



IZEG

WITH DRAINAGE PIPE SYSTEMS

FIRE TEST 2021

Proven
**SECURITY
FLAWS**
for fire integrity
downwards

Informationszentrum Entwässerungstechnik Guss e. V.

www.izeg.de

FIRE PROTECTION: SAFETY FIRST

BACKGROUND INFORMATION ON THE IZEG FIRE TEST

STARTING POINT

In a multi-storey building in Germany, we rely on the building and its equipment being as safe as possible. After all, there are strict requirements for the safety of buildings in this country, including preventive structural fire protection.

Buildings in Germany are classified according to building classes. Higher buildings in particular (building classes 4 and 5, i.e. buildings of 7 m or 13 m of height, according to section 2 para. 3 nos. 4 and 5 of the Model Building Code - MBO) are classified into fire compartments depending on the requirements on the rooms. Fire protection has the highest priority and is regulated by a large number of legal standards. If a fire breaks out, it should be ensured that it does not spread to other fire compartments within certain periods. This applies in all directions: laterally, upwards and downwards.

FIRE PROTECTION REQUIREMENTS FOR WASTE WATER PIPES

- Building services installations, such as drainage pipes, often pass through the walls and ceilings of fire compartments. Section 40 para. 1 MBO requires that such pipes may only be routed through structural elements with fire integrity (walls and ceilings) for which fire resistance is prescribed, if there is no risk that the fire will spread in the near future.
- According to Section 31 MBO, ceilings between storeys must be fire-resistant as structural elements with fire integrity of building class 5 and highly fire-retardant of building class 4. This means that building components compartments must withstand a fire for 90 minutes and highly fire-retardant compartments must withstand a fire for 60 minutes (DIN 4102-2:1977-09).
- Consequently, certain pipe installations or their penetration seals must also have the same fire resistance (MLAR 2015, Section 4.1). Only with the same fire resistance, the necessary safety of the fire barrier can be achieved.

FIRE SAFETY TESTING

It must be proven by appropriate tests whether safe fire protection is ensured. The relevant test standard DIN EN 1366-3, however, only requires an upward test for vertical penetration seals through slabs for drainage pipes, but not a downward test. The test standard explicitly states that the risk of fire spreading downwards cannot be assessed with the test procedure regulated therein.



Detailed fire protection requirements and background information can be found at izeg.de/brandversuch-2021.

AIM OF THE IZEG FIRE TEST

As a responsible specialist institution for cast iron drainage technology, we are always interested in the highest safety and quality standards of drainage products. Therefore, together with leading manufacturers of cast iron drainage pipe systems, we have carried out the IZEG fire test.

Our aim was to find out how well different drainage pipe and penetration seals pass the fire test not only upwards but also downwards. This orienting fire test was carried out on 05 February 2021 at the accredited materials testing institute (Materialprüfungsanstalt) in Braunschweig.

» Information on MPA Braunschweig is available at mpa.tu-braunschweig.de



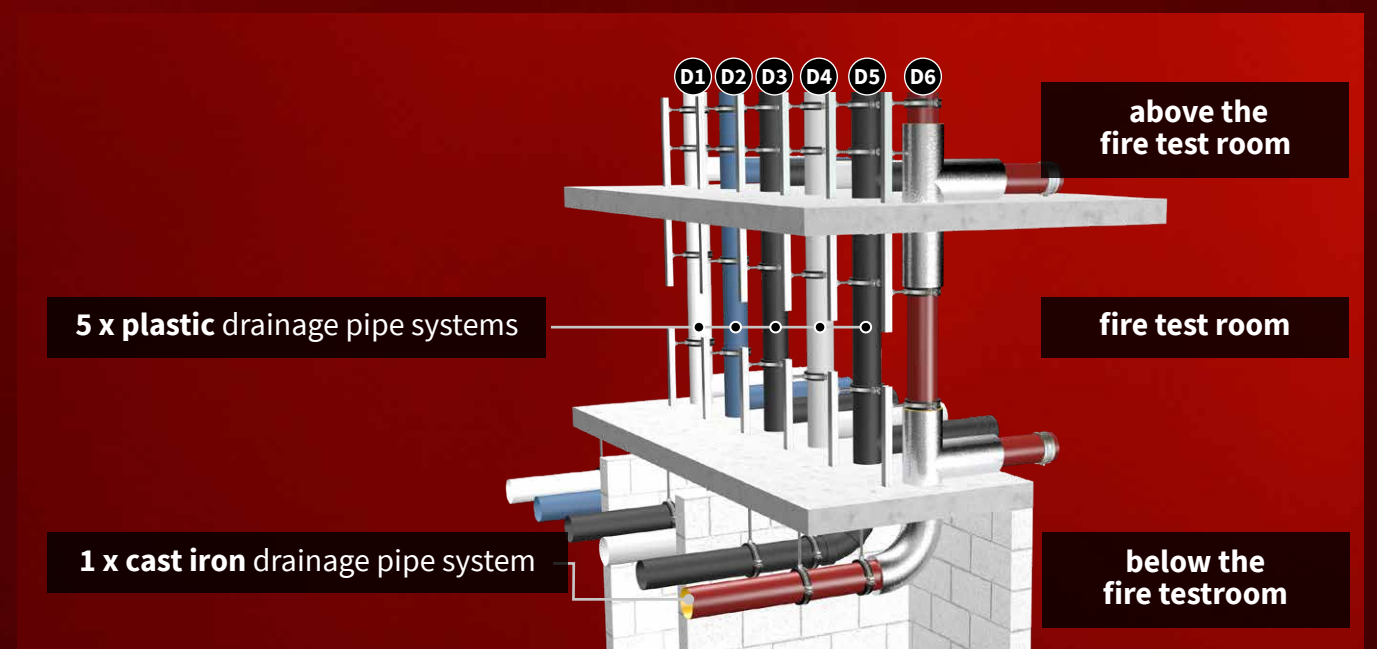
THE QUESTION – FIRE INTEGRITY IN CASE OF FIRE ON THE TEST BENCH

The various drainage pipe systems with approved penetration seals were tested for the behaviour and integrity in the event of a fire. The focus of the investigation was the effect on the integrity of ceilings, especially of the categories „fire-resistant“ and „highly fire-retardant“, required in the Model Building Code and the respective administrative regulations based on the standards. The IZEG fire test was carried out under the following conditions:

- Test for continuous maintenance of the fire integrity over the test duration of 90 minutes
- Evaluation of **smoke development outside the fire test room**
- Observation of possible flame formation** in the lower room
- Checking the **temperature transmission** to adjacent rooms for inadmissible increase

SETUP OF THE EXPERIMENT

The installation of a cast-iron SML pipe system and various plastic pipe systems was carried out in a test set-up with three floors. The downpipes of the pipe systems passed through a room in which a fire was generated according to the standard temperature curve. The pipes penetrated a ceiling upwards into the open air and a floor downwards, where they then ended in a horizontal line.



RESULTS BELOW THE FIRE TEST ROOM

TEST DURATION

90 min



DRAINAGE PIPE SYSTEM

● Inadmissible ● Critical ● Secure

TEARING OFF / OPENING OF THE PIPE

SMOKE DEVELOPMENT

FIRE INTEGRITY CLOSURE TO THE LOWER ROOM

FLAME FORMATION

INACCEPTABLE TEMPERATURE TRANSMISSION

BURNING FALLING OFF of components

RESULTS ABOVE THE FIRE TEST ROOM:

All tested pipe systems were able to comply with the penetration seal guidelines.

REQUEST THE MPA INVESTIGATION REPORT NOW AT:

izeg.de/brandversuch-2021

	D1 REHAU RAUPIANO PLUS	D2 POLO-KAL XS	D3 GEBERIT SILENT-PRO	D4 WAVIN AS	D5 GEBERIT SILENT DB20	D6 SML (DÜKER, PAM-GLOBAL®, PREIS®)
TEARING OFF / OPENING OF THE PIPE	13 min	12 min	18 min	19 min	31 min	Secure
SMOKE DEVELOPMENT	13 min	12 min	16 min	19 min	31 min	Secure
FIRE INTEGRITY CLOSURE TO THE LOWER ROOM	15 min	15 min	20 min	20 min	31 min	Secure
FLAME FORMATION		60 min	25 min	31 min	31 min	Secure
INACCEPTABLE TEMPERATURE TRANSMISSION			26 min	19 min		Secure
BURNING FALLING OFF of components			26 min		32 min	Secure
RESULTS ABOVE THE FIRE TEST ROOM:	14 min	12 min	26 min	26 min	32 min	90 min



EXAMINED DRAINAGE PIPE AND PENETRATION SEAL SYSTEMS

D1 REHAU RAUPIANO PLUS

Waste water pipes and fittings according to abZ Z-42.1-223 of the manufacturer REHAU, installed with pipe collar REHAU Plus abZ Z-19.17-1662 according to the specifications of aBG System REHAU Plus aBG Z-19.53-2459

D2 POLO-KAL XS

Waste water pipes and fittings according to abZ Z-42.1-506 of the manufacturer POLOPLAST, installed with pipe collar system POLO-BSM F according to the specifications of aBG Z-19.53-2306

D3 Geberit Silent-Pro

Waste water pipes and fittings according to abZ Z-42.1-542, installed with system Geberit pipe firestop seal 90 Plus EN according to the specifications of abZ Z-19.53-2236

D4 Wavin AS

Waste water pipes and fittings according to abZ Z-41.1-228, R90 Wavin installed with system BM-R90 according to the specifications of aBG Z-19.53-2307

D5 Geberit Silent db20

Waste water pipes and fittings according to abZ Z-42.1-265, installed with system Geberit pipe firestop seal 90 Plus according to the specifications of the abZ Z-19.17-1927

D6 SML: Düker SML, SAINT-GOBAIN HES PAM-GLOBAL® S, PREIS® SML

Drainage pipes, fittings and joints according to DIN EN 877, installed with penetration seals with ROCKWOOL Klima-rock according to abP P-3725/4130-MPA BS

Result for cast iron drainage pipe systems:

100 % FIRE INTEGRITY, 100 % SAFETY

- ✓ **Secure fire integrity in all directions**
- ✓ **No smoke development in adjacent rooms**
- ✓ **No flame formation in the lower room**
- ✓ **No inadmissible temperature transmission**
- ✓ **No opening or tearing off of the line**

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