Capturing Light: What is Flashing?

GOAL

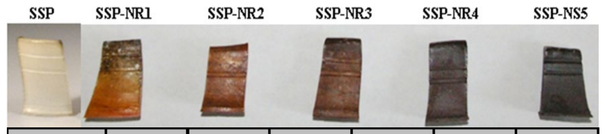
Discover the cause of flashing, and obtain repeatable methods for optimum results in sodium vapor glazing

Approach

Rule out Alumina Silica Ratio
Rule in metallic oxides, fluxes, and firing as factors

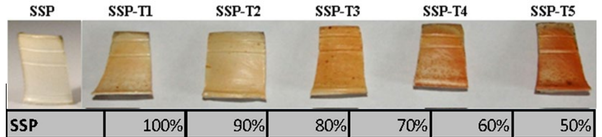
Hue

Increasing iron and titanium in clay additives changes hue



SSP	100%	90%	80%	70%	60%	50%
Newman	0%	10%	20%	30%	40%	50%

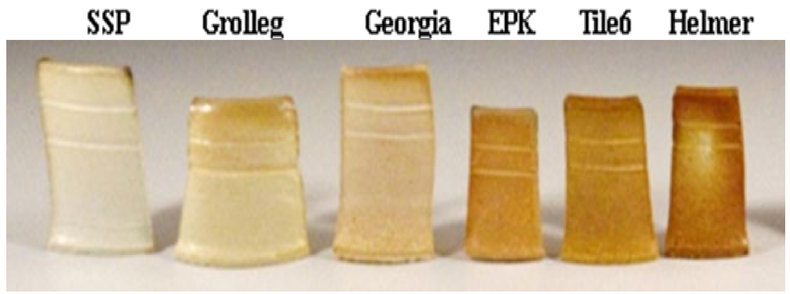
Super Standard Porcelain /Newman



SSP	100%	90%	80%	70%	60%	50%
Tile 6	0%	10%	20%	30%	40%	50%

Super Standard Porcelain /Tile 6

The Silica Alumina Ratio is not a factor

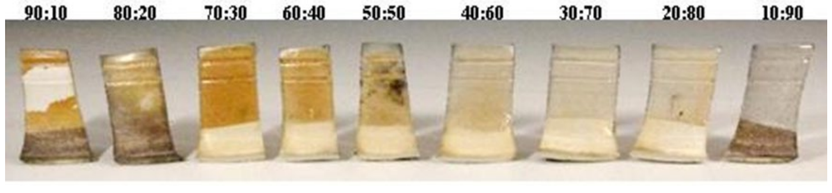


Kaolin clays with similar SiO2:Al2O3 ratios

	Super Standard Porcelain	Grolleg	Georgia	EPK	Tile 6	Helmer
	SSP	GR	GE	EPK	TIL1	H
SiO2	54.14%	54.46%	52.73%	54.08%	54.88%	54.50%
Al2O3	43.68%	41.98%	44.46%	43.75%	42.01%	41.14%
K2O	0.92%	2.16%	0.16%	0.46%	0.00%	0.61%
Na2O	0.17%	0.11%	0.05%	0.00%	0.05%	0.09%
MgO	0.25%	0.34%	0.16%	0.19%	0.63%	0.30%
CaO	0.11%	0.11%	0.27%	0.29%	0.47%	0.57%
Fe2O3	0.45%	0.80%	0.51%	0.59%	0.39%	1.50%
TiO2	0.03%	0.03%	1.65%	0.42%	1.57%	1.30%
SiO2:Al2O	2.11:1	2.21:1	2.02:1	2.10:1	2.22:1	2.25:1

Intensity

Flux percentages in clay bodies or flashing slips optimize the intensity of the flashed color response between 20 and 35%.



Tile 6/ Nepheline Syenite

Color Theory

Intensity Hue Value

NCECA- 2024

Value

Reduction in firing and early cooling can enhance depth of color response.

Oxidized soda-fired porcelain (L)
Reduced soda-fired porcelain (R)

Color Forms in Cooling

Draw ring pulled during firing (L) versus slow cooled in the kiln (R)

Flashing

is a reaction between volatilized sodium (salt/soda) or potassium (wood) in the atmosphere of a reduction fired kiln environment, with iron and titanium oxides in present in clay. The oxides crystalize on the surface in cooling resulting in a colorful response.

Uncovering the root causes of, and methods for, achieving flashing in sodium vapor glazing

Denise Joyal, MFA

denise@kilnjoy.com djoyal@wilson.edu https://linktr.ee/kilnjoy text: (301) 991-2360

February 2024, expanded from MFA Thesis *Capturing Light* 2014

Thesis Advisors: Joyce Michaud, Phil Berneberg, Ben Culbertson, Catherine White
Hood College, Frederick, MD