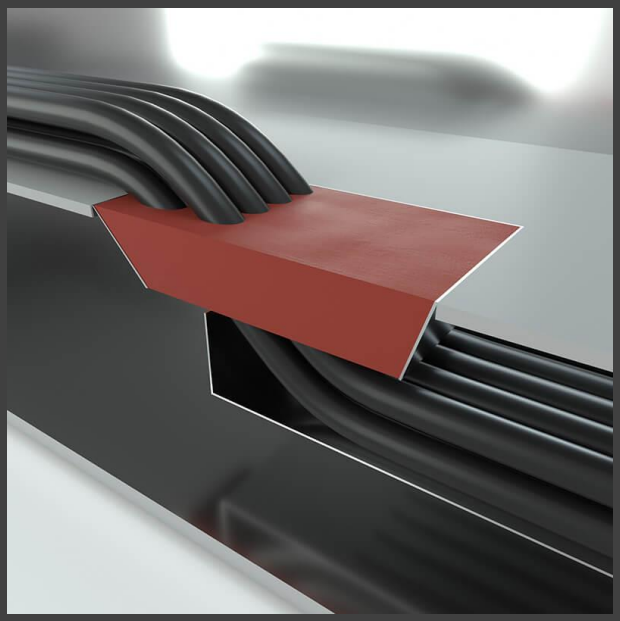
ZZ ZAPP-ZIMMERMANN
INNOVATIVE FIRE-PROTECTION SYSTEMS

FIRE PROTECTION CLOSURE FOR PENETRATIONS IN VEHICLES FLOORS USING **ZZ® 395 FIRE PROTECTION CASTING COMPOUND, ISOCYANATE-FREE**

TECHNICAL INFORMATION



TECHNICAL INFORMATION FOR THE IMPLEMENTATION OF FIRE PROTECTION SEALS IN THE FLOOR OF RAIL VEHICLES

– USING **ZZ® 395 FIRE PROTECTION CASTING COMPOUND, ISOCYANATE-FREE**

1. CONTENT AND USE

- This technical information outlines possible solutions for fire protection of services through openings in the floor of rail vehicles using **ZZ® 395 Fire Protection Casting Compound, isocyanate-free.**
- The test results do not replace a usability certificate but can serve as a basis for evaluation or for planning usability tests.
- Application-specific boundary conditions not addressed in this technical information may impact the functionality of the penetration seal.

2. DESCRIPTION OF **ZZ® 395 FIRE PROTECTION CASTING COMPOUND, ISOCYANATE-FREE**

- **ZZ® 395 Fire Protection Casting Compound, isocyanate-free** is free of isocyanate, borate, melamine and halogen. In the event of a fire, additives ensure strong expansion and the formation of an insulating layer, which significantly slows the spread of fire and smoke and thus enables the rescue of people and materials.
- The penetration seal is suitable for use in rail vehicles and provides fire resistance with compartmentalizing effectiveness for 30 minutes (**E30**) and thermal insulation for up to 30 minutes (**I30**), in accordance with the **EI30** classification. The classification depends on the thickness of the casting compound used.
- The assembly of the penetration seals with **ZZ® 395 Fire Protection Casting Compound, isocyanate-free** is described in detail in the design examples.

3. INSTALLATION OF FIRE PROTECTION CLOSURES FOR CABLE OPENINGS WITH **ZZ® 395 FIRE PROTECTION CASTING COMPOUND, ISOCYANATE-FREE**

Products	**ZZ® 395 Fire Protection Casting Compound, isocyanate-free** This product meets the requirements of EN 45545-2 for hazard levels HL1, HL2, and HL3, and satisfies the criteria R22 and R23.
Suitable Components	Suitable for watertight cable penetrations in rail vehicle floors. The components should meet equivalent fire protection requirements.
Assembly	The component penetration must be cleaned before filling with **ZZ® 395 Fire Protection Casting Compound, isocyanate-free.** The opening is filled with **ZZ® 395** using a formwork installed underneath. Once fully cured, the formwork can be removed and the seal is fully operational.
Services	Electrical cables with Ø ≤ 62,5 mm Cable bundles with Ø ≤ 20 mm (Bundles with individual cable Ø ≤ 1,9 mm)
Special Notes	**ZZ® 395** is isocyanate-free, borate-free, melamine-free and halogen-free. The implementation of the penetration sealing for cable and pipe penetrations using **ZZ® 395 Fire Protection Casting Compound**, **isocyanate-free** was carried out in accordance with the specifications of the current test report (see attachment). The dimensions of the installations used, as well as other details, can also be found in this test report.

4. SUMMARY

- Fire protection measures using **ZZ® 395 Fire Protection Casting Compound, isocyanate-free** in rail vehicles can be implemented after verifying the boundary conditions.
- **ZZ® 395 Protection Casting Compound**, **isocyanate-free** achieves a fire resistance of 30 minutes compartmentalization and up to 30 minutes of thermal insulation, depending on material thickness. These values are in accordance with **EI30** classification.
- The examples (see following pages) highlight the key construction details that typically need to be considered.
- Penetration seals can only be installed if the load bearing (load-transferring and stiffening) components have at least the same fire resistance duration as the penetration seals.
- If constructions are planned that substantially deviate from the examples provided here, ZAPP-ZIMMERMANN is available to assist in the verification process.

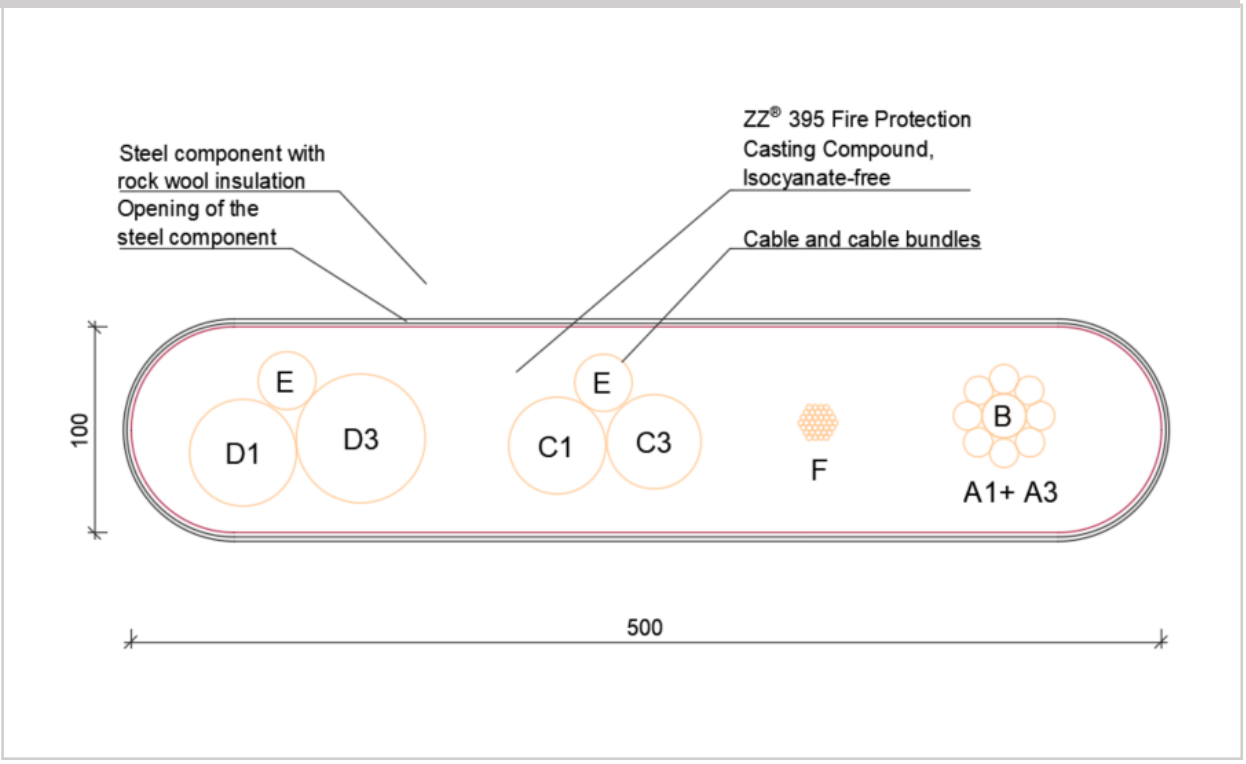
PENETRATION SEAL EXAMPLE

FOR CABLE PENETRATIONS THROUGH FLOOR OR WALL OPENINGS IN RAIL VEHICLES USING **ZZ® 395 FIRE PROTECTION CASTING COMPOUND, ISOCYANATE-FREE**

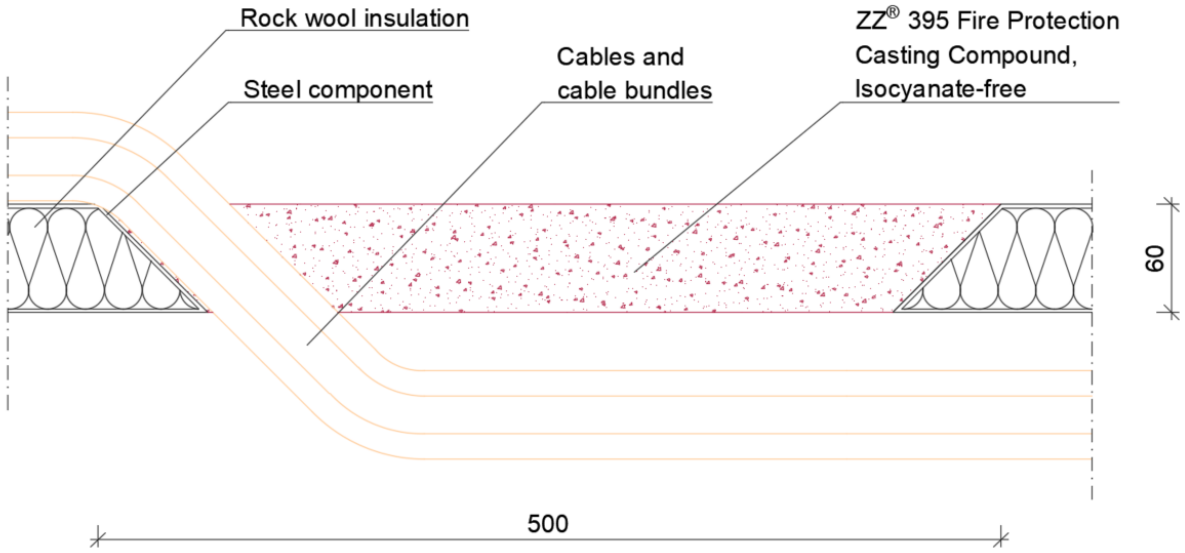
The illustrations depict the fundamental principle of penetration sealing and the installation of **ZZ® 395 Fire Protection Casting Compound**, **isocyanate-free.** It is important to note that a minimum thickness of insulating material must be used to achieve the fire resistance class of the surrounding component.

A 60 mm thick seal made of **ZZ® 395 Fire Protection Casting Compound, isocyanate-free** achieves a compartmentalization and thermal insulation of 30 minutes giving a rating of **EI30**. A 40 mm thick seal still achieves **E30** and **I15**, an overall rating of **EI15**.

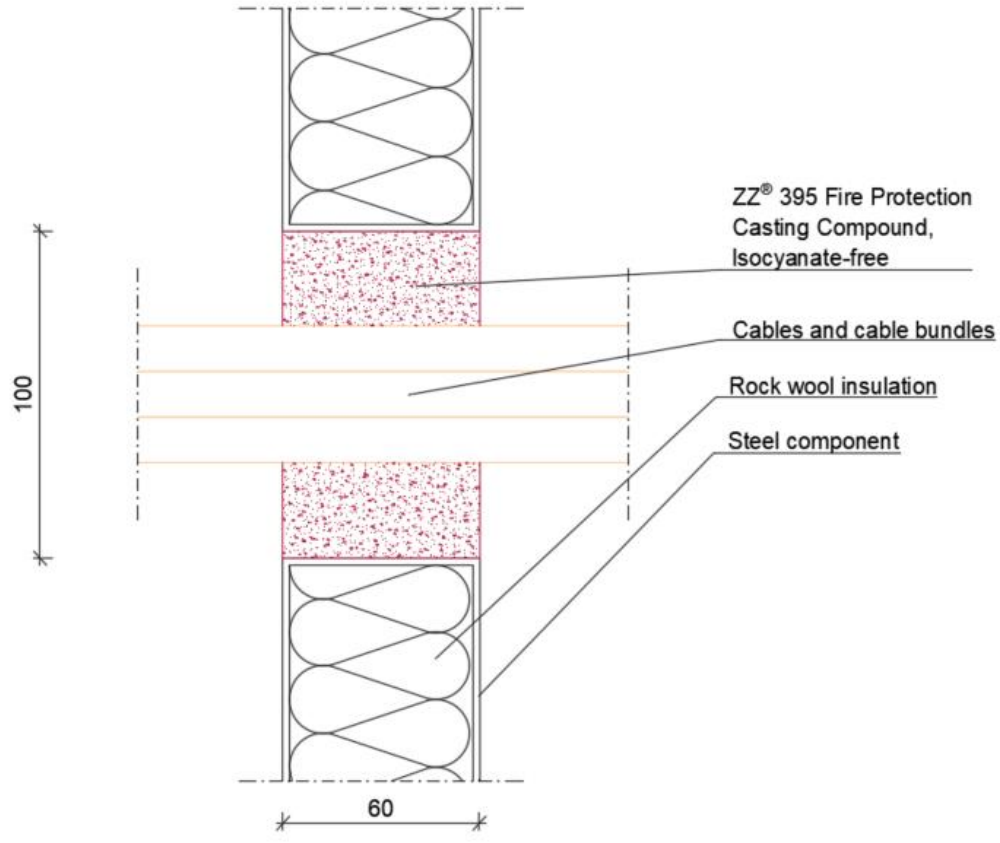
Example Seal – Face View



Example Seal – Floor Section View



Example Seal – Wall Section View



FOUNDATIONS OF THIS TECHNICAL INFORMATION

This technical information on **ZZ® 395 Fire Protection Casting Compound, isocyanate-free** in rail vehicles is based on the following documents:

- Test Report Nr. R23-0372, Currenta. issued 27.09.2023
- Test Report Nr. R23-0711C, Currenta, issued 14.11.2023
- R22, R23 nach EN 45545-2
  - Classification Report Nr. 21/1255, Currenta
  - Test Report Nr. 21/1169 ISO 4589-2, Currenta
  - Test Report Nr. 21/1224 ISO 5659-2, Currenta
- DIN EN 45545-3: 2013
- DIN EN 1364-1: 2015
- EN 1366-3: 2021
- Construction diagrams according to examples

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