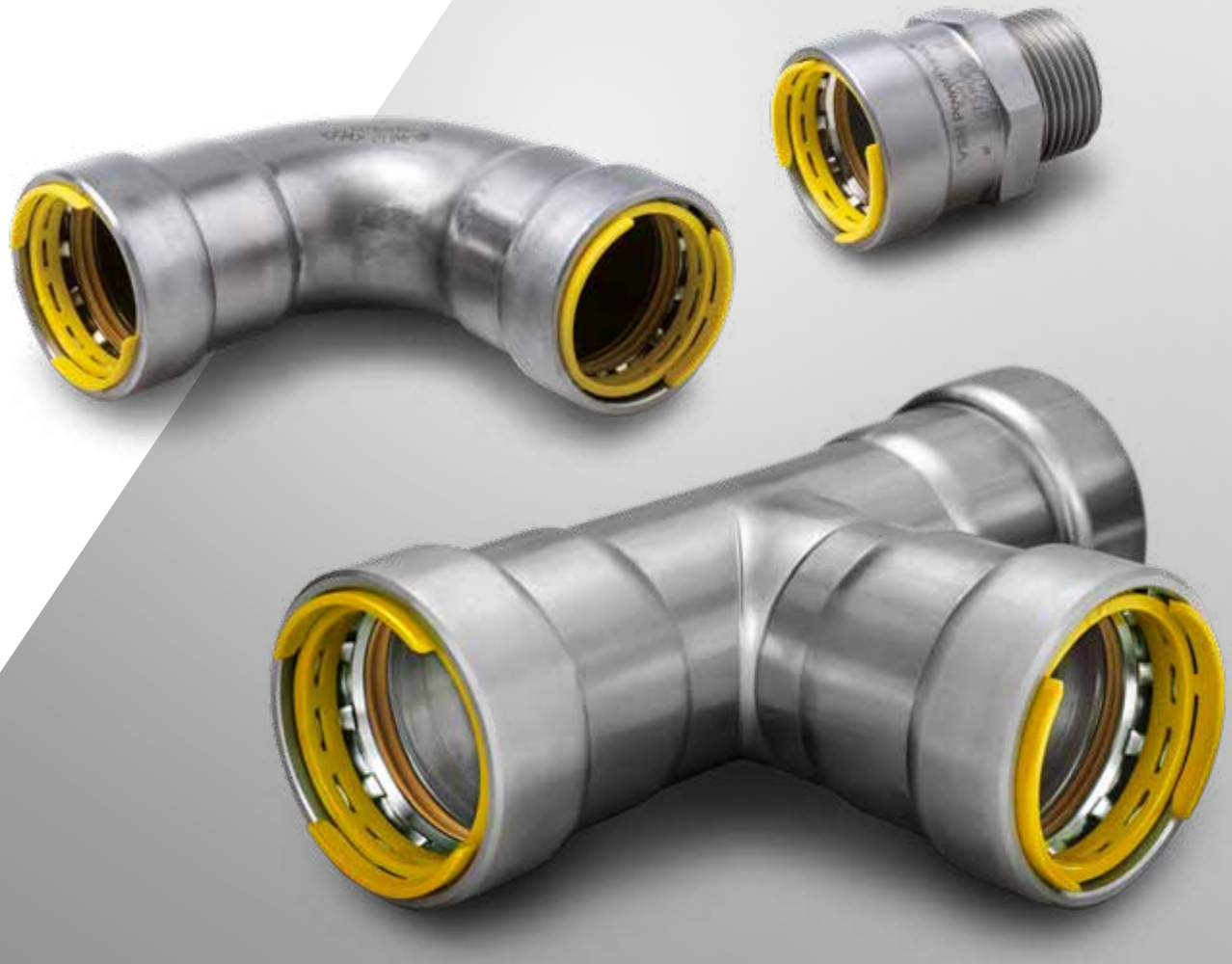
aalberts integrated piping systems

VSH PowerPress® Gas



Environmental Product Declaration

in accordance with
ISO 14044, ISO 14040 and EN 15804

EN

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.
Oude Amersfoortseweg 99 / 1212 AA Hilversum /
+31 (0)35 - 6884 211 / info.nl@aalberts-ips.com /
www.aalberts-ips.eu

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. The Aalberts integrated piping systems production locations mentioned in this document, Hilversum and Zeewolde, are certified acc. ISO 9001, ISO 14001 and ISO 45001.

1.3 declared product

This document applies to the VSH PowerPress® Gas fittings listed in the appendix -chapter 5- of this document. Articles with brass or gunmetal components are not covered in this declaration. A VSH PowerPress® bend 90° FF ¾", article number 123459134, has been used as a reference article.

1.4 verification

The European standard EN15804:2012 +A2:2019 has been used as the core PCR. Environmental product declarations for construction products may not be comparable if they do not comply with the EN15804. It is only possible to make a limited comparison between life cycle assessment results when different background databases are used and/or different assumptions as described in chapter 3.3.

This is a Self-Declared Environmental Product Declaration acc. NEN-EN ISO 14025.

Version:	1.0
Date of issue:	01/09/2023
Author of LCA:	Fabian Bruns
Calculated in:	Ecochain, v4.0.3
Production data:	2021

Hilversum, September 2023
Aalberts integrated piping systems B.V.

Roland Voermans
COO

2 product

2.1 description and application purpose

VSH PowerPress® Gas is a complete piping system suitable for a wide variety of applications, from heating and cooling to solar installations and compressed air systems. The VSH PowerPress® Gas range consists of press fittings, valves and pressing tools. The VSH PowerPress® Gas fittings are pressed with jaws and slings with DW-profile. VSH PowerPress® Gas fittings are manufactured from E235 Carbon steel and protected against corrosion by a zinc-nickel coating of 3-5 µm. Fittings with parts made of gunmetal or brass are not covered by this declaration.

- VSH PowerPress® Gas can be used with carbon steel pipes in accordance with EN 10220 (EN 10216-1 and EN 10217-1), EN 10255

The o-ring has decisive influence on the performance of the system in different applications, with different media and parameters. The material is:

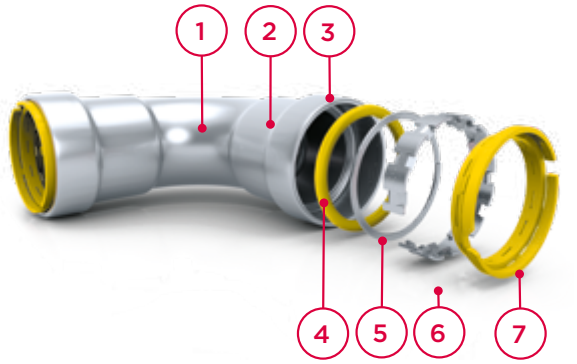
- HNBR (Hydrogenated Nitrile Butadiene Rubber (yellow)

The VSH PowerPress® LBP function is achieved using a special, patented o-ring. Fittings with a Leak Before Pressed function have the advantage that connections which have not been pressed will leak water during pressure testing.

Visu-Control® is an additional safety feature on VSH PowerPress® and VSH PowerPress® Gas fittings which ensures that a visual and tangible check is carried out (in addition to the Leak Before Pressed function). After pressing, the snapped of parts of the Visu-Control® ring are disposed of.

2.2 VSH PowerPress® Gas fittings

All VSH PowerPress® Gas fittings are produced in our modern, automated factory in the Netherlands. The VSH PowerPress® product range includes fittings, valves and tools. VSH PowerPress® Gas 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 body
2. DW-profile
3. insertion socket
4. o-ring
5. protection ring
6. grip-ring
7 Visu-Control® ring

For the composition of the components, see chapter 3.2 “product composition”

2.3 range and conversion factors

The reference product for this declaration is the VSH PowerPress® bend 90° FF ¾”. This article was chosen as a reference because it is the most common product in the VSH PowerPress® article range. 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 5-.

3 life cycle assessment scope

3.1 system boundaries

This EPD can be regarded as a Cradle-to-Gate with options, module C2 and D. The following phases are considered not relevant for this product range: A5, B, C1, C3 and C4.

3.2 declared unit composition

The reference article, VSH PowerPress® Gas 90° bend FF ¾", consists of the following raw materials:

carbon steel:	211 gram
stainless steel:	11
brass:	3
plastic:	2
EPDM:	4 gram
coating:	17 milligram
Total:	231 gram

3.3 assumptions and background information

A1: For the raw material supply 100% of the materials on the bill of materials were modelled using data from the Ecoinvent database.
A2: For transport of materials to Aalberts integrated piping systems in Hilversum specific transport distances from materials suppliers were used. Class Euro5 trucks are used as the main means of transport and were used for calculation.
A3: VSH PowerPress® Gas products are manufactured in the factory of Aalberts integrated piping systems located in Hilversum, Netherlands. This factory makes use of green electricity for manufacturing the VSH PowerPress® Gas products. Therefore the green electricity Netherlands mix, was used for calculating the electricity consumption. Water and auxillary materials were considered negligible.
Assembly of products is done at a separate Aalberts integrated piping systems warehouse located in Zeewolde, Netherlands. This warehouse also uses green electricity. The electricity consumption for this process was estimated and modelled at 10% of the electricity consumed for manufacturing.
A4: Transport from the factory in Hilversum to production partners and the warehouse is done by Aalberts integrated piping systems and logistical partners. The main means of transport is by Class Euro5 trucks. The transportation distance is calculated at 715 km.
Transportation to customers within Europe is done by logistical partners. The main means of transport in Europe is by Class Euro5 trucks. The average transportation distance is calculated at 662 km.
A5: The installation is done by use of a press tool which uses a considered negligible amount of energy.
B1-B7: A VSH PowerPress® Gas fitting is designed for a lifetime of 50+ years of service. A VSH PowerPress® Gas fitting needs no maintenance, repair, replacement or refurbishment and has no operational water or energy use during its lifetime.
C1-C4: The piping system is assumed to be stripped as a whole from a building in the demolition process and separate energy used for the fitting de-construction is considered negligible in this process. Transportation to a waste processing site is assumed at 30 km and modelled by use of Class Euro5 trucks. The waste processing is assumed to be done at a material level rather than component level since the fittings are permanently fitted onto piping. Therefore energy consumption for the waste processing of fittings was considered negligible. Partial disposal was considered to happen at a recycler rather than a waste processer and is therefore calculatedin phase D.
D: Average recycling rates for building materials in Europe were used to calculate the amount of material that went for recycling, incineration and landfill. 90% of steel will be recycled, 42.5% of plastics recycled and remainder incinerated, the O-ring completely incinerated. Remainder of the product was calculated to go to landfill.

3.4 quality of life cycle assessment, data and reporting

This environmental product declaration is based on a life cycle assessment conducted according to the ISO 14040 and ISO 14044 and meets further requirements from the EN 15804:2012 + A2:2019.
The modelling and calculation was done in the Ecochain software tool "Helix", which uses the Ecoinvent database. Inventory data was mainly provided by Aalberts integrated piping systems b.v. and was peer reviewed by several internal partners.
The environmental product declaration report is automatically generated to prevent human errors and ensure its quality. Improved quality of the life cycle assessment will be achieved when it would get externally verified according to ISO 14025.
Because of the nature of a life cycle assessment and accompanying assumptions, the environmental impact of a product will remain an underestimate. Care must be taken when comparing EPDs from different sources. Aalberts integrated piping systems b.v. is committed to providing the most accurate environmental impact possible to its customers and will continue to improve the quality of the data, model and results.

4 life cycle assessment results

The following environmental profile shows the results of the life cycle assessment of a single unit of the declared product.

Environmental Profile

This LCA is calculated according to: ISO 14044, ISO 14040 and EN 15804

Ecochain v3.5.80

Ecochain

Product:	Sudopress Elbow 90° Copper Gas FF 22mm HNBR	LCA standard:	EN15804+A2 (2019)
Unit:	1 units	Standard database:	Worldwide - Ecoinvent v 3.8 Cut-Off
Manufacturer:	Aalberts IPS - FR	Externally verified:	No
		Export date:	30-06-2023

integrated piping systems

The LCA background information and project dossier have been registered in the online Ecochain application in the account Aalberts IPS - FR (2022). (☑ = module declared, MND = module not declared).

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
☑	☑	☑	☑	MND	MND	MND	MND	MND	MND	MND	MND	MND	☑	MND	MND	☑

Product stage

A1 Raw material supply A2 Transport A3 Manufacturing

Construction process stage

A4 Transport gate to site
A5 Assembly / Construction installation process

Use stage

B1 Use B2 Maintenance B3 Repair B4 Replacement B5 Refurbishment
B6 Operational energy use B7 Operational water use

End-of-Life stage

C1 De-construction demolition C2 Transport C3 Waste processing
C4 Disposal

Benefits and loads beyond the system boundaries

D Reuse- Recovery- Recycling- potential

Environmental impacts and parameters

environmental impacts and parameters

GWP-total = EF Climate Change [kg CO_2 eq]; GWP-f = EF Climate change - Fossil [kg CO_2 eq]; GWP-b = EF Climate Change - Biogenic [kg CO_2 eq]; GWP-luluc = EF Climate Change - Land use and LU change [kg CO_2 eq]; ODP = EF Ozone depletion [kg CFC11 eq]; AP = EF Acidification [mol H+ eq]; EP-fw = EF Eutrophication, freshwater [kg P eq]; EP-m = EF Eutrophication, marine [kg N eq]; EP-T = EF Eutrophication, terrestrial [mol N eq]; POCP = EF Photochemical ozone formation [kg NMVOC eq]; ADP-mm = EF Resource use, minerals and metals [kg Sb eq]; ADP-f = EF Resource use, fossils [MJ]; WDP = EF Water use [m3 depriv.]; PM = EF Particulate matter [disease inc.]; IR = EF Ionising radiation [kBq U-235 eq]; ETP-fw = EF Ecotoxicity, freshwater [CTUe]; HTP-c = EF Human toxicity, cancer [CTUh]; HTP-nc = EF Human toxicity, non-cancer [CTUh]; SQP = EF Land use [Pt]; PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials [MJ]; PERM = Use of renewable primary energy resources used as raw materials [MJ]; PERT = Total use of renewable primary energy resources [MJ]; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials [MJ]; PENRM = Use of non-renewable primary energy resources used as raw materials [MJ]; PENRT = Total use of non-renewable primary energy resources [MJ]; PET = Total energy [MJ]; SM = Use of secondary material [kg]; RSF = Use of renewable secondary fuels [MJ]; NRSF = Use of non-renewable secondary fuels [MJ]; FW = Use of net fresh water [m3]; HWD = Hazardous waste disposed [kg]; NHWD = Non-hazardous waste disposed [kg]; RWD = Radioactive waste disposed [kg]; CRU = Components for re-use [kg]; MFR = Materials for recycling [kg]; MER = Materials for energy recovery [kg]; EE = Exported energy [MJ]; EET = Exported energy thermic [MJ]; EEE = Exported energy electric [MJ]

statement of confidentiality

results

Environmental impact	Unit	A1	A2	A3	A1-A3	A4	C2	D	Total
GWP-total	kg CO2 eq	4.130E-1	9.817E-3	4.663E-3	4.275E-1	1.853E-2	8.016E-4	-1.275E-1	3.194E-1
GWP-f	kg CO2 eq	4.171E-1	9.805E-3	4.613E-3	4.315E-1	1.851E-2	8.008E-4	-1.271E-1	3.238E-1
GWP-b	kg CO2 eq	-4.503E-3	8.822E-6	4.683E-5	-4.447E-3	1.666E-5	3.542E-7	-2.390E-4	-4.669E-3
GWP-luluc	kg CO2 eq	4.266E-4	3.850E-6	3.635E-6	4.341E-4	7.269E-6	3.564E-7	-1.256E-4	3.161E-4
ODP	kg CFC11 eq	2.383E-8	2.269E-9	1.488E-9	2.759E-8	4.284E-9	3.754E-10	-1.006E-8	2.219E-8
AP	mol H+ eq	4.695E-2	3.979E-5	3.053E-5	4.702E-2	7.512E-5	5.282E-6	-5.593E-3	4.150E-2
EP-fw	kg P eq	3.734E-4	6.874E-8	1.350E-7	3.736E-4	1.298E-7	8.328E-9	-4.467E-5	3.291E-4
EP-m	kg N eq	2.169E-3	1.186E-5	4.692E-6	2.186E-3	2.240E-5	1.380E-6	-5.180E-4	1.691E-3
EP-T	mol N eq	3.287E-2	1.310E-4	5.129E-5	3.305E-2	2.473E-4	1.522E-5	-8.010E-3	2.530E-2
POCP	kg NMVOC eq	8.777E-3	4.012E-5	5.199E-5	8.869E-3	7.574E-5	4.725E-6	-1.763E-3	7.186E-3
ADP-mm	kg Sb eq	2.675E-4	3.409E-8	1.200E-7	2.677E-4	6.437E-8	3.363E-8	-9.321E-5	1.745E-4
ADP-f	MJ	4.490E+0	1.482E-1	4.117E-1	5.050E+0	2.799E-1	2.414E-2	-1.634E+0	3.720E+0
WDP	m3 depriv.	3.403E-1	4.439E-4	4.978E-3	3.457E-1	8.381E-4	4.057E-5	-1.118E-1	2.348E-1
PM	disease inc.	1.010E-7	8.437E-10	1.974E-10	1.020E-7	1.593E-9	5.980E-11	-1.985E-8	8.384E-8
IR	kBq U-235 eq	1.257E-2	6.436E-4	3.480E-3	1.669E-2	1.215E-3	1.042E-4	-7.861E-3	1.015E-2
ETP-fw	CTUe	4.519E+2	1.157E-1	1.616E-1	4.522E+2	2.184E-1	1.619E-2	-9.985E+1	3.526E+2
HTP-c	CTUh	6.283E-9	3.746E-12	4.170E-12	6.291E-9	7.073E-12	3.765E-13	-2.184E-9	4.115E-9
HTP-nc	CTUh	5.379E-7	1.213E-10	1.045E-10	5.381E-7	2.291E-10	1.188E-11	-1.588E-7	3.795E-7
SQP	Pt	6.214E+0	1.019E-1	2.805E-2	6.343E+0	1.923E-1	9.441E-3	-1.704E+0	4.841E+0
Resource use	Unit	A1	A2	A3	A1-A3	A4	C2	D	Total
PERE	MJ	0	2.089E-3	2.690E-2	2.899E-2	3.945E-3	0	3.287E-5	3.297E-2
PERM	MJ	1.305E+0	0	0	1.305E+0	0	1.972E-4	-5.344E-1	7.710E-1
PERT	MJ	1.305E+0	2.089E-3	2.690E-2	1.334E+0	3.945E-3	1.972E-4	-5.344E-1	8.039E-1
PENRE	MJ	0	1.574E-1	4.206E-1	5.780E-1	2.972E-1	0	1.098E-3	8.763E-1
PENRM	MJ	4.787E+0	0	0	4.787E+0	0	2.563E-2	-1.739E+0	3.074E+0
PENRT	MJ	4.787E+0	1.574E-1	4.206E-1	5.365E+0	2.972E-1	2.563E-2	-1.738E+0	3.950E+0
PET	MJ	6.092E+0	1.595E-1	4.475E-1	6.699E+0	3.011E-1	2.583E-2	-2.273E+0	4.754E+0
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m3	8.585E-3	1.652E-5	1.911E-4	8.792E-3	3.120E-5	1.495E-6	-2.816E-3	6.009E-3

Output flows and waste categories	Unit	A1	A2	A3	A1-A3	A4	C2	D	Total
HWD	kg	2.597E-5	3.872E-7	3.054E-7	2.666E-5	7.310E-7	6.569E-8	-2.024E-6	2.543E-5
NHWD	kg	1.580E-1	7.624E-3	6.478E-4	1.663E-1	1.439E-2	5.464E-4	-9.897E-2	8.223E-2
RWD	kg	1.170E-5	1.003E-6	4.643E-6	1.734E-5	1.893E-6	1.673E-7	-7.213E-6	1.219E-5
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0

5 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.

C9401G	VSH PowerPress® Gas straight coupling (2 x press)	
Article no.	**dimension**	**conversion factor**
123459094	½"	0,55
123459095	¾"	0,71
123459096	1"	1,06
123459097	1¼"	1,75
123459098	1½"	2,21
123459099	2"	2,93

C9403G	VSH PowerPress® Gas slip coupling (2 x press)	
Article no.	**dimension**	**conversion factor**
123459106	½"	0,61
123459107	¾"	0,78
123459108	1"	1,16
123459109	1¼"	1,83
123459110	1½"	2,39
123459111	2"	3,11

C9408G	VSH PowerPress® Gas bend 90° (2 x press)	
Article no.	**dimension**	**conversion factor**
123459133	½"	0,74
123459134	¾"	1,00
123459135	1"	1,60
123459136	1¼"	2,50
123459137	1½"	3,34
123459138	2"	4,84

C9411G	VSH PowerPress® Gas bend 90° (press x insert)	
Article no.	**dimension**	**conversion factor**
123459139	½"	0,76
123459140	¾"	1,03
123459141	1"	1,67
123459142	1¼"	2,52
123459143	1½"	3,34
123459144	2"	5,12

C9413G	VSH PowerPress® Gas bend 45° (2 x press)	
Article no.	**dimension**	**conversion factor**
123459151	½"	0,61
123459152	¾"	0,83
123459153	1"	1,31
123459154	1¼"	2,05
123459155	1½"	2,71
123459156	2"	3,82

C9412G	VSH PowerPress® Gas bend 45° (press x insert)	
Article no.	**dimension**	**conversion factor**
123459145	½"	0,63
123459146	¾"	0,85
123459147	1"	1,34
123459148	1¼"	2,07
123459149	1½"	2,76
123459150	2"	4,09

C9414G	VSH PowerPress® Gas tee (3 x press)	
Article no.	**dimension**	**conversion factor**
123459157	½"	1,07
123459158	¾"	1,40
123459159	1"	2,15
123459160	1¼"	3,27
123459161	1½"	4,38
123459162	2"	5,93

C9415G	VSH PowerPress® Gas tee reduced (3 x press)	
Article no.	**dimension**	**conversion factor**
123459163	¾" x ½" x ¾"	1,32
123459164	1" x ½" x 1"	1,89
123459165	1" x ¾" x 1"	1,96
123459166	1¼" x ½" x 1¼"	2,74
123459167	1¼" x ¾" x 1¼"	2,80
123459168	1¼" x 1" x 1¼"	2,98
123459169	1½" x ½" x 1½"	3,57
123459170	1½" x ¾" x 1½"	3,64
123459171	1½" x 1" x 1½"	3,80
123459172	1½" x 1¼" x 1½"	4,15
123459173	2" x ½" x 2"	4,80
123459174	2" x ¾" x 2"	4,86
123459175	2" x 1" x 2"	5,07
123459176	2" x 1¼" x 2"	5,41
123459177	2" x 1½" x 2"	5,61

C9418G	VSH PowerPress® Gas tee female branch (press x female thread x press)	
Article no.	**dimension**	**conversion factor**
123459178	½" x Rp½" x ½"	0,94
123459179	¾" x Rp½" x ¾"	1,20
123459180	1" x Rp½" x 1"	1,81
123459181	1" x Rp¾" x 1"	1,80
123459182	1¼" x Rp½" x 1¼"	2,63
123459183	1¼" x Rp¾ x 1¼"	2,61
123459184	1¼" x Rp1 x 1¼"	2,83
123459185	1½" x Rp½" x 1½"	3,51
123459186	1½" x Rp¾" x 1½"	3,48
123459187	1½" x Rp1" x 1½"	3,67
123459188	2" x Rp½" x 2"	4,65
123459189	2" x Rp¾" x 2"	4,69
123459190	2" x Rp1" x 2"	4,89

C9407G	VSH PowerPress® Gas reducer (press x insert)	
Article no.	**dimension**	**conversion factor**
123459118	Ø¾" x ½"	0,55
123459119	Ø1" x ½"	0,76
123459120	Ø1" x ¾"	0,78
123459121	Ø1¼" x ½"	1,49
123459122	Ø1¼" x ¾"	1,56
123459123	Ø1¼" x 1"	1,41
123459124	Ø1½" x ½"	1,39
123459125	Ø1½" x ¾"	1,43
123459126	Ø1½" x 1"	1,66
123459127	Ø1½" x 1¼"	1,78
123459128	Ø2" x ½"	1,92
123459129	Ø2" x ¾"	2,01
123459130	Ø2" x 1"	2,13
123459131	Ø2" x 1¼"	2,58
123459132	Ø2" x 1½"	2,48

C9405G	VSH PowerPress® Gas straight connector (press x male thread)	
Article no.	**dimension**	**conversion factor**
123459112	½" x R½"	0,40
123459113	¾" x R¾"	0,56
123459114	1" x R1"	0,81
123459115	1¼" x R1¼"	1,38
123459116	1½" x R1½"	1,67
123459117	2" x R2"	2,31

C9402G	VSH PowerPress® Gas straight connector (press x female thread)	
Article no.	**dimension**	**conversion factor**
123459100	½" x Rp½"	0,43
123459101	¾" x Rp¾"	0,61
123459102	1" x Rp1"	0,85
123459103	1¼" x Rp1¼"	1,39
123459104	1½" x Rp1½"	1,71
123459105	2" x Rp2"	2,27

C9439G	VSH PowerPress® Gas reducer (2 x press)	
Article no.	**dimension**	**conversion factor**
123459200	¾" x ½"	0,54
123459201	1" x ½"	0,73
123459202	1" x ¾"	0,78

C9426G	VSH PowerPress® Gas flanged connector PN16 (1 x press)	
article no.	**dimension**	**conversion factor**
123459191	1¼" x DN32	8,09
123459192	1½" x DN40	9,82
123459193	2" x DN50	11,44

C9429G	VSH PowerPress® Gas stop end (1 x press)	
article no.	**dimension**	**conversion factor**
123459194	½"	0,32
123459195	¾"	0,59
123459196	1"	0,90
123459197	1¼"	1,10
123459198	1½"	1,39
123459199	2"	1,85

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our sustainable spirit

reduce

rethink

recycle

more information?

For a complete and up-to-date product range and our additional services, visit: www.aalberts-ips.eu

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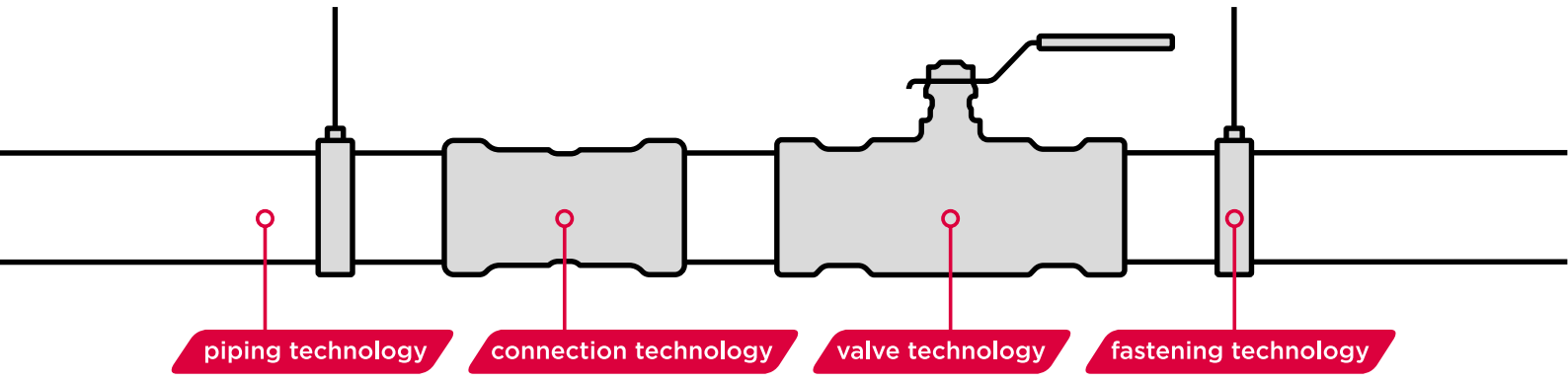
Please contact:

Aalberts integrated piping systems Customer Service
+31 (0)35 68 84 330
salessupport.emea@aalberts-ips.com



Aalberts integrated piping systems B.V.
Oude Amersfoortseweg 99 / 1212 AA Hilversum
P.O. Box 498 / 1200 AL Hilversum
The Netherlands
www.aalberts-ips.eu