

Kachelofen Building Workshop

with **Jessica Steinhäuser** and **Andrew Grzadziel**

The Kacheln that we made two years ago in the “Kacheln 101” workshop have been fired and glazed and are ready to go! We will use those Kacheln to build a small Kachelofen/Grundofen.

It will be quite the unique Kachelofen! Each Kachel was produced and decorated by our 2017 participants.

The focus will be on using local materials to construct the Kachelofen.





Producing the Kachel was a great experience. It was amazing to see all the creativity that these participants had. Each person made a unique Kachel.

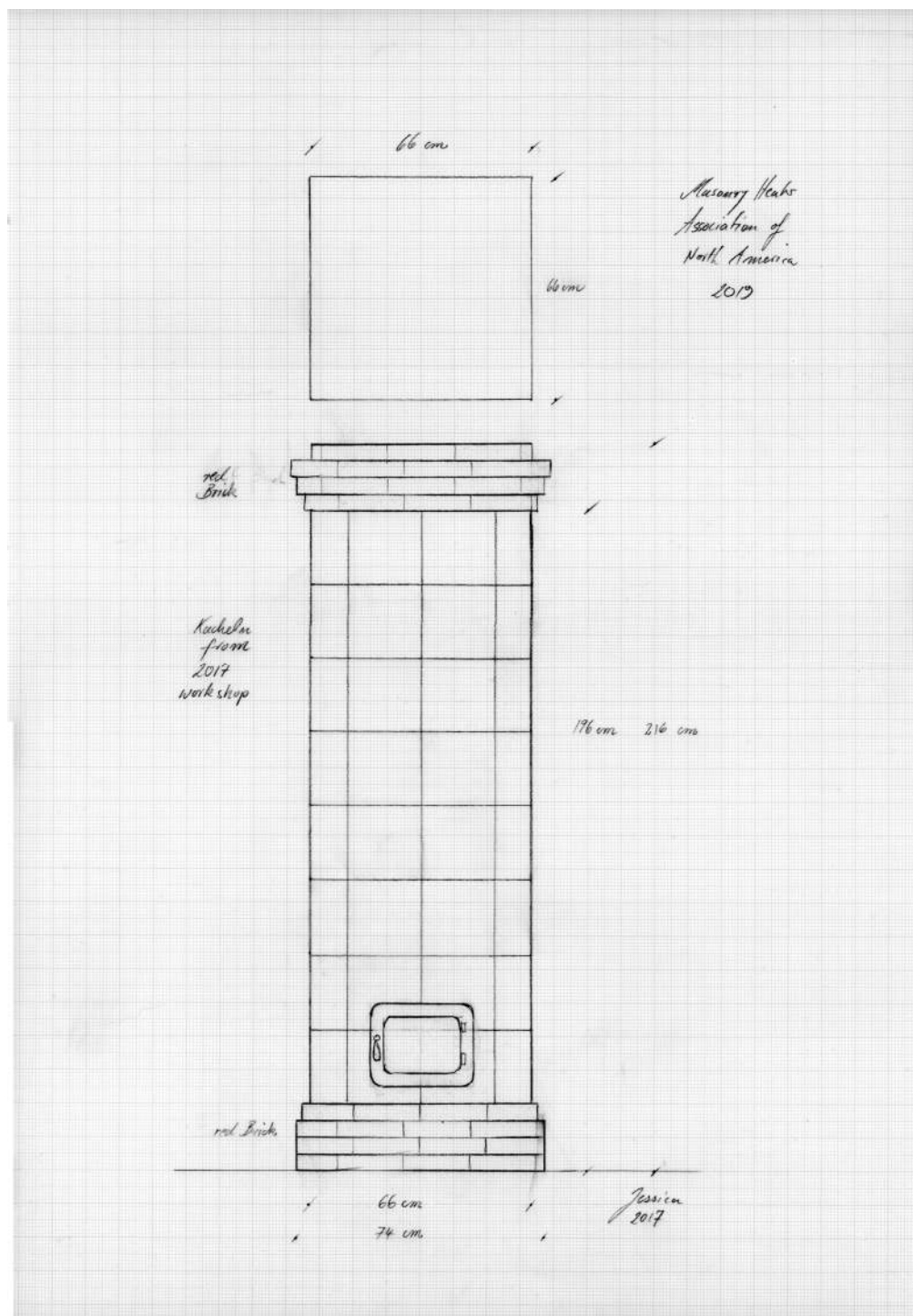




How lucky we are to have a functioning Pottery studio right here at Wildacres. All the Kacheln were bisqued and glazed on site. Thank you to Gary Lee of Rising Sun Pottery for firing the Kacheln and glazing them all!

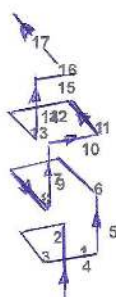
To the left you see all the Kacheln after the first firing (bisque)

We will construct the base and the crown with regular red bricks. We can make it as fancy as we wish. Some of our participants are super skilled with bricks. We chose to glaze all the Kacheln with just a clear glaze to complement the red clay we used to make all the Kacheln.



The inner flue system will be built according the the following calculations with a 3.8 metre flue!

tile stove calculation according to EN 15544

GENERAL INFORMATION: Project number:262 Date:2/3/2019 File:WA2019 AG Designation: Owner:MHA Address:WILD ACRES Location:NORTH CAROLINA	TECHNICAL DATA: Heat output:3,5 kW = 11942,0 BTU Nominal heating time:12 hours Maximum fill-up quantity of wood: 12,9 kg = 28,4 pounds Minimal fill-up quantity of wood:6,5 kg Building material: dense fireclay Length of flue = 3,80 m
CHIMNEY: Effective height: 2.4 m Diameter: 18,0 cm	
COMBUSTION CHAMBER: Base: 1600 cm² Vertical grate cross-section: 121 cm² Gas slot cross-section: 13 cm² h = 55 cm a = 40 cm b = 40 cm	
RESULTS: Quantity turnover of fuel:10,1 kg/h Air volume:0,036 m³/s Flue gas mass flow:0,045 kg/s Minimum length of flue:3,74 m Length of flue:3,80 m Chimney cope inner surface temperature:143 °C Temperature at the chimney mouth:214 °C Efficiency:78 % Pressure difference:0,97 Pa	

Kachelofen calculation - flue details

Nr.	l [m]	h [m]	Uml.	A [cm²]	h [cm]	b/Ø [cm]	T [C°]	VA [m³/s]	v [m/s]	ph [Pa]	λf	pr [Pa]	pd [Pa]	zeta c	pu [Pa]
flue 1	0,18	0,18	0	529	23,0	23,0	539	0,108	2,03	1,48	0,0415	0,03	0,87	0,00	0,00
flue 2	0,24	0,00	90	504	24,0	21,0	515	0,104	2,07	0,00	0,0419	0,04	0,93	1,20	1,12
flue 3	0,24	0,00	90	504	24,0	21,0	488	0,101	2,00	0,00	0,0419	0,04	0,90	1,20	1,08
flue 4	0,24	0,00	90	504	24,0	21,0	463	0,097	1,93	0,00	0,0419	0,04	0,87	1,20	1,04
flue 5	0,27	0,27	90	552	24,0	23,0	437	0,094	1,70	2,07	0,0412	0,03	0,70	1,20	0,84
flue 6	0,24	0,00	90	504	24,0	21,0	413	0,091	1,80	0,00	0,0419	0,04	0,81	1,20	0,97
flue 7	0,24	0,00	90	504	24,0	21,0	392	0,088	1,75	0,00	0,0419	0,04	0,78	1,20	0,94

GRZ LLL, Andrew Grzadziel

The calculation corresponds to the proved calculation guideline of the "Versuchsanstalt der Hafner" (Research Center of the Austrian stove fitters). (State 2019 / VNr.: 2.302)

Schornstein Funktionsnachweis nach EN 13384-1

Projekt	
Bauherr:	MHA
Adresse:	WILD ACRES
Bezeichnung:	
Feuerstätte	
Typ:	
Brennstoff:	
Heizleistung:	3,5 kW
Nennheizzeit:	12 h
Wirkungsgrad:	78,5 %
Abgasmassstrom:	0,045 kg/s
Abgastemperatur:	236,6 °C
notwendiger Förderdruck:	8,93 Pa
CO ₂ :	7,1 Vol%
Verbindungsstück	
Typ:	
gestreckte Länge:	0,20 m
wirksame Höhe:	0,00 m
Abmessungen:	
Wärmedurchlasswiderstand:	0,18864 m ² K/W
mittlere Rauigkeit:	0,0010 m
Schornstein	
Typ:	Metal flue (inside diam. = 18 cm)
wirksame Höhe:	2,4 m
davon Innenliegend:	2,0 m
Abmessungen:	
Wärmedurchlasswiderstand:	0,29136 m ² K/W
mittlere Rauigkeit:	0,0005 m
Werte für den Funktionsnachweis	
Unterdruck an der Schornsteineinführung (P _z):	10,0 Pa
notw. Unterdruck am Schornsteineintritt (P _{ze}):	9,0 Pa
Innenwandtemperatur Schornsteinmündung (Tiob):	143,1 °C
Austrittstemperatur Schornsteinmündung (Tob):	213,6 °C
tatsächliche Abgasgeschwindigkeit (Wm):	2,55 m/s
Grenztemperatur (Tg):	40,4 °C
Funktionsnachweis	
P _z - P _{ze} =	1,0 Pa
P _z - P _B =	4,4 Pa
Tiob - Tg =	102,7 °C
Bewertung der Bedingungen	
Druckbedingung erfüllt:	YES
Temperaturbedingung erfüllt:	YES

all terms concerning EN 13384-1 are fulfilled

According to EN 15544 standard the outside air is definite at 0°C.

Nr.	l [m]	h [m]	Uml.	A [cm ²]	h [cm]	b/Ø [cm]	T [C°]	VA [m ³ /s]	v [m/s]	ph [Pa]	λ _f	pr [Pa]	pd [Pa]	zeta ζ	pu [Pa]
flue 8	0,24	0,00	90	504	24,0	21,0	371	0,085	1,69	0,00	0,0419	0,03	0,76	1,20	0,91
flue 9	0,27	0,27	90	506	23,0	22,0	351	0,083	1,63	1,89	0,0418	0,04	0,73	1,20	0,88
flue 10	0,27	0,00	90	504	24,0	21,0	330	0,080	1,59	0,00	0,0419	0,04	0,71	1,20	0,85
flue 11	0,27	0,00	90	504	24,0	21,0	311	0,077	1,54	0,00	0,0419	0,03	0,69	1,20	0,83
flue 12	0,27	0,00	90	504	24,0	21,0	293	0,075	1,49	0,00	0,0419	0,03	0,67	1,20	0,80
flue 13	0,18	0,00	90	504	24,0	21,0	279	0,073	1,45	0,00	0,0419	0,02	0,65	1,08	0,70
flue 14	0,25	0,25	90	483	23,0	21,0	266	0,071	1,48	1,54	0,0422	0,03	0,69	1,08	0,75
flue 15	0,15	0,00	90	360	18,0	20,0	254	0,070	1,94	0,00	0,0445	0,04	1,22	1,08	1,31
flue 16	0,25	0,00	90	324	18,0	18,0	243	0,068	2,11	0,00	0,0453	0,09	1,47	1,08	1,58
conn.17	0,20			254		18,0	234	0,067	2,65	0,00	0,0313	0,08	2,36	0,00	0,00
a.s.				121									5,32	0,30	5,60
c.c.										4,91					0,00
chim.	2,4			254		18,0	216	0,065	2,55	13,55		0,79		1,20	2,79
sum										25,45		1,49			22,99

Lizenznehmer: GRZ LLL, Andrew Grzadziel

Prüfsumme: DHBGAY+HZ,F8D//BRYN2Z^+4F8V`B;R^+3(N7RHKAJ;^4S+2?GG)30P:AC+4_'''''

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