

VSH Shurjoint

grooved
fittings

ductile iron, painted



Environmental Product Declaration

in accordance with
ISO 14044, ISO 14040 and EN 15804

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 Shurjoint ductile iron fittings listed in the appendix -chapter 6- of this document. Galvanized fittings or Stainless steel fittings are not covered in this declaration. A VSH Shurjoint Grooved elbow 90° MM 114.3 orange with article code: 171100045001, 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 3.9.1
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: 01/12/2024
Author of LCA: Fabian Bruns
Production data: 2023/2024
EPD created with: LCA software
Ecochain Helix | version 4.3.1

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



Roland Voermans
CEO

2 product

2.1 description and application purpose

VSH Shurjoint is a high-quality grooved piping system product range that saves considerable installation time compared to welding, flanged, and threaded connections. It is less labour-intensive, safer, and cleaner. It delivers a consistent quality in all grooved joint connections. VSH Shurjoint is suitable for a wide range of applications, including heating, cooling, compressed air, sprinkler, and dry extinguishing lines. The range includes more than 6000 individual products, including couplings, fittings, grooved to flange adapters, valves, and mechanical outlets. Sizes range from ½" (DN15) to 104" (DN2600).

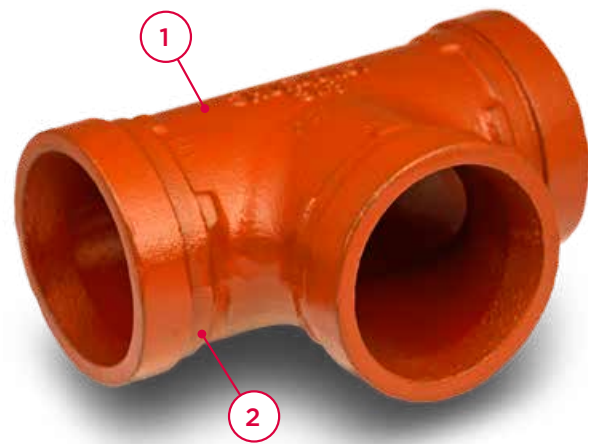
Grooved fittings and pipes are connected to each other by grooved, gasketed couplings. The coupling's 'key' engages with the pipe's or fitting's 'groove', compressing the coupling's gasket to create a seal within the grooved joint. The couplings are assembled with bolts and nuts. VSH Shurjoint couplings and fittings are available in ductile iron and stainless steel material. The couplings and fittings are finished with an orange, red, or black coating or are also offered with a galvanised coating.

materials

Ductile Iron Shurjoint components are made to ASTM A536 grade 65-45-12. This material provides the same or greater strength than forged or cast steel pipe materials, such as forged steel flanges – ASTM A105, steel valves – ASTM A216 WCB, forged steel pipe – ASTM A53 grade B, etc. For optimum performance, it is important that the correct gasket be used. Grooved couplings use various styles (shapes) of gaskets: standard, GapSeal, EP (End Protection) and FF (Fast-Fit) are examples. GapSeal gaskets are compatible with standard couplings and are interchangeable with standard gaskets. Other special types are not interchangeable with standard or GapSeal gaskets.

2.2 VSH Shurjoint fittings (orange & red)

VSH Shurjoint couplings are produced in our modern, automated factory in Taiwan. The VSH Shurjoint product range includes couplings, fittings, grooved to flange adapters, valves and mechanical outlets. Couplings are available in different styles and with different gaskets, to create an optimal connection, suited for the required application.



1. fitting body
2. groove

2.3 product composition

The reference article, VSH Shurjoint grooved elbow 90° MM 114.3 orange article code: 171100045001, has the following composition:

ductile iron:	3080 gram
paint:	40 gram
total circa:	3120 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 Shurjoint ductile iron fitting 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 2023/2024. The used background processes are derived from Worldwide - Ecoinvent v 3.9.1 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 waste and auxiliary materials like water, lubrication oil, bags and pallets.

VSH Shurjoint products are manufactured in the Aipss factory, located in Pingtung, Taiwan. Specific transport distances of materials to Aalberts integrated piping systems from materials suppliers were used. This factory uses the national electricity mix for manufacturing the VSH Shurjoint products. Therefore the national electricity mix Taiwan was used for calculating the electricity consumption.

A4-A5: Transport from the factory in Pingtung, Taiwan, to the warehouse in Zeewolde, Netherlands, is done by Aalberts integrated piping systems and logistical partners. The main means of transport is by average {GLO} trucks or better performing engine and per container ship {GLO}. Transportation to customers within Europe from the warehouse in Zeewolde is done by logistical partners. The main means of transport in Europe is by Class Euro 5 trucks or better performing engine. The average transportation distance is calculated at 561 km. Installation is done by using an Impact wrench or socket ratchet which energy consumption is considered negligible.

B1-B7: A VSH Shurjoint 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 0.01L/Kg of VSH Shurjoint 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].

material	recycling rate	incineration	landfill
ductile iron	90%		10%
ductile iron production waste	100%		
paint (+ waste)		100%	
packaging foil		80%	20%
wooden box		100%	
remainder of product/waste			100%

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

5 References

1. ISO 14040: Environmental management - Life cycle assessment - Principles and Framework', International Organization for Standardization, ISO14040:2006
2. ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO14044:2006
3. ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO14025:2006
4. NEN-EN 15804:2012+A2:2019: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', NEN-EN 15804:2012+A2:2019
5. Forfaitaire waarden (mei 2024): forfaitaire waarden voor verwerking-scenario's einde leven behorende bij: Bepalingsmethode milieuprestatie bouwwerken, <https://milieudatabase.nl/nl/milieuprestatie/bepalingsmethode>
6. the paper value chain reached a 70.5% recycling rate in 2022': CEPI press release 31 july 2023, https://www.cepi.org/wp-content/uploads/2023/07/EPRC-press-release_moniroting-report-2022_FINAL_31072023.pdf

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.

7110 bend 90° (2 x groove), painted orange		
article no.	dimensions	conversion factor
171100010001	33.7	0.08
171100012001	42.4	0.16
171100012002	42.4 (painted red)	0.16
171100015001	48.3	0.18
171100015002	48.3 (painted red)	0.18
171100020001	60.3	0.29
171100029001	76.1	0.45
171100030001	88.9	0.63
171100045001	114.3	1.00
171100052001	139.7	1.38
171100062001	165.1	1.83
171100065001	168.3	1.86
171100085001	219.1	4.17
1711000A1001	273	7.32
1711000A3001	323.9	10.10
1711000A4001	355.6	11.27
1711000A6001	406.4	13.78

7111 bend 45° (2 x groove), painted orange		
article no.	dimensions	conversion factor
171110010001	33.7	0.07
171110012001	42.4	0.10
171110012002	42.4 (painted red)	0.10
171110015001	48.3	0.13
171110015002	48.3 (painted red)	0.13
171110020001	60.3	0.18
171110020002	60.3 (painted red)	0.18
171110029001	76.1	0.30
171110029002	76.1 (painted red)	0.30
171110030001	88.9	0.42
171110030002	88.9 (painted red)	0.42
171110045001	114.3	0.64
171110045002	114.3 (painted red)	0.64
171110052001	139.7	0.93
171110052002	139.7 (painted red)	0.93
171110062001	165.1	1.29
171110062002	165.1 (painted red)	1.29
171110065001	168.3	1.29
171110065002	168.3 (painted red)	1.29
171110085001	219.1	2.56
171110085002	219.1 (painted red)	2.56
1711100A1001	273	4.36
1711100A3001	323.9	6.57
1711100A4001	355.6	7.05
1711100A6001	406.4	11.00

7112 bend 22.5° (2 x groove), painted orange		
article no.	dimensions	conversion factor
171120012001	42.4	0.10
171120015004	48.3	0.13
171120020004	60.3	0.24
171120029004	76.1	0.37
171120030004	88.9	0.43
171120045004	114.3	0.65
171120052001	139.7	0.98
171120062004	165.1	1.41
171120065004	168.3	1.36
171120085004	219.1	2.58
171120085005	219.1 (painted red)	2.58
1711200A1001	273	5.67
1711200A3001	323.9	6.25

7113 bend 11.25° (2 x groove), painted orange		
article no.	dimensions	conversion factor
171130012001	42.4	0.08
171130015001	48.3	0.10
171130020001	60.3	0.14
171130029001	76.1	0.23
171130030001	88.9	0.26
171130045001	114.3	0.32
171130052001	139.7	0.66
171130062001	165.1	0.80
171130065001	168.3	0.80
171130085001	219.1	1.49
1711300A1001	273.0	3.21
1711300A3001	323.9	3.97

901 short radius 90° bend (2 x groove), painted red		
article no.	dimensions	conversion factor
109010020002	60.3	0.22
109010029002	76.1	0.36
109010030002	88.9	0.45
109010045002	114.3	0.69
109010052002	139.7	1.16
109010062002	165.1	1.88
109010065002	168.3	1.88
109010085002	219.1	3.40

7120 tee (3 x groove), painted orange		
article no.	dimensions	conversion factor
171200010001	33.7	0.11
171200012001	42.4	0.22
171200012002	42.4 (painted red)	0.22
171200015001	48.3	0.29
171200015002	48.3 (painted red)	0.29
171200020001	60.3	0.42
171200029001	76.1	0.70
171200030001	88.9	0.99
171200045001	114.3	1.22
171200052001	139.7	2.08
171200062001	165.1	3.16
171200065001	168.3	3.21
171200085001	219.1	5.33
1712000A1001	273	9.94
1712000A3001	323.9	14.05

7121 tee reduced (3 x groove), painted orange		
article no.	dimensions	conversion factor
17121010001	60.3 x 33.7 x 60.3	0.38
17121015001	60.3 x 48.3 x 60.3	0.38
171212920001	76.1 x 60.3 x 76.1	0.56
171213010001	88.9 x 33.7 x 88.9	0.79
171213015001	88.9 x 48.3 x 88.9	0.76
171213020001	88.9 x 60.3 x 88.9	0.90
171213029001	88.9 x 76.1 x 88.9	0.81
171214515001	114.3 x 48.3 x 114.3	1.35
171214520001	114.3 x 60.3 x 114.3	1.27
171214529001	114.3 x 76.1 x 114.3	1.38
171214530001	114.3 x 88.9 x 114.3	1.26
171215220001	139.7 x 60.3 x 139.7	1.67
171215229001	139.7 x 76.1 x 139.7	1.83
171215230001	139.7 x 88.9 x 139.7	1.83
171215245001	139.7 x 114.3 x 139.7	1.99
171216220001	165.1 x 60.3 x 165.1	2.56
171216229001	165.1 x 76.1 x 165.1	2.72
171216230001	165.1 x 88.9 x 165.1	2.95
171216245001	165.1 x 114.3 x 165.1	2.82
171216252001	165.1 x 139.7 x 165.1	3.01
171216520001	168.3 x 60.3 x 168.3	2.56
171216529001	168.3 x 76.1 x 168.3	2.49
171216530001	168.3 x 88.9 x 168.3	2.95
171216545001	168.3 x 114.3 x 168.3	2.82
171216552001	168.3 x 139.7 x 168.3	2.67
171218520001	219.1 x 60.3 x 219.1	4.73
171218529001	219.1 x 76.1 x 219.1	4.81
171218530001	219.1 x 88.9 x 219.1	4.96
171218545001	219.1 x 114.3 x 219.1	5.69
171218552001	219.1 x 219.1 x 139.7	5.71
171218562001	219.1 x 219.1 x 165.1	5.99
171218565001	219.1 x 219.1 x 168.3	5.99
17121A120001	273 x 273 x 60.3	8.78
17121A130001	273 x 273 x 88.9	8.57
17121A145001	273 x 273 x 114.3	9.13
17121A162001	273 x 273 x 165.1	9.62
17121A165001	273 x 273 x 168.3	9.62
17121A185001	273 x 273 x 219.1	10.10
17121A330001	324 x 324 x 88.9	11.90
17121A345001	324 x 324 x 114.3	13.14
17121A362001	324 x 324 x 165.1	12.05

17121A365001	324 x 324 x 168.3	12.18
17121A385001	324 x 324 x 219.1	12.18
17121A3A1001	324 x 324 x 273	12.82

903 short radius tee (3 x groove), painted red		
article no.	dimensions	conversion factor
109030020002	60.3	0.32
109030029002	76.1	0.42
109030030002	88.9	0.64
109030045002	114.3	1.15
109030052002	139.7	1.62
109030062002	165.1	2.40
109030065002	168.3	2.50
109030085002	219.1	4.81

7121M tee male branch (3 x groove), painted orange		
article no.	dimensions	conversion factor
1121M2010008	60.3 x R1 x 60.3	0.38
1121M2012008	60.3 x R1¼ x 60.3	0.38
1121M2015008	60.3 x R1½ x 60.3	0.35
1121M2910008	76.1 x R1 x 76.1	0.54
1121M2920008	76.1 x R2 x 76.1	0.67
1121M3010008	88.9 x R1 x 88.9	0.77
1121M3020008	88.9 x R2 x 88.9	0.90
1121M4510008	114.3 x R1 x 114.3	1.26
1121M4520008	114.3 x R2 x 114.3	1.35
1121M5220008	139.7 x R2 x 139.7	1.65
1121M6220008	165.1 x R2 x 165.1	2.70
1121M6520008	168.3 x R2 x 168.3	2.56
1121M8520008	219.1 x R2 x 219.1	4.81

7150F tee female branch (3 x groove), painted orange		
article no.	dimensions	conversion factor
1150F2920013	76.1 x Rp2	0.22

7135 cross (4 x groove), painted orange		
article no.	dimensions	conversion factor
171350012001	42.4	0.24
171350015001	48.3	0.28
171350020001	60.3	0.38
171350029001	76.1	0.96
171350030001	88.9	0.99
171350045001	114.3	1.67
171350052001	139.7	1.89
171350062001	165.1	4.65
171350065001	168.3	4.65
171350085001	219.1	6.41

7150 concentric reducer (2 x groove), painted orange		
article no.	dimensions	conversion factor
171501210001	42.4 x 33.7	0.06
171501510001	48.3 x 33.7	0.07
171501512001	48.3 x 42.4	0.09
171502010001	60.3 x 33.7	0.12
171502012001	60.3 x 42.4	0.10
171502015001	60.3 x 48.3	0.11
171502912001	76.1 x 42.4	0.16
171502915001	76.1 x 48.3	0.16
171502920001	76.1 x 60.3	0.16
171503012001	88.9 x 42.4	0.19
171503015001	88.9 x 48.3	0.19

171503020001	88.9 x 60.3	0.19
171503029001	88.9 x 76.1	0.19
171504515001	114.3 x 48.3	0.32
171504520001	114.3 x 60.3	0.29
171504529001	114.3 x 76.1	0.33
171504530001	114.3 x 88.9	0.42
171505230001	139.7 x 88.9	0.51
171505245001	139.7 x 114.3	0.46
171505545001	141.3 x 114.3	0.52
171506220001	165.1 x 60.3	0.61
171506229001	165.1 x 76.1	0.64
171506230001	165.1 x 88.9	0.71
171506245001	165.1 x 114.3	0.67
171506252001	165.1 x 139.7	0.80
171506520001	168.3 x 60.3	0.61
171506529001	168.3 x 76.1	0.74
171506530001	168.3 x 88.9	0.74
171506530002	168.3 x 88.9 (painted red)	0.74
171506545001	168.3 x 114.3	0.67
171506552001	168.3 x 139.7	0.87
171508530001	219.1 x 88.9	1.23
171508545001	219.1 x 114.3	1.37
171508552001	219.1 x 139.7	1.37
171508562001	219.1 x 165.1	1.62
171508565001	219.1 x 168.3	1.67
171508565002	219.1 x 168.3 (painted red)	1.67
17150A145001	273 x 114.3	2.71
17150A162001	273 x 165.1	2.88
17150A165001	273 x 168.3	2.88
17150A185001	273 x 219.1	2.87
17150A365001	324 x 168.3	4.49
17150A385001	324 x 219.1	4.49
17150A3A1001	324 x 273	4.38

7150M reducer (2 x groove), painted orange		
article no.	dimensions	conversion factor
1150M2010007	60.3 x R1	0.13
1150M2015007	60.3 x R1½	0.12
1150M2910007	76.1 x R1	0.13
1150M2920007	76.1 x R2	0.13
1150M3010007	88.9 x R1	0.18
1150M3020007	88.9 x R2	0.19
1150M4520007	114.3 x R2	0.34
1150M6220007	165.1 x R2	0.71
1150M6520007	168.3 x R2	0.71

7151 eccentric reducer (2 x groove), painted orange		
article no.	dimensions	conversion factor
171512520001	73 x 60.3	0.21
171512920001	76.1 x 60.3	0.23
171513020001	88.9 x 60.3	0.32
171513025001	88.9 x 73	0.32
171513029001	88.9 x 76.1	0.32
171514520001	114.3 x 60.3	0.41
171514529001	114.3 x 76.1	0.48
171514530001	114.3 x 88.9	0.42
171515230001	139.7 x 88.9	0.76
171515245001	139.7 x 114.3	0.90
171516220001	165.1 x 60.3	0.64
171516230001	165.1 x 88.9	0.85
171516245001	165.1 x 114.3	0.79

171516252001	165.1 x 139.7	0.98
171516520001	168.3 x 60.3	0.64
171516530001	168.3 x 88.9	1.12
171516545001	168.3 x 114.3	0.85
171516552001	168.3 x 139.7	0.98
171518545001	219.1 x 114.3	2.12
171518562001	219.1 x 165.1	1.63
171518565001	219.1 x 168.3	1.56
17151A162001	273 x 165.1	3.69
17151A165001	273 x 168.3	3.69
17151A185001	273 x 219.1	3.90
17151A385001	324 x 219.1	5.93
17151A3A1001	324 x 273.0	6.41

54 adapter (groove x female thread), painted orange		
article no.	dimensions	conversion factor
100541515006	48.3 x Rp1½	0.10
100542020006	60.3 x Rp2	0.13

55 adapter (groove x male thread), painted orange		
article no.	dimensions	conversion factor
100551515007	48.3 x R1½ orange	0.11
100552020007	60.3 x R2 orange	0.13

7160 end cap (groove), painted red		
article no.	dimensions	conversion factor
171600010002	33.7	0.03
171600012002	42.4	0.05
171600015002	48.3	0.06
171600020002	60.3	0.10
171600029002	76.1	0.13
171600030002	88.9	0.22
171600045002	114.3	0.32
171600052002	139.7	0.54
171600055001	141.3 (painted orange)	0.54
171600062002	165.1	0.87
171600065002	168.3	0.87
171600085002	219.1	1.47
1716000A1002	273	2.24
1716000A3002	323.9	3.21
1160H00A4001	355.6 (painted orange)	5.10
1160H00A6001	406.4 (painted orange)	6.41

7170 flange adapter (flange x groove), painted orange		
article no.	dimensions	conversion factor
1170A00A3001	323.9	8.97
1170A00A4001	355.6	15.87
1170A00A6001	406.4	16.03
1170B00A1001	273.0	7.05
1170B00A3001	323.9	8.97
1170B00A4001	355.6	15.87
1170B00A6001	406.4	16.03
1170E00A1001	273.0	7.05
1170E00A3001	323.9	8.97
1170E00A4001	355.6	15.87
1170E00A6001	406.4	16.03

7180 universal flange adapter (flange x groove), painted orange		
article no.	dimensions	conversion factor
171800020001	60.3	0.74
171800029001	76.1	0.99
171800030001	88.9	1.09
171800045001	114.3	1.23
171800052001	139.7	2.14
171800062001	165.1	1.99
171800065001	168.3	1.83
171800085001	219.1	4.38

7160C end cap with concentric drain (groove x female thread), painted red		
article no.	dimensions	conversion factor
1160C2010002	60.3 x Rp1	0.08
1160C2910002	76.1 x Rp1	0.14
1160C2915002	76.1 x Rp1½	0.12
1160C3010002	88.9 x Rp1	0.21
1160C3020002	88.9 x Rp2	0.15
1160C4510002	114.3 x Rp1	0.36
1160C4520002	114.3 x Rp2	0.31
1160C5220002	139.7 x Rp2	0.47
1160C6220002	165.1 x Rp2	0.73
1160C6520002	168.3 x Rp2	0.79
1160C8520002	219.1 x Rp2	1.46

7160T end cap with eccentric drain (groove x female thread), painted		
article no.	dimensions	conversion factor
1160T2010002	60.3 x Rc1	0.08
1160T2910002	76.1 x Rc1	0.14
1160T2912002	76.1 x Rc1¼	0.11
1160T2915002	76.1 x Rc1½	0.13
1160T3010002	88.9 x Rc1	0.21
1160T3012002	88.9 x Rc1¼	0.21
1160T3015002	88.9 x Rc1½	0.19
1160T3020002	88.9 x Rc2	0.16
1160T4510002	114.3 x Rc1	0.30
1160T4512002	114.3 x Rc1¼	0.30
1160T4515002	114.3 x Rc1½	0.29
1160T4520002	114.3 x Rc2	0.29
1160T5220002	139.7 x Rc2	0.48
1160T6220002	165.1 x Rc2	0.80
1160T6520002	168.3 x Rc2	0.83
1160T8520002	219.1 x Rc2	1.44

58 welding nipple (groove x weld)		
article no.	dimensions	conversion factor
100582040001	60.3	0.16
100582940001	76.1	0.29
100583040001	88.9	0.35
100584560001	114.3	0.75
100585260001	139.7	1.06
100586560001	168.3	1.44
100588560001	219.1	2.08

59 welding nipple (groove x male thread)		
article no.	dimensions	conversion factor
100591040002	33.7 x R1	0.07
100591240002	42.4 x R1¼	0.10
100591540002	48.3 x R1½	0.11
100592040002	60.3 x R2	0.15
100592940002	76.1 x R2½	0.23
100593040002	88.9 x R3	0.34
100594560002	114.3 x R4	0.74

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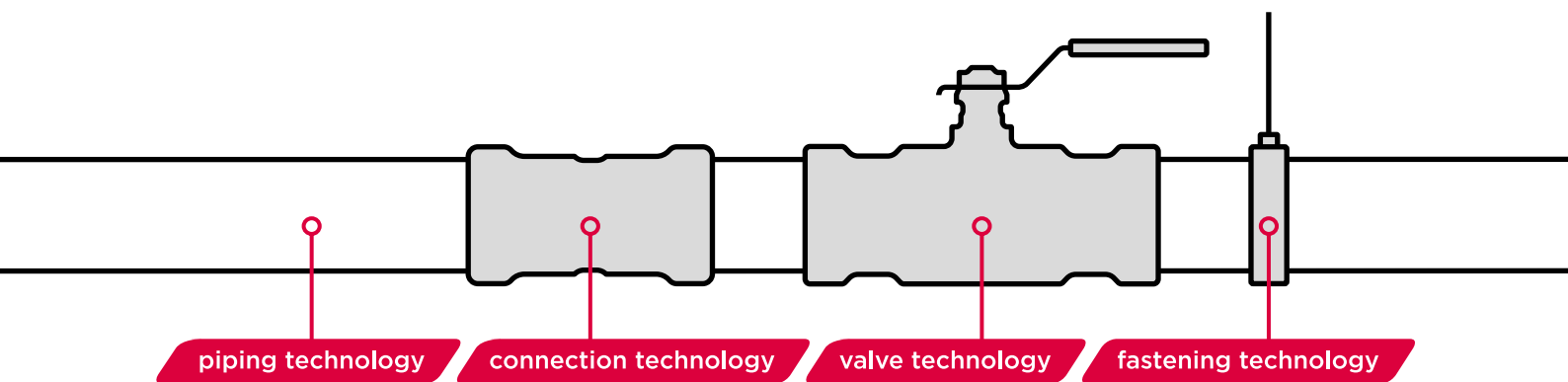
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