DIN EN 15534-1:2014-04 (E)

Composites made from cellulose-b ased materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC)) - Part 1: Test methods for characterisation of compounds and products

Contents

Page

Foreword 4

Introduction 5

1 Scope 6

2 Normative references 6

3 Terms and definitions 8

4 Test specimens 9

5 Conditioning of test specimens 9
5.1 General 9
5.2 Reference conditioning 9
5.3 Conditioning for factory production control and testing under other conditions 10
5.4 Conditioning for tests performed by third-parties 10

6 Physical properties 10
6.1 Appearance (applicable to products) 10
6.2 Density 10
6.3 Moisture content 10
6.4 Slipperiness 11
6.4.1 General 11
6.4.2 Pendulum test 11
6.4.3 Inclination plan test 11
6.4.4 Dynamic coefficient of friction 12
6.5 Linear mass (applicable to profiles) 12
6.5.1 Apparatus 12
6.5.2 Test specimens 12
6.5.3 Procedure 13
6.5.4 Calculation and expression of results 13
6.6 Dimensional characteristics 13
6.6.1 Conditioning 13
6.6.2 Thickness, width and length (applicable to profiles, only) 13
6.6.3 Deviation from straightness (applicable to profiles, only) 13
6.6.4 Cupping 14

7 Mechanical properties 14
7.1 Impact resistance 14
7.1.1 Impact resistance (applicable to compounds) 14
7.1.2 Falling mass impact resistance (applicable to products) 15
7.1.3 Extreme temperatures 18
7.2 Tensile properties (applicable to compounds) 18
7.3 Flexural properties 18
7.3.1 Flexural properties (applicable to compounds) 18
7.3.2 Flexural properties (applicable to non-load bearing products) 18
7.4 Creep behaviour (applicable to finished products for non-load bearing applications) 19
7.4.1 Known span in use 19

7.4.2 Unknown span in use 20
7.5 Resistance to indentation 21
7.5.1 Principle 21
7.5.2 Apparatus 21
7.5.3 Test specimens 21
7.5.4 Test method 21
7.6 Nail and screw withdrawal 22
7.7 Pull through resistance 22

8 Durability 23
8.1 Resistance to artificial weathering 23
8.1.1 Test methods for artificial weathering 23
8.1.2 Methods for assessing of the resistance to artificial weathering 23
8.2 Resistance to natural ageing (external use) 23
8.2.1 Test methods for natural ageing 23
8.2.2 Methods for assessing the resistance to natural ageing 24
8.3 Moisture resistance 24
8.3.1 Swelling and water absorption 24
8.3.2 Moisture resistance under cyclic conditions 26
8.3.3 Moisture resistance - Boiling test 27
8.4 Resistance against termites 27
8.5 Resistance against biological agents 28
8.5.1 Pre-treatment 28
8.5.2 Resistance against basidiomycetes 28
8.5.3 Resistance against soft rotting micro-fungi 31
8.5.4 Resistance against discolouring micro-fungi according to ASTM D 3273 32
8.5.5 Resistance against discolouring micro-fungi according to ISO 16869 34
8.5.6 Resistance against discolouring algae 35
8.6 Resistance to salt spray 35

9 Thermal properties 36
9.1 Heat deflection temperature (HDT) 36
9.2 Linear thermal expansion 36
9.3 Heat reversion 36
9.4 Heat build-up (applicable to products) 36
9.4.1 Principle 36
9.4.2 Apparatus 36
9.4.3 Test specimens 37
9.4.4 Procedure 37
9.4.5 Expression of results 38
9.4.6 Test report 39
9.5 Oxygen index (OI) 39
9.6 Reaction to fire 39
9.6.1 Single flame source test 39
9.6.2 Single burning item (SBI) test (applicable to cladding only) 39
9.6.3 Radiant heat source test (floorings) 46

10 Other properties 46
10.1 Degree of chalking (applicable to coated products, only) 46
10.2 Change of gloss 46
10.3 Peel strength (applicable to profiles with laminated foil) 46
10.3.1 Principle 46
10.3.2 Apparatus 47
10.3.3 Preparation of test pieces 47
10.3.4 Conditioning 48
10.3.5 Procedure 48
10.3.6 Test report 48

Annex A (normative) Determination of the modulus of elasticity in bending and bending strength of profiles 50

Bibliography 57