

DIN EN 17175:2020-04 (E)

Gas-fired overhead radiant strip heaters and multi-burner continuous radiant tube heater systems for non-domestic use - Safety and energy efficiency

Contents		Page
European foreword		6
1	Scope	7
2	Normative references	7
3	Terms, definitions and symbols	9
4	Classification of appliances	28
5	Constructional requirements	30
6	Operational requirements	45
7	Energy Efficiency	77
8	Requirements of energy efficiency (rational use of energy)	89
9	Risk assessment	93
10	Marking and instructions	93
Annex A (informative) National situations		101
A.1	General	101
A.1.1	Categories	101
A.1.2	Gas rate adjusters, aeration adjusters and regulators	101
A.1.3	Conversion to different gases	101
A.2	Gas connections in the various countries	101
A.3	Flue connections in the various countries	103
Annex B (informative) Types of appliances		104
B.1	Single burner overhead radiant strip heaters	104
B.1.1	Type B appliances with a fan in the combustion circuit	104
B.1.2	Type C appliances with a fan in the combustion circuit	106
B.2	Multiple burner overhead continuous radiant tube heater systems - Type B22 or B52 appliances with a fan in the combustion circuit	109
Annex C (informative) Equivalence rules		110
C.1	Conversion to categories within a restricted Wobbe Index range	110
C.2	Conversion to categories within an identical Wobbe Index range	110
C.3	Conversion to categories within a wider Wobbe Index range	111
Annex D (informative) Calculation of the mass flow rate of flue gases		112
D.1	Flue gas mass flow rate	112
D.2	Quantity of air in the flue gas	112
D.3	Flue gas excess air ratio (λ)	112
D.4	Quantity of water vapour in the flue gas	113

D.5	Quantity of Nitrogen in the flue gas	113
D.6	Quantity of Oxygen in the flue gas	113
D.7	Dry quantity of flue gas	113
D.8	Quantity of carbon dioxide in the flue gas	114
Annex E (informative) Identification of the types of gas in use in various countries		115
Annex F (normative) Special national conditions		117
Annex G (normative) Calculation of conversions of NOx		118
G.1	NOx emission conversion factors	118
G.2	NOx Conversion -- Calculation	119
Annex H (informative) National situations of countries whose national bodies are CEN associate members		121
Annex I (informative) Different types of heat input control		122
Annex J (informative) Radiometer design		123
J.1	Principle radiometer design features	123
J.2	Radiometer technical design	124
J.3	Pyro-electric detector	124
J.4	Ulbricht Sphere	124
J.4.1	General	124
J.4.2	Dimensions of the Ulbricht sphere	125
J.4.3	Surface of the Ulbricht sphere	125
J.4.4	Angular responsivity test of the Ulbricht sphere	126
Annex K (informative) Radiometer calibration		127
K.1	Radiometer calibration	127
K.2	Black body calibration equipment and procedure	127
K.2.1	General	127
K.2.2	Temperature calibration at reference condition	128
K.2.3	Temperature calibration at higher temperatures	129
K.2.4	Calibration calculation	130
K.3	Calibration procedure in detail, presented as a worked example	131
K.3.1	Calibration Measurements	131
K.3.2	Selecting the average readings	131
K.3.3	Determination of the 1/S sensitivity per temperature	132
K.3.4	Determining the 1/S sensitivity of the radiometer	132
K.3.5	Documentation of calibration results	132
Annex L (normative) Correction of measured radiant output for absorption by H ₂ O and CO ₂ . 136		
L.1	General	136
L.2	Calculation method	138
Annex M (informative) Radiant heat output data - Recording of results		139
M.1	General information to be recorded	139
M.1.1	Test and appliance data	139
M.1.2	Radiometer technical data	139
M.1.3	Measuring plane technical data	139
M.2	Measurement results	140
M.2.1	Test information	140
M.2.2	Test ambient conditions	140
M.2.3	Gas/heat input data	140
M.2.4	Flue gas data	141
M.2.5	Absorption of water vapour and CO ₂ data	141

M.2.6	Irradiation measurement data	141
Annex N (informative) Worked example		142
N.1	General information	142
N.2	Radiometer technical data	142
N.3	Measuring plane technical data	142
N.4	Measurement results	143
N.4.1	Test information	143
N.4.2	Test ambient conditions	143
N.4.3	Gas/heat input data	143
N.4.4	Flue gas data	144
N.4.5	Absorption of water vapour and CO ₂ data	144
N.4.6	Irradiation measurement data	144
Annex O (normative) Flue test probes		145
Annex P (normative) Product information required		150
Annex Q (informative) Derivation of equations to determine thermal efficiency		152
Annex R (normative) Flue gas heat exchanger		154
R.1	General	154
R.2	Materials	154
R.3	Corrosion resistance	154
R.4	Thermal insulation	155
R.5	Gas tightness	155
R.6	Removal of condensate	155
R.7	Non-metallic flue system	155
R.8	Frost protection	156
R.9	Distance to flammable materials	156
R.10	Safety-related equipment	156
R.11	Operation over-pressure when using water as secondary medium	156
R.12	Calculation of the heat transfer performance	156
R.12.1	Test requirements	156
R.12.2	Heat transfer calculations	156
R.12.2.1	Heat transfer efficiency	156
R.12.2.2	Determination of thermal energy gain by secondary heat transfer medium	157
R.12.2.3	Determination of thermal energy of the products of combustion	157
R.12.3	Minimum requirements	157
Annex S (normative) Uncertainty of measurements		158
Annex ZA (informative) Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 2015/1188 aimed to be covered		160
Bibliography		161