aalberts integrated piping systems

**VSH** SudoXPress Carbon tube



# 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.**
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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 SudoXPress Carbon tubes listed in the appendix -chapter 5- of this document. The declared unit is 1 tonne of VSH SudoXPress Carbon tube.

## 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 document is based on third party verified EPD data acc ISO 14025 provided to us by our supplier. This third party verified data was first issued in November 2022 and is valid till November 2027. For further details about this data, please contact Aalberts integrated piping systems B.V.

| | |
|---|---|
| Version: | 1.0 |
| Date of issue: | 01/04/2024 |
| Calculated in: | GaBi and GaBi database |
| Production data: | 2016-2017 |

Hilversum, April 2024
Aalberts integrated piping systems B.V.
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Roland Voermans
COO

# 2 product

## 2.1 description and application purpose

VSH SudoXPress Carbon tubes are precision tubes manufactured in accordance with EN 10305 (formerly DIN 2394/ NEN 1982) from a special, very low carbon content steel, which results in a very easy to bend tube. The zinc layer is applied thermally, which results in good adhesion between the zinc layer and the tube.

**applications**

- closed heating installations in accordance with DIN 4751
- closed cooling installations with water/glycol mixture
- compressed air
- solar installations (closed-loop systems)

## 2.2 VSH SudoXPress Carbon tube

All VSH SudoXPress Carbon tubes are protected against external corrosion by a coating of zinc plating and a passivating chrome layer. The zinc layer is applied thermally, which results in good adhesion between the zinc layer and the tube. The tubes are also leak tested in accordance with EN 10246-1, so that all tubes are guaranteed to be leak-free.

## 2.3 range and conversion factors

The reference unit for this declaration is 1 tonne of VSH SudoXPress Carbon tube. The life cycle assessment results in chapter 4 can be converted to 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 C and D. The specific modules considered are: A1-A3, C and D. The life cycle stages are explained in more detail in section 3.3.

## 3.2 declared unit composition

The declared unit is 1 tonne of VSH SudoXPress Carbon tube.

## 3.3 assumptions and background information

**A1:** For the raw material supply <99% of the materials on the bill of materials were modelled, including raw material extraction, preparation of recycled scrap, steelmaking, casting and production of steel coil.
**A2:** For transport of materials several transport scenarios were combined to create an equivalent truck and ship transport distance.
**A3:** Includes impact from processing tubes for manufacturing and packaging tubes for delivery.
**C:** The impact from deconstruction/demolition, transport from site, processing and 1% disposal were calculated.
**D:** For the benefits a 7% reuse and 92% recycling rate were calculated.

## 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 software tool GaBi which uses the GaBi material database.
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..

# 4 life cycle assessment results

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

| Parameter | Unit | A1 – A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| **GWP-total** | kg $CO_2$eq | 2.79E+03 | 4.31E+01 | 1.22E+01 | 7.59E-01 | 1.45E-01 | -1.73E+03 |
| **GWP-fossil** | kg $CO_2$eq | 2.79E+03 | 4.30E+01 | 1.23E+01 | 7.57E-01 | 1.49E-01 | -1.73E+03 |
| **GWP-biogenic** | kg $CO_2$eq | -3.95E-02 | 6.09E-02 | -1.08E-01 | 1.91E-03 | -4.42E-03 | 7.87E-01 |
| **GWP-luluc** | kg $CO_2$eq | 5.37E-01 | 6.88E-04 | 1.92E-04 | 5.11E-05 | 2.75E-04 | -6.93E-02 |
| **ODP** | kg CFC11 eq | 1.78E-09 | 1.18E-11 | 1.33E-12 | 3.45E-12 | 3.51E-13 | -1.28E-10 |
| **AP** | mol $H^+$eq | 6.71E+00 | 4.41E-02 | 4.11E-02 | 8.73E-04 | 1.06E-03 | -3.77E+00 |
| **EP-freshwater** | kg $PO_4$eq | 1.18E-03 | 9.94E-06 | 2.72E-06 | 8.40E-07 | 2.53E-07 | -3.61E-04 |
| **EP-marine** | kg N eq | 1.72E+00 | 1.47E-02 | 1.96E-02 | 3.01E-04 | 2.71E-04 | -7.00E-01 |
| **EP-terrestrial** | mol N eq | 1.78E+01 | 1.63E-01 | 2.15E-01 | 3.27E-03 | 2.97E-03 | -6.34E+00 |
| **POCP** | kg NMVOC eq | 5.79E+00 | 4.78E-02 | 3.88E-02 | 9.30E-04 | 8.22E-04 | -2.76E+00 |
| **ADP-minerals&metals** | kg Sb eq | 2.50E-02 | 1.52E-06 | 6.01E-07 | 7.13E-08 | 1.53E-08 | -5.57E-03 |
| **ADP-fossil** | MJ net calorific value | 2.78E+04 | 5.62E+02 | 1.61E+02 | 1.01E+01 | 1.95E+00 | -1.60E+04 |
| **WDP** | $m^3$world eq deprived | 4.52E+01 | 1.04E-01 | 1.43E-02 | 1.01E-02 | 1.64E-02 | -2.88E+02 |
| **PM** | Disease incidence | ND | ND | ND | ND | ND | ND |
| **IRP** | kBq U235 eq | ND | ND | ND | ND | ND | ND |
| **ETP-fw** | CTUe | ND | ND | ND | ND | ND | ND |
| **HTP-c** | CTUh | ND | ND | ND | ND | ND | ND |
| **HTP-nc** | CTUh | ND | ND | ND | ND | ND | ND |
| **SQP** | | ND | ND | ND | ND | ND | ND |

GWP-total = Global Warming Potential total
GWP-fossil = Global Warming Potential fossil fuels
GWP-biogenic = Global Warming Potential biogenic
GWP-luluc = Global Warming Potential land use and land use change
ODP = Depletion potential of stratospheric ozone layer
AP = Acidification potential, Accumulated Exceedance
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment
EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment
EP-terrestrial = Eutrophication potential, Accumulated Exceedance
POCP = Formation potential of tropospheric ozone
ADP-minerals&metals = Abiotic depletion potential for non-fossil resources
ADP-fossil = Abiotic depletion potential for fossil resources
WDP = Water (user) deprivation potential, deprivation-weighted water consumption
PM = Potential incidence of disease due to PM emissions
IRP = Potential Human exposure efficiency relative to U235
ETP-fw = Potential Comparative Toxic Unit for ecosystems
HTP-c = Potential Comparative Toxic Unit for humans
HTP-nc = Potential Comparative Toxic Unit for humans
SQP = Potential soil quality index
The following indicators should be used with care as the uncertainties on these results are high or as there is limited experience with the indicator : ADP-minerals&metals, ADP-fossil, and WDP.

## results

| Parameter | Unit | A1 – A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| **PERE** | MJ | 1.80E+03 | 6.64E+00 | 9.61E+00 | 1.82E+00 | 2.93E-01 | 7.62E+02 |
| **PERM** | MJ | 6.73E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -4.71E+00 |
| **PERT** | MJ | 1.87E+03 | 6.64E+00 | 9.61E+00 | 1.82E+00 | 2.93E-01 | 7.58E+02 |
| **PENRE** | MJ | 2.78E+04 | 5.63E+02 | 1.62E+02 | 1.01E+01 | 1.96E+00 | -1.60E+04 |
| **PENRM** | MJ | 1.78E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.24E+00 |
| **PENRT** | MJ | 2.78E+04 | 5.63E+02 | 1.62E+02 | 1.01E+01 | 1.96E+00 | -1.60E+04 |
| **SM** | kg | 3.60E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -2.54E+00 |
| **RSF** | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **NRSF** | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **FW** | $m^3$ | 2.41E+00 | 5.39E-03 | 7.94E-04 | 9.14E-04 | 4.97E-04 | -6.61E+00 |

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials

PERM = Use of renewable primary energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

PENRT = Total use of non-renewable primary energy resources

SM = Input of secondary material

RSF = Use of renewable secondary fuels

NRSF = Use of non-renewable secondary fuels

FW = Use of net fresh water

| Parameter | Unit | A1 – A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| **HWD** | kg | 6.25E-04 | 1.95E-09 | 3.03E-10 | 4.08E-10 | 1.00E-10 | -4.38E-05 |
| **NHWD** | kg | 1.61E+02 | 1.35E-01 | 1.75E-02 | 6.53E-03 | 1.00E+01 | 2.02E+02 |
| **RWD** | kg | 2.11E-01 | 6.06E-04 | 1.17E-04 | 1.32E-04 | 2.17E-05 | -1.30E-02 |
| **CRU** | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E+01 | 0.00E+00 |
| **MFR** | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.20E+02 | 0.00E+00 |
| **MER** | kg | 8.63E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -6.04E-01 |
| **EEE** | MJ | 1.61E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.12E+00 |
| **EET** | MJ | 1.71E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.20E+00 |

HWD = Hazardous waste disposed

NHWD = Non-hazardous waste disposed

RWD = Radioactive waste disposed

CRU = Components for reuse

MFR = Materials for recycling

MER = Materials for energy recovery

EEE = Exported electrical energy

EET = Exported thermal energy

# 5 appendix

The life cycle assessment results listed in chapter 4 can be converted to the sales articles listed using the conversion factor in accordance with the following table. Take into account that the conversion factor counts for 1 meter of tube.

| **C1459** | **VSH SudoXPress Carbon tube** | | |
|---|---|---|---|
| **article no.** | **dimensions** | | **conversion factor** |
| 6206266 | 12 x 1.2 | (3 m) | 0.000271 |
| 6205144 | 12 x 1.2 | (6 m) | 0.000271 |
| 6209929 | 12 x 1.2 HB | (6 m) | 0.000271 |
| 6206277 | 15 x 1.2 | (3 m) | 0.00042 |
| 6205155 | 15 x 1.2 | (6 m) | 0.00042 |
| 6209931 | 15 x 1.2 HB | (6 m) | 0.00042 |
| 6206288 | 18 x 1.2 | (3 m) | 0.000494 |
| 6205166 | 18 x 1.2 | (6 m) | 0.000494 |
| 6209940 | 18 x 1.2 HB | (6 m) | 0.000494 |
| 6206299 | 22 x 1.5 | (3 m) | 0.000761 |
| 6205177 | 22 x 1.5 | (6 m) | 0.000761 |
| 6209951 | 22 x 1.5 HB | (6 m) | 0.000761 |
| 6206301 | 28 x 1.5 | (3 m) | 0.000981 |
| 6205188 | 28 x 1.5 | (6 m) | 0.000981 |
| 6209962 | 28 x 1.5 HB | (6 m) | 0.00098 |
| 6206310 | 35 x 1.5 | (3 m) | 0.001241 |
| 6205199 | 35 x 1.5 | (6 m) | 0.001241 |
| 6203923 | 35 x 1.5 HB | (6 m) | 0.001241 |
| 6206321 | 42 x 1.5 | (3 m) | 0.00156 |
| 6205201 | 42 x 1.5 | (6 m) | 0.00156 |
| 6203934 | 42 x 1.5 HB | (6 m) | 0.0015 |
| 6206332 | 54 x 1.5 | (3 m) | 0.002098 |
| 6205221 | 54 x 1.5 | (6 m) | 0.002098 |
| 6203945 | 54 x 1.5 HB | (6 m) | 0.0021 |
| 6204836 | 66.7 x 1.5 | (6 m) | 0.002411 |
| 6208972 | 66.7 x 1.5 HB | (6 m) | 0.002411 |
| 6204803 | 76.1 x 2.0 | (6 m) | 0.00371 |
| 6203956 | 76.1 x 2.0 HB | (6 m) | 0.00371 |
| 6204814 | 88.9 x 2.0 | (6 m) | 0.00446 |
| 6203967 | 88.9 x 2.0 HB | (6 m) | 0.00446 |
| 6204825 | 108 x 2.0 | (6 m) | 0.00531 |
| 6203978 | 108 x 2.0 HB | (6 m) | 0.00531 |

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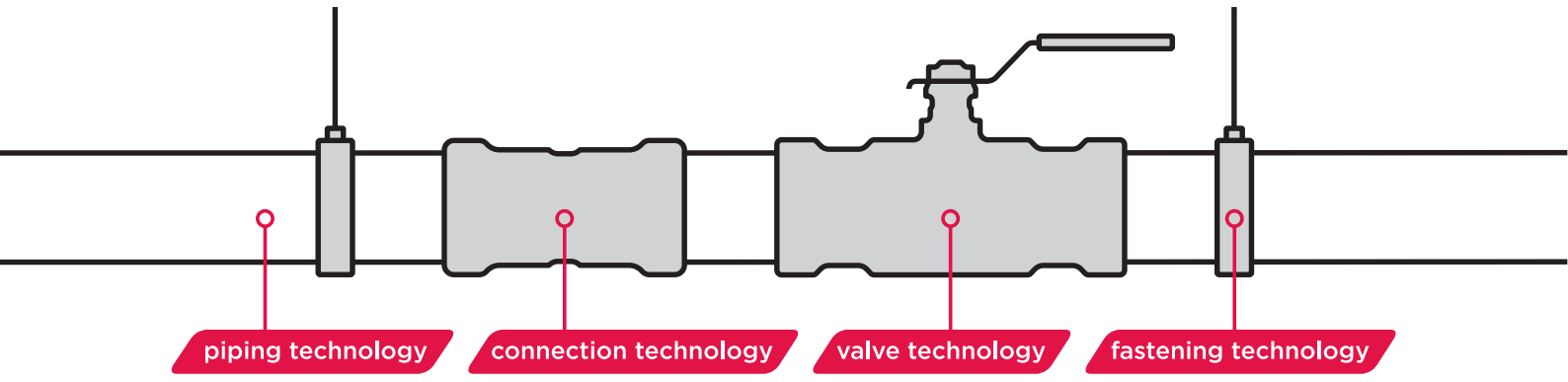


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