



Fraunhofer Institut
Bauphysik

Institution for testing, supervision
and certification,
officially recognized by the building
supervisory authority

Research, development,
demonstration and consultancy in
the field of building physics

Directors
Univ.-Prof. Dr.-Ing. Gerd Hauser
Univ.-Prof. Dr.-Ing. Klaus Sedlbauer

Test report P8-149/2006

**Report about the initial type test of the open fire
fired by solid fuels type „Magnum 42“
according to DIN EN 13229**

Ordering party:
Schiedel Skorstene A/S
Industrivej 23
7470 Karup J.
Denmark

Stuttgart,
October 25, 2006

Notified test laboratory	Heating and chimney systems Fraunhofer-Institut für Bauphysik (IBP) Nobelstr. 12 70569 Stuttgart Germany
Number	1004
Manufacturer	Schiedel Skorstone A/S Industrivej 23 7470 Karup J. Denmark
Type	„Magnum 42“
Serial number	-
Nominal heat output	17,4 kW
Description	Lightweight concrete with firebrick lining of the firebox and with a cut off device made of cast iron in the flue gas collector
Ordering party	Manufacturer
Supply date	September 4, 2006
Choice of the appliance	By the manufacturer

Short report of the test laboratory:

This report contains the results of the initial type test of the open fire fired by solid fuels type „Magnum 42“ according to DIN EN 13229 and according to the essential characteristics of Annex ZA1 of DIN EN 13229, who have to be tested by a notified test laboratory: fire safety, emission of combustion products, surface temperature, thermal output/energy efficiency.

The open fire „Magnum 42“ was tested with the test fuel wood logs and for the operational mode: intermittent burning appliance not meeting the requirement for reduced combustion.

The open fire „Magnum 42“ was tested with the following distances to adjacent combustible materials:

	Thickness / Distance		
	side wall	rear wall	hearth
	cm	cm	cm
Distance open fire – adjacent combustible materials	7,5	7,5	0,0

The open fire „Magnum 42“ belongs to a family of appliances. Because of the temperatures on the adjacent combustible materials according to A.4.7 (test of nominal heat output) are nearly the same for the open fire „Magnum 42“ and for the open fire „Magnum 36“ (see test report P8-094/2006), it was abstained to do the temperature safety test for the open fire „Magnum 42“.

The tests were carry out in the laboratory DAP-PL-3743.25 "heating/chimney systems" of the Fraunhofer-Institut für Bauphysik (IBP) which has a flexible accreditation according to DIN EN ISO/IEC 17025 and is a notified body for space heating appliances burning solid and liquid fuels (notified body number 1004).

This test report is written irrespective of the rights of a third party, especially of private trademark or industrial property rights towards the client or manufacturer.

This report contains 11 pages and 4 annexes.

Stuttgart, October 25, 2006

Fraunhofer-Institut für Bauphysik

Head of the test laboratory

A. Kalisch

Dr.-Ing. Andreas Kalisch



Check of materials, design and construction according to 4

requirement	requirement according to	requirement is fulfilled
Production documentation <ul style="list-style-type: none"> Documents, drawings Specification of the materials Nominal heat output 	4.1	yes
		yes
		yes
General construction requirements <ul style="list-style-type: none"> No asbestos No hard solder with cadmium Thermal insulation: non combustible, no hazard to health Replacement parts: designed to ensure correct fitting Seal: located securely Seal is made with fire cement: supported by adjacent metal surfaces 	4.2	not to apply
		not to apply
		not to apply
		not to apply
		not to apply
		not to apply
Flue spigot or socket <ul style="list-style-type: none"> Good fit, suitable gas tightness Overlap length: <ul style="list-style-type: none"> $\varnothing \leq 160 \text{ mm} \rightarrow \geq 25 \text{ mm}$ $\varnothing \geq 160 \text{ mm} \rightarrow \geq 40 \text{ mm}$ Insertion depth $\geq 25 \text{ mm}$ 	4.3	yes
		not to apply
		not to apply
		yes
Combustion control device <ul style="list-style-type: none"> Easily accessible Permanently marked 	4.4	not to apply
		not to apply
Flue ways <ul style="list-style-type: none"> Minimum dimension: <ul style="list-style-type: none"> Bituminous coal $\geq 30 \text{ mm}$ Other than bituminous coal $\geq 15 \text{ mm}$ Brushes and scrapers available, where ordinary household bushes cannot be used effectively 	4.5 and 4.6	not to apply
		not to apply
		yes
Fire doors and charging doors <ul style="list-style-type: none"> Appliance can be filled with commercial fuels Prevents accidental opening Facilitates positive closure 	4.7	not to apply
		not to apply
		not to apply



Check of materials, design and construction according to 4

requirement	requirement according to	requirement is fulfilled
Combustion air supply <ul style="list-style-type: none"> Primary air inlet control Adjusting control: operation is readily understandable Means of identification of the thermostat Secondary air inlet control: no restrictions when the firebox is filled to the recommended capacity 	4.8	not to apply
		not to apply
		not to apply
		not to apply
Internal flue gas diverter <ul style="list-style-type: none"> Capable of maintaining any position No isolation fire box – flue outlet If removable, ensures correct assembly 	4.9	not to apply
		not to apply
		not to apply
Bottom grate <ul style="list-style-type: none"> If removable, ensures correct assembly De-ashing mechanism: be capable of de-ashing the fuel 	4.10	not to apply
		not to apply
Front fire bars, deepening plate <ul style="list-style-type: none"> No incorrectly fitted is possible No accidentally dislodged is possible 	4.11	not to apply
		not to apply
Ashpan, Ash removal <ul style="list-style-type: none"> Ashpan capable of containing the residue from two full charges Retaining sufficient space above to allow primary air flow through the bottom grate ore fire bed 	4.12	not to apply
		not to apply
Control of flue gas <ul style="list-style-type: none"> Flue damper fitted Easy to operate Aperture $\geq 20 \text{ cm}^2$ or $\geq 3 \%$ of the cross sectional area of the blade Position recognisable Draught regulator: easily accessible for cleaning 	4.14	not to apply
		not to apply
		not to apply
		not to apply
		not to apply
Cleaning of heating surfaces <ul style="list-style-type: none"> Accessible from the flue gas side for inspection Special tools required: supplied by the manufacturer 	4.15	yes
		yes



Check of safety according to 5

requirement	acc. to	test acc. to	requirement is fulfilled
Cut off device for appliances without doors	5.1		
• Separates the appliance from the chimney			yes
• Shall not hinder control or cleaning of the connection parts			yes
• Shall maintain the position			yes
• Position is marked			yes
• Only into flue gas collector, flue spigot or flue gas connector			yes
Temperatures of adjacent combustible materials	5.2	A.4.7 and A.4.9	yes ¹⁾
• Temperatures ≤ 65 K above ambient temperature			
Operating tools	5.3	A.4.7	
• Operating tool provided			not to apply
• Maximum surface temperatures			not to apply
Natural draught safety test	5.4	A.4.9.4	
• Flue draught ≥ 3 Pa			not to apply
• Or flue draught < 3 Pa CO-Volume ≤ 250 dm ³ /10 h			not to apply
Safety test for spillage of combustion gas and discharge of embers	5.5	A.4.7 and A.4.9	
• No potentially harmful spillage of flue gases			yes
• No fall out of embers			yes
Temperature in integral fuel storage container	5.6	A.4.7 and A.4.9	not to apply
• Temperature ≤ 65 K above ambient temperature			
Thermal discharge control	5.7	A.4.9.6	not to apply
• Operates before 105 °C			
Strength and leak tightness of boiler shells	5.8	A.4.9.5 and A.4.7	not to apply
• No leak or permanently deformation			

¹⁾ Temperature safety test was made with the open fire „Magnum 36“ (see test report P8-094/2006).



Ans

Test fuel specifications according to Table B.1

Test fuel	Moisture content	Ash content	Volatile matter	Hydrogen content	Carbon content	Sulfur content	Net calorific value	Length
	% i. an	% i. an	% i. waf	% i. an	% i. an	% i. an	kJ/kg i. an	cm
Wood log (Beech)	14,39	0,04	-	5,18	45,89	-	16830	33
Timber wood	12,20	-	-	5,96	48,70	-	16470	-



Ank

Test of nominal heat output, efficiency and of the minimum refuelling interval according to A.4.7

		require- ment acc. to	test 1	test 2	average from 1 and 2	require- ment is fulfilled
Date			26.09.06	26.09.06		
Test fuel		Tab. B.1	Wood log	Wood log		
Fuel load	kg	A.4.2	9,53	9,50		
Flue draught	Pa	6.1	10	10	10	yes
Flue gas temperature	°C		139	147	143	
Flue gas temperature in the flue gas outlet	°C		137	145	141	
CO ₂ -content	%		1,39	1,49	1,44	
Flue gas mass flow	g/s		183,7	170,42	176,8	
CO-content	%		0,03	0,04	0,04	
CO-content to reference 13 % O ₂	%	6.3	0,18	0,21	0,20	yes
Refuelling interval	h	6.5	1,13	1,13		yes
Thermal losses in the flue gas	%		53,52	53,29		
Chemical losses in the flue gas	%		1,46	1,74		
Heat losses due to combustible constituents in the residue	%		0,50	0,50		
Efficiency	%	6.4	44,52	44,47	44,49	yes
Total heat output	kW	6.8	17,51	17,44	17,47	yes
Deviation of the refuelling interval from the minimum value	%	A.5	0,0	0,0		yes
Calculated test duration	h	A.4.7.4	not to apply	not to apply		not to apply
Calculated heat output	kW	A.4.7.4	not to apply	not to apply		not to apply
Fall out of embers		5.5	no	no		yes
Spillage of flue gases		5.5	no	no		yes



Check of the temperatures on the operating tools and on the adjacent combustible materials according to A.4.7

		requirement acc. to	test result	requirement is fulfilled
Date	-		26.09.06	
Test fuel	-	Tab. B1	Wood log	
Total fuel load	kg		34,57	
Numbers of burning periods	-		4	
Flue draught	Pa	6.1	10	yes
Heat output	kW		17,47	
Operating tools necessary	-		-	
Operating tools supplied	-		-	
Temperature on the operating tools above ambient temperature:				
• Fire door knob	K	5.3	not to apply	-
• Primary air device knob	K	5.3	not to apply	-
• Secondary air device knob	K	5.3	not to apply	-
• Flue damper knob	K	5.3	not to apply	-
Maximum temperatures of the adjacent combustible materials above ambient temperature				
• Hearth	K	5.2	- ¹⁾	yes
• Rear wall	K	5.2	20	yes
• Side wall	K	5.2	7	yes
• Fuel storage container	K	5.2	not to apply	-

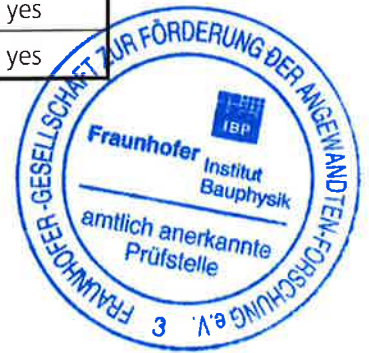
¹⁾ Was not measured.



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Operation with open fire box according to A.4.9.7

		require- ment acc. to	test results	requirement is fulfilled
Date	-		26.09.06	
Test fuel	-	Tab. B.1	Wood log	yes
Total fuel load	kg	A.4.2	9,53	yes
Flue draught	Pa		6	yes
Duration of the burning period	h		1,00	yes
Fall out of embers	-	5.5	no	yes
Spillage of flue gases	-	5.5	no	yes



anh

Check of the instructions according to 7

	requirement according to	requirement is fulfilled
In the language of the country of intended destination	7.1	yes
Not in contradiction to the test results	7.1	yes
Requirements of all dashes	7.2	yes
Requirements of all dashes	7.3	yes
The following requirements of 7.2 are not fulfilled: none		
The following requirements of 7.3 are not fulfilled none		

Check of the marking information according to 8

	requirement according to	requirement is fulfilled
Legibly	8	yes
Permanent	8	yes
Completed designation	8	yes

The following designation are missed:

none



Anh

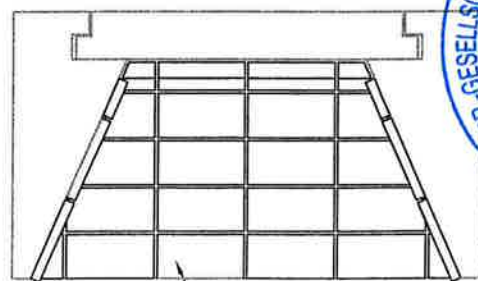
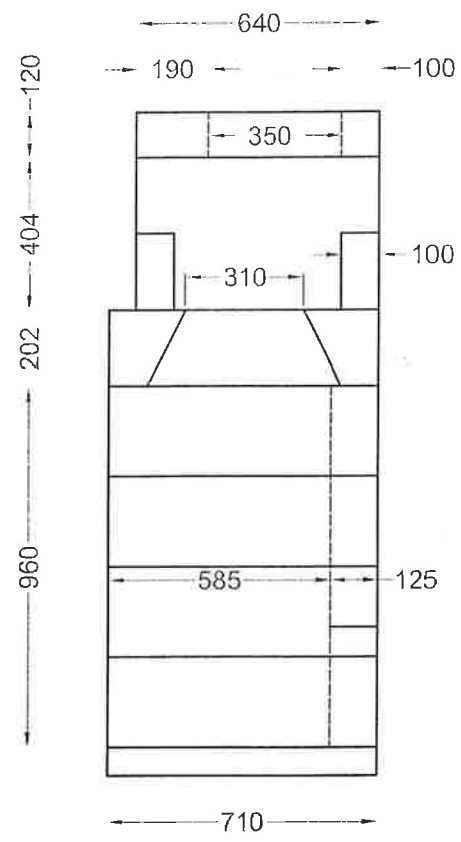
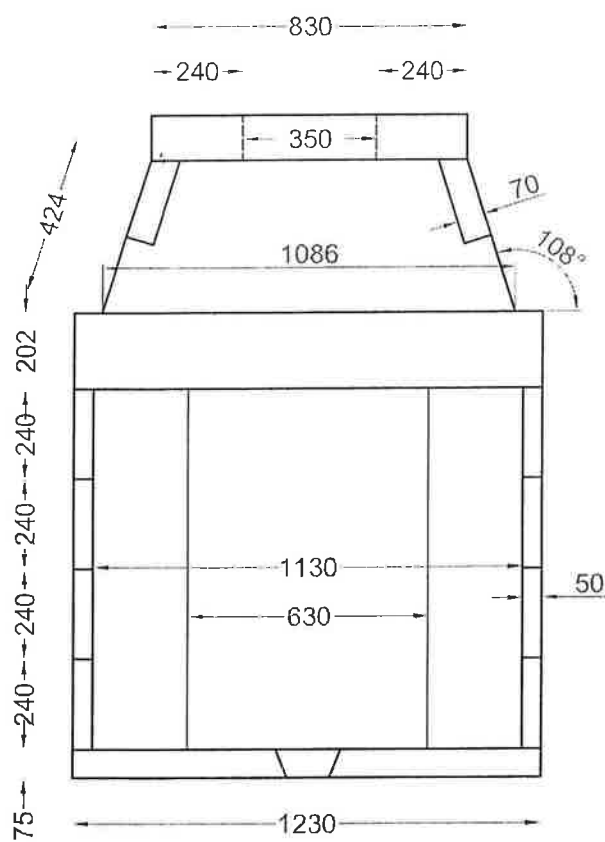
– Annex 1 –

Photo

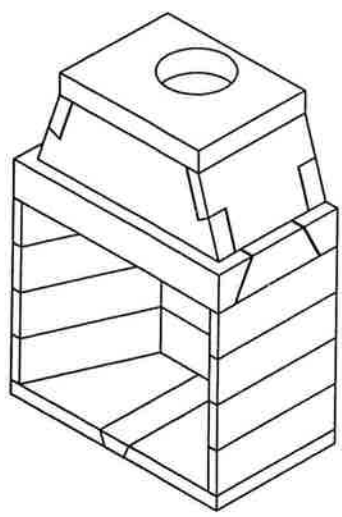


Open fire „Magnum 42“
of the manufacturer Schiedel Skorstene A/S, 7470 Karup J., Denmark

– Annex 2 –
Drawings

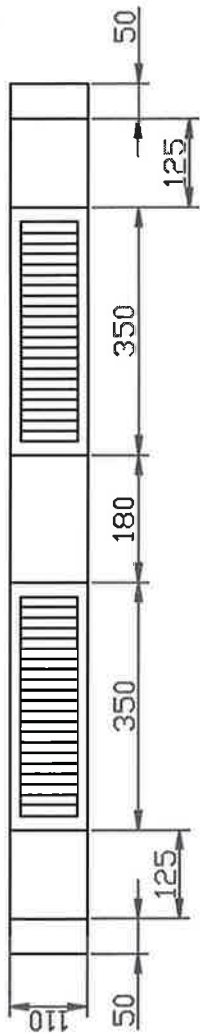


Combustion Chamber is lined with Fireproof Bricks according to Manufacturers instructions.



All measures in mm

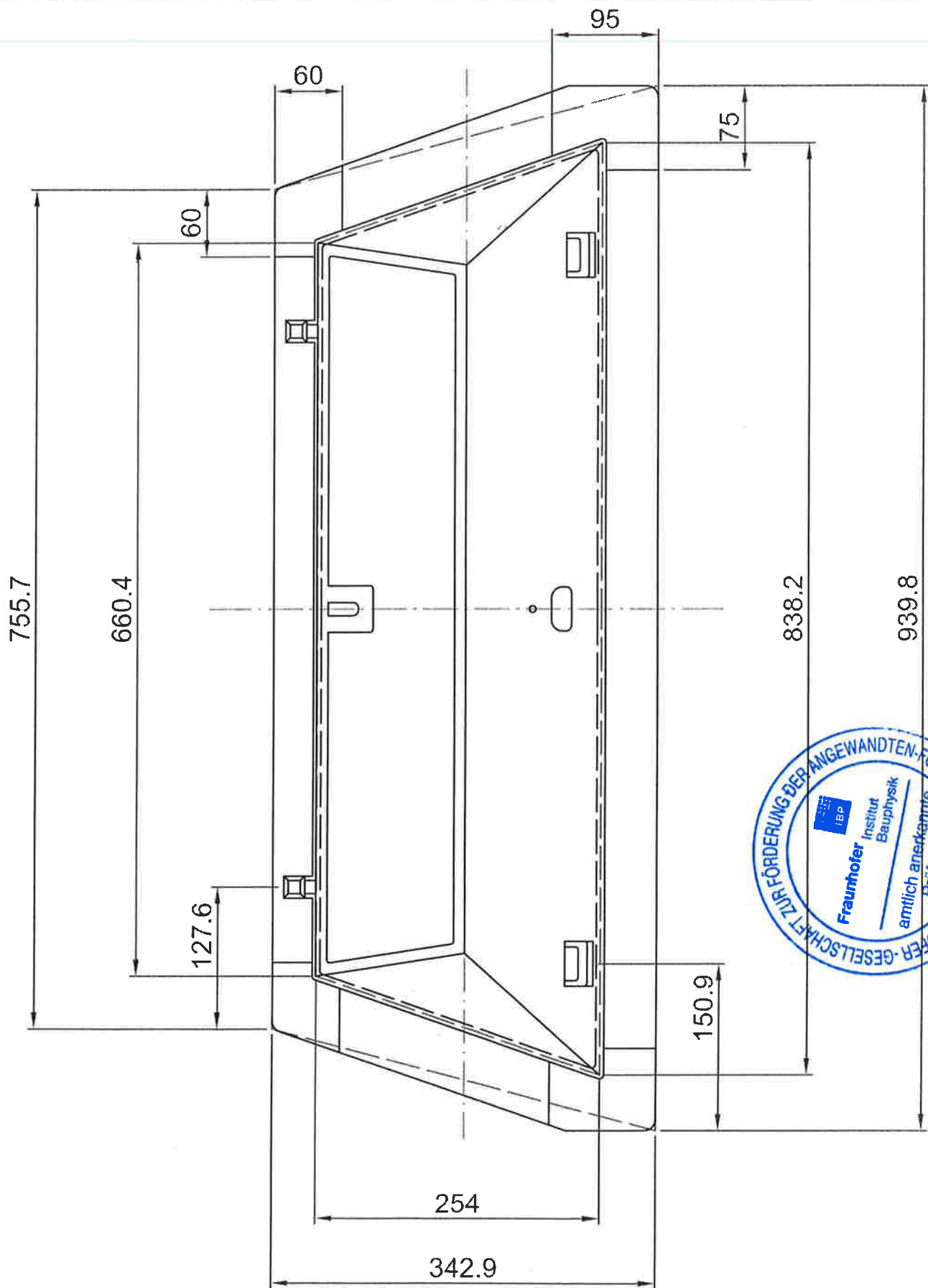
Subject: 42" Magnum - 4 sideelements				
SCHIEDEL Industrivej 23 7470 Karup J.	Area:	Measure:	Date:	Resp:
	dm ²	1:20	170203	MG/SH
	Vol:	Tol.: ± 3 mm	Rev.: 300805	Drawing Nr.: 82042
Material: Pumice				



Area of vent holes 236 cm²



SCHIEDEL Industriest. 23 7470 Karup J.		Subject: Construction with vent holes 42"		Drawing nr: Appendix B	
Area:	dm ²	Mat.:	Measure:	Date:	250406
Mass:	l.	Tol.:		Rev.:	
				Resp:	MG/SH



Thickness of iron = 7 mm
Corners = 10 mm

SCHIEDEL

Industrivej 23
7470 Karup J.

Area:	dm ²
Mass:	l.

Subject: Cut-off device 33"

Mat.: Cast iron

Measure: 1:5

Date: 270601

Drawing nr:

Tol.:

Rev.: 180505

80933-2

Resp: MG/SH

– Annex 3 –
Marking Information

Label

Manufacturer:	Schiedel Skorstene A/S Industrivej 23 7470 Karup J. Denmark
Type:	„Magnum 42" "
Capable operation:	Intermittent
Nominal heat output:	17,4 kW
Standard:	DIN EN 13229: 2005-10
Fuel:	Wood log
CO-content to reference 13 % O ₂ :	0,20 %
Efficiency:	44 %

- „read and follow the operation instructions" –
- „use only recommended fuels" –



– Annex 4 –

Installation and User Operating Instructions

Product specifications

Appendix A page 1

Manufacturer	Schiedel Skorstene A/S Industrivej 23 7470 Karup J. Denmark
Type	KingFire Magnum Fireplace 42"
Standard	EN 13229:2001 and EN 13229 A2
Nominal heat output	17,4 Kilowatt
Mean flue gas temperature	141 C°
Flue gas mass flow	176,8 grams pr. second
Minimum chimney draught requirements	10 Pa
Supply of combustion air	National regulations need to be complied
Thermal resistance	0,354 m² Kilowatt
Efficiency	≥44 %
Mass of fireplace	775 kg
Material – cut-off device	Cast iron
Material – grates in vent holes	Metal
Material – fireplace	Light weight concrete
Used for	Indoor and outdoor fireplace
Size height x width x depth	1761 x 1230 x 710 mm
Size opening height x width	960 x 1130 mm
Distance to combustible material	75 mm
Recommended fuel	Birch wood and beech wood
Modification	Any modification of the construction can cause permanent damages to the fireplace and the surroundings. The guarantee becomes void. Changing is only allowed with approval of the manufacturer
Heat generation	Be aware that the surface of the fireplace becomes hot
Radiant heat	Be aware that the fireplace opening generates radiant heat
Chimney fire	In case of chimney fire Call fire brigade
Installation room	If the pressure in the room is low it can be necessary to install a chimney fan
Sweeping	National regulations need to be complied
Ventilation	National regulations need to be complied
Cleaning	As needed
IMPORTANT: READ AND FOLLOW THE INSTRUCTIONS	



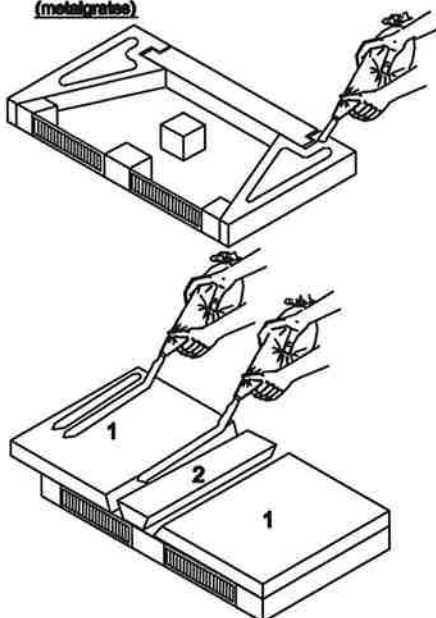
INSTALLATION INSTRUCTIONS KINGFIRE MAGNUM 42"

NATIONAL REGULATIONS NEED TO BE COMPLIED

Floor construction: Calculate the carrying capacity of the floor from the total weight of the fireplace and the chimney.

Non-combustible floor: The fireplace must be placed on minimum 100 mm concrete foundation, minimum 150 mm larger than the Fireplace (both wide and length)

Combustible floor: Build up with vent holes (metalgrates)

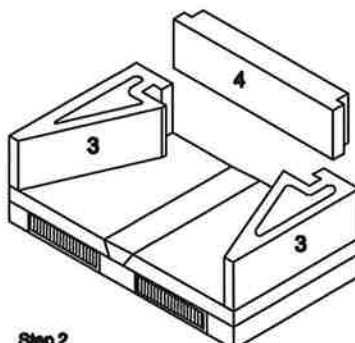


Step 1

The Start Plates (1+2) are placed on the foundation, so the whole surface is supported.

Make sure the Start plates are horizontal by using a level. The Fireplace is glued with the enclosed Chimney glue. The best way to apply the glue is by using the enclosed mortarbag. Press the elements together leaving only a few mm joint. It is recommended to apply 2 mortar streaks side by side.

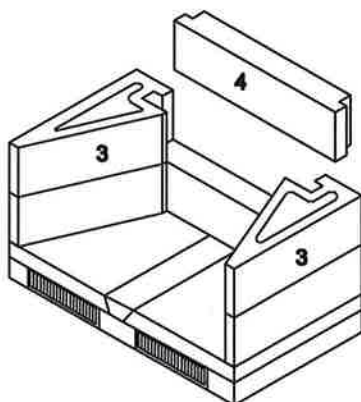
Make sure the elements are in level and plumb during the entire build up process.



Step 2

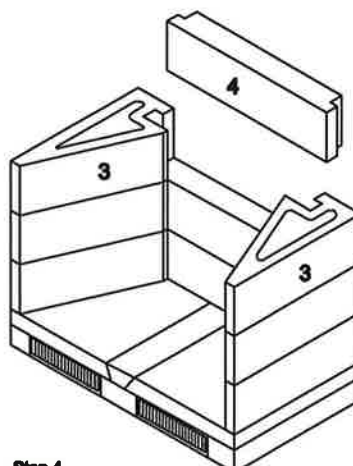
The sideelements (3) are placed in level with the start plate (1) edges and the back wall (4) is lowered into the sideelements leave openings.

Extra glue is removed to avoid "bumps" on the outside of the elements. Be particularly aware where the Fireproof Bricks are going to be.



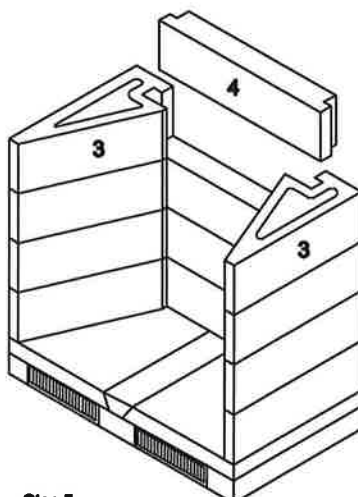
Step 3

Step 2 is repeated for the next layer.



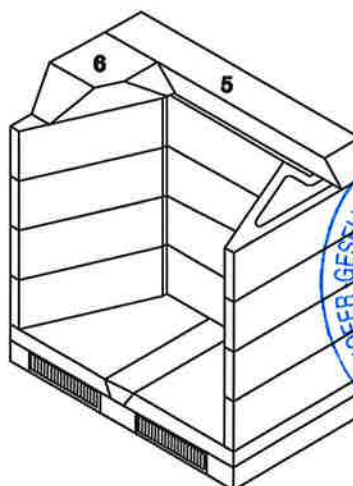
Step 4

Step 2 is repeated for the next layer.



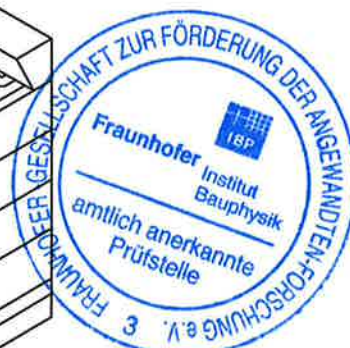
Step 5

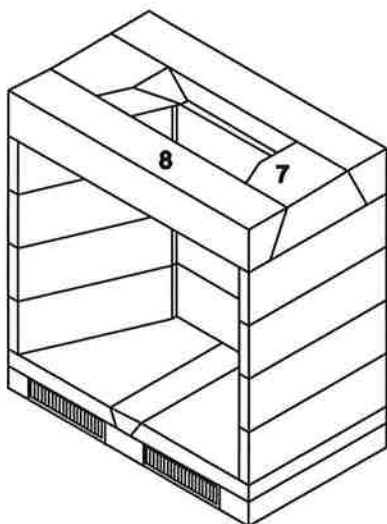
Step 2 is repeated for the next layer.



Step 6

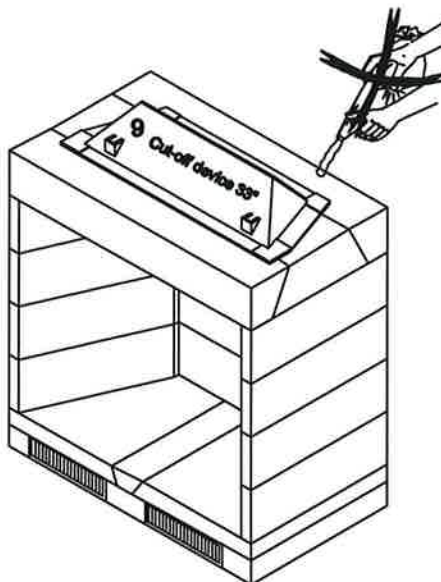
The back supporter (5) is placed centered and in line with the outside of the back wall (4) The left Cut-off device supporter (6) is placed on the top side element (3)





Step 7

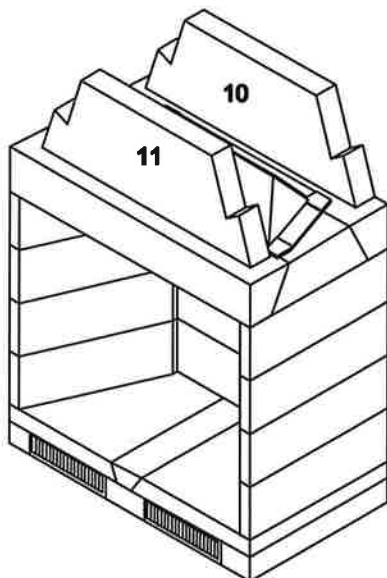
The right Cut-off device supporter (7) is placed on the top sideelement (3) and the front Cut-off device supporter (8) is placed to fit the Cut-off device supporters (left+right) (6+7) and in line with the front edge of the sideelements (3)



Step 8

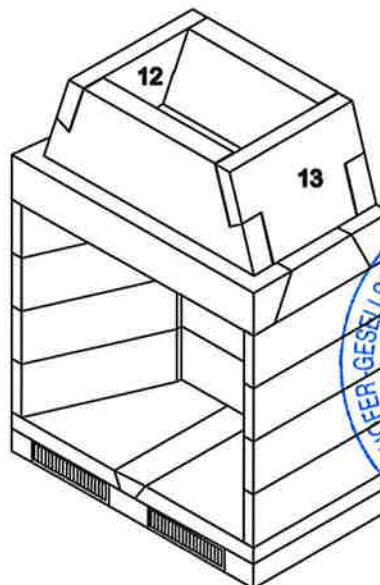
The Cut-off device (9) is placed so all planes of the Cut-off device is supported.

IMPORTANT: The Cut-off device (9) CAN NOT be built in or in any way be fastened. Allow c 15 mm freedom of movement to all sides, since the Cut-off device expands influenced by heat.



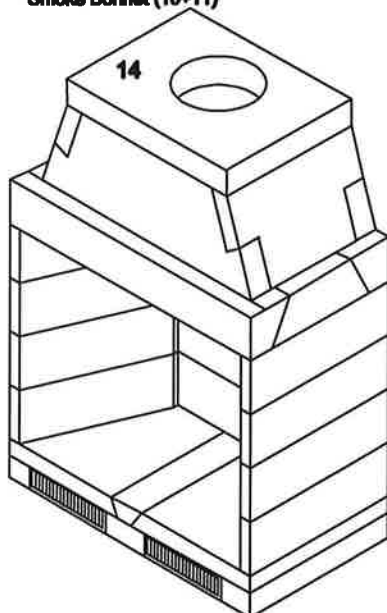
Step 9

The back Smoke Bonnet (10) is placed centered and in line with the outside of the back Cut-off device supporter (6). The front Smoke Bonnet (11) is placed on the front Cut-off device supporter (8) and the Smoke Bonnet is adjusted when the sides of the Smoke Bonnet (12+13) are placed (see step 10)



Step 10

The sides of the Smoke Bonnet (12+13) are placed in the leave openings in the front and back of the Smoke Bonnet (10+11)



Step 11

The Smoke Bonnet is completed with a Top plate (14) which makes the foundation for the construction of the chimney.

Firebricks

Product: Schiedel or similar

Mortar

Product: Maede Industri or similar



SCHIEDEL

MG/SH 30-06-2006

Instructions for Kingfire Magnum Fireplace 42"

Congratulations with the new Fireplace. To get the best utilization and a long life of the Fireplace, the following instructions must be kept.

The first lightning in the Fireplace cannot be done until 48 hours after the fireproof bricks are build in. The fireproof bricks are built in the Fireplace with a Fireplace mortar.

It is recommended that only birch wood with a humidity of up to 15 % is used for fuel.

First lightning:

Arrange kindlings with a firelighter in the middle as shown on picture.

Make sure the damper is open to ensure free passage of the smoke.

Light the firelighter.



When the fire is burning, put 2 – 3 pieces of wood on as shown on picture.



At the first lightning it is only allowed to stoke up the fire as instructed above because the Fireplace cannot be heavy loaded at the first lightning.

Subsequently lightings:

Light the Fireplace as described for the first lightning. Wait until the fuel is burned through (see picture) and the Fireplace can now be used with a reasonably amount of fuel.



Notice:

A maximum of 9,5 kg wood every hour is allowed.

When firing is done, the damper cannot be closed as long as there are live pieces of wood in the Fireplace.

When the ashes is removed from the Fireplace it should be placed in a steel bucket with a matching lid and then placed unavailable and on fireproof material. The ashes can first be disposed when it is ensured that there are no live pieces of wood left in the ashes.

Enjoy the Fireplace, Schiedel Skorstene AIS

