

# DIN EN 13381-2:2014-12 (E)

## Test methods for determining the contribution to the fire resistance of structural members - Part 2: Vertical protective members

---

Contents	Page
<b>Foreword .....</b>	<b>4</b>
<b>1 Scope .....</b>	<b>6</b>
<b>2 Normative references .....</b>	<b>6</b>
<b>3 Terms and definitions, symbols and units .....</b>	<b>7</b>
<b>3.1 Terms and definitions .....</b>	<b>7</b>
<b>3.2 Symbols and units .....</b>	<b>8</b>
<b>4 Test equipment .....</b>	<b>8</b>
<b>4.1 General .....</b>	<b>8</b>
<b>4.2 Furnace .....</b>	<b>9</b>
<b>4.3 Test frame .....</b>	<b>9</b>
<b>4.4 Supporting construction .....</b>	<b>9</b>
<b>4.5 Furnace closure .....</b>	<b>9</b>
<b>5 Test conditions .....</b>	<b>10</b>
<b>5.1 General .....</b>	<b>10</b>
<b>5.2 Support and restraint .....</b>	<b>10</b>
<b>5.2.1 Standard conditions .....</b>	<b>10</b>
<b>5.2.2 Other support and restraint conditions .....</b>	<b>10</b>
<b>6 Test specimens .....</b>	<b>10</b>
<b>6.1 General .....</b>	<b>10</b>
<b>6.2 Number of tests .....</b>	<b>11</b>
<b>6.3 Size of test specimen .....</b>	<b>11</b>
<b>6.4 Structural building members .....</b>	<b>11</b>
<b>6.4.1 Standard vertical structural building members .....</b>	<b>11</b>
<b>6.4.2 Practical vertical structural members .....</b>	<b>12</b>
<b>6.5 Properties of test materials .....</b>	<b>13</b>
<b>6.6 Verification of the test specimen .....</b>	<b>13</b>
<b>6.7 Optional and additional plate thermometers within the cavity .....</b>	<b>13</b>
<b>7 Installation of the test construction .....</b>	<b>14</b>
<b>8 Conditioning .....</b>	<b>14</b>
<b>9 Application of instrumentation .....</b>	<b>14</b>
<b>9.1 General .....</b>	<b>14</b>
<b>9.2 Instrumentation for measurement of furnace temperature .....</b>	<b>14</b>
<b>9.3 Instrumentation for measurement of specimen temperature .....</b>	<b>15</b>
<b>9.3.1 General .....</b>	<b>15</b>
<b>9.3.2 Instrumentation for measuring cavity temperature .....</b>	<b>15</b>
<b>9.3.3 Instrumentation for measuring surface temperatures .....</b>	<b>15</b>
<b>9.3.4 Optional and supplementary instrumentation for measuring temperature .....</b>	<b>16</b>
<b>9.4 Instrumentation for measurement of pressure .....</b>	<b>16</b>
<b>10 Test procedure .....</b>	<b>16</b>
<b>10.1 General .....</b>	<b>16</b>
<b>10.2 Furnace temperature and pressure .....</b>	<b>16</b>

10.3	Temperatures of the test specimen .....	17
10.4	Observations .....	17
10.5	Termination of the test .....	17
11	Test results .....	17
11.1	Acceptability of test results .....	17
11.2	Presentation of test results .....	17
12	Test report .....	18
13	Assessment .....	18
13.1	General .....	18
13.2	Assessment of loadbearing capacity .....	19
13.2.1	General .....	19
13.2.2	Characteristic temperature curve: cavity temperatures .....	19
13.2.3	Characteristic temperature curve: surface temperatures (steel or concrete or composite columns) .....	19
13.2.4	Application of method of limiting temperatures .....	19
13.3	Assessment of integrity and insulation .....	20
13.4	Assessment of data for calculation purposes .....	20
14	Report of the assessment .....	20
15	Limits of applicability of the results of the assessment .....	21
15.1	Type of vertical structural building member .....	21
15.2	Type of steel column .....	23
15.3	Size of concrete column .....	23
15.4	Size of concrete filled hollow steel composite column .....	23
15.5	Type of concrete .....	23
15.6	Timber column .....	24
15.7	Depth of the cavity .....	24
15.8	Type of closure opposite to the vertical protective membrane .....	24
15.9	Properties of the vertical protective membrane .....	24
15.10	Size of the vertical protective membrane .....	24
15.11	Size of panels within the vertical protective membrane .....	24
15.12	Fixtures and fittings .....	24
15.13	Applicability of results from test columns to beams or combined column /beam structural building members .....	25
<b>Annex A (normative)</b>	<b>Measurement of properties of vertical protective membranes and components .....</b>	<b>30</b>
A.1	General .....	30
A.2	Thickness of vertical protective membrane and components thereof .....	30
A.3	Density of vertical protective membranes and components thereof .....	31
A.3.1	General .....	31
A.4	Moisture content of vertical protective membrane and components thereof .....	32
<b>Annex B (normative)</b>	<b>Test method to the smouldering fire (slow heating curve) .....</b>	<b>33</b>
B.1	Introduction .....	33
B.2	Test equipment .....	33
B.3	Test specimens .....	33
B.4	Termination of test .....	33
B.5	Evaluation of the results .....	34
<b>Bibliography</b> .....	<b>35</b>	