



FASTfire BRONZclay new schedule & info

A Must Keep

Product Review

Projects

by
Bill x

Here is some new additional information regarding the firing of our FASTfire BRONZclay. Please remember it is always best for you to fire test pieces to determine the proper firing schedule for your specific set up. There are a lot of factors when firing, including kiln, pan used, placement of the pieces in the pan, pan placement in the kiln, etc.

The following testing was done using a Paragon SC2 kiln (which is the most commonly used kiln for BRONZ clay within the metal clay world). This particular kiln was found to heat up very fast and its temperature read 45°F (25°C) higher than the reading on its controller, which was 1500°F (816°C). This shows the importance of testing your own kiln, as unfortunately they are all slightly different.

The original firing schedule for the FASTfire BRONZclay was based on the use of another kiln. After tests were done on the SC2, a new set of firing instructions were written, please find these below:

New firing schedule

Ramp at 1525°F (829°C) per hour to 1525°F (829°C) and hold for 1 hour

(The total firing time is less than 2 hours. Please note that the ramp and hold temperatures are the actual temperature inside the kiln, not the reading on the front of the kiln. Unfortunately, the new clay is quite sensitive to firing temperature - too hot and it blisters - too cold and it breaks when bent due to insufficient sintering).

Test firing

I strongly recommend that you fire a test piece before committing the time and materials to making jewelry, since I have learned that actual kiln temperatures can be off by 90°F (50°C) in either direction from the temperature set on the kiln temperature controller.

My standard test strips are 3cm x 1cm x 1mm thick. After firing a test piece, look at its surface. If there are a few small blisters, reduce both the ramp and the hold temperatures to 1500°F (816°C). If there are extensive large blisters, reduce both the ramp and hold temperatures to 1475°F (807°C). If the surface is smooth, try to bend the fired test strip in an L (90° bend), and look at the outside of the bend. If the piece has a large crack or breaks, increase

both the ramp and hold temperatures to 1575°F (862°C). If the outside of the bend has a little crack or no crack, continue bending it into a U (180° bend). If the piece has a large crack or it breaks, increase both the ramp and hold temperatures to 1550°F (843°C). If the surface is smooth and the U bend has no crack, then no adjustment is needed.

If you have to make any amendments to the temperatures, use a new test strip every time. After firing the second test piece, visually inspect the surface and repeat the bend tests to find out if further adjustments to the firing schedule are needed. Blistering will require another 25-50°F decrease and bend failure will require another 25-50°F increase.

Porosity testing

All fired metal clays have pores. To determine the kind of porosity, a small drop of water with a little detergent is placed on the surface of the strip. If the drop sinks into the surface, the porosity is open like a sponge and is not very good for making jewellery. If the drop stays on the surface, the porosity is closed, which is okay for jewellery making.

Test results

Below is the raw data used to develop the above recommended firing schedule. The samples were fired 6 at a time (3 x A samples and 3 x M samples) with the lowest number near the edge of the pan, and the highest number near the centre of the pan. A samples refer to a 200gm pack of Rio Grande's clay. M samples refer to bulk clay

straight from the kitchen?).

The key:

General

L = length (cm)

W = width (cm)

T = thickness (cm)

M = mass (gm)

D = density (gm/cc)

Porosity

C = closed porosity

O = open porosity

Bend

P = pass

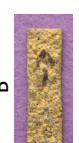
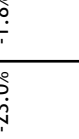
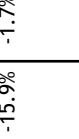
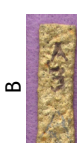
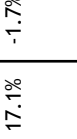
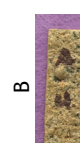
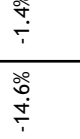
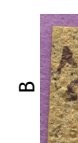
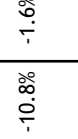
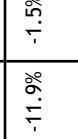
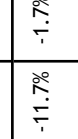
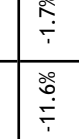
C = crack

B = broke

Surface

S = smooth

B = blisters

	DRY CLAY					FIRING CONDITIONS (Add 45F for actual temps)					FIRED CLAY					% Difference			POROSITY, BEND & SURFACE RESULTS				
Sample	L	W	T	M	D	Kiln	Pan	Ramp F/hr	To F	Hold HR	L	W	T	M	D	L	W	M	Porosity	Surface	Bend 90	Bend 180	
A1	3.853	1.219	0.1166	3.211	5.75	SC2	small	1600	1600	1	3.444	0.939	bad	3.153	NA	-10.6%	-23.0%	-1.8%	O			C	
A2	3.839	1.269	0.1156	3.391	5.83	SC2	small	1600	1600	1	3.447	1.067	bad	3.335	NA	-10.2%	-15.9%	-1.7%	O			C	
A3	3.875	1.210	0.1201	3.363	5.96	SC2	small	1600	1600	1	3.516	1.003	bad	3.306	NA	-9.3%	17.1%	-1.7%	O			C	
A4	3.882	1.267	0.1246	3.534	5.96	SC2	small	1550	1550	1	3.491	1.082	bad	3.484	NA	-10.1%	-14.6%	-1.4%	O			C	
A5	3.855	1.282	0.1233	3.491	5.96	SC2	small	1550	1550	1	3.489	1.143	bad	3.435	NA	-9.5%	-10.8%	-1.6%	O			C	
A6	3.867	1.185	0.1137	3.109	5.97	SC2	small	1550	1550	1	3.492	1.044	bad	3.062	NA	-9.7%	-11.9%	-1.5%	O			P	
A7	3.792	1.151	0.1078	2.877	5.90	SC2	small	1500	1500	1	3.421	1.016	0.11	2.828	7.2	-9.8%	-11.7%	-1.7%	C			P	
A8	3.775	1.244	0.1124	3.133	5.92	SC2	small	1500	1500	1	3.422	1.100	0.11	3.079	7.3	-9.4%	-11.6%	-1.7%	O			P	

Sample	DRY CLAY						FIRING CONDITIONS (Add 45F for actual temps)					FIRED CLAY							% Difference				POROSITY, BEND & SURFACE RESULTS			
	L	W	T	M	D	Kiln	Pan	Ramp F/hr	To F	Hold HR	L	W	T	M	D	L	W	M	Poro- sity	Surface	Bend 90	Bend 180				
A9	3.746	1.186	0.1119	3.079	6.15	SC2	small	1500	1500	1	3.435	1.049	0.11	3.026	7.3	-8.3%	-11.6%	-1.7%	O	S 	P 	P 				
A10	3.853	1.147	0.1180	3.032	6.07	SC2	small	1450	1450	1	3.614	1.050	0.11	2.981	7	-6.2%	-8.5%	-1.7%	O	S 	C 	B 				
A11	3.804	1.237	0.1098	3.159	6.08	SC2	small	1450	1450	1	3.644	1.163	0.10	3.098	6.6	-4.2%	-6.0%	-1.9%	O	S 	C 	B 				
A12	3.815	1.205	0.1110	3.095	6.07	SC2	small	1450	1450	1	3.698	1.159	0.12	3.030	6.1	-3.1%	-3.8%	-2.1%	O	S 	B 	B 				
A13	3.862	1.170	0.1121	3.021	5.89	SC2	large	1500	1500	1	3.526	1.040	0.11	2.969	7.5	-8.7%	-11.1%	-1.7%	C	S 	P 	P 				
A14	3.849	1.253	0.1123	3.209	5.85	SC2	large	1500	1500	1	3.489	1.102	0.10	3.152	7.7	-9.4%	-12.1%	-1.8%	C	S 	P 	P 				
A15	3.870	1.181	0.1148	3.084	5.93	SC2	large	1500	1500	1	3.523	1.045	0.10	3.029	7.6	-9.0%	-11.5%	-1.8%	C	S 	P 	P 				
A16	3.842	1.253	0.1132	3.255	5.95	SC2	small	full	1500	2	3.486	1.100	0.11	3.189	7.6	-9.3%	-12.2%	-2.0%	C	B 	P 	C 				

Sample	DRY CLAY						FIRING CONDITIONS (Add 45F for actual temps)					FIRED CLAY							% Difference				POROSITY, BEND & SURFACE RESULTS			
	L	W	T	M	D	Kiln	Pan	Ramp F/hr	To F	Hold HR	L	W	T	M	D	L	W	M	Porosity	Surface	Bend 90	Bend 180				
A17	3.821	1.227	0.1134	3.232	6.06	SC2	small	full	1500	2	3.444	1.055	0.10	3.167	7.9	-9.6%	-13.8%	-2.0%	C	S 	P 	P				
A18	3.842	1.235	0.1128	3.174	5.89	SC2	small	full	1500	2	3.473	1.065	0.1	3.110	7.7	-9.6%	-13.8%	-2.0%	C	S 	P 	P				
A19	3.828	1.181	0.1145	3.094	6.03	SC2	small	full	1450	2	3.597	1.084	0.11	3.041	7.0	-6.0%	-8.2%	-1.7%	C	S 	P 	P				
A20	3.806	1.257	0.1161	3.263	6.01	SC2	small	full	1450	2	3.602	1.169	0.11	3.211	6.9	-5.4%	-7.0%	-1.6%	C	S 	P 	C				
A21	3.782	1.222	0.1121	3.105	5.92	SC2	small	full	1450	2	3.581	1.138	0.11	3.051	6.7	-5.3%	-6.9%	-1.7%	C	S 	P 	B				
M1	3.612	1.211	0.1094	3.005	6.14	SC2	small	1600	1600	1	3.206	0.978	bad	2.952	NA	-11.2%	-19.2%	-1.8%	O	B 	P 	C				
M2	3.615	1.248	0.1121	3.191	6.32	SC2	small	1600	1600	1	3.300	1.039	bad	3.136	NA	-8.7%	-16.7%	-1.7%	O	B 	P 	C				
M3	3.690	1.177	0.1147	3.021	6.22	SC2	small	1600	1600	1	3.313	0.990	bad	2.970	NA	-10.2%	-15.9%	-1.7%	O	B 	P 	C				

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Sample	L	W	T	M	D	Kiln	Pan	Ramp F/hr	To F	Hold HR	L	W	T	M	D	L	W	M	Porosity	Surface	Bend 90	Bend 180
M4	3.727	1.203	0.1101	3.019	6.02	SC2	small	1550	1550	1	3.361	1.043	bad	2.971	NA	-9.8%	-13.3%	-1.6%	O	B	P	C
M5	3.735	1.270	0.1140	3.201	6.03	SC2	small	1550	1500	1	3.412	1.131	bad	3.150	NA	-8.6%	-10.9%	-1.6%	O	B	P	C
M6	3.712	1.234	0.1108	3.076	6.00	SC2	small	1550	1550	1	3.398	1.094	bad	3.023	NA	-8.5%	-11.3%	-1.7%	O	B	P	C
M7	3.822	1.166	0.1167	3.062	5.76	SC2	small	1500	1500	1	3.455	1.026	0.11	3.009	7.7	-9.6%	-12.0%	-1.7%	C	S	P	P
M8	3.838	1.250	0.1171	3.297	5.76	SC2	small	1500	1500	1	3.509	1.106	0.11	3.239	7.5	-8.6%	-11.5%	-1.8%	O	S	P	P
M9	3.863	1.212	0.1170	3.242	5.81	SC2	small	1500	1500	1	3.554	1.080	0.10	3.193	7.5	-8.0%	-10.9%	-1.5%	C	S	P	P
M10	3.881	1.178	0.1211	3.235	5.94	SC2	small	1450	1450	1	3.735	1.111	0.12	3.175	6.2	-3.8%	-5.7%	-1.9%	O	S	B	B
M11	3.873	1.246	0.1219	3.415	5.94	SC2	small	1450	1450	1	3.776	1.197	0.12	3.351	5.9	-2.5%	-3.9%	-1.9%	O	S	B	B

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	L	W	T	M	D	Kiln	Pan	Ramp F/hr	To F	Hold HR	L	W	T	M	D	L	W	M	Porosity	Surface	Bend 90	Bend 180				
M12	3.879	1.203	0.1215	3.272	5.88	SC2	small	1450	1450	1	3.798	1.169	0.12	3.210	5.8	-2.1%	-2.8%	-1.9%	O	S 	B 	B 				
M13	3.763	1.252	0.1166	3.176	5.78	SC2	large	1500	1500	1	3.413	1.109	0.11	3.122	7.3	-9.3%	-11.4%	-1.7%	C	S 	P 	P 				
M14	3.796	1.276	0.1194	3.329	5.90	SC2	large	1500	1500	1	3.446	1.134	0.11	3.296	7.5	-9.2%	-11.1%	-1.0%	C	S 	P 	P 				
M15	3.771	1.194	0.1181	3.121	5.95	SC2	large	1500	1500	1	3.428	1.065	0.11	3.065	7.4	-9.1%	-10.8%	-1.8%	C	S 	P 	P 				
M16	3.818	1.237	0.1175	3.282	5.96	SC2	small	full	1500	2	3.408	1.086	0.11	3.218	7.8	-10.7%	-12.2%	-2.0%	C	B 	P 	C 				
M17	3.768	1.270	0.1163	3.367	6.04	SC2	small	full	1500	2	3.347	1.108	0.10	3.305	7.9	-11.2%	-12.8%	-1.8%	C	S 	P 	P 				
M18	3.727	1.195	0.1172	3.104	5.98	SC2	small	full	1500	2	3.331	1.037	0.10	3.044	7.9	-10.6%	-13.2%	-1.9%	C	S 	P 	P 				
M19	3.803	1.166	0.1164	3.057	5.91	SC2	small	full	1450	2	3.573	1.078	0.11	3.010	6.9	-6.0%	-7.5%	-1.5%	C	S 	P 	P 				

	DRY CLAY					FIRING CONDITIONS (Add 45F for actual temps)					FIRED CLAY					% Difference			POROSITY, BEND & SURFACE RESULTS			
Sample	L	W	T	M	D	Kiln	Pan	Ramp F/hr	To F	Hold HR	L	W	T	M	D	L	W	M	Porosity	Surface	Bend 90	Bend 180
M20	3.770	1.269	0.1128	3.197	5.73	SC2	small	full	1450	2	3.559	1.173	0.11	3.148	6.7	-5.6%	-7.6%	-1.5%	C	S	P	P
M21	3.794	1.200	0.1148	3.046	5.74	SC2	small	full	1450	2	3.587	1.118	0.11	2.992	6.6	-5.5%	-6.8%	-1.8%	O	S	C	B