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RAUWIPEX district heating system

Technical information



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This Technical Information "RAUPIPEX district heating system" is valid from November 2024. With its publication, the previous Technical Information 817603 (as of July 2024) loses its validity.

All of the following data supplement the corresponding data and technical properties of the Technical Information "RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems", print number 817602 as of 06/2020, and apply to the RAUPIPEX pipe system.

You can download our current technical documents from www.rehau.com/TI.

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01 Information and safety instructions

Validity

This Technical Information is valid for United Kingdom and Ireland.

Other applicable Technical Information

- RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems, print number 817602

Navigation

You will find a detailed table of contents with hierarchical headings and corresponding page numbers at the start of this Technical Information.

Pictograms and logos



Safety notice



Legal notice



Important information to observe



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Currentness of Technical Information

To ensure your safety and the proper use of our products, please regularly check whether a more recent version of the Technical Information is available. You will find the issue date of your Technical Information on the bottom right-hand side of the back cover or on the inside of the title page. You can obtain the current Technical Information from your REHAU Sales Office, specialist wholesaler or you can download it from the internet at www.rehau.uk/districtheating

Intended use

The REHAU pipe systems must only be designed, installed and operated as described in this Technical Information or in the installation instructions associated with the individual components. Any other use is deemed to be outside the scope of intended use and therefore is not permitted. For more detailed consulting support, please contact your REHAU Sales Office.

Use in line with specification means compliance with all of the information in this Technical Information as well as the assembly, operating and maintenance instructions. No liability can be accepted for any use which is not in line with the specifications or inadmissible alterations to the product or any consequences resulting from this.

Safety instructions and operating instructions

- For your own safety and the safety of other people, please read through all safety instructions and operating instructions carefully and completely before commencing installation.
- Keep the operating instructions safe and have them available.
- If you do not understand the safety instructions or the individual installation procedures, or if something is unclear, please contact your REHAU Sales Office.
- Failure to follow the safety instructions can result in damage to property, environment or personal injury.

Observe all national and international piece laying, installation, accident prevention and safety regulations as well as the notes in this Technical Information when installing pipe systems.

Also observe the applicable laws, standards, guidelines and regulations (e.g. DIN, EN, ISO, DVGW, TRGI, VDE and VDI) as well as regulations on environmental protection, regulations of the Employer's Liability Insurance Association and specifications of the local public utilities companies. Please ensure that the guidelines, standards and regulations are the valid issue in each case.

The planning and installation instructions relate directly to the relevant REHAU product. At points, we will refer to generally applicable standards or regulations. More specific standards, regulations and instructions relating to the planning, installation and operation of drinking water or heating systems or systems for building services must also be observed and do not form part of this Technical Information.

Application areas which are not covered by this Technical Information (special applications) require consultation with our Technical Applications Department.

For more detailed advice, please contact your REHAU Sales Office.

Prerequisites for personnel

- Our systems must only be installed by authorised and trained persons.
- Only trained and authorised personnel may work on electrical installations or piecework components.

General precautions

- Keep your workplace clean and free of obstructions.
- Ensure that your work space has adequate lighting.
- Keep children, pets and unauthorised persons away from tools and installation areas. This particularly applies to renovations in occupied areas.
- Only use the components intended for your particular REHAU system. The application of components from other systems or the use of tools which do not come from the relevant REHAU installation system can result in accidents or other hazards.

Working clothes

- Wear safety glasses, appropriate working clothes, safety shoes, a protective helmet and, if you have long hair, a hairnet.
- Do not wear loose-fitting clothing or jewellery, as they may get caught in moving parts.

During installation

- Always read and follow the operating instructions for the REHAU installation tool you are using.
- Incorrect handling of tools can cause serious cut injuries, crushing or removal of limbs.
- Incorrect handling of tools can damage connecting components or cause leaks.
- The REHAU pipe cutters have a sharp blade. Store and handle them in such a way that there is no risk of injury from the REHAU pipe cutters.
- When cutting pipes, make sure to maintain the safety gap between the holding hand and the cutting tool.
- Never reach into the cutting area of the tool or touch moving parts during the cutting process.
- After the expanding procedure, the expanded pipe end returns to its original shape (memory effect). Do not place any foreign objects in the expanded pipe end during this phase.
- During the compression process, never reach into the pressing zone of the tool or touch moving parts.
- Until the pressing procedure is complete, the fitting part can fall out of the pipe. Risk of injury!
- During all maintenance or refitting work and when changing installation areas, always unplug the tool and make sure that it cannot be switched on unintentionally.

Operating parameters

- If the operating parameters are exceeded, this leads to overstressing of the pipes and connections. It is therefore not permitted to exceed the operating parameters.
- Compliance with the operating parameters is to be ensured through safety and control systems (e.g. pressure reducer, safety valves and similar).

System-specific safety instructions

- Deburr or remove edges on insulating sleeves in order to prevent possible injury.
- When working with PUR shroud foam (polyol and isocyanate components) the safety data sheets must be observed and chemicalresistant protective gloves and protective goggles worn at all times.
- A dust mask must be worn when sawing or sanding PUR rigid foam.
- When welding electrofusion couplers and foam moulding with PUR shroud foam, the component heats up.
- When working with tension belts to fix the pipes there is a crushing risk. Do not reach into the hazardous areas.

02 Heat supply for generations with RAUPIPEX

The use of polymer pipe systems enables the expansion of heating networks to be accelerated and thus makes a substantial contribution to the green transformation of the heating supply towards climate neutrality. The decisive factors for the acceptance of products and system solutions are their technical suitability for the specific application and their user-friendliness. In this context, REHAU has developed the new RAUPIPEX pipe system – the all-rounder for heating and cooling.

The new RAUPIPEX pipe system is a PU-foamed flexible pipe with an outstanding combination of insulating effect, robustness and flexibility during installation, thus setting a new standard. It is ideally suited to connecting heat pumps and district heating networks.



Fig. 02-1 RAUPIPEX – all-rounder for heating and cooling

The material properties of the pipes and pipe connections used are a decisive factor for the service life, safety and cost-effectiveness of heating networks. REHAU has more than 40 years of experience in the development and manufacturing of high-pressure cross-linked polyethylene PE-Xa pipes. In addition, REHAU has been offering a compression sleeve system since 1987, which enables a permanent seal without O-rings. The system approval for PE-Xa service pipes and fittings in accordance with DIN EN ISO 15875-5 by the independent, certified and accredited IMA Dresden test centre guarantees a long-term and reliable supply. With RAUPIPEX, the patented longitudinally watertight barrier also ensures maximum safety during installation and operation. And finally, the clip and shrink shrouds are certified as watertight under increased testing requirements.



Fig. 02-2 RAUPIPEX is the new integral component of the REHAU overall system

The use of highly stabilised REHAU PE-Xa service pipes specially designed for district heating has guaranteed the longevity of the application since 2000 – i.e. district heating supplies for generations. Modern low-temperature heating networks with a flow temperature of 65 °C in continuous operation, for example, have a service life of at least 100 years. Compared to conventional PE-Xa pipes, a service life that is up to 70 % longer is achieved by fulfilling the requirements of DIN EN 15632.

03 Material properties



The following data supplements the corresponding chapter of the Technical Information "RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems", print number 817602, and assumes knowledge of the chapter.

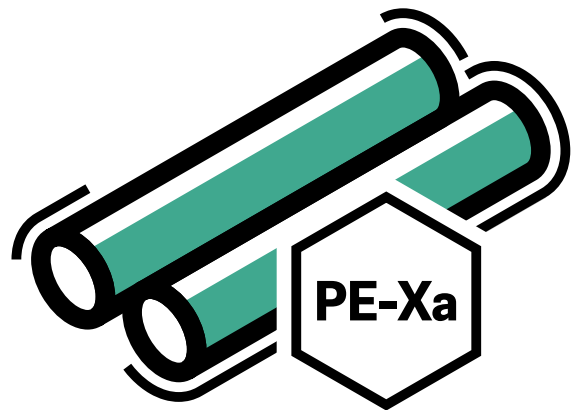
03.01 Carrier pipes

The same REHAU PE-Xa carrier pipes SDR 11 are used for the RAUPIPEX pipe system as for RAUVITHERM and RAUTHERMEX. REHAU PE-Xa service pipes SDR 11 are highly stabilised and externally tested in accordance with EN 15632 especially for local and district heating applications. Therefore, the contents of the following chapters from the Technical Information "RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems" (print number 817602) apply unchanged to RAUPIPEX:

- 03.01 Carrier pipes
- 03.01.01 District heating application: PE-Xa SDR 11 carrier pipe
- 03.01.04 Continuous quality control



Fig. 03-1 District heating carrier pipes SDR 11



03.02 RAUPIPEX SDR 11 pipe system

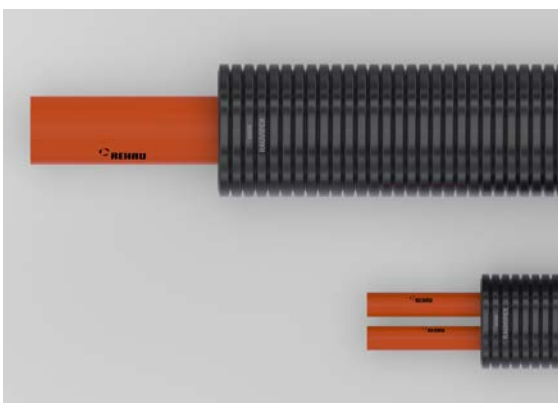


Fig. 03-2 RAUPIPEX composite pipe

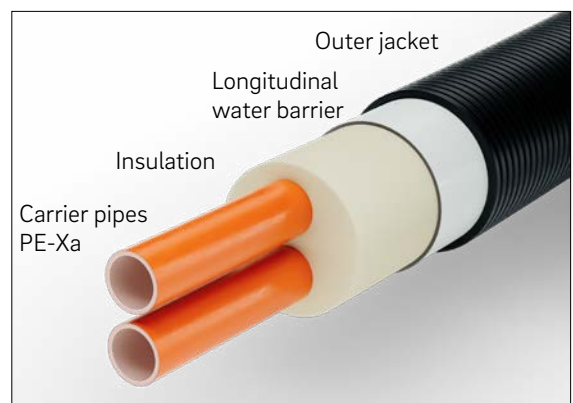
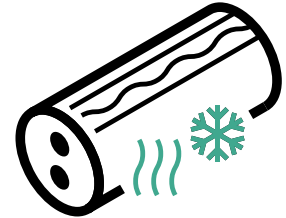


Fig. 03-3 RAUPIPEX main components

03.03 Pipe insulation

The main insulating layer of RAUPIPEX pipes consists of continuously produced, innovative, flexible and CFC-free PU foam.

Property	Value	Standard
Thermal conductivity $\lambda_{50, \text{initial}}$	0,022 W/mK	EN 15632
GWP (global warming potential)	0.5	-
ODP (ozone depletion potential)	0	-
Density ρ	> 50 kg/m ³	ISO 845
Compressive strength	0.15 MPa	ISO 844
Water absorption	≤ 10 %	EN 15632-1
Axial shear strength	≥ 90 kPa	EN 15632-2
Construction material class	B2 (normal flammability)	DIN 4102

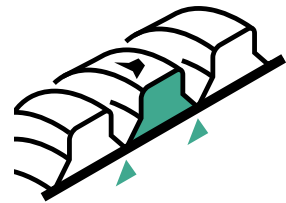


Tab. 03-1 Technical properties of the thermal insulation PU foam

A patented additional, multi-layered longitudinal water barrier layer made of cross-linked and closed-cell PE material is included between the pipe insulation and the outer casing. The barrier layer is extremely elastic and adheres fully to both the PU foam and the corrugated valleys of the outer shell.

This longitudinal water barrier layer achieves longitudinal water tightness in accordance with AGFW FW 420-1 Class A for the RAUPIPEX pipe system.

Property	Value	Standard
Thermal conductivity λ_{50}	0.05 W/mK	EN 15632
Density ρ	≥ 30 kg/m ³	ISO 1183
Water absorption	≤ 1 % vol.	DIN 53428
Long-term temperature resistance	≥ 95 °C	
Construction material class	B2 (normal flammability)	DIN 4102
Longitudinal watertightness	Class A	FW 420-1

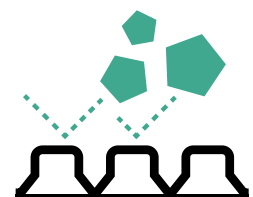


Tab. 03-2 Technical properties of the longitudinal water barrier layer

03.04 Outer jacket

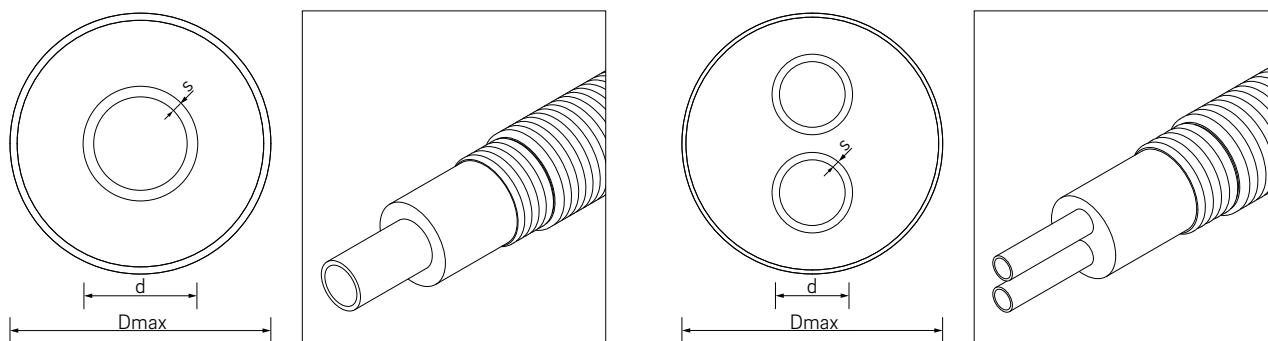
RAUPIPEX pipes have a special outer casing geometry consisting of U-shaped wave crests and V-shaped wave troughs. This mould is produced using state-of-the-art vacuum corrugator technology in a continuous process with a PE-MD material and significantly improves the static properties, robustness and bending flexibility of the pipe.

Property	Value	Standard
Thermal conductivity λ_{50}	0.40 W/mK	DIN 52612
Density ρ	0.95 g/cm ³	ISO 1183
Construction material class	B2 (normal flammability)	DIN 4102



Tab. 03-3 Technical properties of the outer casing

03.05 Pipe dimensions RAUPIPEX



Typ	d	s	di	Dmax	U-value	Volume	2.4 m x 1.2 m	2.8 m x 1.6 m	Weight
	mm	mm	mm	mm	W/(mK)	l/m	Standard coil m	Special coil ¹⁾ m	
UNO 25/100	25	2.3	20.4	100	0.095	0.33	325	-	1.6
UNO 25/125	25	2.3	20.4	125	0.079	0.33	215	-	2.0
UNO 32/100	32	2.9	26.2	100	0.116	0.54	325	-	1.5
UNO 32/125	32	2.9	26.2	125	0.093	0.54	215	-	2.1
UNO 40/100	40	3.7	32.6	100	0.145	0.84	325	-	1.6
UNO 40/125	40	3.7	32.6	125	0.109	0.84	215	-	2.2
UNO 50/125	50	4.6	40.8	125	0.144	1.31	215	-	2.4
UNO 63/150	63	5.8	51.4	150	0.151	2.08	165	305	3.4
UNO 75/175	75	6.8	61.4	175	0.155	2.96	110	210	5.7
UNO 90/175	90	8.2	73.6	175	0.199	4.25	110	210	5.7
UNO 110/175	110	10.0	90.0	175	0.287	6.36	110	210	5.7
UNO 125/200	125	11.4	102.2	200	0.286	8.20	105 ²⁾	140	7.5
UNO 140/225	140	12.7	114.6	225	0.285	10.32	90 ²⁾	120	9.3
DUO 20 + 20/125	20	1.9	16.2	125	0.111	0.21	215	-	2.4
DUO 25 + 25/125	25	2.3	20.4	125	0.134	0.33	215	-	2.4
DUO 32 + 32/125	32	2.9	26.2	125	0.176	0.54	215	-	2.3
DUO 40 + 40/150	40	3.7	32.6	150	0.200	1.31	165	305	3.3
DUO 50 + 50/175	50	4.6	40.8	175	0.181	2.07	110	210	5.7
DUO 63 + 63/200	63	5.8	51.4	200	0.219	2.07	105 ²⁾	140	7.4
DUO 75 + 75/225	75	6.8	61.4	225	0.253	2.96	90 ²⁾	120	9.1

1) Special order production

2) 2.8 m x 1.2 m

Tab. 03-4 Pipe dimensions RAUPIPEX

04 Jointing technology and secondary insulation



The following data supplements the corresponding chapter of the Technical Information "RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems", print number 817602, and assumes knowledge of the chapter.

04.01 Shroud technology

RAUPIPEX can be used for buried joints with both the REHAU heat shrink shroud system and the REHAU CLIP-FLEX shroud system (see current catalogue).



Fig. 04-1 REHAU heat shrink shrouds



Fig. 04-2 CLIP-FLEX shrouds

System	Watertightness	Angle deviation	Standard
REHAU heat shrink shrouds	5 m water column	$\pm 20^\circ$	EN 489
REHAU CLIP-FLEX shrouds	3 m water column	$\pm 22.5^\circ$	EN 489

Tab. 04-1 Watertightness combination of RAUPIPEX pipes and shrouds technology



- RAUPIPEX can be combined with the RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems using the specified shrouds.
- RAUPIPEX is not compatible with the RAUTHERMEX clip shroud system.

05 Building connection and wall entry



The following data supplements the corresponding chapter of the Technical Information "RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems", print number 817602, and assumes knowledge of the chapter.

05.01 Sealing collar



Fig. 05-1 Sealing collar

For direct integration into in-situ concrete components or for sealing with expanding mortar in masonry, a sealing collar has been specially developed for the RAUVIPEX system to match the outer casing of the pipe.

This achieves a tightness of up to 2 m water column (see current catalogue).

The radon-proof sealing collar is mounted directly onto the RAUVIPEX pipe using a stainless steel jubilee clamp. Tightening torque: 3 Nm



Other wall sealing rings or labyrinth seals are not approved for RAUVIPEX.

05.02 Sealing flange



Fig. 05-2 Sealing flange FA 40-B (left) and FA 80-B (right)

The FA 40-B and FA 80-B sealing flanges can be used as a sealing flange in casing pipes or core drill holes for all pipe sizes of the RAUVIPEX system (see current catalogue).

	FA 40-B	FA 80-B
Tightness	3 m water column	5 m water column
	radon leak-proof	
Width	85 mm	125 mm
Implementation	split for retrofitting	

Tab. 05-1 Technical data and properties of sealing flanges

Outside pipe diameter	Diameter
	Core drill hole or casing pipe
100 mm	150 ± 2 mm
125 mm	200 ± 2 mm
150 mm	200 ± 2 mm
175 mm	250 ± 2 mm
200 mm	300 ± 2 mm
225 mm	300 ± 2 mm

Tab. 05-2 Outer diameter and core bore

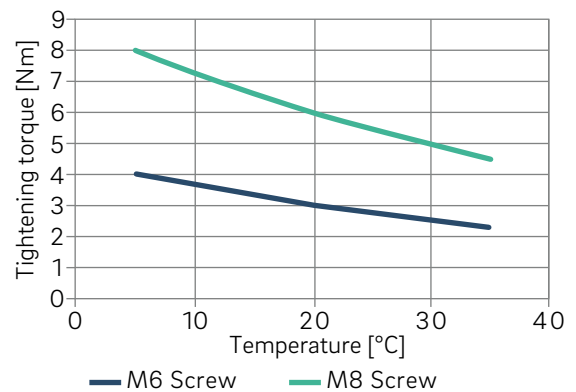


Fig. 05-3 Tightening torques for sealing flange

06 Planning and sizing heating networks

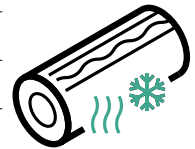


The following data supplements the corresponding chapter of the Technical Information "RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems", print number 817602, and assumes knowledge of the chapter.

06.01 Heat losses

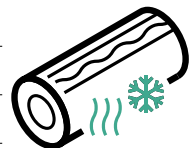
Heat loss data \dot{Q} /metre [W/m] RAUPIPEX UNO/DUO SDR 11

Pipe size	Average operating temperature ϑ_B					
	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
UNO 25/100	2 x 1.9	2 x 2.9	2 x 3.8	2 x 4.8	2 x 5.7	2 x 6.7
UNO 25/125	2 x 1.6	2 x 2.4	2 x 3.2	2 x 4.0	2 x 4.7	2 x 5.5
UNO 32/100	2 x 2.3	2 x 3.5	2 x 4.6	2 x 5.8	2 x 7.0	2 x 8.1
UNO 32/125	2 x 1.9	2 x 2.8	2 x 3.7	2 x 4.7	2 x 5.6	2 x 6.5
UNO 40/100	2 x 2.9	2 x 4.4	2 x 5.8	2 x 7.3	2 x 8.7	2 x 10.2
UNO 40/125	2 x 2.2	2 x 3.3	2 x 4.4	2 x 5.5	2 x 6.5	2 x 7.6
UNO 50/125	2 x 2.9	2 x 4.3	2 x 5.8	2 x 7.2	2 x 8.6	2 x 10.1
UNO 63/150	2 x 3.0	2 x 4.5	2 x 6.0	2 x 7.6	2 x 9.1	2 x 10.6
UNO 75/175	2 x 3.1	2 x 4.7	2 x 6.2	2 x 7.8	2 x 9.3	2 x 10.9
UNO 90/175	2 x 4.0	2 x 6.0	2 x 8.0	2 x 10.0	2 x 11.9	2 x 13.9
UNO 110/175	2 x 5.7	2 x 8.6	2 x 11.5	2 x 14.4	2 x 17.2	2 x 20.1
UNO 125/200	2 x 5.7	2 x 8.6	2 x 11.4	2 x 14.3	2 x 17.2	2 x 20.0
UNO 140/225	2 x 5.7	2 x 8.6	2 x 11.4	2 x 14.3	2 x 17.1	2 x 20.0



Tab. 06-1 Heat loss data \dot{Q} /metre [W/m] RAUPIPEX UNO SDR 11

Pipe size	Average operating temperature ϑ_B					
	30 °C	40 °C	50 °C	60 °C	70 °C	80 °C
DUO 20 + 20/125	2.2	3.3	4.4	5.6	6.7	7.8
DUO 25 + 25/125	2.7	4.0	5.4	6.7	8.0	9.4
DUO 32 + 32/125	3.5	5.3	7.0	8.8	10.6	12.3
DUO 40 + 40/150	4.0	6.0	8.0	10.0	12.0	14.0
DUO 50 + 50/175	3.6	5.4	7.2	9.1	10.9	12.7
DUO 63 + 63/200	4.4	6.6	8.8	11.0	13.1	15.3
DUO 75 + 75/225	5.1	7.6	10.1	12.7	15.2	17.7



Tab. 06-2 Heat loss data \dot{Q} /metre [W/m] RAUPIPEX DUO SDR 11

07 Installation of the heat network



The following data supplements the corresponding chapter of the Technical Information "RAUTHERMEX and RAUVITHERM Pre-insulated pipe systems", print number 817602, and assumes knowledge of the chapter.

07.01 Additional information on traffic loads

RAUPIPEX can be driven over and loaded up to SLW 60. Static calculations for pipe are recommended depending on the local conditions and the design of the pipe trench.

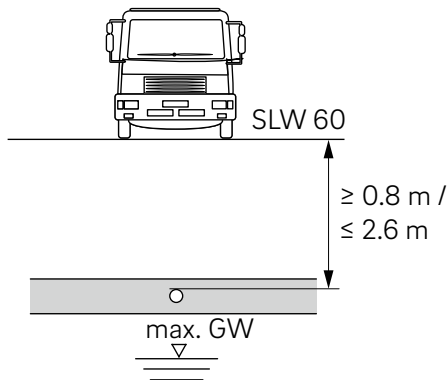


Fig. 07-1 Pipe cover with moving loads over RAUPIPEX

All RAUPIPEX pipe sizes have a ring stiffness of SN 8, making RAUPIPEX a high-load pipe for civil engineering applications.

07.02 Trench cross-sections

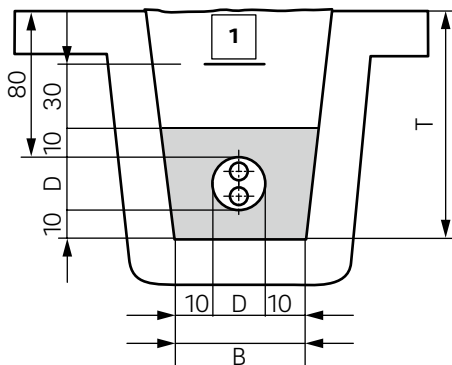


Fig. 07-2 Trench cross-section of RAUPIPEX pipe

Thanks to its very robust pipe construction and special outer casing, RAUPIPEX is also suitable for crushed and granular backfill and bedding material up to a maximum grain size of 16 mm in accordance with Table 07-1.



Fig. 07-3 RAUPIPEX pipe in a trench

In addition to DIN EN 1610, approved coating materials for RAUPIPEX in the pipe area.

Backfilling material	Actual grain size [mm] Uniform distribution
Backfilling sand	0-4
Round sand	0-4 0-8
Grit (crushed material)	2-4 4-8 4-11
Round gravel Round gravel mixture	0-16 4-8 4-16
Gravel mixture (crushed material)	0-11 4-8
Glass sand and glass chippings	0-8
Glass chippings from Recycled glass	4-8

Tab. 07-1 Grain sizes of various backfilling materials



The pipe area around the shrouds must be backfilled in line with existing systems with backfilling sand 0-4, with ZFSV or with special protection against mechanical damage.

07.03 Bending radii RAUPIPEX

Typ	Minimum bending radius at 10 °C jacket temperature cm
UNO 25/100	55
UNO 25/125	60
UNO 32/100	55
UNO 32/125	60
UNO 40/100	55
UNO 40/125	60
UNO 50/125	60
UNO 63/150	70
UNO 75/175	90
UNO 90/175	90
UNO 110/175	90
UNO 125/200	110
UNO 140/225	130

Tab. 07-2 Bending radius UNO pipes

Type	Minimum bending radius at 10 °C jacket temperature cm
DUO 20 + 20/125	60
DUO 25 + 25/125	60
DUO 32 + 32/125	60
DUO 40 + 40/150	70
DUO 50 + 50/175	90
DUO 63 + 63/200	110
DUO 75 + 75/225	130

Tab. 07-3 Bending radius DUO pipes

07.04 Bending forces

Compared to other pipe systems, RAUPIPEX is characterised by its significantly reduced bending forces during installation. This significantly simplifies handling and assembly on the construction site.

Bending forces RAUPIPEX (at 20 °C)

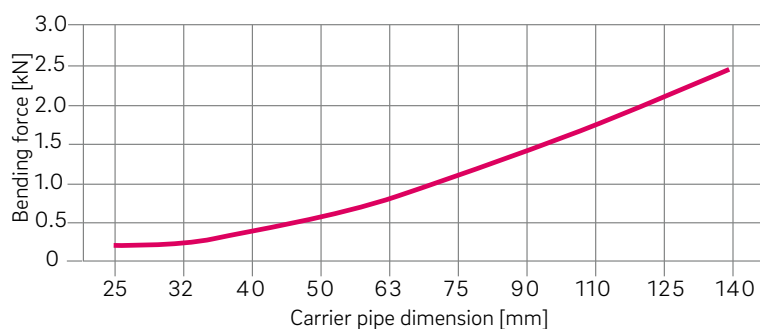


Fig. 07-4 Bending forces UNO pipes

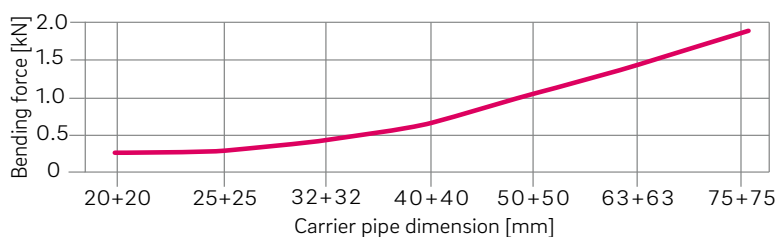
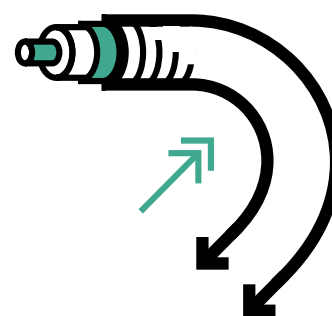


Fig. 07-5 Bending forces DUO pipes



Further extensive system accessories such as end caps, fittings or pre-insulated components for the RAUPIPEX pipe system can be found in the current parts/price list.

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© REHAU Limited
Hill Court, Walford,
Ross-on-Wye, HR9 5QN
United Kingdom

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