

# DIN EN 16084:2011-07 (E)

## Refrigerating systems and heat pumps - Qualification of tightness of components and joints

---

<b>Contents</b>		<b>Page</b>
Foreword .....		3
<b>1</b>	<b>Scope .....</b>	<b>4</b>
<b>2</b>	<b>Normative references .....</b>	<b>4</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>5</b>
<b>4</b>	<b>Symbols .....</b>	<b>6</b>
<b>5</b>	<b>Test requirements .....</b>	<b>7</b>
<b>6</b>	<b>Requirements for hermetically sealed systems .....</b>	<b>11</b>
<b>7</b>	<b>Test procedures .....</b>	<b>11</b>
7.1	General .....	11
7.2	Sampling .....	11
7.3	Test temperature .....	11
7.4	Tightness test .....	12
7.4.1	General .....	12
7.4.2	Tightness control level .....	13
7.5	Requirements for joints .....	15
7.5.1	Test samples .....	15
7.5.2	Torque .....	15
7.5.3	Reusable joint .....	15
7.5.4	Requirements for hermetically sealed joints .....	15
7.6	Pressure-temperature vibration tests (PTV) .....	16
7.6.1	General .....	16
7.6.2	Samples .....	16
7.6.3	Test method .....	16
7.6.4	Method 1: Combined pressure-temperature cycle test with integrated vibration test .....	17
7.6.5	Method 2: Combined pressure-temperature cycle test with a separate vibration test .....	18
7.7	Operation simulation .....	24
7.8	Freezing test .....	25
7.9	Additional pressure test for hermetically sealed joints .....	26
7.10	Vacuum Test .....	26
7.11	Compatibility Screening Test .....	27
7.11.1	General .....	27
7.11.2	Test fluids .....	27
7.11.3	Test specimens .....	27
7.11.4	Test setup parameters .....	27
7.11.5	Test procedure .....	28
7.11.6	Pass/fail criteria for sealing elements .....	29
7.12	Fatigue test for hermetically sealed joints .....	30
<b>8</b>	<b>Test report .....</b>	<b>30</b>
<b>9</b>	<b>Information to the user .....</b>	<b>30</b>
<b>Annex A (normative)</b>	<b>Equivalent tightness control levels .....</b>	<b>31</b>

<b>A.1</b>	<b>Calculation models .....</b>	<b>31</b>
<b>A.2</b>	<b>From volumetric flow to mass flow .....</b>	<b>32</b>
<b>A.3</b>	<b>Tightness control level stated as bubbles of air in unit time .....</b>	<b>34</b>
	<b>Annex B (informative) Test arrangements .....</b>	<b>37</b>
	<b>Bibliography .....</b>	<b>38</b>