

PT/302/0410 – AS (April 2010)
Assessment Schedule for Flex-Seal Couplings
Ltd's Type FA 200B flexible saddle for
concrete pipes



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1. Scope

1.1 To assess the flexible saddle developed and produced by Flex-Seal Couplings Ltd for the *in situ* connection of laterals etc. to gravity sewers and pressure pipes.

1.2 Version 1 of the flexible saddle is designed to connect 200 mm drainage pipes (clay, plastics, iron) to DN 450 up to DN 1500 concrete pipes.

1.3 A rubber bush is needed for connecting to some pipes. Future developments will increase the range of product sizes and the scope of assessments required.

2. Assessment schedule

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

2.2 Witness selected testing of flexible saddles in sizes representative of the range.

2.3 Audit installation instructions.

2.4 Witness on-site installation for compliance with instructions.

3. Review of properties

3.1 WIS 4-41-01⁽¹⁾ and EN 295-4⁽²⁾ are the leading standards for flexible couplings for gravity sewerage and drainage pipes. This assessment schedule has been drafted taking into account the requirements of these standards and the performance claims of the product. BS EN 1916⁽³⁾ and BS 5911-1⁽⁴⁾ have also been consulted.

3.2 Dimensions and tolerances to minimum specified (Table 1⁽¹⁾/ Table A.2⁽²⁾) in accordance with clause 8.1⁽¹⁾ and manufacturer's specification. The saddle

shall not protrude through the wall of the concrete pipe. It must stop between 5 mm and 10 mm from the inside of the concrete pipe.

3.3 Tolerance of flexible saddle to fit into diamond cored hole - manufacturer's stated diameter +1/-0 mm.

3.4 Materials Properties:

- a) elastomeric components to BS EN 681-1⁽⁵⁾;
- b) stainless steel clamp bands to clause A.2.1⁽²⁾;
- c) A.B.S sleeve to manufacturer's specification.

3.5 Properties of flexible coupler (connection to lateral):

- a) strength of clamp band (A.6.1⁽²⁾);
- b) watertightness as listed in the Tables 1** and 2 below.

** The shear test for Type 1 couplings to EN 295-4 will be used in conjunction with the pressure regimes in WIS 4- 41-01.

3.6 Each drainage pipe material will need to be tested under the appropriate range of tests. Where a bush is needed, the tests shall be carried out with this assembled. All tests shall be carried out at the recommended assembly torque.

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Test	Clause (WIS 4-41-01)	Conditions
Vacuum/ shear	App C.3 with modified shear to EN 295-4	-0.25 bar/ 25 N/mm pipe
Vacuum/ deflection	App C.4	-0.25 bar/ 13°
Pressure/ shear	App C.5 with modified shear to EN 295-4	1 bar/ 25 N/mm pipe
Pressure/ deflection	App C.6	1 bar/ 13°

Note: angle of deflection comprises a 10° angle of entry and a 3° additional deflection when coupling is tightened

Table 1 – To clay and iron pipes

Test	Clause	Conditions
Vacuum/ deflection	App C.4	-0.25 bar/ 13°
Pressure/ deflection	App C.6	1 bar/ 13°
Vacuum/ distortion	App C.7	-0.25 bar/ 5%
Pressure/ distortion	App C.8	1 bar/ 5%

Note: angle of deflection comprises a 10° angle of entry and a 3° additional deflection when coupling is tightened

Table 2 – To plastic and structured wall plastic pipes

3.7 Properties of saddle connection (to concrete pipe):

- a) vertical load on connection (20 kN) without visible signs of damage;

- b) shear load through connection as given in Table 3. The tests shall be carried on DN 450 concrete pipe.

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

Table 3 – Shear loads on connection

4. Review of procedures

4.1 In addition to the performance of the flexible saddles, the following items will be checked.

4.2 Installation procedures including:

- a) cutting of concrete pipe;
- b) fitting instructions;
- c) connection of laterals.

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

5. Reference documents

1. WIS 4-41-01: Specification for flexible couplings for gravity sewerage and drainage pipes. Issue 2, 1993.

2. BS EN 295-4: Vitriified clay pipe and fittings and pipe joints for drains and sewers - Part 4 Requirements for special fittings, adaptors and compatible accessories. 1995.

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

4. BS 5911-1: Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete pipes (including jacking pipes) and fittings

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with flexible joints (complementary to BS EN 1916:2002). November 2002.

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