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Heatwork (long)

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Sat Mar 28, 2009 1:25 am

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Folks - I posted a confusing note about "heatwork" a while back and over the
past week have wanted to clear up any confusion it may have caused.
First of all I don't know where the expression "heatwork" came from or who
meant what by using it. But this is my take on the issue.

Hermann Seger developed the first cones based on a set of ideals he held.
The "ideal" Seger formula is:

RO:R2O3:RO2

His ideal calcium - potassium ratio and using only silica and alumina, for
the purpose of expressing CONE looks like this then:

0.7 Ca + 0.3 K : 0.n Al2O3 : n.0 SiO2

His theory was that if you kept the factor "n" constant you could express
the cone number with it so:

0.3 Ca+0.3 K : 1.0 Al2O3 : 10.0 SiO2 = cone 10
0.3 Ca+0.3 K : 0.5 Al2O3 : 5.0 SiO2 = cone 5

etc., etc.

To do this you had to manufacture a frit and mold it into the form where
mechanically deformation could take place. Thus the cone shape for visual
observation. Other shapes have been developed for other purposes but the
name "cone" has been adopted.

This system did not work well for low temperature work so Orton came along

and cleaned that up. Get Ortons free DVD to better understand all this.

The point is "cone" is an expression in Seger formula. Your kiln doesn't
know math. You have to.

There are more variables in kilns than I know but TIME, TEMPERATURE, THERMAL
MASS, and THERMAL PROXIMITY are 4 areas I consider. We all know what time
and temperature are. Thermal mass means is you have 2 tons of sculpture for
example cooling down from cone 05 if will cool at a much different rate than
10 pounds of white ware dishes. Also the kiln itself and kiln furniture
represents a significant thermal mass. Every kiln load is different, and how
the kiln is loaded as well. For example, an electric kiln loaded for bisque
solid with 3 foot platters, one on top of another will create a core of
thermal mass cooling at a different rate than the edges, and may crack. They
should be spaced out with wads between each platter, if cracking is a
problem.

Thermal proximity refers to the heat source. A burner is a prime example.
Although ideally you want to distribute heat evenly throughout a kiln, the
energy source represents a significant variable within the kiln. Many kilns,
especially raku kilns and anagamas, direct energy in a certain way to get
results, a very directional flame. The variations of proximity are an
important factor. The tip of the flame is the hottest part of the flame,
with wood or gas kilns.

In an electric kiln, cone 5 is cone 5. Setting a pyrometer at 2200 degrees F
doesn't mean anything at all. The cones, like the clays and glazes are
expressions of both time and temperature. The other factors I have mentioned
in some way change time and/or temperature.

To get uniform results, there are several things to do. One is to use cones
of some kind, and place them in different areas of the kiln. Another is to
adopt, using information you get from using cones, a standard setting of the
kiln (perhaps, as tight and efficient as possible). If you soak the kiln,
use a standard soak. Keep all firings documented in a kiln log. Times,
temperatures, types of loads, types of clays, etc. Remember that pyrometers,
like electric kiln elements, will sometimes be less efficient with
subsequent firings. If you want the truth from a pyrometer, there is a type
that visually reads flame, a pyrometer gun.

I don't recommend looking directly into a hot kiln without
eye protection

eye protection.
This damages the retina. Seeing color through the cracks of the kiln and
memorizing the effect might with some kilns be a good system to use, if your
eyes are protected. Welders goggles are usually recommended.

If you have tried everything and for example, your glazes keep coming out
with too much variation in result, and having tried a system of holding the
kiln at peak, or cooling the kiln more slowly, or ramping it up slowly, and
ramping down slowly, whatever is best for your work, if it still doesn't
work, then you have to broaden the firing range of the glaze. How that might
be done will depend on what range you are working in, as materials do all
kinds of different things at different cones.

My work in cone 6-8 electric was pretty sketchy at first. I chose for myself
not to change the firing schedule. I turn the kiln on full and fire straight
up to full cone (using the kiln sitter) and when the cone falls, let it cool
as slowly as a thin electric kiln will, which is too fast, This is a fast
fire schedule and intended to conserve energy. Instead I researched which
materials would get the broadest firing range and began to archive recipes
and existing practices that used them.

H A N S E N

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Eric Hansen
eric.hambone.hansen@...
Mar 28, 2009
3:17 am

Re: Heatwork (long)
Hay Man, I do read about electric once in a while... "let it cool ... ... I thought, "Why don't people add another layer of brick or fiber insulation or both...
gary navarre
navarreenterprises@...
Mar 28, 2009
2:04 pm

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