



Engineering progress
Enhancing lives

RAUSPEED Inhouse

Technical Information



This "RAUSPEED Inhouse" Technical Information is valid from December 2020.

Our current technical documents are available for download at www.rehau.de.

All dimensions and weights are reference values. Subject to errors and modifications.

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01 Information and safety instructions

Validity

This Technical Information is valid worldwide.

Latest version of the Technical Information

For your safety and to ensure the correct use of our products, please check at regular intervals whether a new version of this Technical Information is already available. You can obtain the latest version of the document from your local retailer, your REHAU sales office or you can download it from

www.rehau.de/TI

Pictograms and logos



Safety instructions



Legal notice



Important information



Your benefits



Information available online

Intended use

The REHAU RAUSPEED Inhouse products may only be designed, installed and operated as described in this Technical Information. Any other use that does not fall within the intended use of the system is prohibited.

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 comply with the safety instructions can result in damage to property or personal injury.

Observe all applicable national and international regulations relating to installation, safety and the prevention of accidents when installing RAUSPEED Inhouse, as well as the instructions in this Technical Information. Areas of application which are not covered by this Technical Information (special applications) must be discussed with our Technical Applications Department. Contact your REHAU sales office.

02 Your solution to optical fibre installation in buildings

In today's world, we see more and more ambitious requirements regarding features in facilities and buildings of different types – from sophisticated detached houses to large hospitals, from small production halls to airports.

Especially in buildings where many people live and work, fast communication options and safety aspects are of paramount importance.

Even holidaymakers and business travellers want unlimited and comfortable communication via laptop and computer when staying in hotels. At the same time, applications of the future (video streaming, telemedicine, smart metering, smart home, etc.) demand more and more bandwidth.



Installation of a fibre optic cable infrastructure in buildings is, therefore, an investment in the future and an appreciation of the property value. With compact micro ducts, all flats and areas of the building can be deployed, from a central point, with fibre optic without wasting significant area for excessively large installation shafts. The work is further simplified thanks to the option of step-by-step installation of ducts and the subsequent installation of a continuous cable.

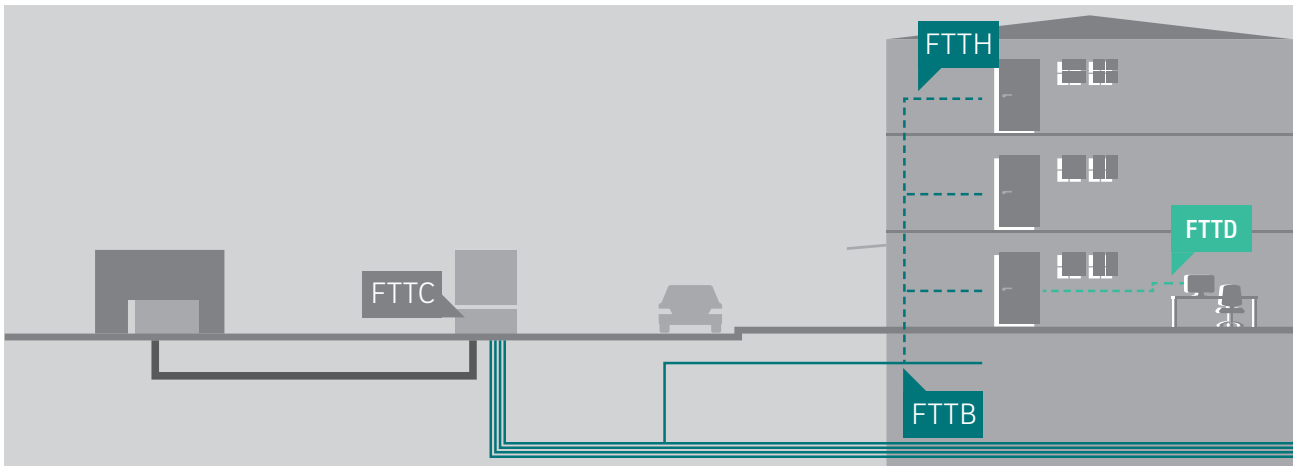
REHAU ensures reliable cable protection

The new REHAU RAUSPEED Inhouse system is the solution to the secure installation of fibre optic cables in buildings. Micro ducts and fittings parts have been optimised such that they do not pose any hazard to people or materials in the event of fire. High-quality materials provide the best conditions for the installation and blowing-in of the fibre optic cables.



03 Optimum components for each stage of deployment

The "last mile" is a bottleneck for broadband connections. Even the best network is of little use if the last few meters are not covered by fibre optics but by conventional copper cable. FTTX is the generic term for the various fibre optic deployment stages in the "last mile". With each deployment stage, the length of the copper cable in use is minimised, and higher bandwidths are ensured. REHAU can supply suitable cable protection systems for each expansion stage.



FTTC – Fibre to the Curb.

Fibre optic cables are installed up to the distribution point, normally next to the curb. The connections to customers are then established using copper cabling. The greater the distance between the distribution point and the house connection, the smaller the bandwidth due to the high damping rate of copper.

FTTB – Fibre to the Building/FTTH – Fibre to the Home.

In FTTB / FTTH fibre optic cable ends within the building at the termination point. For single dwelling units FTTB and FTTH is the same. For multi dwelling units FTTB is the fibre connection to the building whereas FTTH is the fibre connection to each individual flat. This enables practically unlimited potential transmission speeds of more than one gigabit (> 1,000 Mbit/s).

FTTD – Fibre to the Desk.

FTTD means end-to-end, in-house optical fibre cabling. This stage is already in place in many public administration offices, universities, computing centres and hospitals. When optical fibre is installed all the way to individual work stations, users can access speeds of up to 10 Gbit/s and more.

04 LSOH - safety in the event of fire

RAUSPEED Inhouse micro ducts are suitable for indoor installation (the fire protection regulations applicable in the respective countries must be checked and complied with). For maximum safety in the event of a fire, RAUSPEED Inhouse micro ducts provide the following properties.



LSOH - low smoke zero halogen

Low smoke generation in the event of fire:

Smoke density in accordance with EN 61034-2 (VDE 0482-1034-2): 2006-03



Self-extinguishing

No spread of fire through the pipes:

Flame resistance according to EN 61386-1 (VDE 0605-1): 2009-03



Halogen-free

Minimum release of corrosive gases:

Halogen-free (corrosiveness of the fumes) in accordance with VDE V 0604-2-100: 2012-08



Resistant

High-quality, durable material and reliable pressure resistance:

Internal creep pressure according to DIN 16874 (80 °C/4.0 N/mm²/ 170 h)



For maximum safety in the event of a fire, RAUSPEED Inhouse micro ducts are designed to be flame resistant. After removing the source of ignition, the micro ducts extinguish by themselves.

If the ducts burn due to the effect of an external source of ignition, the smoke development compared to standard PE ducts is extremely reduced. This helps escaping persons and response personnel in clearly identifying the escape routes.

Moreover, the release of toxic and corrosive gases during the burning is minimised to a non-hazardous level. The formulation of hydraulic acid is not possible. This considerably limits the risk to people and property.

Standards and guidelines

The following section should give you an overview of standards and guidelines concerning in-house installations with micro ducts. The information in here contains summaries and excerpts from a wide range of documents, therefore there is no claim to completeness. Furthermore, the respective national regulations must be observed that cannot be covered in this document.



What must be installed?

This topic is covered in the "IEC 60364-5-52:2009 Low-voltage electrical installations – Part 5-52: Selection and erection of electrical equipment – Wiring systems" (hereinafter referred to as IEC). According to this, electrical installation ducts and accessories must meet EN 61386 (see page 12 IEC). The installation of the system must not interfere with the occupational and fire safety of the building. If the cables and lines are classified in accordance with EN 61386 as non-flame-spreading, no special measures are required during the installation (see page 30 IEC).

CE marking

The dimensions of the RAUSPEED Inhouse micro ducts are not included in the EN 61386. In addition, the micro ducts are generally intended for fibre optic cables that are operated without electrical current. This means that micro ducts do not fall under EN 61386 and the low-voltage directive (applies to electrical equipment from 50 V alternating current). Nevertheless, to give a reference point and a legal basis to the customers for the installation, the RAUSPEED Inhouse micro ducts are tested to EN 61386 and meet all requirements (except for the micro duct dimensions, as the standard was not written for solid wall micro ducts). Since empty micro ducts installed in a building may also be used for power cables, our RAUSPEED micro ducts are signed with CE mark based on the low-voltage directive.

Construction Product Directive

The RAUSPEED Inhouse micro ducts are installed permanently in buildings and their performance with respect to fire protection influences the basic requirements of the structure. Hence, they are a construction product by definition.

BUT: The 2016/C 209/03 directory for construction product provision does not contain any suitable standard harmonised for micro ducts. Products that do not fall under the area of application of the construction product provision, may not carry a corresponding CE marking. The national provisions with respect to construction products and fire protection apply.



Flame testing on RAUSPEED Inhouse: a defined flame is applied to a micro duct for 20–35 seconds depending on the wall thickness. After removing the source of ignition, the material must extinguish by itself. Flaming droplets are not permissible. The images show the flaming at 6 and 28 seconds after 47 seconds after removing the source of ignition, where the fire extinguished.

05 Technical data

05.01 RAUSPEED Inhouse micro ducts

	7/5.5	7/4	10/8	10/6	12/9.8	12/8	14/10	16/12	Comments
Temperature range	-15 °C up to min. +90 °C for installation and operation to EN 61386-22								
Bending radius	Tested to EN 61386-22 with 30 x OD (smooth pipes) in the specified temperature range								
Tensile force	100	250	250	500	250	500	500	500	As per EN 61386-22 incl. connector
Out-of-roundness max.	During production 0.1 mm								
Max. blow-in pressure*	10 bar	16 bar	10 bar	16 bar	10 bar	16 bar	16 bar	16 bar	
Long-term hydrostatic strength	80 °C/4.0 Mpa/170 h								16874
Classification according to EN 613386-22									
Pressure load	1	3	1	3	1	3	3	3	1st digit
Impact stress	4	4	4	5	4	5	5	5	2nd digit
Minimum temperature	3	3	3	3	3	3	3	3	3rd digit
Highest temperature	2	3	2	2	2	2	3	3	4th digit
Bending	2	2	2	2	2	2	2	2	5th digit
Electrical properties	0	0	0	0	0	0	0	0	6th digit
Tight against solids **	0	0	0	0	0	0	0	0	7th digit
Tight against water **	0	0	0	0	0	0	0	0	8th digit
Corrosion	4	4	4	4	4	4	4	4	9th digit
Tensile strength	1	2	2	3	2	3	3	3	10th digit
Flame propagation	1	1	1	1	1	1	1	1	11th digit
Hanging load	0	0	0	0	0	0	0	0	12th digit

* Blowing-in temperature min. -5°C to max. +35°C, optimal installation and blow-in at +5 to +20°C

** The connectors and end caps are tested for tightness up to 15 bar (test duration 1 h)

Additional features

- UV stabilisation for two years (Central Europe)
- White, translucent colour without coloured stripes for discreet installation indoors
- To achieve long blow-in lengths as well as to minimise duct jacket abrasion, the RAUSPEED micro ducts are fitted with the REHAU trapezoidal grooving (RTR) on the interior. The excellent properties of this internal grooving have been proven in blow-in tests. The results are available on request. RAUSPEED micro ducts are suitable for a service life of at least 50 years.



05.02 RAUSPEED Inhouse accessories

The RAUSPEED Inhouse accessories range features flame-retardant properties in accordance with EN 61386-22, making it an optimal choice for indoor use. The components are halogen-free.

- RAUSPEED Inhouse connectors are used for the pressure-tight connection of micro ducts. End caps close empty micro ducts, protect them from dirt and enable pressure testing. The RAUSPEED Inhouse connectors and end caps are suitable for a blow-in pressure of up to 15 bar.

Properties of Connector and End Caps:

- Blow-in pressure up to 15 bar
- Flame-retardant according to EN 61386-22
- Halogenfrei nach DIN VDE 0604-2-100
- 100% check for tightness
- Creep test based on DIN 16874 (80 °C/4.0 Mpa/170 h)
- Base body made of impact-resistant material (proven with spade test followed by pressure testing)
- Transparent base body for visual inspection of the connection
- Corrosion-free metal parts (EN 61386-24 or EN 61386-1; highest classification Cl. 4)
- Pre-fitted locking clips prevent accidental disengage when installed
- Can be removed and reused, if necessary
- Suitable for thin and thick-walled micro ducts



- RAUSPEED Inhouse Divisible Gasblock seal empty and occupied micro ducts up to 0,5 bar gas- and water-tight. Divisible connectors enclose two micro duct ends pressure-tight up to 0.5 bar or can also seal both micro ducts against each other, if needed.



06 Product range

06.01 RAUSPEED Inhouse micro ducts

- For blowing in fibre optic cables, specifically suitable for indoor use
- Material: PE-HD according to DIN 16874 translucent base material to identify the occupancy, white colour for unobtrusive use indoors
- Optimised REHAU RTR internal grooving for optimal blow-in results – low-smoke according to EN 61034-2, flame-retardant according to EN 61386-1 and halogen-free to DIN V VDE V 0604-2-100 (LSOH) for maximum safety in the event of a fire
- Classification according to EN 61386-22 (VDE0605) for defining the installation
- Creep test according to DIN 16874 (80 °C/4.0 Mpa/170 h)
- Ultraviolet resistance for min. two years in Central Europe



	Diameter mm	Width mm	Core mm	Empty weight kg
Standard drum	1200	370	464	20
Small drum	400	316	200	2,8

Dimensions mm	Material number	Packaging m Standard drum/ small drum
7/5.5	11044901001	1250
	11044901002	450
7/4	11044921001	1250
	11044921002	450
10/8	11044931001	2500
	11044931002	220
10/6	11044941001	2500
	11044941002	220
12/9.8	11044951001	1750
	11044951002	150
12/8	11044961001	1750
	11044961002	150
14/10	11044981001	1250
16/12	11045001001	1000

Other dimensions, delivery lengths and combinations available on request.

06.02 RAUSPEED Inhouse Connector

- Suitable for inhouse use, provides a high-tensile, pressure-tight connection for micro ducts with identical outer diameters
- Base body made of impact-resistant material
- Transparent base body
- Corrosion-free metal parts
- Pre-assembled safety clips
- Blow-in pressure up to 15 bar
- Creep test on the basis of DIN 16874
- Can be removed and reused, if necessary
- Flame-retardant according to EN 61386-22
- Halogen-free according to DIN VDE 0604-2-100
- Also suitable for below ground installations, see TI RAUSPEED (print number 374680, TYPE 02.2020)



Material number	OD* mm	Packaging unit pcs.
13290971001	7	50
13290991001	10	50
13291061001	12	25
13291071001	14	25
13291081001	16	25

*OD - outer diameter

06.03 RAUSPEED Inhouse end caps

- For permanent sealing of micro ducts
- Base body made of impact-resistant material
- Transparent base body
- Corrosion-free metal parts
- Pre-assembled safety clips
- Blow-in pressure up to 15 bar
- Creep test on the basis of DIN 16874
- Can be removed and reused, if necessary
- Also suitable for in-house use, flame-retardant according to EN 61386-22 and halogen-free
- Flame-retardant according to EN 61386-22
- Halogen-free according to DIN VDE 0604-2-100
- Also suitable for below ground installations, see TI RAUSPEED (print number 374680, TYPE 02.2020)



Material number	OD* mm	Packaging unit pcs.
13291131001	7	50
13291141001	10	50
13291161001	12	25
13291171001	14	25
13291181001	16	25

*OD - outer diameter

06.04 RAUSPEED Inhouse Divisible Gasblock

- Divisible and reusable Gasblock for sealing unoccupied and occupied RAUSPEED Inhouse micro ducts
- Gas and water-tight up to 0.5 bar
- Flame-retardant according to EN 61386-22
- Halogen-free, flame-retardant material
- Labelling tag included (33 x 14 mm)
- White colour for subtle installation indoors



Material number	OD* mm	Cable diameter mm	Packaging unit pcs.
13193041001	7	0.8-2.5	25
13193051001	7	2.0-4.0	25
13193061001	10	1.8-3.5	25
13193071001	10	3.0-5.0	25
13193081001	10	4.5-6.0	25
13193091001	12	3.0-5.0	25
13193101001	12	5.0-6.5	25
13193111001	12	6.5-8.0	25
13193121001	14	3.0-5.0	25
13193131001	14	5.0-6.5	25
13193141001	14	6.5-8.0	25

06.05 RAUSPEED Inhouse divisible connector

- Divisible connector for gas- and water-tight connection of occupied RAUSPEED Inhouse micro ducts
- Also available as a Gasblock version for additional seal against the cable
- Gas and water-tight up to 0.5 bar
- The variants can be differentiated using a flag tag when closed
- Flame-retardant according to EN 61386-22
- Halogen-free, flame-retardant material
- White colour for subtle installation indoors



With Gasblock:

Material number	OD* mm	Cable diameter mm	Packaging unit pcs.
13193151001	7	0.8-2.5	10
13193161001	7	2.0-4.0	10
13193171001	10	1.8-3.5	10
13193181001	10	3.0-5.0	10
13193191001	10	4.5-6.0	10
13193201001	12	3.0-5.0	10
13193211001	12	5.0-6.5	10
13193221001	12	6.5-8.0	10
13193231001	14	3.0-5.0	10
13193241001	14	5.0-6.5	10
13193251001	14	6.5-8.0	10

Without Gasblock:

Material number	OD* mm	Packaging unit pcs.
13193261001	7	10
13193271001	10	10
13193281001	12	10
13193291001	14	10

*OD - outer diameter of micro duct

06.06 RAUSPEED Inhouse guide bend

- Micro duct guide bend for secure bending of RAUSPEED Inhouse micro ducts.
- Prevents kinks and holds the bend in the correct position.
- Not flame retardant; therefore, must be completely installed in non-flammable material in accordance with IEC 60364-5-52:2009.



Material number	OD* mm	Bending radius approx. mm	Packaging unit pcs.
12278331001	7	70	25
12393331001	10	100	25
12393431001	12	120	25

*OD - outer diameter

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use or processing of the products. Responsibility for these activities therefore remains entirely with the respective user/processor. Where claims for liability nonetheless arise, they shall be governed exclusively according to our terms and conditions, available at www.rehau.com/conditions, insofar as nothing else has been agreed upon with REHAU in writing. This shall also apply for all warranty claims, with the warranty applying to the consistent quality of our products in accordance with our specifications. Subject to technical changes.

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