**0.138**
climate change - biogenic (EN15804+A2)	kg CO_2 eq	-4.367E-3	1.021E-5	1.276E-4	-4.229E-3	1.731E-5	8.158E-8	2.787E-7	3.433E-4	5.606E-3	5.856E-3	**7.594E-3**
climate change - land use and LU change (EN15804+A2)	kg CO_2 eq	4.166E-4	4.454E-6	7.456E-6	4.285E-4	7.556E-6	2.312E-8	2.212E-7	1.025E-5	5.263E-7	-7.014E-5	**3.769E-4**
ozone depletion	kg CFC11 eq	2.449E-8	2.625E-9	2.676E-9	2.979E-8	4.453E-9	6.335E-11	1.333E-10	1.972E-10	2.877E-10	-1.105E-8	**2.387E-8**
acidification	mol H+ eq	6.887E-3	4.603E-5	6.480E-5	6.998E-3	7.809E-5	3.068E-6	3.502E-6	2.968E-5	9.336E-6	-6.226E-3	**8.949E-4**
eutrophication, freshwater	kg P eq	5.838E-5	7.953E-8	2.980E-7	5.876E-5	1.349E-7	1.068E-9	6.091E-9	5.338E-8	1.526E-8	-4.859E-5	**1.038E-5**
eutrophication, marine	kg N eq	6.863E-4	1.373E-5	1.007E-5	7.101E-4	2.328E-5	1.354E-6	1.234E-6	1.058E-5	3.565E-6	-4.952E-4	**2.550E-4**
eutrophication, terrestrial	mol N eq	0.01	1.515E-4	1.094E-4	0.01	2.571E-4	1.486E-5	1.360E-5	1.140E-4	3.813E-5	-8.904E-3	**1.950E-3**
photochemical ozone formation	kg NMVOC eq	2.294E-3	4.641E-5	9.135E-5	2.432E-3	7.873E-5	4.086E-6	3.884E-6	3.641E-5	1.060E-5	-1.953E-3	**6.120E-4**
resource use, minerals and metals	kg Sb eq	1.096E-4	3.945E-8	2.949E-7	1.099E-4	6.691E-8	4.499E-10	1.530E-8	2.775E-8	3.134E-8	-1.042E-4	**5.889E-6**
resource use, fossils	MJ	3.495	0.172	1.02	4.687	0.291	4.037E-3	9.106E-3	0.062	0.021	-1.771	**3.303**
water use	m^3 depriv.	0.147	5.136E-4	7.927E-3	0.156	8.712E-4	5.407E-6	3.257E-5	3.167E-4	2.432E-4	-0.124	**0.033**
particulate matter	disease inc.	2.576E-8	9.761E-10	4.005E-10	2.714E-8	1.656E-9	8.117E-11	5.422E-11	4.501E-10	1.295E-10	-2.192E-8	**7.586E-9**
Ionising radiation	kBq U-235 eq	0.014	7.446E-4	9.206E-3	0.024	1.263E-3	1.730E-5	3.815E-5	7.140E-5	8.267E-5	-8.595E-3	**0.017**
ecotoxicity, freshwater	CTUe	118.79	0.134	0.365	119.289	0.227	2.434E-3	8.120E-3	0.083	0.034	-111.302	**8.341**
human toxicity, cancer	CTUh	2.592E-9	4.334E-12	9.700E-12	2.606E-9	7.353E-12	8.504E-14	2.634E-13	2.729E-12	1.344E-12	-2.439E-9	**1.786E-10**
human toxicity, non-cancer	CTUh	1.869E-7	1.404E-10	2.411E-10	1.873E-7	2.381E-10	2.089E-12	8.882E-12	6.429E-11	5.137E-11	-1.775E-7	**1.014E-8**
land use	Pt	3.216	0.118	0.061	3.395	0.2	5.166E-4	7.900E-3	0.043	0.019	-1.884	**1.782**
use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	0.114	2.417E-3	0.072	0.189	4.101E-3	0	0	1.130E-3	2.833E-4	7.007E-3	**0.202**
use of renewable primary energy resources used as raw materials	MJ	0.034	0	0	0.034	0	2.184E-5	1.140E-4	1.140E-4	5.960E-5	-0.598	**-0.563**
total use of renewable primary energy resources	MJ	0.878	2.417E-3	0.072	0.953	4.101E-3	2.184E-5	1.140E-4	1.244E-3	3.429E-4	-0.591	**0.368**
use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	0.223	0.182	1.037	1.442	0.309	0	0	0.056	0.021	0.063	**1.891**
use of non-renewable primary energy resources used as raw materials	MJ	0.165	0	0	0.165	0	4.287E-3	9.668E-3	9.668E-3	1.122E-3	-1.947	**-1.758**
total use of non-renewable primary energy resources	MJ	3.728	0.182	1.037	4.947	0.309	4.287E-3	9.668E-3	0.066	0.022	-1.884	**3.474**
total energy	MJ	0.486	0.185	1.109	1.78	0.313	4.309E-3	9.782E-3	0.067	0.023	-2.475	**-0.278**
use of secondary material	kg	0.047	0	0	0.047	0	0	0	0	0	0	**0.047**
use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	**0**
use of non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	**0**
use of net fresh water	m^3	3.931E-3	1.912E-5	3.880E-4	4.338E-3	3.243E-5	2.078E-7	1.109E-6	1.268E-5	9.357E-6	-3.117E-3	**1.276E-3**

impact category	unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	total
hazardous waste disposed	kg.	4.056E-6	4.480E-7	6.031E-7	5.107E-6	7.599E-7	1.100E-8	2.308E-8	3.503E-7	5.674E-8	-1.977E-6	**4.331E-6**
non-hazardous waste disposed	kg	0.124	8.821E-3	1.542E-3	0.134	0.015	4.780E-6	5.776E-4	3.191E-3	6.148E-3	-0.106	**0.053**
radioactive waste disposed	kg	1.525E-5	1.160E-6	1.220E-5	2.861E-5	1.968E-6	2.803E-8	5.980E-8	8.172E-8	1.273E-7	-7.917E-6	**2.296E-5**
components for re-use	kg	0	0	0	0	0	0	0	0	0	0	**0**
materials for recycling	kg	0	0	0	0	0	0	0	0	0	0	**0**
materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	**0**
exported energy	MJ	0	0	0	0	0	0	0	0	0	0	**0**
exported energy thermic	MJ	4.174E-3	0	0	4.174E-3	0	0	0	0	0	0	**4.174E-3**
exported energy electric	MJ	2.424E-3	0	0	2.424E-3	0	0	0	0	0	0	**2.424E-3**

5 References

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6 appendix

The life cycle assessment results listed in chapter 4 can be converted to the other sales articles listed using the conversion factor in accordance with the following tables.

G7270	straight coupling (2 x press)	
article no.	**dimensions**	**conversion factor**
4804437	15	0.41
4804448	18	0.48
4804459	22	0.63
4804461	28	0.79

G7270S	slip coupling (2 x press)	
article no.	**dimensions**	**conversion factor**
4804503	15	0.65
4804514	18	0.84
4804525	22	1.02
4804536	28	1.41

G7002A	bend 90° (2 x press)	
article no.	**dimensions**	**conversion factor**
4803832	15	0.57
4803843	18	0.70
4803854	22	1.00
4803865	28	1.47

G7001A	bend 90° (press x male)	
article no.		**conversion factor**
4803766	15	0.56
4803777	18	0.73
4803788	22	0.96
4803799	28	1.47

G7041	bend 45° (2 x press)	
article no.	**dimensions**	**conversion factor**
4803975	15	0.51
4803986	18	0.57
4803997	22	0.80
4804008	28	1.14

G7040	bend 45° (press x male)	
article no.	**dimensions**	**conversion factor**
4803909	15	0.51
4803911	18	0.58
4803920	22	0.78
4803931	28	1.16

G7085	crossover (2 x press)	
article no.	**dimensions**	**conversion factor**
4804041	15	1.21
4804063	22	2.07

G7130	tee (3 x press)	
article no.	**dimensions**	**conversion factor**
4804107	15	0.96
4804118	18	1.25
4804129	22	1.59
4804131	28	2.32

G7125	tee reduced (3 x press)	
article no.	**dimensions**	**conversion factor**
4804173	18 x 15 x 18	1.27
4804195	22 x 15 x 22	1.70
4804206	22 x 18 x 22	1.65
4804228	28 x 15 x 28	2.25
4804241	28 x 22 x 28	2.43

G7126	tee reduced (3 x press)	
article no.	**dimensions**	**conversion factor**
4804217	22 x 22 x 15	1.73

G7127	tee reduced (3 x press)	
article no.	**dimensions**	**conversion factor**
4804184	22 x 15 x 15	1.73

G6130G	tee female branch (press x female thread x press)	
article no.	**dimensions**	**conversion factor**
4804833	15 x Rp½" x 15	1.59
4804844	18 x Rp½" x 18	1.77
4804855	22 x Rp½" x 22	2.25
4804866	22 x Rp¾" x 22	2.42
4804877	28 x Rp½" x 28	2.79
4804888	28 x Rp¾" x 28	3.68

G7243	reducer (male x press)	
article no.	**dimensions**	**conversion factor**
4804305	ØF 18 x 15	0.43
4804316	ØF 22 x 15	0.49
4804327	ØF 22 x 18	0.58
4804338	ØF 28 x 15	0.74
4804349	ØF 28 x 18	0.70
4804351	ØF 28 x 22	0.67

G6243G	straight connector (press x male thread)	
article no.	**dimensions**	**conversion factor**
4803414	15 x R½"	0.67
4803425	15 x R¾"	0.78
4803436	18 x R½"	0.62
4803447	18 x R¾"	1.00
4803458	22 x R½"	1.01
4803469	22 x R¾"	0.99
4803471	22 x R1"	1.19
4803480	28 x R¾"	1.14
4803491	28 x R1"	1.43
4803502	28 x R1¼"	1.89

G6270G	straight connector (press x female thread)	
article no.	**dimensions**	**conversion factor**
4803568	15 x Rp½"	0.65
4803579	15 x Rp¾"	0.83
4803581	18 x Rp½"	0.68
4803590	18 x Rp¾"	0.88
4803601	22 x Rp½"	1.07
4803612	22 x Rp¾"	0.88
4803623	28 x Rp1"	1.25

G6092G	adapter bend 90° (press x male thread)	
article no.	**dimensions**	**conversion factor**
4804756	15 x R½"	1.10
4804767	18 x R½"	1.73
4804778	18 x R¾"	1.93
4804789	22 x R¾"	2.31
4804791	28 x R1"	3.06

G6090G	adapter bend 90° (press x female thread)	
article no.	**dimensions**	**conversion factor**
4804646	15 x Rp½"	1.12
4804657	15 x Rp¾"	2.19
4804668	18 x Rp½"	1.57
4804679	18 x Rp¾"	1.60
4804681	22 x Rp½"	1.68
4804690	22 x Rp¾"	2.01
4804701	22 x Rp1"	2.15
4804712	28 x Rp1"	2.69

G6340	straight union (2 x press)	
article no.	**dimensions**	**conversion factor**
4803667	15	2.32
4803689	22	3.33
4803691	28	4.64

G6360	coupling with nut (press x female thread)	
article no.	**dimensions**	**conversion factor**
4803733	15 x G⅞"	1.22
4803755	28 x G1⅜"	2.80

G6471G	wall plate 90° (press x female thread)	
article no.	**dimensions**	**conversion factor**
4804954	15 x Rp½"	1.99
4804965	18 x Rp½"	2.02
4804976	22 x Rp¾"	3.93

G7301	stop end (1 x press)	
article no.	**dimensions**	**conversion factor**
4804571	15	0.30
4804580	18	0.35
4804591	22	0.43
4804602	28	0.60

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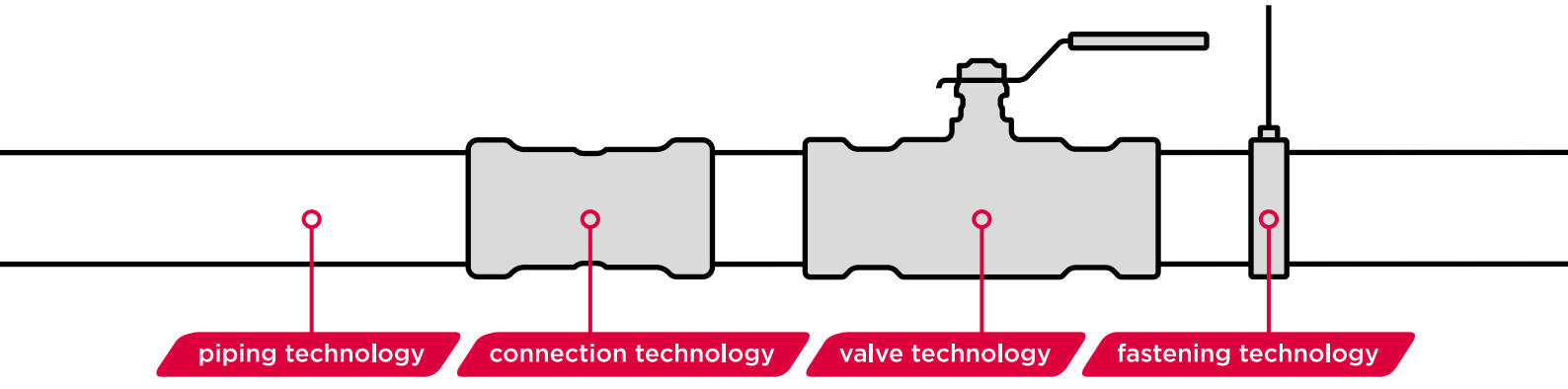

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