



Assessment of FABEKUN junction with adjustable socket for connection of laterals to concrete pipes - schedule

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1. Scope

FUNKE KUNSTSTOFFE GmbH produce the Fabekun adjustable socket junctions for the *in situ* connection of DN160 and DN200 (OD) laterals to DN300 up to DN2400 (ID) smooth, solid wall gravity sewers of 30mm minimum wall thickness. This assessment schedule applies to the Fabekun adjustable socket junction fitted to concrete gravity sewer pipes.

The angular adjustment of the socket ranges from 0° to 13° which allows up to 5° adjustment for deflection of the connecting pipe plus up to 8° to compensate for ground settlement.

The body of the junction comprises a single piece moulded PVC-U body plus a moulded PVC-U socket. The socket has 2 elastomeric seals made from EPDM. The outer seal sits between the socket and the body of the coupling, the inner seal locates the lateral. A further EPDM seal, which engages with the concrete pipe, is fixed to the body of the junction in the factory by an adhesive.

The junction may be used for connecting laterals made of clay, solid wall plastic and structured wall plastics. Adapters are required for clay and structured wall plastic laterals. Various types of adapter are available, Funke Kunststoffe GmbH or their agents will advise upon the preferred type.

The junction is locked to the concrete pipe using a PVC-U screw ring and shaped collar. The space between the junction and the concrete pipe is filled

with expanding polyurethane resin supplied with the junction. A reusable screw lid is used to seal off the junction during pressure testing of the sewer.

2. Assessment schedule

2.1 To assess the product against the performance requirements listed below through an audit of test data.

2.2 Witness testing of the junction.

2.4 Audit installation instructions.

2.5 Witness on-site installation for compliance with instructions.

3. Review of properties

3.1 EN 1401⁷, EN 476² and EN 295¹ are the leading standards for couplings for gravity sewerage and drainage pipes. This assessment schedule has taken into account the requirements of these standards and the performance claims of the product. EN 1916⁹ has also been consulted.

3.2 Dimensions and tolerances are in accordance with the manufacturer's specification. The critical dimensions are the ID of socket into which the lateral fits and OD of the lip plus seal that fits into the concrete pipe.

3.3 Tolerance of the junction to fit into diamond cored hole (diameter 200 +/- 1mm).

3.4 Materials Properties:

- Elastomeric components to BS EN 681-1³;



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- PVC-U components to clause 4 EN 1401-1⁷;
- Expanding PU resin and adhesive used to secure lower rubber seal in place: to manufacturer's specification.

3.5 Mechanical and physical properties of the junction in accordance with Tables 11 and 13 of EN 1401-1⁷. This covers impact strength to EN 12061⁸, vicat softening temperature to EN 727⁴ and effects of heating to Method A EN 763⁵.

3.6 Performance requirements with regard to water tightness of the connection to lateral as listed in the Tables 1 and 2.

| Test | EN295-1 | Conditions |
|----------------------|------------|--|
| Vacuum/ shear | Clause 3.4 | -0.05 and -0.5bar with 25N/mm dia load on pipe |
| Vacuum/ deflection | Clause 3.3 | -0.05/-0.5 bar with 2° deflection |
| Pressure/ shear | Clause 3.4 | 0.05 and 1.0 bar with 25N/mm dia load on pipe |
| Pressure/ deflection | Clause 3.3 | 0.05 and 1.0 bar with 2° deflection |

Table 1 - Clay laterals

Each category of lateral pipe material will be tested under the appropriate range of tests with the junction fitted to DN500 concrete pipe. Where an

adapter is needed, the tests shall be carried out with a typical adapter as recommended by Funke Kunststoffe GmbH.

| Test | EN 1277 | Conditions |
|----------------------|---------------------------------|--|
| Vacuum/ deflection | Method 4 condition C | -0.3bar at 2° and 15° deflection (Design angle +2°) |
| Pressure/ deflection | Method 4 condition C | 0.05 and 0.5 bar at 2° and 15° deflection (Design angle +2°) |
| Vacuum/ distortion | Based upon method 4 condition B | -0.3 bar with 5% spigot distortion @ entry to junction |
| Pressure/ distortion | Based upon method 4 condition B | 0.05 and 0.5 bar with 5% spigot distortion @ entry to junction |

Table 2 - Plastic laterals including structured wall pipes

3.7 Properties of the junction fitted to concrete pipe: vertical load on connection (20kN) without visible signs of damage; shear load through connection as given in Table 3. The tests shall be carried out on DN500 concrete pipe.

| Test | Conditions |
|---------------|-------------------------------|
| Vacuum/ shear | -0.25 bar and 25N/mm pipe dia |
| Pressure/ | 1 bar and |



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| | |
|-------|-----------------|
| shear | 25N/mm pipe dia |
|-------|-----------------|

Table 3 - Shear loads on connection

4. Review of procedures

In addition to the performance of the junction, the following items will be checked.

Installation procedures including:

- cutting of main pipe;
- fitting instructions;
- connection of laterals.

Procedures for controlling the quality during manufacture.

5. Reference documents

1. BS EN 295: Vitrified clay pipe and fittings and pipe joints for drains and sewers.

Part 1, 1991: Requirements

Part 3, 1991: Test methods

Part 4, 1995: Requirements for special fittings, adapters and compatible accessories.

2. BS EN 476 1998: General requirements for components used in discharge pipes, drains and sewers for gravity systems.

3. BS EN 681-1 1996: Elastomeric seals. Materials requirements for pipe joint seals used in water and drainage applications - Vulcanised rubber.

4. BS EN 727 1995: Plastics piping and ducting systems. Thermoplastic pipes and fittings. Determination of Vicat softening temperature (VST).

5. BS EN 763 1995: Plastics piping and ducting systems. Injection-

moulded thermoplastics fittings. Test method for visually assessing effects of heating.

6. BS EN 1277 2003: Plastics piping systems – Thermoplastics piping systems for non-pressure applications – Test methods for leaktightness of elastomeric sealing ring type joints

7. BS EN 1401 1998: Plastics piping systems for non-pressure underground drainage and sewerage – Unplasticized poly(vinyl chloride) (PVC-U) – Part 1: Specification for pipes, fittings and the system.

8. BS EN 12061 1999: Plastics piping systems – Thermoplastics fittings – Test method for impact resistance.

9. BS EN 1916, 2002: Concrete pipes and fittings, unreinforced, steel fibre and reinforced.