

# DIN EN 416-2:2006-10 (E)

## Single-burner gas-fired overhead radiant tube heaters for non-domestic use - Part 2: Rational use of energy

---

<b>Contents</b>		<b>Page</b>
Foreword .....		4
<b>1</b>	<b>Scope .....</b>	<b>5</b>
<b>2</b>	<b>Normative references .....</b>	<b>5</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>5</b>
<b>4</b>	<b>Classification of appliances .....</b>	<b>7</b>
4.1	Classification according to the nature of the gases used .....	7
4.2	Classification according to the gases capable of being used .....	7
4.3	Classification according to the mode of evacuation of the combustion products .....	7
<b>5</b>	<b>Symbols .....</b>	<b>7</b>
<b>6</b>	<b>Requirements for the rational use of energy .....</b>	<b>8</b>
<b>7</b>	<b>Test methods .....</b>	<b>9</b>
7.1	General .....	9
7.2	Radiant factor .....	9
7.2.1	General .....	9
7.2.2	Method A .....	9
7.2.3	Method B .....	18
<b>Annex A (informative) Recording test data (Test method A) .....</b>		<b>21</b>
A.1	General information to be recorded .....	21
A.2	Measurement results .....	21
<b>Annex B (informative) Blank forms (Test method A) .....</b>		<b>22</b>
B.1	Model test result form - Quarter sphere burner end and opposite end .....	22
B.2	Model test result form - Quarter cylinder (Burner side and opposite side) .....	23
B.3	Model test result form - Half sphere for appliances less than or equal to 1,3 m long .....	24
<b>Annex C (informative) Worked example (Test method A) .....</b>		<b>25</b>
C.1	Radiant factor - Recorded data and calculation .....	25
C.2	Radiant output - Recorded data and calculation .....	26
C.2.1	Quarter spheres (Burner end and opposite end) .....	26
C.2.2	Quarter cylinders (Burner side and opposite side) .....	27
<b>Annex D (normative) Procedure for measuring the window correction factor (F<sub>w</sub>) (Test method A) ..</b>		<b>28</b>
<b>Annex E (normative) Correction of measured radiant output for absorption by air (Test methods A and B) .....</b>		<b>29</b>
E.1	General .....	29
E.2	Mean beam length (D) .....	29
E.3	Absorption of radiation by water vapour .....	29
E.4	Absorption of radiation by carbon dioxide .....	30

E.5	Total radiation absorption .....	31
E.6	Calculation method .....	31
<b>Annex F (informative) Radiant heat output data - Recording of results (Test method B) .....</b>		<b>32</b>
F.1	General information to be recorded .....	32
F.1.1	Test and appliance data .....	32
F.1.2	Radiometer technical data .....	32
F.1.3	Measuring plane technical data .....	32
F.2	Measurement results .....	33
F.2.1	Test information .....	33
F.2.2	Test ambient conditions .....	33
F.2.3	Gas/heat input data .....	33
F.2.4	Flue gas data .....	33
F.2.5	Absorption of water vapour and CO2 data .....	34
F.2.6	Irradiation measurement data .....	34
<b>Annex G (informative) Worked example (Test method B) .....</b>		<b>35</b>
G.1	General information .....	35
G.2	Radiometer technical data .....	35
G.3	Measuring plane technical data .....	35
G.4	Measurement results .....	36
G.4.1	Test information .....	36
G.4.2	Test ambient conditions .....	36
G.4.3	Gas/heat input data .....	36
G.4.4	Flue gas data .....	36
G.4.5	Absorption of water vapour and CO2 data .....	37
G.4.6	Irradiation measurement data .....	37
<b>Annex H (informative) Radiometer design (Test method B) .....</b>		<b>40</b>
H.1	Principle radiometer design features .....	40
H.2	Radiometer technical design .....	41
H.3	Pyro-electric detector .....	41
<b>Annex I (normative) Radiometer calibration (Test method B) .....</b>		<b>42</b>
I.1	Radiometer calibration .....	42
I.1.1	General .....	42
I.1.2	Black Body calibration method .....	42
I.2	Worked example .....	43
<b>Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU directives .....</b>		<b>45</b>