

# DIN EN 13163:2017-02 (E)

## Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products - Specification (includes Amendment :20 16)

---

<b>Contents</b>		<b>Page</b>
European foreword .....		6
<b>1</b>	<b>Scope .....</b>	<b>9</b>
<b>2</b>	<b>Normative references .....</b>	<b>9</b>
<b>3</b>	<b>Terms, definitions, symbols, units and abbreviated terms .....</b>	<b>11</b>
<b>3.1</b>	<b>Terms and definitions .....</b>	<b>11</b>
<b>3.2</b>	<b>Symbols, units and abbreviated terms .....</b>	<b>12</b>
<b>4</b>	<b>Requirements .....</b>	<b>15</b>
<b>4.1</b>	<b>General .....</b>	<b>15</b>
<b>4.2</b>	<b>For all applications .....</b>	<b>16</b>
<b>4.2.1</b>	<b>Thermal resistance and thermal conductivity .....</b>	<b>16</b>
<b>4.2.2</b>	<b>Length and width .....</b>	<b>16</b>
<b>4.2.3</b>	<b>Thickness .....</b>	<b>16</b>
<b>4.2.4</b>	<b>Squareness .....</b>	<b>16</b>
<b>4.2.5</b>	<b>Flatness .....</b>	<b>17</b>
<b>4.2.6</b>	<b>Reaction to fire of the product as placed on the market .....</b>	<b>17</b>
<b>4.2.7</b>	<b>Durability characteristics .....</b>	<b>17</b>
<b>4.3</b>	<b>For specific applications .....</b>	<b>18</b>
<b>4.3.1</b>	<b>General .....</b>	<b>18</b>
<b>4.3.2</b>	<b>Dimensional stability .....</b>	<b>18</b>
<b>4.3.3</b>	<b>Squareness .....</b>	<b>19</b>
<b>4.3.4</b>	<b>Compressive stress at 10 % deformation .....</b>	<b>19</b>
<b>4.3.5</b>	<b>Bending strength .....</b>	<b>19</b>
<b>4.3.6</b>	<b>Tensile strength perpendicular to faces .....</b>	<b>20</b>
<b>4.3.7</b>	<b>Deformation under specified compressive load and temperature conditions .....</b>	<b>20</b>
<b>4.3.8</b>	<b>Compressive creep .....</b>	<b>21</b>
<b>4.3.9</b>	<b>Shear behaviour .....</b>	<b>21</b>
<b>4.3.10</b>	<b>Cyclic loading behaviour .....</b>	<b>22</b>
<b>4.3.11</b>	<b>Water absorption .....</b>	<b>22</b>
<b>4.3.12</b>	<b>Freeze-thaw resistance .....</b>	<b>22</b>
<b>4.3.13</b>	<b>Water vapour transmission .....</b>	<b>23</b>
<b>4.3.14</b>	<b>Dynamic stiffness .....</b>	<b>23</b>
<b>4.3.15</b>	<b>Compressibility (only applicable on EPS T products) .....</b>	<b>23</b>
<b>4.3.16</b>	<b>Apparent density .....</b>	<b>25</b>
<b>4.3.17</b>	<b>Reaction to fire of the product in standardised assemblies simulating end-use applications .....</b>	<b>25</b>
<b>4.3.18</b>	<b>Continuous glowing combustion .....</b>	<b>25</b>
<b>4.3.19</b>	<b>Release of dangerous substances .....</b>	<b>25</b>
<b>5</b>	<b>Test methods .....</b>	<b>25</b>
<b>5.1</b>	<b>Sampling .....</b>	<b>25</b>
<b>5.2</b>	<b>Conditioning .....</b>	<b>25</b>
<b>5.3</b>	<b>Testing .....</b>	<b>26</b>
<b>5.3.1</b>	<b>General .....</b>	<b>26</b>
<b>5.3.2</b>	<b>Thermal resistance and thermal conductivity .....</b>	<b>26</b>
<b>6</b>	<b>Designation code .....</b>	<b>28</b>

DINEN13163:2017-02 EN 13163:2012+A2:2016 (E) 7 Assessment and Verification of the Constancy of Performance (AVCP) .....	30
7.1 General .....	30
7.2 Product Type Determination (PTD) .....	30
7.3 Factory Production Control (FPC) .....	30
8 Marking and labelling .....	30
Annex A (normative) Determination of the declared values of thermal resistance and thermal conductivity .....	32
A.1 General .....	32
A.2 Input data .....	32
A.3 Declared values .....	32
A.3.1 General .....	32
A.3.2 Case where thermal resistance and thermal conductivity are declared .....	32
A.3.3 Case where thermal resistance is declared .....	33
Annex B (normative) "Product type determination" ("PTD") and factory production control (FPC) ....	34
B.1 "Product type determination" and factory production control .....	34
B.2 Indirect testing for factory production control .....	39
B.2.1 General .....	39
B.2.2 Compressive stress at 10 % deformation .....	39
B.2.3 Thermal conductivity .....	40
B.2.4 Thickness effect .....	41
B.2.5 Dynamic stiffness .....	41
Annex C (normative) Product classification .....	42
Annex D (normative) Multi layered EPS products .....	44
D.1 General .....	44
D.2 Requirements .....	44
D.2.1 For all applications .....	44
D.2.2 For specific applications .....	45
D.3 Test methods .....	45
D.4 Evaluation of conformity .....	45
Annex E (informative) Verification of the reaction to fire classification of raw materials .....	46
E.1 General .....	46
E.2 Material covered by this annex .....	46
E.3 Preparation of samples .....	46
E.4 "Product type determination" for EPS raw material .....	46
E.5 Factory Production Control for EPS raw material .....	47
E.5.1 General .....	47
E.5.2 Testing frequency .....	47
E.6 Certification of conformity for EPS raw material .....	47
E.6.1 Bodies involved in the evaluation of conformity procedure .....	47
E.6.2 Test specimens .....	47
E.6.3 "Product type determination" .....	47
E.7 Continuous surveillance of EPS raw material .....	48
E.7.1 Production .....	48
E.7.2 Factory production control .....	48
E.8 Material certificate for EPS raw material .....	48
E.9 Requirement for raw material supply .....	49
E.9.1 Declaration for the raw material supply .....	49
E.9.2 Labelling .....	49
Annex F (informative) Additional properties .....	50

<b>DINEN13163:2017-02 EN 13163:2012+A2:2016 (E) F.1 General</b>	<b>50</b>
<b>F.2 Long-term compressive behaviour</b>	<b>50</b>
<b>F.3 Shear behaviour</b>	<b>50</b>
<b>F.4 Water vapour diffusion resistance factor</b>	<b>51</b>
<b>F.5 Examples of determination of thermal conductivity</b>	<b>52</b>
<b>F.6 Additional information</b>	<b>53</b>
<b>Annex ZA (informative) "Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation"</b>	<b>54</b>
<b>Bibliography</b>	<b>65</b>
<b>Tables Table 1 -- Classes of dimensional tolerances</b>	<b>17</b>
<b>Table 2 -- Dimensional stability under specified temperature or specified temperature and humidity conditions</b>	<b>18</b>
<b>Table 3 -- Levels for compressive stress at 10 % deformation</b>	<b>19</b>
<b>Table 4 -- Levels for bending strength</b>	<b>20</b>
<b>Table 5 -- Levels of deformation under specified compressive load and temperature conditions</b>	<b>21</b>
<b>Table 6 -- Levels for dynamic stiffness</b>	<b>23</b>
<b>Table 7 -- Classes for thickness tolerances</b>	<b>24</b>
<b>Table 8 -- Levels for compressibility</b>	<b>24</b>
<b>Table 9 -- Test methods, test specimens and conditions</b>	<b>27</b>
<b>Table A.1 -- Values for k for one sided 90 % tolerance interval with a confidence level of 90 %</b>	<b>33</b>
<b>Table B.1 -- Number of tests for "PTD" and minimum product testing frequencies</b>	<b>34</b>
<b>Table B.2 -- Minimum product testing frequencies for the reaction to fire characteristics</b>	<b>37</b>
<b>Table C.1 -- Classification of EPS products</b>	<b>42</b>
<b>Table C.2 -- Classification EPS products with acoustical properties</b>	<b>43</b>
<b>Table E.1 -- Testing frequency of raw material</b>	<b>48</b>
<b>Table F.1 -- Correlation between bending strength and shear strength</b>	<b>51</b>
<b>Table F.2 -- Tabulated values of water vapour diffusion resistance index and water vapour permeability</b>	<b>52</b>
<b>Table ZA.1 -- Relevant clauses for factory made expanded polystyrene and intended use</b>	<b>55</b>
<b>Table ZA.2 -- Systems of AVCP</b>	<b>56</b>
<b>Table ZA.3.1 -- Assignment of AVCP tasks for factory made expanded polystyrene products under system 1 for reaction to fire and system 3 (see Table ZA.2)</b>	<b>57</b>
<b>Table ZA.3.2 -- Assignment of AVCP tasks for factory made expanded polystyrene products under system 3 (see Table ZA.2)</b>	<b>58</b>
<b>Table ZA.3.3 -- Assignment of AVCP tasks for factory made expanded polystyrene products under combined system 4 for reaction to fire and system 3 (see Table ZA.2)</b>	<b>59</b>

<b>DINEN13163:2017-02 EN 13163:2012+A2:2016 (E) Figures Figure B.1 -- Relationship between compressive stress at 10 % deformation and apparent density for indirect testing .....</b>	<b>40</b>
<b>Figure F.1 -- Example of a relationship between thermal conductivity (at 50 mm reference thickness and 10 °C mean temperature) apparent density for indirect testing of non infrared absorbing EPS .....</b>	<b>53</b>
<b>Figure ZA.1 -- #Example CE marking information\$ .....</b>	<b>64</b>