

## VSH XPress Copper

35 - 108 mm



# 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. The Aalberts integrated 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 XPress Copper fittings listed in the appendix -chapter 6- of this document. Articles with bronze, brass or gunmetal components are not covered in this declaration. A VSH XPress Copper bend 90° FF 42, article number: 4800367, 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: 01/09/2024  
Author of LCA: Fabian Bruns  
Production data: 2023  
EPD created with: LCA software Ecochain Helix |  
version 4.3.1

Hilversum, September 2024  
Aalberts integrated piping systems B.V.

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Roland Voermans  
COO

## 2 product

### 2.1 description and application purpose

VSH XPress Copper 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 range consists of press fittings and pressing tools. The VSH XPress Copper fittings are pressed with jaws and slings with M-profile and are available from 12 up to and including 108 mm.

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

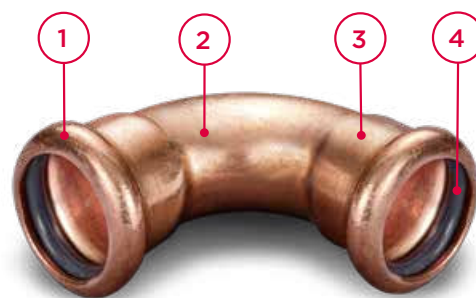
The o-ring has decisive influence on the performance of the system in different applications, with different media and parameters. Depending on the application, different o-rings can be inserted in the fittings:

- EPDM (Ethylene Propylene Diene Monomer / black) – standard
- FPM (Fluoroelastomer / green) – for use in specific applications

The VSH XPress Copper LBP function on fittings up to 54 mm is achieved using a LBP function in the material itself (o-ring bead). The LBP function on the VSH XPress Copper is created by a triangle shaped o-ring bead, which will leak as long as the joint has not been pressed. Fittings with a Leak Before Pressed function have the advantage that connections which have not been pressed will leak water or testing gas during pressure testing, causing the test pressure to drop. When the test is done with water, the leakage will show around the unpressed connection.

### 2.2 VSH XPress Copper fittings

VSH XPress Copper fittings are produced in our modern, automated factories in France and Hungary. The VSH XPress Copper 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 90° bend FF 42, article number 4800367, consists of the following raw materials:

copper:	245 gram
elastomers:	4.1 gram
Total circa:	249 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 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 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 materials 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 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 1375km.

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 662km.

The installation is done by use of a press tool which uses a considered negligible amount of energy.

**B1-B7:** A VSH XPress Copper 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 XPress copper fitting.

The following transport distances were used; 50 km for waste separation, 100km 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 Elbow 90 (2 x press), diameter 42 mm according to EN15804+A2 (2019)

## results

impact category	unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	total
climate change (EN15804+A2)	kg CO <sub>2</sub> eq	0.665	0.013	0.337	1.016	0.098	8.169E-4	1.682E-3	0.014	0.024	-0.429	0.726
climate change - fossil	kg CO <sub>2</sub> eq	0.674	0.013	0.334	1.021	0.098	8.166E-4	1.681E-3	0.014	0.013	-0.439	0.709
climate change - biogenic (EN15804+A2)	kg CO <sub>2</sub> eq	-9.917E-3	5.563E-5	3.307E-3	-6.554E-3	9.595E-5	2.271E-7	7.760E-7	6.613E-4	0.011	0.011	0.016
climate change - land use and LU change (EN15804+A2)	kg CO <sub>2</sub> eq	1.042E-3	8.036E-6	2.777E-4	1.327E-3	4.676E-5	6.436E-8	6.159E-7	3.175E-5	1.423E-6	-3.064E-4	1.102E-3
ozone depletion	kg CFC11 eq	7.854E-8	2.614E-9	2.962E-8	1.108E-7	2.078E-9	1.764E-10	3.710E-10	5.590E-10	7.974E-10	-3.482E-8	7.993E-8
acidification	mol H+ eq	0.021	5.862E-5	1.852E-3	0.023	3.115E-4	8.541E-6	9.748E-6	8.724E-5	2.483E-5	-0.02	4.137E-3
eutrophication, freshwater	kg P eq	1.814E-4	2.864E-7	4.454E-5	2.262E-4	7.643E-7	2.973E-9	1.696E-8	1.525E-7	4.097E-8	-1.541E-4	7.310E-5
eutrophication, marine	kg N eq	2.089E-3	1.338E-5	2.386E-4	2.341E-3	1.059E-4	3.770E-6	3.435E-6	3.097E-5	9.377E-6	-1.657E-3	8.376E-4
eutrophication, terrestrial	mol N eq	0.031	1.482E-4	2.722E-3	0.034	1.131E-3	4.137E-5	3.787E-5	3.342E-4	1.006E-4	-0.028	7.875E-3
photochemical ozone formation	kg NMVOC eq	7.040E-3	6.332E-5	8.759E-4	7.979E-3	4.654E-4	1.137E-5	1.081E-5	1.058E-4	2.809E-5	-6.151E-3	2.450E-3
resource use, minerals and metals	kg Sb eq	3.461E-4	4.749E-7	2.501E-6	3.491E-4	3.067E-7	1.252E-9	4.259E-8	7.757E-8	8.702E-8	-3.268E-4	2.280E-5
resource use, fossils	MJ	10.545	0.382	8.614	19.542	1.354	0.011	0.025	0.181	0.057	-5.619	15.552
water use	m³ depriv.	0.455	8.005E-3	0.189	0.652	5.531E-3	1.505E-5	9.068E-5	9.148E-4	6.389E-4	-0.389	0.27
particulate matter	disease inc.	7.905E-8	1.852E-9	4.511E-9	8.541E-8	7.575E-9	2.260E-10	1.509E-10	1.295E-9	3.516E-10	-6.910E-8	2.591E-8
ionising radiation	kBq U-235 eq	0.045	6.026E-4	0.079	0.125	6.789E-4	4.816E-5	1.062E-4	1.968E-4	2.296E-4	-0.027	0.099
ecotoxicity, freshwater	CTUe	370.411	0.186	3.959	374.556	1.313	6.775E-3	0.023	0.236	0.089	-349.564	26.659
human toxicity, cancer	CTUh	8.083E-9	6.871E-12	1.352E-10	8.225E-9	4.354E-11	2.368E-13	7.332E-13	7.744E-12	3.284E-12	-7.655E-9	6.257E-10
human toxicity, non-cancer	CTUh	5.829E-7	3.267E-10	4.151E-9	5.873E-7	1.255E-9	5.816E-12	2.473E-11	1.859E-10	1.254E-10	-5.568E-7	3.213E-8
land use	Pt	9.43	0.36	1.522	11.311	0.811	1.438E-3	0.022	0.13	0.053	-5.933	6.396
use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	0.231	8.156E-3	0.746	0.985	0.021	0	0	3.154E-3	7.601E-4	0.013	1.023
use of renewable primary energy resources used as raw materials	MJ	0.105	0	0	0.105	0	6.079E-5	3.174E-4	3.174E-4	1.659E-4	-1.874	-1.769
total use of renewable primary energy resources	MJ	2.611	8.156E-3	0.746	3.365	0.021	6.079E-5	3.174E-4	3.472E-3	9.260E-4	-1.861	1.53
use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	0.769	0.411	9.017	10.197	1.44	0	0	0.166	0.058	0.129	11.989
use of non-renewable primary energy resources used as raw materials	MJ	0.052	0	0	0.052	0	0.012	0.027	0.027	3.123E-3	-6.108	-5.987
total use of non-renewable primary energy resources	MJ	11.241	0.411	9.017	20.669	1.44	0.012	0.027	0.193	0.061	-5.979	16.422
total energy	MJ	1	0.419	9.762	11.182	1.461	0.012	0.027	0.196	0.062	-7.84	5.1
use of secondary material	kg	0.147	0	0	0.147	0	0	0	0	0	0	0.147
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0

impact category	unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D	total
use of non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0
use of net fresh water	m³	0.012	2.083E-4	6.300E-3	0.019	1.800E-4	5.784E-7	3.088E-6	3.687E-5	2.450E-5	-9.822E-3	9.072E-3
hazardous waste disposed	kg.	1.201E-5	2.433E-7	4.694E-6	1.695E-5	8.624E-6	3.061E-8	6.424E-8	1.026E-6	1.529E-7	-6.547E-6	2.030E-5
non-hazardous waste disposed	kg	0.383	0.029	0.027	0.439	0.066	1.331E-5	1.608E-3	9.561E-3	0.017	-0.339	0.194
radioactive waste disposed	kg	4.845E-5	7.267E-7	6.502E-5	1.142E-4	4.401E-7	7.804E-8	1.665E-7	2.248E-7	3.540E-7	-2.498E-5	9.048E-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	0.013	0	0	0.013	0	0	0	0	0	0	0.013
exported energy electric	MJ	7.560E-3	0	0	7.560E-3	0	0	0	0	0	0	7.560E-3

## 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](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.

7270	straight coupling (2 x press)	
article no.	dimensions	conversion factor
4800059	35	0.35
4800061	42	0.55
4800070	54	0.84
4806001	64	3.13
4800081	66.7	1.75
4800092	76.1	2.35
4800103	88.9	3.65
4800114	108	5.07

7270S	slip coupling (2 x press)	
article no.	dimensions	conversion factor
4800169	35	0.59
4800171	42	0.86
4800180	54	1.37
4806604	66.7	1.94
4800202	76.1	2.39
4800213	88.9	2.95
4800224	108	4.51

7002A	bend 90° (2 x press)	
article no.	dimensions	conversion factor
4800356	35	0.70
4800367	42	1.00
4800378	54	1.56
4806021	64	3.25
4800389	66.7	3.33
4800391	76.1	4.46
4800400	88.9	7.27
4800411	108	9.88

7001A	bend 90° (press x male)	
article no.	dimensions	conversion factor
4800477	35 x Ø35	0.77
4800488	42 x Ø42	1.08
4800499	54 x Ø54	1.68
4800501	66.7 x Ø66.7	3.22
4800510	76.1 x Ø76.1	4.48
4800521	88.9 x Ø88.9	6.47
4800532	108 x Ø108	9.12

7041	bend 45° (2 x press)	
article no.	dimensions	conversion factor
4800598	35	0.53
4800609	42	0.82
4800611	54	1.16
4800620	66.7	2.61
4800631	76.1	3.41
4800642	88.9	4.91
4800653	108	8.43

7040	bend 45° (press x male)	
article no.	dimensions	conversion factor
4800719	35 x Ø35	0.57
4800721	42 x Ø42	0.86
4800730	54 x Ø54	1.27
4800741	66.7 x Ø66.7	2.97
4800752	76.1 x Ø76.1	4.02
4800763	88.9 x Ø88.9	6.02
4800774	108 x Ø108	6.91

7130	tee (3 x press)	
article no.	dimensions	conversion factor
4801643	35	1.11
4801654	42	1.49
4801665	54	2.44
4806087	64	7.67
4801676	66.7	5.35
4801687	76.1	6.02
4801698	88.9	15.18
4801709	108	13.88

7125	tee reduced (3 x press)	
article no.	dimensions	conversion factor
4801940	35 x 15 x 35	0.70
4801951	35 x 22 x 35	0.67
4801962	35 x 28 x 35	0.75
4801973	42 x 15 x 42	1.14
4801984	42 x 22 x 42	1.24
4801995	42 x 28 x 42	1.55
4802006	42 x 35 x 42	1.35
4802017	54 x 22 x 54	1.80
4802028	54 x 28 x 54	1.74
4802039	54 x 35 x 54	1.83
4802041	54 x 42 x 54	2.27
4806197	66.7 x 28 x 66.7	3.41
4805361	66.7 x 35 x 66.7	3.27
4805350	66.7 x 42 x 66.7	3.65
4805341	66.7 x 54 x 66.7	3.73
4805372	76.1 x 22 x 76.1	4.47
4805383	76.1 x 28 x 76.1	4.45
4802061	76.1 x 35 x 76.1	4.58
4802072	76.1 x 42 x 76.1	4.86
4802083	76.1 x 54 x 76.1	5.12
4802105	88.9 x 54 x 88.9	7.83
4802116	88.9 x 76.1 x 88.9	8.57
4802127	108 x 54 x 108	9.64
4805394	108 x 66.7 x 108	10.34
4802138	108 x 76.1 x 108	10.36

7126 tee reduced (3 x press)		
article no.	dimensions	conversion factor
4805416	35 x 35 x 22	1.16
4805427	35 x 35 x 28	1.14

7127 tee reduced (3 x press)		
article no.	dimensions	conversion factor
4805449	35 x 22 x 22	1.02
4805451	35 x 22 x 28	1.16
4805460	35 x 28 x 28	1.17
4805471	42 x 35 x 35	1.45
4805680	54 x 42 x 42	2.50

7128 tee reduced (3 x press)		
article no.	dimensions	conversion factor
4800191	28 x 35 x 28	1.29

7240 reducer (2 x press)		
article no.	dimensions	conversion factor
4805625	42 x 35	0.59
4805636	54 x 42	0.82

7243 reducer (male x press)		
article no.	dimensions	conversion factor
4802336	Ø35 x 22	0.30
4802347	Ø35 x 28	0.32
4802358	Ø42 x 22	0.44
4802369	Ø42 x 28	0.47
4802371	Ø42 x 35	0.44
4802380	Ø54 x 28	0.71
4802391	Ø54 x 35	0.62
4802402	Ø54 x 42	0.74
4806208	Ø66.7 x 28	1.30
4802424	Ø66.7 x 35	1.29
4802435	Ø66.7 x 42	1.29
4802446	Ø66.7 x 54	1.12
4802457	Ø76.1 x 35	1.70
4802468	Ø76.1 x 42	1.67
4802479	Ø76.1 x 54	1.74
4802481	Ø76.1 x 66.7	2.05
4802490	Ø88.9 x 42	2.39
4802501	Ø88.9 x 54	2.44
4802512	Ø88.9 x 76.1	3.02
4802523	Ø108 x 42	3.75
4802534	Ø108 x 54	3.79
4806329	Ø108 x 66.7	4.21
4802556	Ø108 x 76.1	4.40
4802567	Ø108 x 88.9	4.65

6330 straight union coupling (2 x press)		
article no.	dimensions	conversion factor
4803381	35	1.56
4803392	42	2.14
4803403	54	3.43

7301 stop end (1 x press)		
article no.	dimensions	conversion factor
4802985	35	0.27
4802996	42	0.37
4803007	54	0.59
4806340	66.7	1.88
4803029	76.1	2.09
4806351	88.9	3.04
4803040	108	4.39

7510 flanged connector PN10/16 (press x flange)		
article no.	dimensions	conversion factor
4806373	66.7 DN65	16.74
4806441	76.1 DN65	16.71
4806384	76.1 DN80	17.35
4806395	88.9 DN80	17.50
4806406	108 DN100	22.19

7520 flanged connector PN10/16 (male x flange)		
article no.	dimensions	conversion factor
4806428	66.7 DN65	15.55
4806439	76.1 DN80	17.43
4806516	108 DN100	20.66

## our sustainable spirit



reduce



rethink



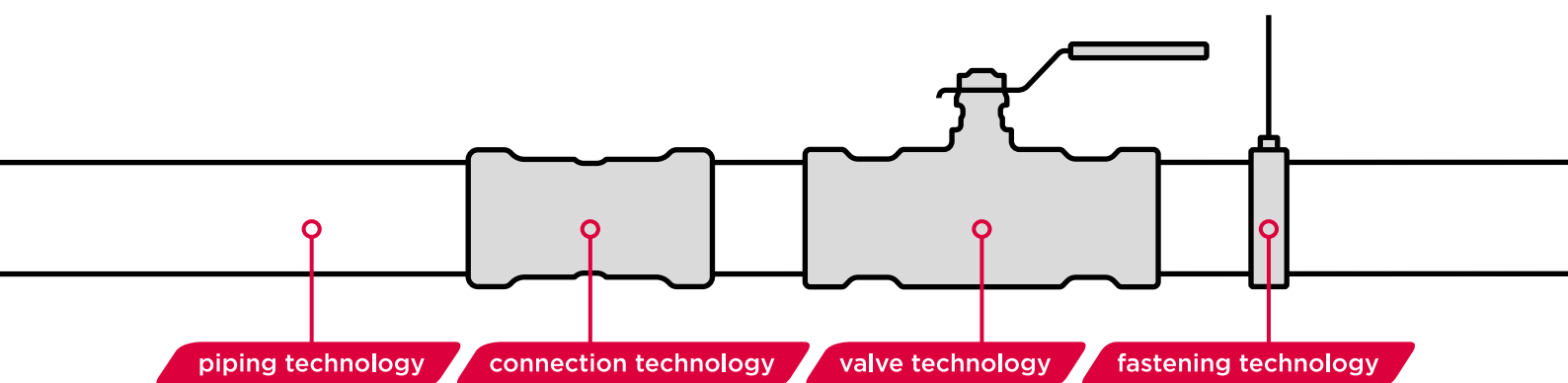
recycle

## more information?

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