SENTINEL HOLDING
INSTITUT

SHI PRODUCT PASSPORT

Find products. Certify buildings.

SHI Product Passport No.:

1275-10-1019

Roth Systemrohr Alu-Laserplus

Product group: Pipe systems / Fittings - Pipes / pipe cladding - Systems

Roth Werke GmbH
Am Seerain 2
35232 Dautphetal-Buchenau

Product qualities:

- SHI Product Assessment 2024
- QNG Qualitätssiegel Nachhaltiges Gebäude
- DGNB NEW CONSTRUCTION 2023.2
- DGNB NEW CONSTRUCTION 2023
- DGNB NEW CONSTRUCTION 2018
- BNB-BN NEUBAU V2015
- BREEAM DE NEUBAU 2018
- LEED v4.1 (outside US)

CERTIFIED SUSTAINABLE PRODUCT – SHI PRODUCT PASSPORT – SENTINEL HOLDING INSTITUT – www.sentinel-holding.eu

Köttner

Helmut Köttner
Scientific Director
Freiburg, 26 August 2026

SENTINEL HOLDING
INSTITUT

Product:
Roth Systemrohr Alu-Laserplus

SHI Product Passport no.:
1275-10-1019

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The SHI Database is the first and only database for construction products whose comprehensive processes and data accuracy are regularly verified by the independent auditing company SGS-TÜV Saar

SENTINEL HOLDING
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Product:
Roth Systemrohr Alu-Laserplus

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SHI Product Assessment 2024

Since 2008, Sentinel Holding Institut GmbH (SHI) has been establishing a unique standard for products that support healthy indoor air. Experts carry out independent product assessments based on clear and transparent criteria. In addition, the independent testing company SGS regularly audits the processes and data accuracy.

Criteria	Product category	Assessment
SHI Product Assessment		Indoor air neutral

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QNG - Qualitätssiegel Nachhaltiges Gebäude

The Qualitätssiegel Nachhaltiges Gebäude (Quality Seal for Sustainable Buildings), developed by the German Federal Ministry for Housing, Urban Development and Building (BMWSB), defines requirements for the ecological, socio-cultural, and economic quality of buildings. The Sentinel Holding Institut evaluates construction products in accordance with QNG requirements for certification and awards the QNG ready label. Compliance with the QNG standard is a prerequisite for eligibility for the KfW funding programme. For certain product groups, the QNG currently has no specific requirements defined. Although classified as not assessment-relevant, these products remain suitable for QNG-certified projects.

Criteria	Pos. / product group	Considered substances	QNG assessment
3.1.3 Schadstoffvermeidung in Baumaterialien			QNG ready - Not relevant for assessment

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Product:
Roth Systemrohr Alu-Laserplus

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DGNB New Construction 2023.2

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact			Not relevant for assessment

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Roth Systemrohr Alu-Laserplus

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DGNB New Construction 2023

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings. The 2023 version sets high standards for ecological, economic, socio-cultural, and functional aspects throughout the entire life cycle of a building.

Criteria	Assessment
SOC2.1 Barrier-free design (*)	May positively contribute to the overall building score

Criteria	Assessment
ECO1.1 Life cycle cost (*)	May positively contribute to the overall building score

Criteria	Assessment
ENV2.2 Potable water demand and waste water volume (*)	May positively contribute to the overall building score

Criteria	Assessment
ENV1.1 Climate action and energy (*)	May positively contribute to the overall building score

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 03.05.2024 (3rd edition)			Not relevant for assessment

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact, 29.05.2025 (4th edition)			Not relevant for assessment

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SHI Product Passport no.:
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DGNB New Construction 2018

The DGNB System (German Sustainable Building Council) assesses the sustainability of various types of buildings. It can be applied to both large-scale private and commercial projects as well as smaller residential buildings.

Criteria	No. / Relevant building components / construction materials / surfaces	Considered substances / aspects	Quality level
ENV 1.2 Local environmental impact			Not relevant for assessment

SENTINEL HOLDING
INSTITUT

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Roth Systemrohr Alu-Laserplus

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BNB-BN Neubau V2015

The Bewertungssystem Nachhaltiges Bauen (Assessment System for Sustainable Building) is a tool for evaluating public office and administrative buildings, educational facilities, laboratory buildings, and outdoor areas in Germany. The BNB was developed by the former Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and is now overseen by the Federal Ministry for Housing, Urban Development and Building (BMWSB).

Criteria	Pos. / product type	Considered substance group	Quality level
1.1.6 Risiken für die lokale Umwelt			Not relevant for assessment

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BREEAM DE Neubau 2018

BREEAM (Building Research Establishment Environmental Assessment Methodology) is a UK-based building assessment system that evaluates the sustainability of new constructions, refurbishments, and conversions. Developed by the Building Research Establishment (BRE), the system aims to assess and improve the environmental, economic, and social performance of buildings.

Criteria	Product category	Considered substances	Quality level
Hea 02 Indoor Air Quality			Not relevant for assessment

SENTINEL HOLDING
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Product:
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LEED v4.1

LEED (Leadership in Energy and Environmental Design) is an internationally recognised building certification system developed by the U.S. Green Building Council. It is one of the most widely used sustainability standards for buildings worldwide and is particularly applied in internationally oriented projects. LEED assesses buildings holistically across categories such as energy efficiency, resource conservation, material selection, indoor environmental quality and site sustainability. Depending on the number of points achieved, projects are awarded one of the certification levels: LEED Certified, Silver, Gold or Platinum.

Criteria	Product category	Considered substances	Assessment
EQ Credit: Low-Emitting Materials			Not relevant for assessment

SENTINEL HOLDING
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Product:
Roth Systemrohr Alu-Laserplus

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Product labels

In the construction industry, high-quality materials are crucial for a building's indoor air quality and sustainability. Product labels and certificates offer guidance to meet these requirements. However, the evaluation criteria of these labels vary, and it is important to carefully assess them to ensure products align with the specific needs of a construction project.

Products bearing the Sentinel Holding Institute QNG-ready seal are suitable for projects aiming to achieve the "Qualitätssiegel Nachhaltiges Gebäude" (Quality Seal for Sustainable Buildings). QNG-ready products meet the requirements of QNG Appendix Document 3.1.3, "Avoidance of Harmful Substances in Building Materials." The KfW loan program Climate-Friendly New Construction with QNG may allow for additional funding.

Product:
Roth Systemrohr Alu-Laserplus

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Legal notices

(*) These criteria apply to the construction project as a whole. While individual products can positively contribute to the overall building score through proper planning, the evaluation is always conducted at the building level. The information was provided entirely by the manufacturer.

Find our criteria here: https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfkriterien%20f%C3%BCr%20Produkte

The SHI Database is the first and only database for construction products whose comprehensive processes and data accuracy are regularly verified by the independent auditing company SGS-TÜV Saar

Publisher

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Rohr-Installationssystem – Alu-Laserplus
Datenblatt

Beschreibung

Die Roth Systemrohre Alu-Laserplus sind 5-schichtige Sicherheitsrohre aus PE-RT (Polyethylen mit erhöhter Temperaturbeständigkeit) mit Aluminiummantel gemäß DIN EN ISO 21003-2. Das dickwandige Innenrohr sorgt für hohe Druck- und Temperaturstabilität. Die stumpf-lasergeschweißte Aluminiumschicht gewährleistet die Formstabilität nach dem Biegen, bei gleichzeitiger Sauerstoffdichtigkeit. Das Alu-Laserplusrohr besitzt durch seinen speziellen Aufbau und die Verwendung einer im Verbund integrierten Aluminiumschicht, eine sehr geringe temperaturabhängige Längenausdehnung. Durch die hochwertige Herstellung der Rohre ist zudem die Innenwandung besonders glatt, woraus sehr geringe Druckverluste resultieren und Inkrustationen vermieden werden. Die spezielle Rohrkonstruktion hat hohe Sicherheitsreserven für eine lange Lebensdauer gemäß den entsprechenden Normvorgaben.



Die Systemrohre sind beständig gegen Spannungsrissbildung.

Abmessungen und Wasserinhalt

Rohrbezeichnung	14 × 2	17 × 2	20 × 2	26 × 3	32 × 3	40 × 3,5	50 x 4	63 x 4,5
Rohraußendurchmesser [mm]	14	17	20	26	32	40	50	63
Rohrinnendurchmesser [mm]	10	13	16	20	26	33	42	54
Wasserinhalt [l/m]	0,08	0,13	0,20	0,32	0,53	0,87	1,41	2,28
max. Länge entsprechend 3-Liter-Regel [m]	38,2	22,6	14,9	9,5	5,6	3,4	2,1	1,3

Technische Daten

Einsatzbereich	Trinkwasser-Installationen Heizungs-Installationen
Werkstoff	PE-RT/Al/PE-RT
Merkmale	flexibel, formstabil
Farbe	weißes Mantelrohr mit schwarzer Signierung
Rohrschichten	5-Schicht-Rohr
Wärmeleitfähigkeit [W/mK]	0,35
mittlerer linearer Längenausdehnungs-koeffizient [1/K]	0,25 x 10^{-4}
Baustoffklasse	B2 nach DIN 4102 E nach EN 13501-1
min. Biegeradius	5 x da

13. Dezember 2016 · 01 ·Technische Änderungen vorbehalten.

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min. Biegeradius mit Biegefeder	4 x da
Rohrrauigkeit [mm]	0,0003
max. Temperatur dauerhaft [°C]	70 (bei 10 bar)
max. Temperatur kurzzeitig [°C]	95 (bei 6 bar)
max. Druck [bar]	10
Prüf- und Zertifizierungsgrundlagen	DVGW W542, UBA KTW, DVGW W270, DVGW W534, EN ISO 21003, DIN 4726
geprüfte Rohrklassen	Class 1, 2, 4 / 10bar; Class 5 / 6bar (8bar)
Zulassungsnummer (System)	DW-8501BR0037
Verbindungstechnik	Roth PressCheck®
Montagetemperatur [°C]	-20 bis +40
freigegebener Wasserzusatz	Roth Frostschutzmittel FKN 28

Qualitätssicherung durch Fremd- und Eigenüberwachung

Im Rahmen von Überwachungsverträgen werden regelmäßig die wichtigsten Eigenschaftswerte überprüft. Je nach Land werden die Produkte überwacht durch:

IMA-D, TGM-A, KIWA-NL, DTI-DK, VTT-Fi, CSTB-F, WRAS-GB

Das Systemrohr Alu-Laserplus wird fertigungsbegleitend, gemäß aller relevanten Produktnormen, strengen Kontrollen unterzogen.

Rohrverbindungen

Die Rohrverbindungen erfolgen ausschließlich mit den Roth Pressverbindern aus PPSU oder einem entzinkungsbeständigen Sondermessing, mit definierter Leckage im unverpressten Zustand, die eine unlösbare, kraftschlüssige und dauerhaft dichte Verbindung sicherstellen.

Transport und Lagerung

Das Roth Systemrohr Alu-Laserplus wird durch spezielle Stopfen und den Karton vor Verschmutzung sowie Beschädigungen geschützt. Das Rohr sollte keiner direkten Sonneneinstrahlung ausgesetzt werden.

Chemische Beständigkeit

Das Roth Systemrohr Alu-Laserplus ist generell vor direktem Kontakt mit Chemikalien, Lösungsmitteln, Klebern, Fetten/Ölen und aggressiven Gasen/Medien zu schützen.

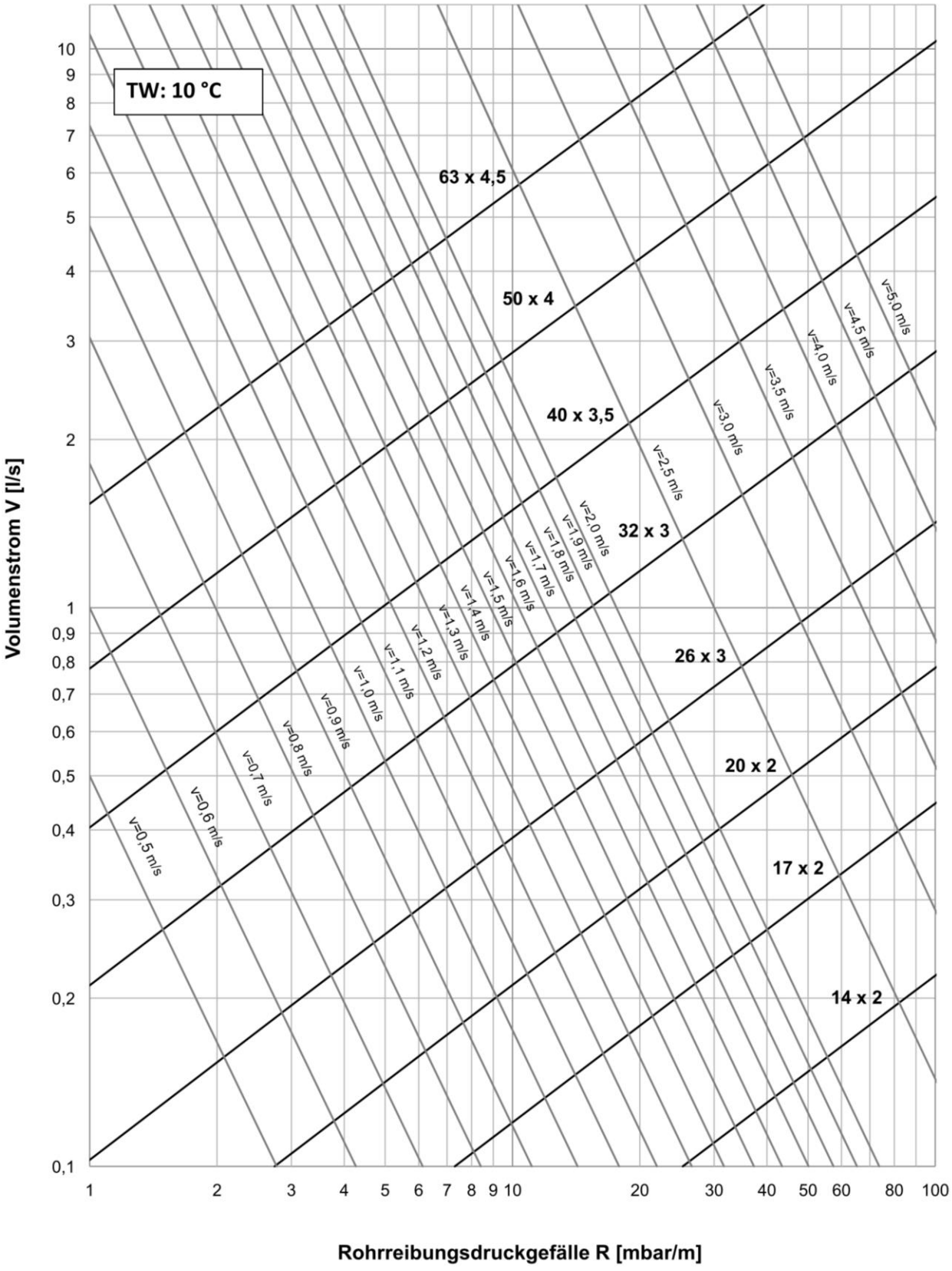
Anmerkung: Die jeweils gültigen Herstellerangaben/Montagevorschriften für die Systemlösungen sind zu beachten.

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Leistungsdaten

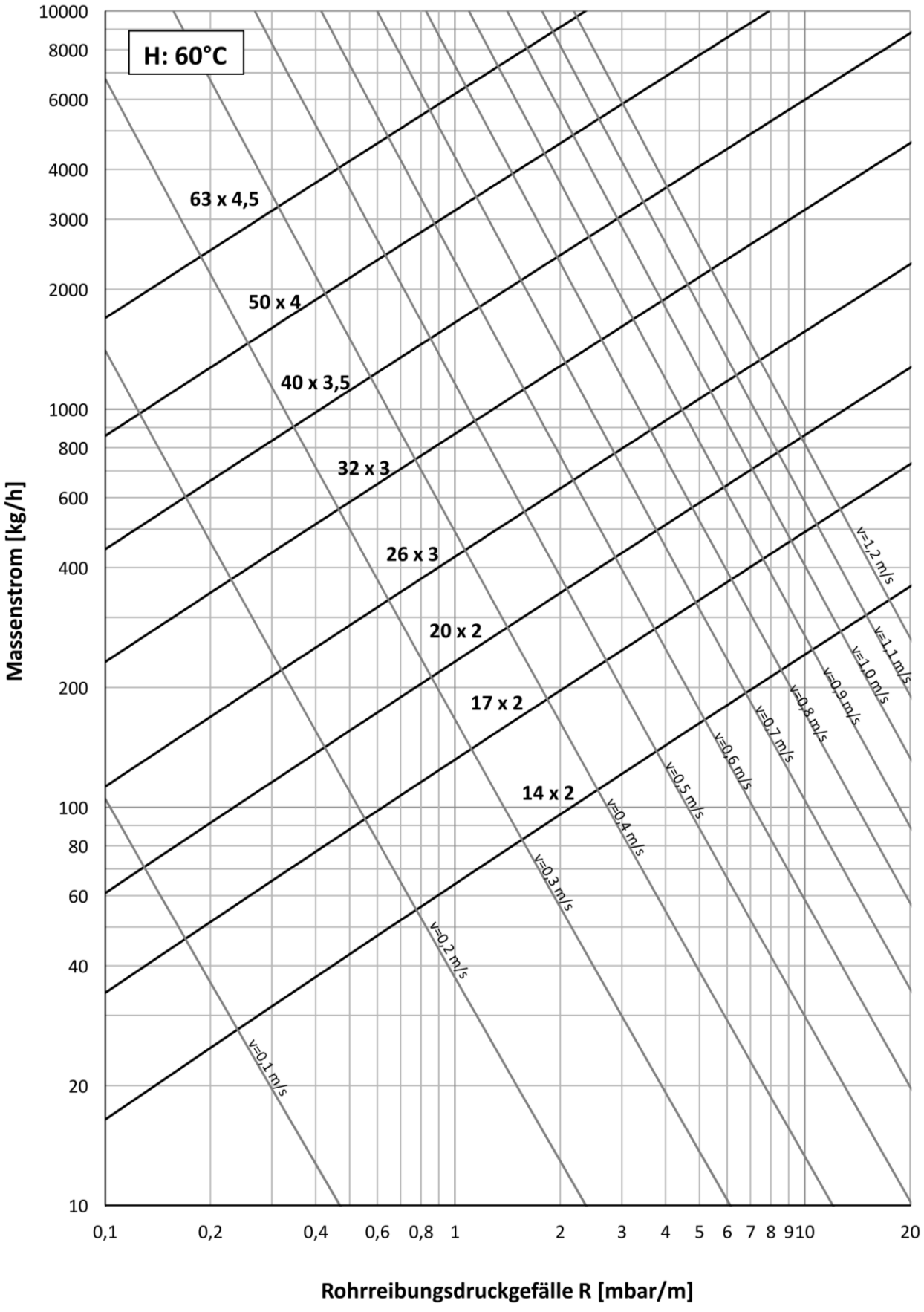
Druckverlustdiagramm Alu-Laserplus für Trinkwasseranwendung



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Druckverlustdiagramm Alu-Laserplus für Heizungsanwendung



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13. Dezember 2016 · 01 · Technische Änderungen vorbehalten.

epd-global
Powered by EPD-Norway

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Roth Alu-LaserPlus®



EPD-Global

Owner of the declaration:
Roth North Europe A/S

Product:
Roth Alu-LaserPlus®

Declared unit:
1 kg

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR Part A: Construction products and services. Ver. 2.0 March 2021

Program operator:
EPD-Global

Declaration number:

Issue date:

Valid to:

EPD software:
LCAno EPD generator ID: 1335679

General information

Product:

Roth Alu-LaserPlus®

Owner of the declaration:

Roth North Europe A/S
Contact person: Stine Bøgh Petersen
Phone: +45 47 33 97 00
e-mail: sustainability@roth-northeurope.com

Program operator:

EPD-Global
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-global.com

Manufacturer:

Roth North Europe A/S
Centervej 5
3600 Frederikssund, Denmark

Declaration number:

Place of production:

Roth Germany
Germany

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR Part A: Construction products and services. Ver. 2.0 March 2021

Management system:

EN ISO 9001:2015, EN ISO 14001:2015

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD-Global shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

34012113

Declared unit:

1 kg Roth Alu-LaserPlus®

Issue date:

Declared unit with option:

A1-A3, A4, A5, C1, C2, C3, C4, D

Valid to:

Year of study:

2024

Functional unit:

No functional unit declared

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Global's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Global, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Global's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD-Global.

Developer of EPD: Stine Bøgh Petersen

Reviewer of company-specific input data and EPD: Kim Haugsted Neubert

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPD-Global's procedures and guidelines for verification and approval of EPD tools.

Approved:

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Product:

Product description:

The Alu-LaserPlus® pipe is a 5-layer pipe that utilizes the best properties of PE-RT and metal. The couplings to the system are based on pressing technology, which is easy to install and gives the safest result.

The Alu-LaserPlus® pipe is a high-quality product specially developed for heating, cooling and hot water. What is unique to Roth Alu-LaserPlus® pipe is the aluminum sheath, which is laser welded to achieve the best tolerance and homogeneity. The pipe is made of two layers of PE-RT with a layer of aluminum in between. Due to the flexibility of the PE-RT, the Roth Alu-LaserPlus® pipe becomes the market's most flexible pipe to work with.

Production of the Alu-LaserPlus® pipe takes place at the company's own German factories, ensuring stringent quality control measures aligned with ISO 9001 standards. This commitment to quality assurance further reinforces the reliability and performance of the Alu-LaserPlus® pipe.

The pipe is available in different dimensions to cater to various installation needs, including sizes of 17 x 2.0mm, 20 x 2.0mm, 26 x 3.00 mm, 32 x 3.00mm, 40 x 3.5mm, 50 x 4.00 mm and 63 x 4,5 mm.

Product specification:

Materials	Value	Unit
Polyethylene mid density (basic pipe)	60-70	%
Aluminum	20-30	%
Polyethylene (adhesive)	0-5	%
Polyethylene (process aid)	0-5	%
Packaging, cardboard box	0-5	%
Packaging, plastic film	0-5	%
Packaging, wooden pallet	0-5	%
Packaging, plastic tape	0-5	%

Technical data:

The Alu-LaserPlus® pipe is one of the most flexible multilayer pipes on the market. It exhibits excellent heat stability, allowing for a permissible operating temperature of up to 70°C (with a maximum short-term temperature of 95°C) at an operating pressure of 6 bar (with a maximum short-term pressure of 10 bar). Additionally, it possesses a heat-conduction capacity of 0.35 W/mK.

The Alu-LaserPlus® pipe also proves to be very strong and robust in long-term tests at high temperatures. An Alu-LaserPlus® pipe features a safety factor that goes well beyond the normal requirement. Continuous tests are performed in accordance with DIN 16892.

Market:

Europe

Reference service life, product:

50 years (Haugbølle, K., et.al, 2022)

Reference service life, building or construction works:

50 years (Haugbølle, K., et.al, 2022)

LCA: Calculation rules

Declared unit:

1 kg Roth Alu-LaserPlus®

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Aluminium foil	ecoinvent 3.6	Database	2019
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Wood	ecoinvent 3.6	Database	2019
Plastic - Polyethylene (LDPE)	ecoinvent 3.6	Database	2019
Plastic - Polyethylene (MDPE)	ecoinvent 3.6	Database	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

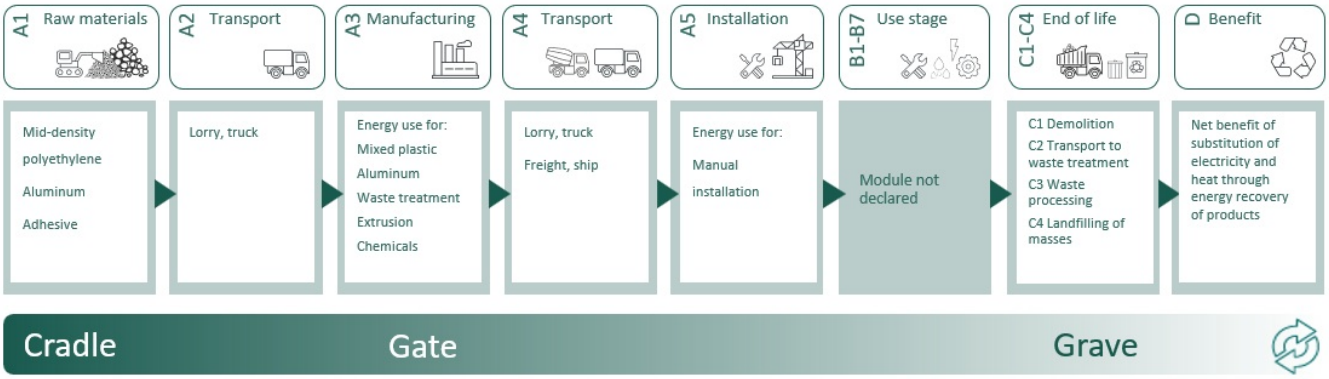
Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

Module A1: Packaging has been included by average use of packaging pr. 1 kg of product. The pipes are assumed packaged in a cardboard box, closed with tape, wrapped with plastic foil and stacked on a single-use wooden pallet. Other packaging modes can be requested and provided in a project specific EPD.

Module A4: A generic transportation distance of 300km is assumed. Other transportation distances and modes can be requested and provided in a project specific EPD.

Module C2: The estimated transportion distance to the waste handling facility in this EPD is 100 km, assuming the use of a truck as the transport method.



Additional technical information:

No technical information declared.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36.7 %	300.00	0.043	l/tkm	12.90

Assembly (A5)	Unit	Value			
Waste, packaging, pallet, EUR wooden pallet, single use, average treatment (kg)	kg	0.04571			
Waste, packaging, plastic film (LDPE), to average treatment (kg)	kg	0.00251			
Waste, packaging, corrugated board box, to average treatment (kg)	kg	0.08			
Waste, packaging, plastic tape, to average treatment (kg)	kg	0.00002			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 5 (km) - Europe	36.7 %	100.00	0.044	l/tkm	4.40

Waste processing (C3)	Unit	Value			
Waste treatment per kg Polyethylene (PE), incineration with fly ash extraction (kg)	kg	0.744			
Waste, Materials to recycling (kg)	kg	0.2381			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	kg	0.02622			
Waste, scrap aluminium, to landfill (kg)	kg	0.01792			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity (MJ)	MJ	1.44			
Substitution of thermal energy, district heating (MJ)	MJ	21.83			
Substitution of primary aluminium with net scrap (kg)	kg	0.1613			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
	Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	5.61E+00	5.53E-02	2.08E-01	0	1.88E-02	2.24E+00	1.72E-03	-1.60E+00
	GWP-fossil	kg CO_2 -eq	5.78E+00	5.53E-02	2.72E-03	0	1.88E-02	2.24E+00	1.72E-03	-1.56E+00
	GWP-biogenic	kg CO_2 -eq	-1.83E-01	2.29E-05	2.05E-01	0	7.67E-06	1.81E-05	1.59E-06	-6.84E-03
	GWP-luluc	kg CO_2 -eq	1.46E-02	1.97E-05	7.59E-07	0	6.57E-06	2.66E-06	3.20E-07	-3.16E-02
	ODP	kg CFC11 -eq	2.43E-07	1.25E-08	4.81E-10	0	4.29E-09	1.72E-09	2.24E-10	-9.22E-03
	AP	mol H+ -eq	3.10E-02	1.59E-04	1.63E-05	0	7.69E-05	2.81E-04	7.03E-06	-1.07E-02
	EP-FreshWater	kg P -eq	2.36E-04	4.42E-07	2.58E-08	0	1.48E-07	1.72E-07	2.45E-08	-6.66E-05
	EP-Marine	kg N -eq	4.85E-03	3.14E-05	6.50E-06	0	2.28E-05	1.35E-04	2.28E-06	-1.56E-03
	EP-Terrestial	mol N -eq	5.48E-02	3.52E-04	6.83E-05	0	2.52E-04	1.46E-03	2.59E-05	-1.72E-02
	POCP	kg NMVOC -eq	1.85E-02	1.35E-04	1.83E-05	0	7.72E-05	3.49E-04	7.19E-06	-5.56E-03
	ADP-minerals&metals[1]	kg Sb-eq	3.26E-05	1.53E-06	5.25E-08	0	5.09E-07	7.86E-08	9.81E-09	9.42E-07
	ADP-fossil[1]	MJ	9.79E+01	8.36E-01	3.34E-02	0	2.84E-01	1.47E-01	1.88E-02	-2.00E+01
	WDP[1]	m^3	4.97E+02	8.09E-01	4.81E-02	0	2.71E-01	3.32E-01	2.93E-01	-8.43E+02

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 the 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 for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts:

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	3.27E-07	3.39E-09	2.15E-10	0	1.35E-09	1.10E-09	9.70E-11	-1.63E-07
	IRP[2]	kgBq U235 -eq	1.39E-01	3.65E-03	1.34E-04	0	1.24E-03	2.48E-04	1.01E-04	-9.08E-02
	ETP-fw[1]	CTUe	1.20E+02	6.20E-01	4.14E-02	0	2.09E-01	4.38E-01	1.11E+01	-3.15E+01
	HTP-c[1]	CTUh	5.54E-09	0.00E+00	3.00E-12	0	0.00E+00	4.90E-11	2.00E-12	-3.81E-09
	HTP-nc[1]	CTUh	1.09E-07	6.77E-10	1.19E-10	0	2.26E-10	1.88E-09	5.40E-11	-5.17E-08
	SQP[1]	dimensionless	1.83E+01	5.85E-01	2.17E-02	0	1.96E-01	1.78E-02	5.21E-02	-1.23E+01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use										
Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	7.22E+00	1.20E-02	6.16E-04	0	4.00E-03	4.32E-03	1.61E-03	-1.78E+01
	PERM	MJ	1.29E+00	0.00E+00	-1.29E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	8.51E+00	1.20E-02	-1.29E+00	0	4.00E-03	4.32E-03	1.61E-03	-1.78E+01
	PENRE	MJ	6.62E+01	8.36E-01	3.34E-02	0	2.84E-01	1.47E-01	1.88E-02	-2.00E+01
	PENRM	MJ	3.17E+01	0.00E+00	-1.07E-01	0	0.00E+00	-3.16E+01	0.00E+00	0.00E+00
	PENRT	MJ	9.79E+01	8.36E-01	-7.39E-02	0	2.84E-01	-3.15E+01	1.88E-02	-2.00E+01
	SM	kg	1.15E-01	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	4.72E-01	4.28E-04	1.91E-05	0	1.43E-04	1.22E-04	3.65E-05	-4.65E-03
	NRSF	MJ	1.57E-02	1.53E-03	1.41E-04	0	5.11E-04	0.00E+00	2.68E-03	-6.53E-01
	FW	m^3	5.15E-02	8.94E-05	1.95E-05	0	2.99E-05	4.15E-04	1.96E-05	-4.95E-02

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 = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	3.18E-02	4.31E-05	0.00E+00	0	1.45E-05	0.00E+00	2.22E-02	5.95E-03
	NHWD	kg	8.24E-01	4.07E-02	1.28E-01	0	1.36E-02	0.00E+00	3.01E-02	-4.59E-01
	RWD	kg	1.46E-04	5.69E-06	0.00E+00	0	1.93E-06	0.00E+00	7.77E-08	-8.39E-05

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	8.42E-02	0.00E+00	7.57E-02	0	0.00E+00	2.38E-01	0.00E+00	0.00E+00
	MER	kg	2.17E-02	0.00E+00	5.09E-02	0	0.00E+00	7.44E-01	0.00E+00	0.00E+00
	EEE	MJ	2.71E-02	0.00E+00	3.61E-02	0	0.00E+00	1.44E+00	0.00E+00	0.00E+00
	EET	MJ	4.10E-01	0.00E+00	5.46E-01	0	0.00E+00	2.18E+01	0.00E+00	0.00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9.0 E-03 = 9.0*10-3 = 0.009"

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in accompanying packaging	kg C	5.59E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase:

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, Germany (kWh)	ecoinvent 3.6	585.93	g CO2-eq/kWh

Dangerous substances:

The product contains no substances given by the REACH Candidate list.

Indoor environment:

Not relevant. No tests have been carried out on the product concerning indoor environment.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	5.85E+00	5.53E-02	2.73E-03	0	1.88E-02	2.24E+00	1.77E-03	-1.53E+00

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21
Graafland, J. and Ruttenborg, M. (2023) EPD generator for Plastic products, Background information for EPD generator application and LCA data, LCA.no report number: 06.23
NPCR Part A: Construction products and services. Ver. 2.0. March 2021, EPD-Norge.
Haugbølle, K., Mahdi, V., Morelli, M., & Wahedi, H. (2022). BUILD Levetidstabel. BUILD - Institut for Byggeri, by Og Miljø, 2, 978-87-563-2072–6. https://build.dk/Pages/BUILD-levetidstabel.aspx

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ECO PLATFORM EPD VERIFIED	ECO Platform ECO Portal	web: web:	www.eco-platform.org ECO Portal

DVGW-Baumusterprüfzertifikat

DVGW type examination certificate

DW-8236BP5589
Registriernummer
registration number

Anwendungsbereich ***field of application***	Produkte der Wasserversorgung *products of water supply*
Vertreiber ***distributor***	ROTH WERKE GmbH Am Seerain, D-35232 Dautphetal
Produktart ***product category***	Verbundrohre für die Trinkwasserinstallation: PE-RT/Al/PE-RT-Rohr, Fert.-Gr. 1 (8236)
Produktbezeichnung ***product description***	Verbundrohr PE-RT/Al/PE-RT für die Trinkwasserinstallation
Modell ***model***	Roth Alu-Laserplus
Prüfberichte ***test reports***	Kontrollprüfung Labor: V381/18 vom 19.12.2018 (IMA) Mechanikprüfung: B432/08.1 vom 27.10.2009 (IMA) Baumusterprüfung: B162.1/4 vom 18.08.2004 (IMA) KTW-Prüfung: K-299080-18-Bs/st vom 06.06.2018 (WHY) Mikrobiologische Prüfung: W-294566-18-Sl/Krü vom 08.02.2018 (WHY)
Prüfgrundlagen ***test basis***	DVGW W 542 (01.08.2009) UBA KTW (07.03.2016) DVGW W 270 (01.11.2007)
Ablaufdatum / AZ ***date of expiry / file no.***	18.08.2024 / 19-0292-WNV

70028-04-A-DE

17.05.2019 LE B-1/2
Datum, Bearbeiter, Blatt, Leiter der Zertifizierungsstelle
date, issued by, sheet, head of certification body

DVGW CERT GmbH ist von der DAkkS nach DIN EN ISO/IEC 17065:2013 akkreditierte Stelle für die Zertifizierung von Produkten der Energie- und Wasserversorgung.

DVGW CERT GmbH is an accredited body by DAkkS according to DIN EN ISO/IEC 17065:2013 for certification of products for energy and water supply industry.

DAkkS
Deutsche Akkreditierungsstelle
D-ZE-16028-01-05

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Typ *type*	Technische Daten *technical data*	Bemerkungen *remarks*
Roth Alu-Laserplus	Fertigungsgruppe: 1	

Verwendungshinweise / Bemerkungen
hints of utilization / remarks

geprüfte Abmessungen: 14 x 2,0 mm, 16 x 2,0 mm, 17 x 2,0 mm, 20 x 2,0 mm, 25 x 2,5 mm, 32 x 3,0 mm, 40 x 3,5 mm, 50 x 4,0 mm, 63 x 4,5 mm

ÖSTERREICHISCHE VEREINIGUNG
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GEPRÜFT

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Akkreditierung Austria
0922
ISO/IEC 17065

ÖVGW-Zertifikat

über die Verleihung des Rechtes zur Führung der ÖVGW-Qualitätsmarke Wasser

Registrierungsnummer

W 1.433

Geltungsdauer

bis Ende November 2024

Inhaber

Roth Werke GmbH
Am Seerain
35232 Dautphetal
DEUTSCHLAND

◆ Vertrieb in Österreich

Roth Austria Vertriebsniederlassung
Dinstlstraße 4
3500 Krems

Hersteller

System & Verbinder: Roth Werke GmbH / DE
Rohre: Becker Plastics GmbH / DE

Prüfungsart

Verlängerungsprüfung

Prüfbericht

TGM – VA KU 29222/1 vom 12. Januar 2022

Qualitätsstandards/Prüfrichtlinien

- QS-W 301 Ausgabe Mai 2020

Produkt

Roth Trinkwasser – System

Mehrschichtverbund-Rohre M mit weißem Außenmantel PE-RT Typ II/Al/PE-RT Typ II

in den Dimensionen:
(14x2,0), (17x2,0), (20x2,0), (26x3,0), (32x3,0), (40x3,5), (50x4,0) und (63x4,5) mm

(Anwendungsklassen 1, 2 / p_D = 10 bar)

Pressverbinder aus Messing oder PPSU

Weitere Angaben siehe Seite 2

ZVR 818158001

Die Verleihung erfolgt unter Zugrundelegung der Allgemeinen Geschäftsbedingungen GW 30 ÖVGW-Qualitätsmarke Produkte Gas & Wasser „Voraussetzungen für die Zuerkennung der ÖVGW-Qualitätsmarke für Produkte der Gas- und Wasserversorgung."

Wien, am 27. Jänner 2022

Dipl.-Ing (FH) Alexander Schwanzer
Leiter der ÖVGW-Zertifizierungsstelle

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Produkt (Fortsetzung)

Pressverbinder aus PPSU:	**Dimensionen (mm):**
T-Stück	14x14x14, 17x17x17, 20x20x20, 25x25x25, 32x32x32, 40x40x40, 50x50x50
T-Stück im Abgang reduziert	17x14x17, 20x14x20, 20x17x20, 25x17x25, 25x20x25, 32x17x32, 32x20x32, 32x25x32, 40x20x40, 40x25x40, 40x32x40, 50x40x50
T-Stück im Durchgang reduziert	17x17x14, 20x20x17, 25x25x20
T-Stück im Abgang und Durchgang reduziert	17x14x14, 20x17x17, 25x17x17, 25x17x20, 25x20x20, 32x20x20, 32x20x25, 32x25x25
T-Stück im Abgang erweitert	17x20x17, 20x25x17, 20x25x20, 20x32x20, 25x32x25
Kupplung	14x14, 17x17, 20x20, 25x25, 32x32, 40x40, 50x50
Kupplung reduziert	17x14, 20x14, 20x17, 25x17, 25x20, 32x20, 32x25, 40x32, 50x40
Winkel 90°	14x14, 17x17, 20x20, 25x25, 32x32, 40x40, 50x50
Winkel 45°	25x25, 32x32, 40x40

Pressverbinder aus Messing:	**Dimensionen (mm):**
T-Stück	63x63x63
T-Stück im Abgang reduziert	50x20x50, 50x25x50, 50x32x50, 63x25x63, 63x32x63, 63x40x63, 63x50x63
T-Stück im Abgang und Durchgang reduziert	40x32x32, 63x50x50
Kupplung	63x63
Kupplung reduziert	40x25, 50x32, 63x40, 63x50
Winkel 90°	63x63
Winkel 45°	50x50, 63x63
Übergangsmuffe mit IG	14x½", 17x½", 17x¾", 20x½", 20x¾", 25x¾", 25x1", 32x1", 32x1¼", 40x1¼", 40x1½", 50x1½", 63x2"
Übergangsnippel mit AG	14x½", 14x¾", 17x½", 17x¾", 20x½", 20x¾", 25x¾", 25x1", 32x1", 32x1¼", 40x1¼", 50x1½", 63x2"
Übergangswinkel mit IG	17x½", 17x¾", 20x½", 20x¾", 25x¾", 25x1", 32x1", 32x1¼", 40x1½", 50x1½"
Übergangswinkel mit AG	14x½", 17x½", 17x¾", 20x½", 20x¾", 25x¾", 25x1", 32x1", 32x1¼", 40x1¼", 50x1½"
Wandscheibe mit IG	14x½", 17x½", 20x½", 20x¾", 25x¾"
U-Wandscheibe mit IG	17x½"x17, 17x2½"x20, 20x½"x17, 20x½"x20
Thermoentkoppler mit IG	17-20
Übergangsstück Meplafix mit IG	17x½"
Übergangswinkel Meplafix mit IG	17x½"
Durchgangs-T-Stück Meplafix mit IG	17x½"x17
Wandscheibenset Typ A/SE (153) mit IG	17x½", 20x½"
Wandscheibenset Typ I/SE (153) mit IG	17x½", 20x½"
Wandscheibenset Typ I/SE (80) mit IG	17x½"
U-Wandscheibenset Typ A/SE (153) mit IG	17x½"x17, 20x½"x20
U-Wandscheibenset Typ I/SE (153) mit IG	17x½"x17, 20x½"x20

Dipl-Ing (FH) Alexander Schwanzer
Leiter der ÖVGW-Zertifizierungsstelle

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ISO/IEC 17065

Produkt (Fortsetzung)

T-Stück mit IG	17x½"x17, 17x¾"x17, 20x½",20, 20x¾"x20, 25x½"x25, 25x¾"x25, 32x½"x32, 32x¾"x32, 40x¾"x40, 40x1"x40, 50x1"x50, 63x1"x63
Anschlusswinkel mit IG/AG	17x½"(¾"AG)
Geräteverschraubungen mit AG	20x¾", 20x1", 25x1", 32x1", 32x1¼"
Geräteverschraubungen mit IG	20x¾", 20x1", 25x1", 32x1", 32x1¼"
Pressverschraubungen	14, 17, 20
Anschlussverschraubungen mit IG	17x½", 17x¾", 20x¾", 20x1", 25x¾", 25x1", 32x¾", 32x1", 32x1¼", 40x1½"

Dipl-Ing (FH) Alexander Schwanzer
Leiter der ÖVGW-Zertifizierungsstelle

CERTIFICATE

Technical-approval-with-product certificate
K43968/06

Issued *2021-08-15*

Replaces *K43968/05*

Roth Werke System

STATEMENT BY KIWA
With this technical approval-with-product certificate, issued in accordance with the Kiwa Regulations for Certification, Kiwa declares that legitimate confidence exists that the products supplied by

Roth Werke GmbH

As specified in this technical approval-with-product certificate and marked with the Kiwa®-mark in the manner as indicated in this technical approval-with-product certificate may, on delivery, be relied upon to comply with Kiwa evaluation guideline BRL-K536 G "Plastics piping systems of PE-RT/Al intended for transport of hot and cold drinking water" dated 15-12-2011, inclusive amendment sheet dated 13-03-2018."

Within the framework of this technical approval-with-product certificate Kiwa does not impose any inspections with regard to the production of other parts of the plastics piping system, nor the manufacturing of the plastics piping system itself.

Ron Scheepers
Kiwa

283171015

Publication of this certificate is allowed.
Advice: consult www.kiwa.nl in order to ensure that this certificate is still valid.

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PRODUCTS RvA C 002

Roth Werke System

PRODUCT SPECIFICATION

Plastics piping systems of PE-RT/Al intended for the transport of cold and heated drinking water according to BRL-K536 part G

The system consists of:

- PE-RT/Al/PE-RT pipes manufactured by Becker Plastics (certificate K44813);
- PPSU press fittings (dimensions 16 to 50 mm) manufactured by Roth Werke GmbH (certificate K43967);
- Metal press fittings manufactured by Roth Werke GmbH (certificate K67757).

The pipe dimensions as indicated in the table below belong to this certificate.

Nominal outside diameter (mm)	Wall thickness (mm)	Wall thickness aluminum layer (mm)
16	2.0	0.2
17	2.0	0.2
20	2.0	0.2
26	3.0	0.4
32	3.0	0.4
40	3.5	0.6
50	4.0	0.6
63	4.5	0.8

Color pipes : inside naturel, outside white or silver
Color PPSU fittings : grey
Color metal fittings : brass

Press profile: Special Roth press profile

Fitness for contact with drinking water

The pipes and fittings used in this system are approved on the basis of the requirements for hygienic aspects set in the "Regeling materialen en chemicaliën drink- en warm tapwatervoorziening" dated 01-07-2017 (“Materials and chemicals in the supply of drinking water and warm tap water Regulation”; published in the Government Gazette). The criteria for these hygienic aspects are recorded in the respective product certificates.

MARKING

The products are marked with the Kiwa-mark.

Pipes

The minimum required marking on the pipes shall be:

- **KIWA** or * + Class 2 / 10 bar;
- the manufacturer’s name, trade name, system name, logo or certificate number of accompanying technical approval (system)certificate;
- material identification: PE-RT type 2;
- the buildup of the pipe: PE-RT/Al/PE-RT;
- nominal outside diameter and nominal wall thickness of the pipe in mm;
- production code.

Location of the marks: on every pipe at intervals of not more than 2 m.
The realization of the marks is as follows: clear durable and indelible.

*) for smaller diameters permitted by Kiwa.

Roth Werke System

Fittings

The minimum required marking on the fittings shall be:

- **KIWA** or on small products or or KK * or KK * (if not possible **KIWA** only on the smallest packaging unit)**;
- manufacturer's name, trade name or logo;
- nominal outside diameter of the corresponding pipe in mm;
- production code.

Location of the marks: on every fitting.
The realization of the marks is as follows: clear, durable and indelible.

The smallest packaging unit of the fittings are provided with at least the following information:

- **KIWA** ;
- manufacturer's name, trade name, system name, logo or certificate number of the accompanying technical approval (system) certificate, in accordance with the marking of the connecting pipe;
- nominal outside diameter and nominal wall thickness of the corresponding pipe in mm;
- material identification in case the fitting body is made of plastics.

Location of the marks: on every package.
The realization of the marks is as follows: clear, durable and indelible.

*) for small fittings marking with only KK is permitted
**) only after approval by Kiwa

LOGISTICS

Production and assembly of the system is laid down in the annex of the certification agreement.

APPLICATION AND USE

The piping system is intended to be used for the transport of cold and hot drinking water according to a temperature profile class 2 of ISO 10508 and an allowable working pressure of maximum 10 bar.

RECOMMENDATIONS FOR CUSTOMERS

Check at the time of delivery whether:

- the supplier has delivered in accordance with the agreement;
- the mark and the marking method are correct;
- the products show no visible defects as a result of transport etc.

If you should reject a product on the basis of the above, please contact:

- Roth Werke GmbH

and, if necessary,

- Kiwa Nederland B.V.

Consult the supplier's processing guidelines for the proper storage, transport and processing methods.