

# DIN 85051-1:2022-11 (E)

## Pressfitting systems for pipes for use in shipbuilding - General requirements and test methods - Part 1: Operating pressures up to 16 bar

---

<b>Contents</b>		<b>Page</b>
Foreword .....		5
<b>1</b>	<b>Scope .....</b>	<b>6</b>
<b>2</b>	<b>Normative references .....</b>	<b>6</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>8</b>
<b>4</b>	<b>Requirements .....</b>	<b>8</b>
<b>4.1</b>	<b>Materials .....</b>	<b>8</b>
<b>4.1.1</b>	<b>General .....</b>	<b>8</b>
<b>4.1.2</b>	<b>Metallic materials .....</b>	<b>9</b>
<b>4.1.3</b>	<b>Plastics .....</b>	<b>11</b>
<b>4.1.4</b>	<b>Composite materials .....</b>	<b>11</b>
<b>4.1.5</b>	<b>Elastomers .....</b>	<b>12</b>
<b>4.2</b>	<b>Pressing contours and press tools .....</b>	<b>13</b>
<b>4.3</b>	<b>Pressing machine .....</b>	<b>13</b>
<b>4.4</b>	<b>Pressing display and testing .....</b>	<b>13</b>
<b>4.5</b>	<b>Applications and media .....</b>	<b>13</b>
<b>4.6</b>	<b>Requirements for the pipes .....</b>	<b>13</b>
<b>4.7</b>	<b>Connectors .....</b>	<b>14</b>
<b>4.7.1</b>	<b>General .....</b>	<b>14</b>
<b>4.7.2</b>	<b>Leak-tightness .....</b>	<b>14</b>
<b>4.7.3</b>	<b>Surface characteristics/homogeneity .....</b>	<b>14</b>
<b>4.7.4</b>	<b>Positive pressure .....</b>	<b>14</b>
<b>4.7.5</b>	<b>Negative pressure .....</b>	<b>14</b>
<b>4.7.6</b>	<b>Pressure surges .....</b>	<b>14</b>
<b>4.7.7</b>	<b>Thermal cycling .....</b>	<b>14</b>
<b>4.7.8</b>	<b>Vibration .....</b>	<b>15</b>
<b>4.7.9</b>	<b>Forced leakage .....</b>	<b>15</b>
<b>4.7.10</b>	<b>Resistance to stress corrosion cracking of copper-zinc alloys .....</b>	<b>15</b>
<b>4.7.11</b>	<b>Resistance to dezincification .....</b>	<b>15</b>
<b>4.7.12</b>	<b>Leak-tightness of connecting parts with microstructure in the cast state or produced by welding or soldering .....</b>	<b>15</b>
<b>4.8</b>	<b>Hygiene (only for drinking water applications) .....</b>	<b>15</b>
<b>5</b>	<b>Testing .....</b>	<b>15</b>
<b>5.1</b>	<b>Materials .....</b>	<b>15</b>
<b>5.1.1</b>	<b>Metallic materials .....</b>	<b>15</b>
<b>5.1.2</b>	<b>Plastics .....</b>	<b>16</b>
<b>5.1.3</b>	<b>Composite materials .....</b>	<b>16</b>
<b>5.1.4</b>	<b>Elastomers .....</b>	<b>16</b>
<b>5.2</b>	<b>Connections .....</b>	<b>16</b>
<b>5.2.1</b>	<b>Test preparations for connections .....</b>	<b>16</b>
<b>5.2.2</b>	<b>Dimensions of connectors .....</b>	<b>17</b>
<b>5.2.3</b>	<b>Surface characteristics/homogeneity .....</b>	<b>17</b>
<b>5.2.4</b>	<b>Positive pressure .....</b>	<b>17</b>
<b>5.2.5</b>	<b>Negative pressure .....</b>	<b>17</b>
<b>5.2.6</b>	<b>Pressure surges .....</b>	<b>18</b>
<b>5.2.7</b>	<b>Thermal cycling .....</b>	<b>19</b>
<b>5.2.8</b>	<b>Vibration .....</b>	<b>20</b>

5.2.9	Forced leakage .....	21
5.2.10	Resistance to stress corrosion cracking of copper-zinc alloys .....	22
5.2.11	Resistance to dezincification .....	22
5.2.12	Leak-tightness of connecting parts with microstructure in the cast state or produced by welding or soldering .....	22
6	Quality assurance .....	22
6.1	General .....	22
6.2	Tests to be carried out .....	22
6.2.1	Pipe connections .....	22
6.2.2	Elastomers .....	23
7	Classification, designation and coding .....	24
Annex A (normative) Resistance to the media used .....		25
A.1	Purpose .....	25
A.2	Procedure .....	25
A.2.1	Apparatus and test conditions .....	25
A.2.2	Test procedure .....	26
A.2.3	Expression of results .....	27
A.2.4	Evaluation .....	27
Annex B (informative) Pipe dimensions .....		28
B.1	Pipe dimensions of stainless steel pipes .....	28
B.2	Pipe dimensions of pipes of unalloyed steels .....	31
B.3	Pipe dimensions of copper pipes .....	33
B.4	Pipe dimensions of pipes of CuNiFe .....	35
Bibliography .....		36

## Figures

Figure 1	— Example of a test set-up for negative pressure testing (shown schematically) .....	18
Figure 2	— Example of a test set-up for generating pressure surges (shown schematically) .....	18
Figure 3	— Example of a test set-up for the thermal cycling test (schematic diagram, rigid pipes).....	19
Figure 4	— Example of a test set-up for the thermal cycling test $d > 63$ mm.....	20
Figure 5	— Example of a test set-up for the vibration test (schematic diagram).....	21

## Tables

Table 1	— Stainless steels .....	9
Table 2	— Unalloyed steels.....	10
Table 3	— Copper, copper-zinc alloys (brass) and copper-tin-zinc alloys (gunmetal) .....	10
Table 4	— CuNiFe .....	11
Table 5	— Plastics.....	11
Table 6	— Composite materials .....	11
Table 7	— Sealing ring materials for drinking water installations or seawater installations.....	12
Table 8	— Sealing ring materials for gas installations .....	12

<b>Table 9 — Sealing ring materials for other installations .....</b>	<b>13</b>
<b>Table 10 — Pressure test parameters.....</b>	<b>22</b>
<b>Table 11 — Tests to be carried out .....</b>	<b>23</b>
<b>Table 12 — Tests to be carried out .....</b>	<b>23</b>
<b>Table A.1 — Testing after 14 days exposure time (normal test time) .....</b>	<b>27</b>
<b>Table A.2 — Testing after 28 days exposure time .....</b>	<b>27</b>
<b>Table B.1 — Mass of thin-walled stainless steel pipes — series 1 (DIN EN 10312:2005-12, Table 1) .....</b>	<b>28</b>
<b>Table B.2 — Mass of thin-walled stainless steel pipes — series 2 (DIN EN 10312:2005-12, Table 2) .....</b>	<b>28</b>
<b>Table B.3 — Stainless steel pipes — Tolerances for outside diameter (DIN EN ISO 1127:2019-03, Table 1).....</b>	<b>29</b>
<b>Table B.4 — Stainless steel pipes — Tolerances for wall thickness (DIN EN ISO 1127:2019-03, Table 2).....</b>	<b>29</b>
<b>Table B.5 — Stainless steels, dimensions per unit length of austenitic stainless steels.....</b>	<b>30</b>
<b>Table B.6 — Stainless steels, dimensions per unit length of ferritic and martensitic stainless steels .....</b>	<b>30</b>
<b>Table B.7 — Steel pipe overview for industrial and heating plants, pipes as in DIN EN 10255, DIN EN 10220/DIN EN 10216-1, DIN EN 10220/DIN EN 10217-1.....</b>	<b>31</b>
<b>Table B.8 — Steel pipe overview for gases as in DVGW G 260, pipes as in DIN EN 10255.....</b>	<b>31</b>
<b>Table B.9 — Steel pipe for gases as in DVGW G 260 pipes (series 1) as in DIN EN 10255/DIN EN 10216-1, DIN EN 10220/DIN EN 10217-1.....</b>	<b>32</b>
<b>Table B.10 — Precision steel pipes of unalloyed steel, as in DIN EN 10305-3, electroplated zinc coating, for heating systems.....</b>	<b>32</b>
<b>Table B.11 — Precision steel pipes of unalloyed, galvanized steel (DIN EN 10305-3).....</b>	<b>33</b>
<b>Table B.12 — Pipe dimensions and tolerances for hard-drawn pipes R 290 in extended lengths (DVGW GW 392:2015-04, Table 1b).....</b>	<b>33</b>
<b>Table B.13 — Pipe dimensions for semi-hard-drawn pipes R 250 in extended lengths (DVGW GW 392:2015-04, Table 1c).....</b>	<b>34</b>
<b>Table B.14 — Pipe dimensions for annealed pipes R 220 in rings (DVGW GW 392:2015-04, Table 1d) .....</b>	<b>34</b>
<b>Table B.15 — Pipes with outside diameter 15 mm to 108 mm (DIN 86019:2006-02, Table 3) .....</b>	<b>35</b>