



Installation manual FIRE PROTECTION SYSTEMS FOR PIPES

Thermo-teK PS Pro ALU tested in accordance with EN 1366-3



SAFETY DURING FIRE

Fire safety is one of the primary considerations in building design. Larger buildings are frequently divided into so-called fire compartments, which are separated by fire-resistant walls and ceilings. In the event of fire, these constructions must guarantee full fire and smoke resistance for prescribed fire sistance.



FIRE COMPARTMENTS IN BUILDING

If supply pipes have to pass through fire compartment constructions, these penetrations must also maintain the fire resistance demanded for the primary constructions. All leakages must be clogged and installation must follow to the conditions described in fire testing certificates.

FIRE TESTING

The testing standard EN 1366-3 (Fire resistance tests for service installations – Part 3: Penetration seals) can be considered as the main requirement for pipe penetration systems. Systems tested to this standard are consequently classified in accordance to harmonized norm EN 13501-2 (Fire classification of construction products and building elements - Part 2: Classification using d ata from fire resistance tests, excluding ventilation services). The expected use of pipes (rain water, waste water, heating water, ...) determines the required test conditions prescribed by EN 1366-3. This test provides information on the safe use of pipes. End pipe closing can be capped (closed) or uncapped (open).



FIRE TESTING OF CAPPED SYSTEMS



FIRE TESTING OF UNCAPPED SYSTEMS

NATIONAL REQUIREMENTS



Products and systems used for fire resisting constructions must fulfill both national and European building codes. For pipes, national requirements usually differ between 30 to 180 minutes of specific fire resistance, mainly in categories E (integrity) and I (insulation). In addition to this basic classification, fire resistance of pipes is further determined by the type of end pipe closing.

Following table shows requirements by the European standard EN 1366-3.



EXAMPLE OF FINAL CLASSIFICATION OF PIPE SYSTEM

METAL PIPES (TABLE H.2 FROM EN 1366-3)	INSIDE OVEN	OUTSIDE OVEN	COVERED BY KI SYSTEMS
HANGED PIPE SYSTEMS WITH FIRE CLASSIFICATION	С	U	YES
HANGED PIPE SYSTEMS WITHOUT FIRE CLASSIFICATION	U	С	YES
WASTE SHAFTS CREATED BY PIPES	U	С	YES

COMPOSITE PLASTIC PIPES	(TABLE H.1 FROM EN 1366-3)	INSIDE OVEN	OUTSIDE OVEN	COVERED BY KI SYSTEMS
RAIN WATER PIPES	-	U	U	NO
	VENTILATED	U	U	NO
WASIE WAIEK PIPES	UNVENTILATED	U	С	YES
PIPES FOR GAS, DRINKING	G WATER, HEATING WATER	U	С	YES

	SUSTAINED	INTERRUPTED
CONTINUED	CS	
LOCALISED		

 According to EN 1366-3, fire protection pipe systems are split into these 4 scenarios.

All current systems from Knauf Insulation are sustained, therefore Insulation always runs through the walls and ceilings.

A major advantage of Thermo-teK PS Pro ALU is, that only one piece of pipe section is needed in the middle of the wall/ceiling to achieve fire resistance up to E1120. Details of use are on the next pages.



Knauf Insulation also offers these one-side insulated pipe systems (so called asymmetrical installation) for composite plastic pipes. Details of use are on the next pages.

WALL PENETRATION SYSTEMS WITH KNAUF INSULATION PS PRO ALU

METAL PIPES

			FIRE CLASSIFICATION (ONE PIPE SECTION IN THE MIDDLE OF THE PENETRATION)*	FIRE CLASSIFICATION (COMPLETE PIPE INSULATION)*
PIPE MATERIAL	OUTER PIPE DIAMETER (mm)	INSULATION THICKNESS** (mm)		
	≤ 54	20–100	EI120-C/U	
STAINLESS STEEL,	54-89	30–120	EI120-C/U	
CAST IRON	89–108	30–110	EI90-C/U	
	≤ 115	30–110	EI90-C/U	EI120-C/U (including EI 90-C/U)
STAINLESS STEEL,	115–140	30-90	EI90-C/U	(
CAST IRON	140–168	50	EI90-C/U	
		50-80	EI60-C/U	

* C/U classified systems can be used also for U/C and C/C requirements.

PLASTIC PIPES (MULTILAYER COMPOSITE PIPES) FOR COMPLETE WALL PENETRATION

				FIRE CLASSIFICATION (ONE PIPE SECTION IN THE MIDDLE OF THE PENETRATION)*	FIRE CLASSIFICATION (COMPLETE PIPE INSULATION)*
PIPE MATERIAL	OUTER PIPE DIAMETER (mm)	PIPE WALL THICKNESS (mm)	INSULATION THICKNESS** (mm)		
	≤ 50	≤ 6,9	20–100		
PLASTIC		≤ 10	30–100	EI120-C/U	EI120-C/U (including EL90-C/)
PIPES	≤ 110	> 10 – ≤	30		(
		15,2	> 30 - 100	EI90-C/U	EI90-C/U

* C/U classified systems can be used also for U/C and C/C requirements.

PLASTIC PIPES (MULTILAYER COMPOSITE PIPES) FOR PARTIAL WALL PENETRATION

PIPE MATERIAL/NAME	OUTER PIPE DIAMETER (mm)	PIPE WALL THICKNESS (mm)	INSULATION THICKNESS** (mm)	FIRE CLASSIFICATION*	N4497000000
PLASTIC COMPOSITE PIPES	≤ 32	≤ 4,5	20-50	EI60-U/C	023970097493009
ALPEX F50 PROFI		≤ 3,0		EI90-U/C	

** The insulation thickness shown can be installed according to the test certificate. The insulation thickness must be selected according to energy aspects or national regulations.

CEILING PENETRATION SYSTEMS WITH KNAUF INSULATION PS PRO ALU



METAL PIPES

			FIRE CLASSIFICATION (ONE PIPE SECTION IN THE MIDDLE OF THE PENETRATION)*	FIRE CLASSIFICATION (COMPLETE PIPE INSULATION)*
PIPE MATERIAL	OUTER PIPE DIAMETER (mm)	INSULATION THICKNESS (mm)		
COPPER, STEEL,	≤ 54	20–100	EI120-C/U	
STAINLESS STEEL,	54-89	30–120	EI120-C/U	
CAST IRON	89–108	30–110	EI90-C/U	
	≤ 115	30–110	EI120-C/U	E1120-C/ 0
CAST IRON	115–140	30-90	EI120-C/U	
	140–168	50-80	EI120-C/U	

* C/U classified systems can be used also for U/C and C/C requirements.

PLASTIC PIPES (MULTILAYER COMPOSITE PIPES) FOR COMPLETE CEILING PENETRATION

			FIRE CLASSIFICATION (ONE PIPE SECTION IN THE MIDDLE OF THE PENETRATION)*	FIRE CLASSIFICATION (COMPLETE PIPE INSULATION)*
PIPE MATERIAL	OUTER PIPE DIAMETER (mm)	INSULATION THICKNESS (mm)		
PLASTIC COMPOSITE	≤ 50	20–100	EI120-C/U	EI120-C/U
PIPES	≤ 110	30–100	(including EI90-C/U)	(including EI90-C/U)

PLASTIC PIPES (MULTILAYER COMPOSITE PIPES) FOR PARTIAL CEILING PENETRATION

IPE MATERIAL/ NAME	OUTER PIPE DIAMETER (mm)	PIPE WALL THICKNESS (mm)	INSULATION THICKNESS ** (mm)	FIRE CLASSIFICATION*
PLASTIC COMPOSITE PIPES		≤ 4 , 5	20-50	EI60-U/C
ALPEX F50 PROFI	≤ 32		20-50	EI120-U/C
UPONOR PLASTIC		≤ 3,0	20	EI120-U/C
COMPOSITE PIPES			> 20 - 50	EI90-U/C

* C/U classified systems can be used also for U/C and C/C requirements.

** The insulation thickness shown can be installed according to the test certificate. The insulation thickness must be selected according to energy aspects or national regulations.

INSTALLATION INSTRUCTIONS

BASIC REQUIREMENTS

- All adhesion surfaces must be dry and free from dust, grease and dirt.
- The protective strip must be removed from the pipe section before it is closed with longitudinal self-adhesive overlap coating.
- Pipe section joints must be sealed with self-adhesive aluminium tape, equally covering both sides.
- Thermo-teK PS Pro ALU is manufactured with a slight slit on the side opposite to the longitudinal opening. This makes it much easier to push the section over the pipe which is to be insulated.

1. WALL STRUCTURE

Knauf Insulation seal systems for pipes penetrating wall might be used both in light weight and massive walls. The same fire resistance intended for pipe insulation must be applied to the wall. The thickness of the wall must be a minimum of 100 mm for dense walls, 94 mm for lighweight walls and no part of the penetration seal may be located less than 100 mm from the lightweight wall post.

2. GAP FILLING

The remaining gap between the insulation and supporting structure must be filled with mineral construction materials

with Euroclass Reaction to Fire classification of A1. Suitable materials might be cement mortals, gypsum, etc. The gap width must be in a range of 1–5 cm (requirement only for lightweight walls).

3. SUSPENSION SYSTEM

Firstly brackets (supports) for the pipes must be positioned at spacings of ≤ 650 mm from the wall. The brackets must be non-combustible.

4. PIPES

Pipe dimensions and material must be in harmony with materials listed in pages 4 and 5.

5. CEILING STRUCTURE

Ceiling structures are dense. Their thickness must be \geq 150 mm and their density \geq 550 kg/m3.

6. GENERAL REQUIREMENTS

All pipes must only be passed through the wall/ceiling at right angels. In addition, pipe insulation must be wound by steel wire with a thickness of $\emptyset \ge 0.6$ mm and at least 6 turns/m. The spacing between wire loops must be < 200 mm.





7. ALLOWED PIPE ASSEMBLIES

Pipes can be easily grouped in existing holes. The distance between grouped insulated pipes is 0 mm. This pipe assembly will have fire resistance equal to the shortest classification period. Aspacing of \geq 100 mm must be observed from other installations/penetration seals.





8. FORBIDDEN PIPE ASSEMBLIES

Closed circle grouping is not allowed, because the space between the individual pipes cannot be sealed.



9. WALL INSTALLATION DIMENSIONS



10. CEILING INSTALLATION DIMENSIONS



Product properties and supportive documentation of Knauf Insulation Thermo-teK PS Pro ALU with ECOSE® technology are available on www.knaufinsulation-ts.com.

Knauf Insulation Mineral Wool products with ECOSE[®] Technology benefit from a no added formaldehyde binder made from rapidly renewable bio-based materials instead of petroleum-based chemicals.







Our products save energy, cut emissions and are designed to make sure buildings and applications are good for the environment and keep people healthy, safe and well. Across our company, we have been working on sustainability for over a decade. We have focused on zero harm, reducing our energy use and emissions, recycling our production waste, incorporating circular economy principles and constantly campaigning for better and more sustainable buildings and applications. Over the past decade, we have achieved great things and we are proud of how we have changed our company, helped our colleagues, communities and customers and reduced our impact on the environment. But sustainability is a process of continuous improvement. We must do more for our people and our environment. That's why we've created our new sustainability strategy. We call the new strategy '**For A Better World**' because it builds on the success of our mission statement: "Our vision is to lead the change in smarter insulation solutions for a better world."



LIVING WITH A GREEN HEART

The "Living with a Green Heart" initiative promotes a comprehensive approach to sustainable development with

emphasis on societal and social sustainable development, placing an informed individual at the forefront of sustainable transformation of society. "Living with a Green Heart" presents a unique story and approach that encourages companies, organisations, and individuals to:

- Create sustainable products and solutions which can transform grey cities into green oasis, build safe and comfortable homes and lead to a better world for all of us.
- Lead social sustainability actions, cocreating a more informed and kinder future for ourselves and those that come after us.
 - Build a friendlier and more responsible environment for employees at all levels and in all aspects, appreciating the diversity and improving our relationships, as well as the way we work, collaborate, and coexist within our environments.

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COMPANY PROFILE

Knauf Insulation is one of the most respected names in the insulation industry worldwide with over 40 years of experience and still growing fast. Over 6.000 employees in more than 40 countries and 29 manufacturing sites. Being part of the family-owned Knauf group, Knauf Insulation Technical Solutions provides solutions for customers' requirements in industry, marine applications, heating, ventilation and air conditioning. A profound market understanding and insulation know-how enables us to provide a broad range of products to meet your specific needs.

FOR FURTHER INFORMATION VISIT OUR WEBSITE WWW.KNAUFINSULATION-TS.COM,

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