DIN EN 1745:2020-10 (E)

Masonry and masonry products - Methods for determining thermal properties

Contents

Page

European foreword 4

Introduction 5

1 Scope 8

2 Normative references 8

3 Terms, definitions and symbols 9
3.1 Terms and definitions 9
3.2 Symbols 10

4 Determination of 10,dry, unit -values for solid masonry units and 10,dry,mor -values for mortars 11
4.1 General 11
4.2 10,dry, mat -values for solid masonry units and mortars 12
4.2.1 Method S1. Determination of 10,dry,unit -values from tabulated 10,dry,mat /net dry density relationship 12
4.2.2 Method S2. Determination of 10,dry,unit -values based on 10,dry,mat /net dry density curve 12
4.2.3 Method S3. Determination of 10,dry,unit -values from determining the thermal transmittance (Umas) of masonry built from solid masonry units and mortar 14
4.3 Test methods and numbers of samples to be taken 16

5 Determination of equivalent 10,dry,unit -values for masonry units with formed voids and composite masonry units 16
5.1 General 16
5.2 Calculation methods 17
5.3 10,dry,unit -values of masonry units with formed voids and composite units 17
5.3.1 Determination of 10,dry,unit -values from tabulated unit /mat relationship 17
5.3.2 Determination of 10,dry,unit-values based on calculation 18
5.3.3 Method P5. Determination of 10,dry,unit -values from determining the thermal transmittance (Umas) of masonry built from masonry units with formed voids or composite masonry units and mortar 18
5.4 Test methods and numbers of samples to be taken 21

6 Moisture conversion 22
6.1 General 22
6.2 Procedure A (for materials, mortar, solid masonry units and masonry): 22
6.3 Procedure B (for masonry units with formed voids): 23
6.4 Procedure C (for composite masonry units): 23

7 Determination of design thermal values (Rdesign,mas or design,mas) for masonry built from masonry units and mortar 23
7.1 General 23
7.2 Rdesign,mas - or design,mas -values based on calculation 24
7.2.1 Rdesign,mas - or design,mas -values based on design -values for the masonry units and the mortar 24
7.2.2 Rdesign,mas -or design,mas -values using a numerical calculation method based on the design thermal conductivity of the materials used - 24
7.3 Rdesign,mas - or design,mas -values of masonry built from masonry units with formed voids and mortar based on tabulated values 24

7.3.1 Tabulated values 24
7.3.2 Application of Annex B 25
7.3.3 Alternative application of Annex B 25
7.4 Method S4/P6 Rdesign,mas - or design,mas -values of masonry based on masonry testing 26

8 Determination of the thermal transmittance of masonry 26

9 Specific heat capacity 27

10 Rounding rules for -values for masonry units and masonry 27

Annex A (normative) Tabulated 10,dry,mat -values of materials used for masonry products 28

Annex B (informative) Rdry,mas - or 10,dry,mas -values of masonry built from a range of masonry units containing formed voids 38

Annex C (informative) Example of how to use the tables in Annex B 78

Annex D (normative) Requirements for appropriate calculation procedures 80

D.1 Capabilities of the program 80
D.2 Input data and results 80
D.3 Testing of the program accuracy 81
D.4 Reference cases 81
D.4.1 Case 1: Calculation of thermal resistance R and thermal conductivity 10,dry,unit of a masonry unit (vertically perforated unit) 81
D.4.2 Case 2: Calculation of thermal resistance Rdry,mas of masonry consisting of vertically perforated masonry units, bed joints with mortar layers and internal/ external plaster layers 83
D.4.3 CASE 3: Calculation of thermal resistance Rt of masonry consisting of masonry units, horizontal mortar layers, vertical mortar pockets and additional external insulation layer 85

Annex E (informative) Assessment and verification of constancy of performance 89

Annex F (informative) Alternative procedure for the moisture correction of units with formed voids 91

Annex G (informative) Simplified methodology for determining design moisture content of composite masonry units 92