

**Assessment of Connex junction for connection of laterals to plastics sewer pipes - schedule**



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**1. Scope**

To assess the Connex junction produced by FUNKE KUNSTSTOFFE GmbH for the *in situ* connection of DN160 and DN200 (OD) laterals primarily to solid wall plastics pipe gravity sewers DN200 to 1500 (OD). The Connex junction may also be used with gravity sewers made from other materials of suitable wall thickness such as glass reinforced plastics and ductile iron. This assessment schedule applies to the use of the junction with plastics sewer pipes with stiffness SN2 (SDR51) to SN8 (SDR34).

The junction may be used for connecting laterals made of clay, solid wall plastics and structured wall plastics. Adapters are required for clay and structured wall plastic laterals. Laterals less than DN200 may also be connected via an adapter. Various types of adapter are available, Funke Kunststoffe GmbH will advise upon the preferred type.

The wall thickness of the sewer pipe must be between 4.0 and 31.8mm.

The angular adjustment of the socket ranges from 0° to 11° which allows up to 5° adjustment for deflection of the connecting pipe plus up to 6° to compensate for ground settlement.

The body of the junction comprises upper and lower moulded PVC-U sections. The lower section locks into the sewer pipe and the upper section screws into the lower section. EPDM seals prevent leakage between: the 2 sections; the lateral and the upper section, and; the lower section and

the sewer pipe. The latter seal is fixed to the lower section in the factory by an adhesive.

During installation, the lower section is held in place by retention clips before being locked to the sewer pipe using a PVC-U screw ring and shaped spacer ring. 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 1401<sup>7</sup>, EN 476<sup>2</sup> and EN 295<sup>1</sup> 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.

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 sewer pipe.

3.3 Tolerance of the junction to fit into the bored hole in the sewer pipe (diameter 200 +/-1mm).



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**3.4 Materials Properties:**

- Elastomeric components to BS EN 681-1<sup>3</sup>;
- PVC-U components to clause 4 EN 1401-1<sup>7</sup>;
- 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 1401-1<sup>7</sup>. This covers impact strength to EN 12061<sup>8</sup>, vicat softening temperature to EN 727<sup>4</sup> and effects of heating to Method A, EN 763<sup>5</sup>.

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**

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

Test	EN 1277	Conditions
Vacuum/ deflection	Method 4 condition C	-0.3bar at 2° deflection
Pressure/ deflection	Method 4 condition C	0.05 and 0.5 bar at 2° deflection
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**

Test	Conditions
Vacuum/ distortion of sewer	-0.3 bar and 10% distortion of sewer pipe at junction
Pressure/ distortion of sewer	0.5 bar and 10% distortion of sewer pipe at junction
Vacuum/ shear	-0.5bar with 25N/mm pipe dia. shear
Pressure/ shear	1bar with 25N/mm pipe dia. shear.
Vacuum/ shear + displacement	-0.3 bar and displacement as per EN 12256
Pressure/ shear + displacement	1 bar and displacement as per EN 12256

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**Table 3 - Loading on connection with sewer pipe**

Each category of lateral pipe material shall be tested with the junction fitted to a PVC-U pipe to EN 1401-1. Where an adapter is needed, the tests shall be carried out with a typical adapter as recommended by Funke Kunststoffe GmbH.

3.7 Performance requirements with regard to water tightness and structural integrity of the junction fitted to plastics sewer pipe as given in Table 3.

**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.

The application of these procedures to be witnessed on-site by WRc.

**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.