DIN 16961-2:2010-03 (E)

Thermoplastics pipes and fittings with profiled wall and smooth pipe inside - Part 2: Technical delivery specifications

Contents

Page

Foreword 4

1 Scope 5

2 Normative references 5

3 Material (moulding materials) 6

4 Requirements 6
4.1 General 6
4.2 Form supplied 6
4.3 Strength 6
4.3.1 Ring stiffness 6
4.3.2 Creep modulus (Ec modulus) 7
4.4 Strength of welded joints 8
4.5 Tightness of joints 8
4.6 Resistance to root penetration 8
4.7 Melt mass-flow rate (MFR) for PE 63, PE 80, PE 100, PE-HD and PP pipes and fittings 8
4.8 Surface finish 8
4.9 Colour 9
4.10 Dimensions 9

5 Testing 9
5.1 Form supplied 9
5.2 Strength 9
5.2.1 Ring stiffness 9
5.2.2 Creep modulus 12
5.3 Tightness of joints 12
5.4 Resistance to root penetration 12
5.5 Melt mass-flow rate (MFR) for PE and PP pipes and fittings 12
5.6 Surface finish 12
5.7 Colour 12
5.8 Dimensions 12
5.9 Weldability of PE and PP pipes and fittings 12

6 Inspection 12
6.1 General 12
6.2 Internal control 13
6.2.1 Type, scope and frequency 13
6.2.2 Defects 13
6.2.3 Documentation 13
6.3 Third party inspection 14
6.3.1 Type, scope and frequency 14
6.3.2 Sampling 14
6.3.3 Inspection report 15

7 Marking 15

Annex A (informative) Calculating SR24 ring stiffness on a solid wall cross section (Example) 16

A.1 Schematic test set-up and measured values 16

A.2 Calculation steps ... 16
A.2.1 Step 1: Determination of the theoretical moment of inertia I ... 16
A.2.2 Step 2: Determination of the theoretical ring stiffness SR24(th) ... 17
A.2.3 Step 3: Determination of the test force F ... 17
A.2.4 Step 4: Test procedure ... 18
A.2.5 Step 5: Calculation of mean vertical deflection ivmd in % ... 18
A.2.6 Step 6: Calculation of coefficient of deflection for a deflection of 2,77 % ... 18
A.2.7 Step 7: Calculation of SR24 value ... 19

Annex B (informative) Methods of assessing the load capacity of pipes ... 20

B.1 General ... 20
B.2 Structural design based on practical experience ... 20
B.3 Structural design based on design calculations ... 23
B.4 Suitability of methods for large pipes ... 23

Annex C (normative) Durability of profiled pipes ... 24

C.1 General ... 24
C.2 Verification of durability ... 24
C.2.1 Use of materials meeting the requirements of the European Standards relating to waste water ... 24
C.2.2 Use of other materials and mixtures of materials ... 24

Annex D (normative) Specification of wall thicknesses for profiled pipes of nominal sizes greater than DN 1 200 for use as non-pressure underground sewage pipes ... 25

D.1 General ... 25
D.2 Minimum wall thickness for pipes > DN 1 200 ... 25

Bibliography ... 27

Figures Figure 1 -- Ring stiffness test using bearing plates ... 10

Figure 2 -- Ring stiffness test using steel angles ... 11

Figure B.1 -- Long-term pipe deflection: maximum values ... 21

Figure B.2 -- Maximum permissible groundwater level above the invert (GW) as in ATV-DVWK-A 127 (DWA-A 127 Code of practice) ... 22

Figure D.1 -- Examples of profiles with wall thicknesses as in DIN EN 13476-2 and DIN EN 13476-3 . 26

Tables Table 1 -- Ring stiffness ... 7

Table 2 -- Ring stiffness classes SN ... 7

Table 3 -- Minimum creep modulus ... 8

Table 4 -- Coefficient of deflection ... 10

Table 5 -- Scope and frequency of internal control ... 13

Table 6 -- Scope and frequency of third party inspection ... 14

Table A.1 -- Result of deflection after subjecting the pipe to test force F ... 18

Table A.2 -- Coefficients of deflection ... 19

Table B.1 -- Conditions on which the graphs in Figure B.1 are based ... 23

Table D.1 -- Minimum wall thickness ... 25