DIN EN 295-3:2012-03 (E)

Vitrified clay pipe systems for drains and sewers - Part 3: Test methods

Contents

Page

Foreword 5

1 Scope 6

2 Normative references 6

3 Terms and definitions 6

4 Symbols and abbreviations 7

5 Test for squareness of ends 8
5.1 Test of squareness of ends for pipes according to EN 295-1:2012 8
5.2 Test of squareness of ends for pipes according to EN 295-7:2012 8

6 Straightness test 9

7 Crushing strength test 10
7.1 General 10
7.1.1 Preconditioning 10
7.1.2 Testing machine 11
7.1.3 Loading 11
7.2 Bearers and bearing strips/facings 11
7.2.1 Bearers 11
7.2.2 Bearing strips/facings 12
7.3 Support system 12
7.3.1 Flexible hose system (for use with any length of pipe, or pipe section not less than 300 mm in length) 12
7.3.2 Common hydraulic manifold system (for use with any length of pipe, or pipe section not less than 300 mm in length) 14
7.3.3 Rigid systems (restricted to use with pipes or pipe sections from 300 mm to 1 100 mm nominal length) 14
7.4 Test load application 14
7.4.1 Plain ended pipes 14
7.4.2 Socketted pipes 14
7.4.3 Loading 14
7.5 Results and reporting 14
7.5.1 Acceptance (proof) tests 14
7.5.2 Ultimate tests 15
7.5.3 Disputes 15
7.5.4 Test records 15

8 Bending tensile test 15
8.1 Preconditioning 15
8.2 Test procedure 15

9 Bending moment resistance (BMR) test 17
9.1 General 17
9.1.1 Preconditioning 17
9.1.2 Testing machine 17
9.1.3 Loading 17
9.1.4 Choice of test method 17
9.2 Four point loading test 17

9.2.1 Test procedure ... 17
9.2.2 Testing by attributes ... 18
9.2.3 Testing by variables ... 18
9.3 Three point loading test ... 18
9.3.1 Test procedure ... 18
9.3.2 Testing by attributes ... 19
9.3.3 Testing by variables ... 19

10 Bond strength of adhesive ... 20

11 Tests for fatigue strength ... 20
11.1 Preconditioning ... 20
11.2 Test using a pipe or pipe section ... 20
11.3 Test using sawn test specimens ... 21

12 Test for watertightness ... 22
12.1 General ... 22
12.2 Pipes and junctions ... 22
12.3 Fittings other than junctions and terminal fittings ... 22

13 Chemical resistance test for pipes and fittings ... 22

14 Determination of hydraulic roughness ... 23

15 Abrasion resistance test ... 23

16 Airtightness test ... 25

17 Tests for resistance to high pressure jetting ... 25
17.1 General ... 25
17.1.1 Water source ... 25
17.1.2 Pressure measurement ... 25
17.1.3 Test temperature ... 25
17.2 Moving jet test ... 26
17.3 Stationary jet test ... 26
17.3.1 General ... 26
17.3.2 Apparatus ... 26
17.3.3 Test pieces ... 27
17.3.4 Procedure ... 27

18 Hardness test for polyurethane ... 28
18.1 Test pieces ... 28
18.2 Test method ... 28

19 Tests for material requirements of polypropylene sleeve couplings ... 28
19.1 Melt flow index ... 28
19.2 Tensile strength and elongation at break ... 29
19.3 Elevated temperature test ... 29

20 Performance test for polypropylene sleeve couplings ... 29

21 Mechanical test methods for joint assemblies ... 29
21.1 General ... 29
21.2 Deflection test ... 30
21.3 Shear resistance test ... 31
21.3.1 Loading arrangements for shear resistance ... 31
21.3.2 Short-term shear resistance test ... 33
21.3.3 Long-term shear resistance test ... 33

22 Continuity of invert test ... 34
22.1 Test methods ... 34
22.2 Pipes and fittings with top marking ... 34

22.3 Pipes and fittings randomly jointed 35
22.3.1 Sampling and dimensions 35
22.3.2 Calculations 35
22.3.3 Evaluation 36

23 Chemical resistance test for joint assemblies 36
23.1 Test solutions 36
23.2 Procedure 36

24 Thermal stability 37
24.1 Thermal cycling stability 37
24.2 Long-term thermal stability 37

25 Creep resistance of rigid fairing materials 38
25.1 Deformation 38
25.1.1 Test samples 38
25.1.2 Test apparatus 38
25.1.3 Procedure 38
25.2 Indentation 38
25.2.1 Test samples 38
25.2.2 Test apparatus 39
25.2.3 Procedure 39

26 Water tightness test for assembled components of manholes and inspection chambers ..39

27 Compressive strength of jacking pipes 39
27.1 Test methods 39
27.1.1 Testing machine 39
27.1.2 Selection and preparation of specimens 39
27.1.3 Test procedure 41
27.1.4 Loading 41
27.2 Calculation of compressive strength 41

28 Water absorption 41
28.1 Test specimen 41
28.2 Water absorption test 42