

DIN EN 509:2025-02 (E)

Decorative fuel-effect gas appliances

Contents	Page
European foreword.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	8
3.1 Decorative fuel effect gas appliances.....	9
3.2 Appliance construction	9
3.2.1 The gas circuit	9
3.2.2 Burner	10
3.2.3 Combustion products circuit.....	11
3.2.4 Auxiliary equipment	11
3.3 Appliance performance	12
3.3.1 nominal heat input	12
3.3.2 Gas combustion.....	12
4 Classification.....	15
4.1 Gases and categories.....	15
4.1.1 Classification of gases.....	15
4.1.2 Appliance categories.....	15
4.2 Classification according to the method of evacuation of the products of combustion	15
5 Constructional requirements	16
5.1 General.....	16
5.1.1 Conversion to different gases	16
5.1.2 Materials and method of construction	17
5.1.3 Accessibility for use and maintenance	18
5.1.4 Connections.....	18
5.1.5 Soundness of the gas circuit	19
5.1.6 Spacing.....	19
5.1.7 Electrical equipment.....	19
5.1.8 Safety in the event of fluctuation, interruption and restoration of the auxiliary energy.....	19
5.2 Adjusting, control and safety devices	20
5.2.1 General.....	20
5.2.2 Gas rate adjusters	20
5.2.3 Flame picture adjuster	20
5.2.4 Manual controls	20
5.2.5 Pressure regulators.....	21
5.2.6 Multifunctional controls.....	22
5.2.7 Flame supervision devices.....	22
5.2.8 Shut-off valves	22
5.2.9 Automatic burner control systems	22
5.2.10 Atmosphere sensing device.....	23
5.3 Ignition devices.....	23
5.3.1 General.....	23
5.3.2 Ignition burners.....	23
5.4 Flame supervision systems.....	23
5.4.1 General.....	23

5.4.2	Appliances with automatic burner control systems	24
5.5	Ignition burner or start-gas flame establishment	24
5.5.1	Appliances with non-automatic burner systems	24
5.5.2	Appliances with automatic burner systems.....	24
5.6	Main flame establishment	24
5.6.1	General	24
5.6.2	Appliances with non-automatic burner systems	24
5.6.3	Appliances with automatic burner control systems	24
5.6.4	Direct establishment of the main flame	24
5.7	Burners.....	25
5.7.1	General	25
5.7.2	Pan burners	25
5.8	Gas pressure test points	25
6	Operational requirements	25
6.1	Soundness of the gas circuit and correct evacuation of combustion products	25
6.1.1	Soundness of the gas circuit.....	25
6.1.2	Correct evacuation of combustion products.....	25
6.1.3	Escape of unburnt gas from the burner	25
6.2	Heat inputs.....	26
6.2.1	Nominal heat input.....	26
6.2.2	Start gas heat input	26
6.2.3	Reduced rate.....	26
6.3	Temperature of various parts of the appliance and its surrounding area	26
6.3.1	Temperature of external parts of the appliance	26
6.3.2	Temperature of components.....	26
6.3.3	Floor temperatures.....	27
6.4	Ignition, cross-lighting and flame stability	27
6.4.1	Ignition and cross lighting.....	27
6.4.2	Flame stability	27
6.4.3	Effect of room draughts	27
6.4.4	Fluctuation of auxiliary energy	27
6.5	Pressure regulators	27
6.6	Combustion.....	28
6.6.1	CO concentration for all appliances	28
6.6.2	Supplementary tests under special conditions.....	28
6.6.3	Measurement of oxides of nitrogen, NO _x (all appliances)	28
6.7	Sooting.....	28
6.7.1	Cold condition	28
6.7.2	Hot condition.....	28
6.7.3	Long cycle	28
6.8	Atmosphere sensing device	29
6.9	Flame supervision device	29
6.9.1	Thermoelectric device	29
6.9.2	Automatic burner control system.....	29
7	Test methods.....	29
7.1	General	29
7.1.1	Characteristics of test gases: reference and limit gases	29
7.1.2	Conditions for preparation of the test gases.....	29
7.1.3	Practical application of test gases	29
7.1.4	Test pressures.....	30
7.1.5	General test conditions.....	32
7.2	Soundness of the gas circuit and correct evacuation of combustion products	38

7.2.1	Soundness of the gas circuit	38
7.2.2	Correct evacuation of combustion products	39
7.2.3	Escape of unburnt gas from the burner	39
7.3	Heat inputs	39
7.3.1	Nominal heat input	39
7.3.2	Calibrated injector rate of appliances without gas adjusters or where these adjusters are put out of action	41
7.3.3	Performance of gas rate adjusters for ungoverned appliances	41
7.3.4	Start-gas heat input	41
7.3.5	Reduced rate	41
7.4	Temperature of various parts of the appliance and its surroundings.....	42
7.4.1	General.....	42
7.4.2	Temperature of external surfaces	42
7.4.3	Temperature of components	42
7.4.4	Temperature of floor	42
7.5	Ignition, cross-lighting and flame stability	44
7.5.1	Ignition and cross-lighting.....	44
7.5.2	Flame stability.....	45
7.5.3	Effect of room draughts.....	46
7.6	Pressure regulators.....	46
7.6.1	Operational pressure regulator.....	46
7.6.2	Pressure regulator out of service.....	46
7.7	Combustion	47
7.7.1	General.....	47
7.7.2	Tests under limit conditions.....	48
7.7.3	Supplementary tests under special conditions.....	49
7.7.4	Measurement of oxides of nitrogen.....	49
7.8	Sooting.....	49
7.8.1	Apparatus for the determination of the smoke number.....	49
7.8.2	Determination of the smoke number	50
7.8.3	Test conditions.....	50
7.9	Atmosphere sensing device.....	51
7.9.1	General.....	51
7.9.2	Test method	53
7.10	Flame supervision device.....	53
7.10.1	Thermoelectric device.....	53
7.10.2	Automatic burner control systems.....	53
8	Marking and instructions.....	54
8.1	Marking.....	54
8.1.1	Marking of the appliance.....	54
8.1.2	Marking of the packaging.....	55
8.1.3	Utilization of symbols on the appliance and packaging.....	55
8.2	Instructions	57
8.2.1	Instructions for installation and adjustment.....	57
8.2.2	Instructions for use and servicing	58
8.2.3	Conversion instructions.....	60
Annex A	(normative) Additional and amended requirements for decorative fuel effect gas appliances not exceeding a net heat input of 20 kW designed to be installed under a non-combustible canopy	61
A.1	Scope.....	61
A.2	Normative references	61

A.3	Terms and definitions.....	62
A.4	Classification of appliances.....	62
A.5	Constructional requirements.....	62
A.6	Operational requirements	62
A.7	Test methods	63
Annex B (informative)	Means of identification of the types of gas in force in the various countries.....	66
Annex C (informative)	Special national conditions.....	68
C.1	General	68
C.2	Belgium.....	68
Annex D (informative)	A-deviations	69
Annex E (normative)	Calculation of conversions of NO_x	70
Annex F (normative)	Additional requirements for decorative fuel effect gas appliances not exceeding a net heat input of 20 kW fitted with a combustion products discharge safety device without a canopy.....	71
F.1	Scope	71
F.2	Normative references	71
F.3	Definitions.....	71
F.4	Classification of appliances.....	71
F.5	Constructional requirements.....	71
F.6	Operational requirements	72
F.7	Test methods	72
F.8	Marking and instructions	74
Bibliography	75