

Heart of Glass- $\Delta 6$

Lab 4-Back to the Flux Capacity

Heart of Glass

Original
070922-1

Neph Sy	39.82
Whiting	14.16
Zinc Oxide	12.39
EPK	8.94
Flint	22.71
Bentonite	1.98
Copper Carbonate	0.99
Water	60



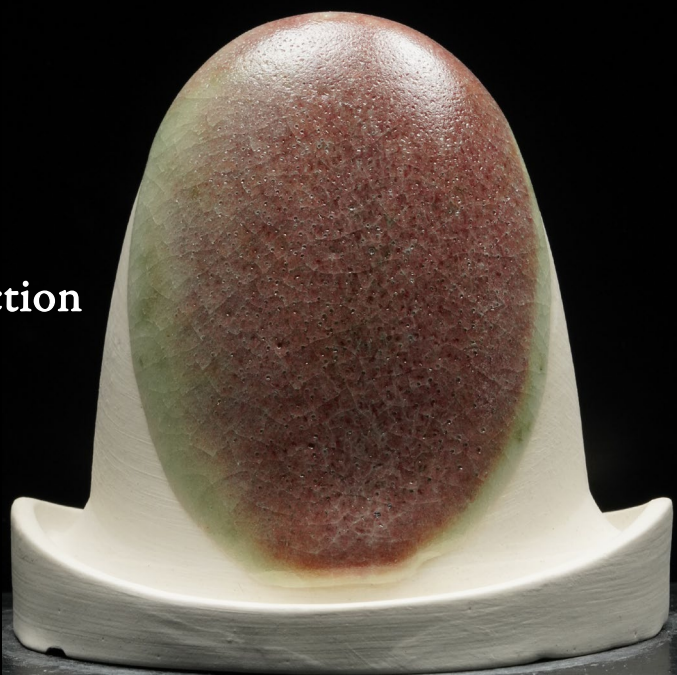
1-3 Second Dip



2-3 Second Dips

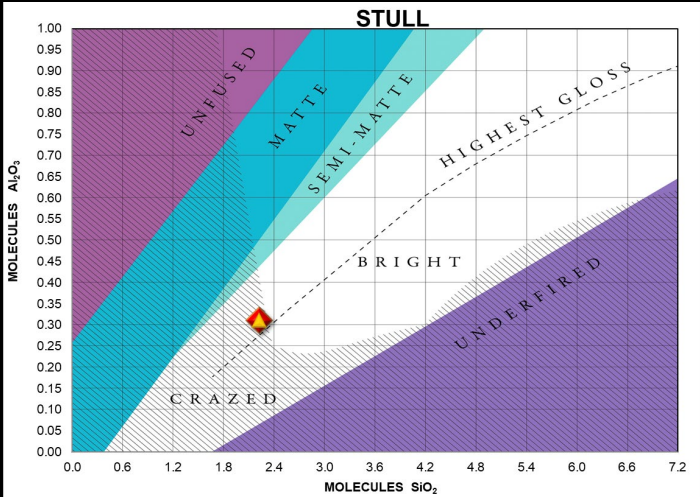


Reduction



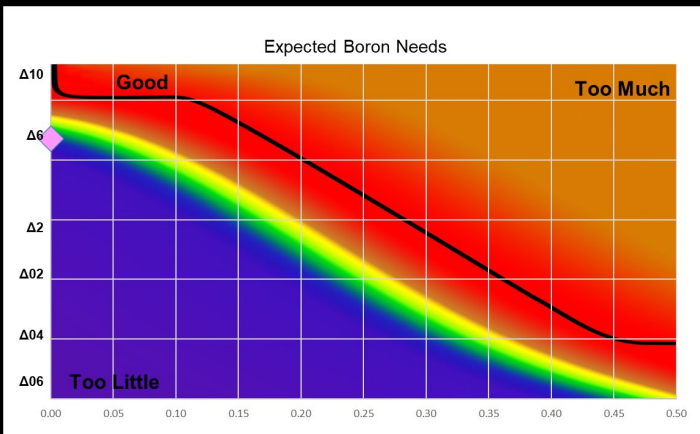
UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.14 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.27	Collective "Al ₂ O ₃ " 0.32	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.32	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.14 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.23	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



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Lab 4-Alkali Metals-Oxidation



070922-1



070922-34



070922-35



070922-36



070922-37



070922-38

1-3 Second Dip

2-3 Second Dips



Original (NS)



w/G200 EU



w/Minspar



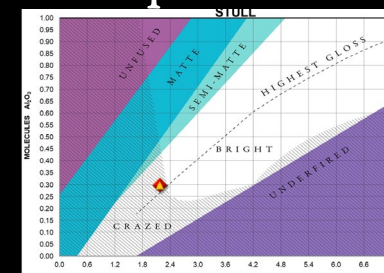
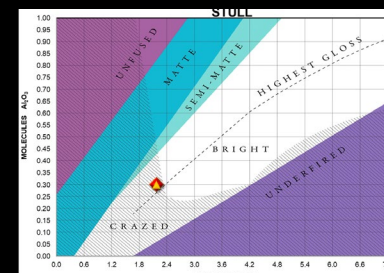
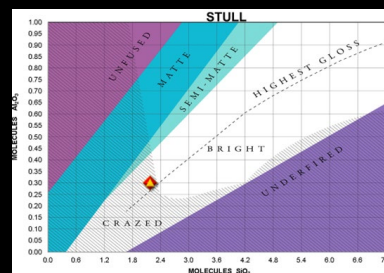
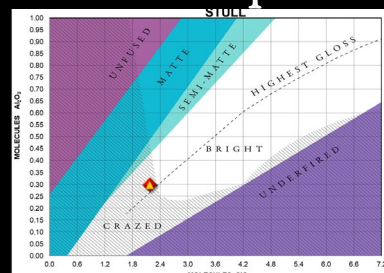
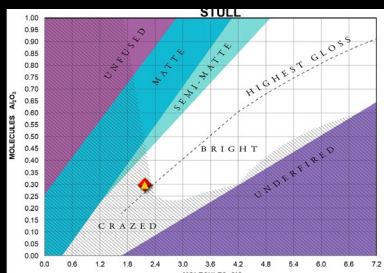
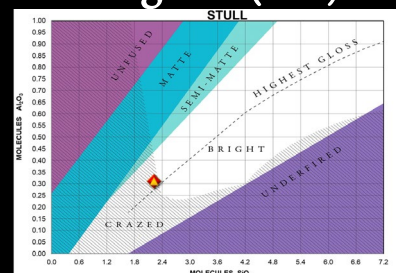
w/Custer



w/Mahavir



w/Spodumene



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Lab 4-Alkali Metals-Oxidation



070922-1



070922-40



070922-42

1-3 Second Dip

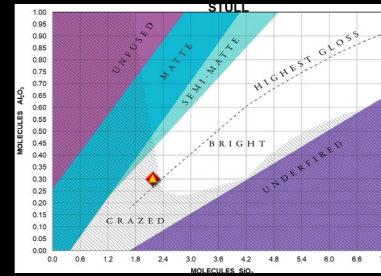
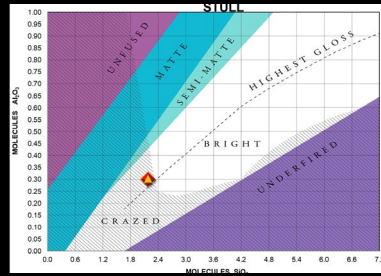
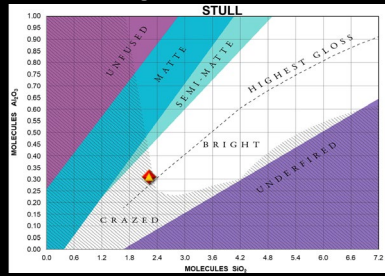


2-3 Second Dips

Original (NS)

w/Frit 3110

w/Lithium Carb



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Lab 4-Alkali Metals-Reduction



070922-1



070922-34



070922-35



070922-36



070922-37



070922-38

1-3 Second Dip



Original (NS)



w/G200 EU



w/Minspar



w/Custer

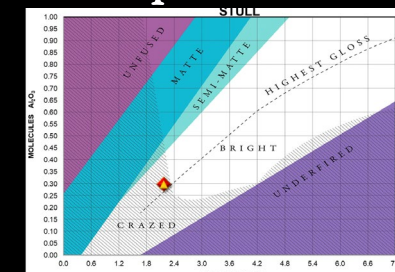
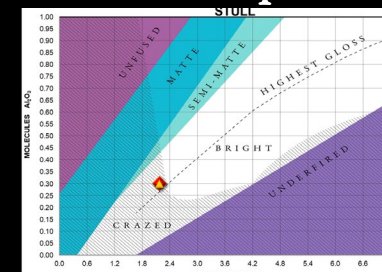
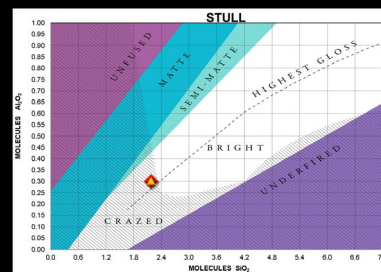
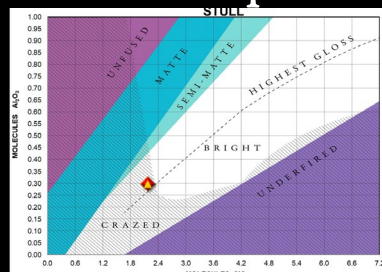
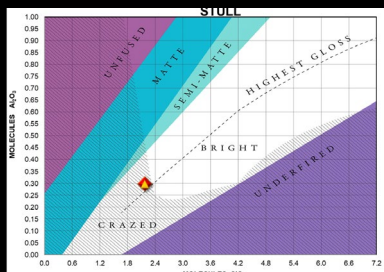
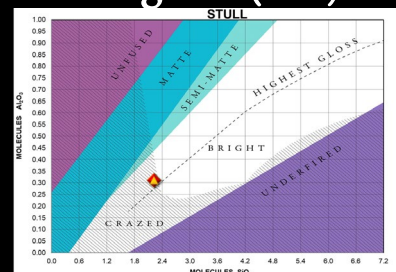


w/Minspar



w/Spodumene

2-3 Second Dips



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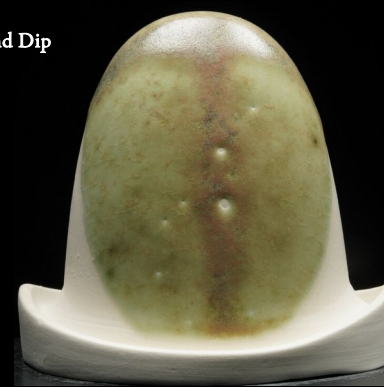
Lab 4-Alkali Metals-Reduction



070922-1



070922-40



070922-42

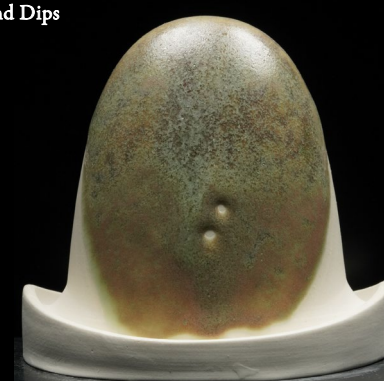
1-3 Second Dip



Original (NS)

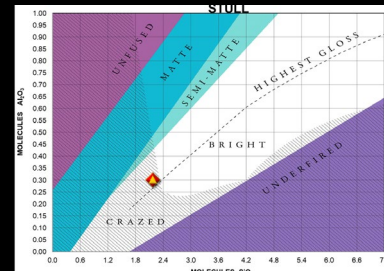
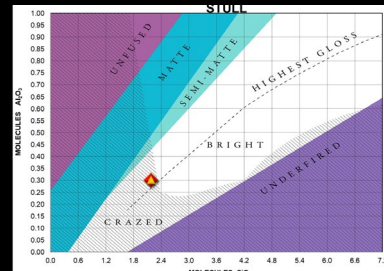
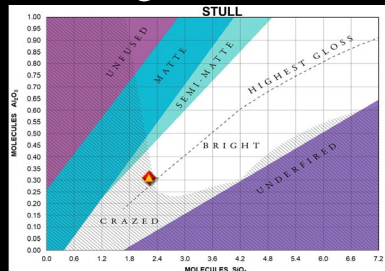


w/Frit 3110



w/Lithium Carb

2-3 Second Dips



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Lab 4-Alkaline Earth-Oxidation



070922-1



070922-43



070922-44

1-3 Second Dip



070922-45



070922-46



070922-47



Original (W)



w/Talc



w/Mag Carb

2-3 Second Dips



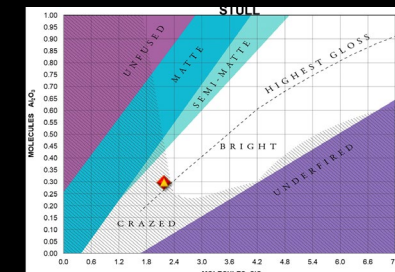
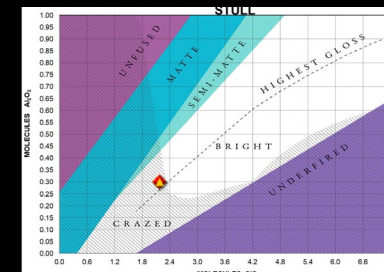
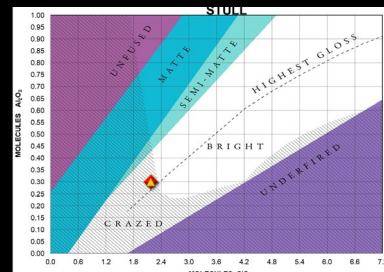
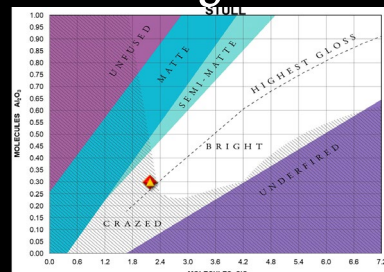
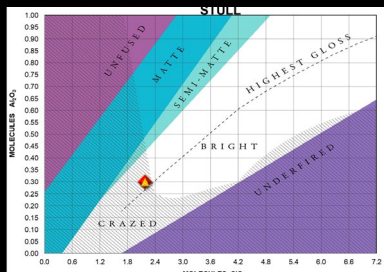
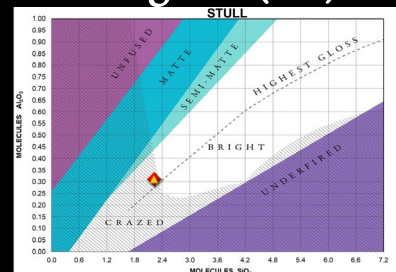
w/Dolomite



w/Wollastonite



w/Strontium Carb



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Lab 4-Alkaline Earth-Oxidation



070922-1



070922-48



070922-49



070922-50

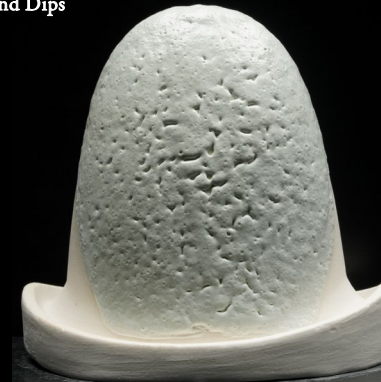
1-3 Second Dip



Original (W)



w/Barium Carb

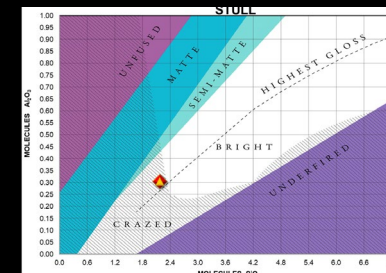
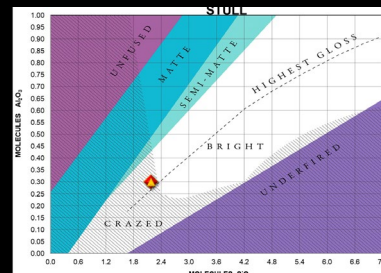
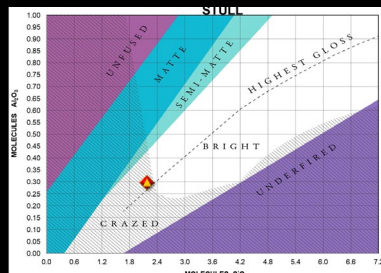
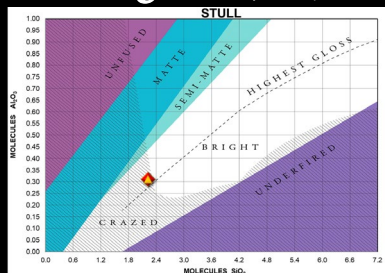


w/Zinc Oxide



w/Bone Ash

2-3 Second Dips



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Lab 4-Alkaline Earth-Reduction



070922-1



070922-43



070922-44



070922-45



070922-46



070922-47

1-3 Second Dip



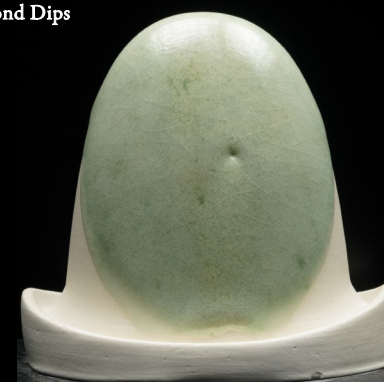
Original (W)



w/Talc



w/Mag Carb



w/Dolomite

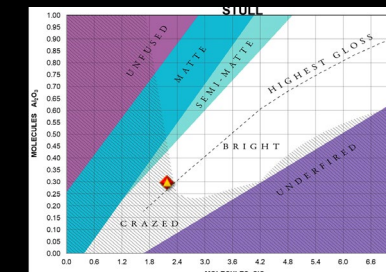
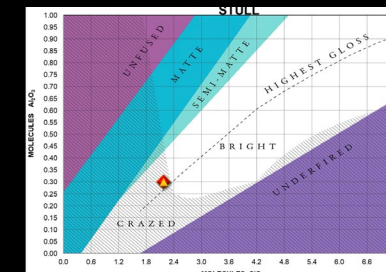
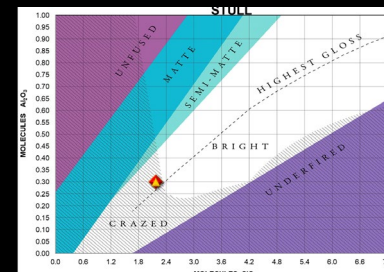
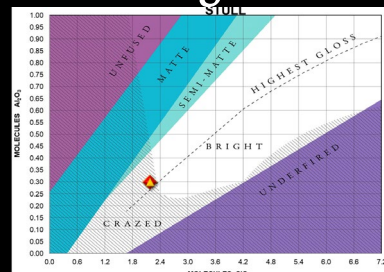
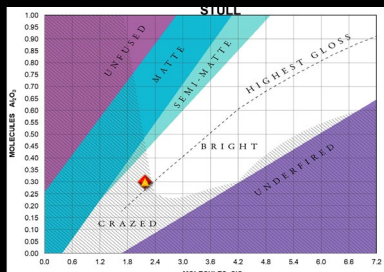
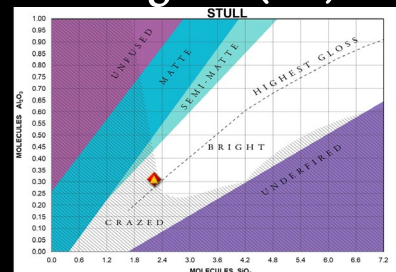


w/Wollastonite



w/Strontium Carb

2-3 Second Dips



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Lab 4-Alkaline Earth-Reduction



070922-1



070922-48



070922-49



070922-50

1-3 Second Dip

2-3 Second Dips



Original (W)



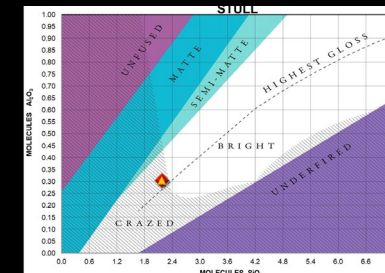
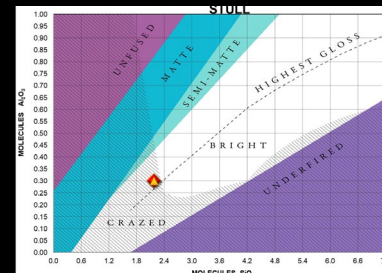
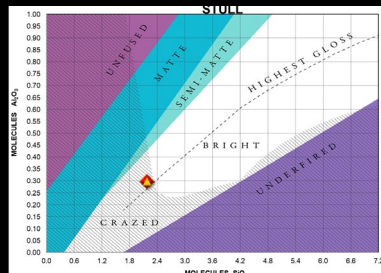
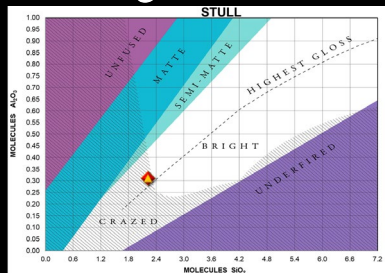
w/Barium Carb



w/Zinc Oxide



w/Bone Ash



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Heart of Glass

Original
070922-1

Neph Sy	39.82
Whiting	14.16
Zinc Oxide	12.39
EPK	8.94
Flint	22.71
Bentonite	1.98
Copper Carbonate	0.99
Water	75



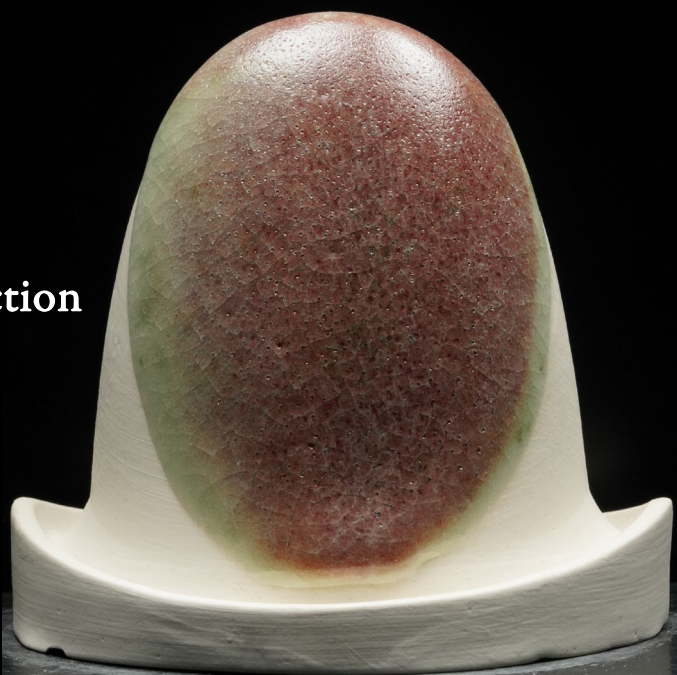
1-3 Second Dip



2-3 Second Dips

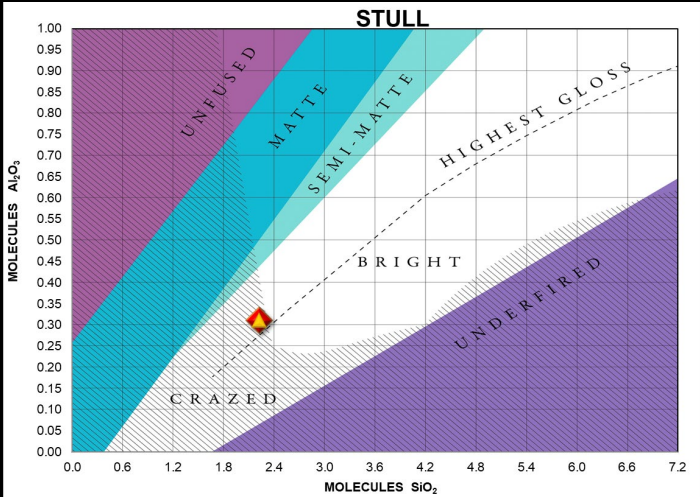


Reduction



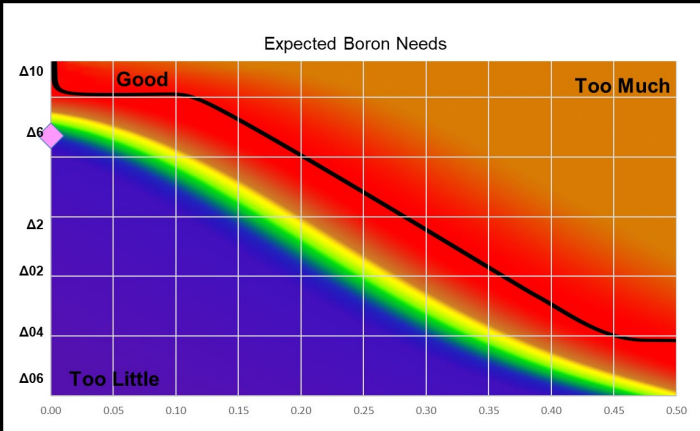
UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.14 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.27	Collective "Al ₂ O ₃ " 0.32	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.32	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.14 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.23	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



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Heart of Glass

Chemical Match
G200 EU Feldspar
070922-34

G200 EU	55.46
Whiting	13.86
Zinc Oxide	12.24
EPK	8.40
Flint	10.04
Copper Carbonate	1.01
Water	70



1-3 Second Dip



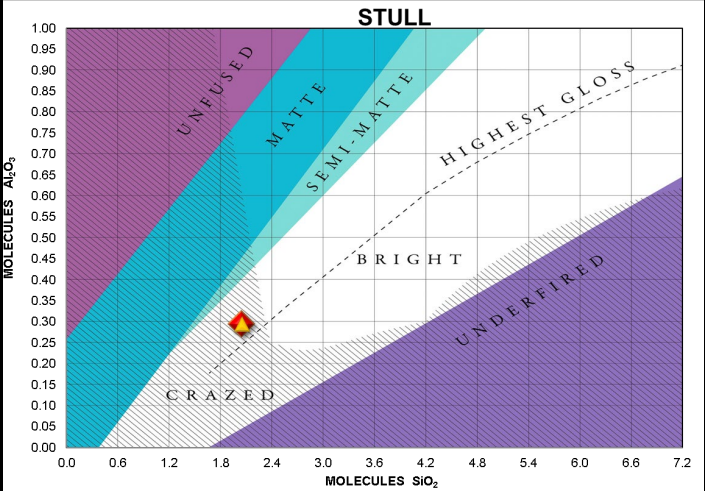
2-3 Second Dips



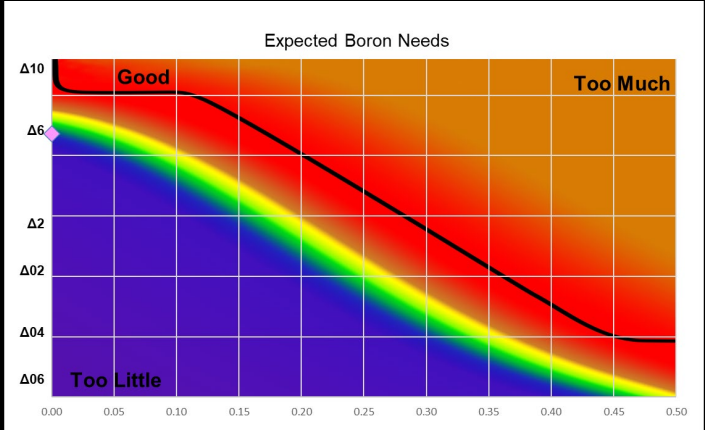
Reduction



SiO ₂ :Al ₂ O ₃ Ratio 6.93 :1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.09	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.05	K ₂ O 0.17	MgO 0.00	CaO 0.43
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.34	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



SiO ₂ :Al ₂ O ₃ Ratio 6.93 :1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.05	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.05	K ₂ O 0.16	MgO 0.00	CaO 0.42
B ₂ O ₃	Al ₂ O ₃ 0.29	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.34	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



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Heart of Glass

Chemical Match
Minspar Feldspar
070922-35

Minspar	60.06
Whiting	13.56
Zinc Oxide	12.88
EPK	1.92
Flint	9.69
Bentonite	1.89
Copper Carbonate	1.01
Water	80

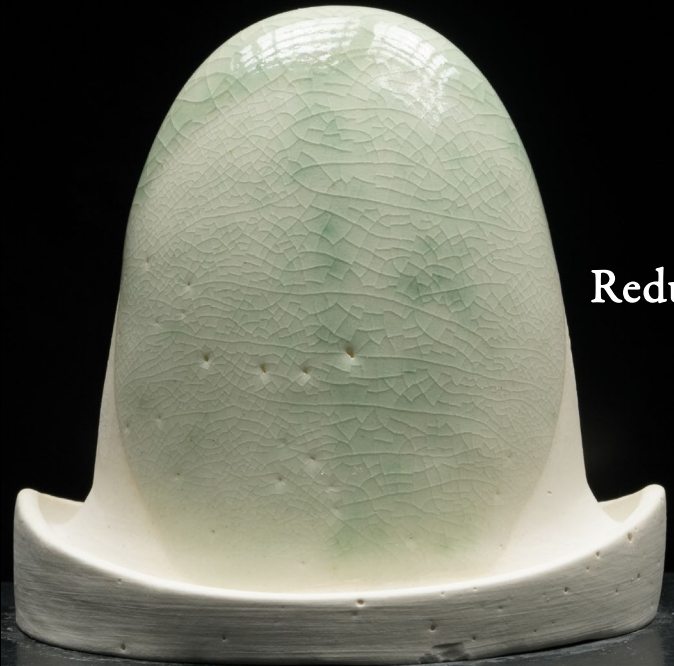


1-3 Second Dip



2-3 Second Dips

Oxidation

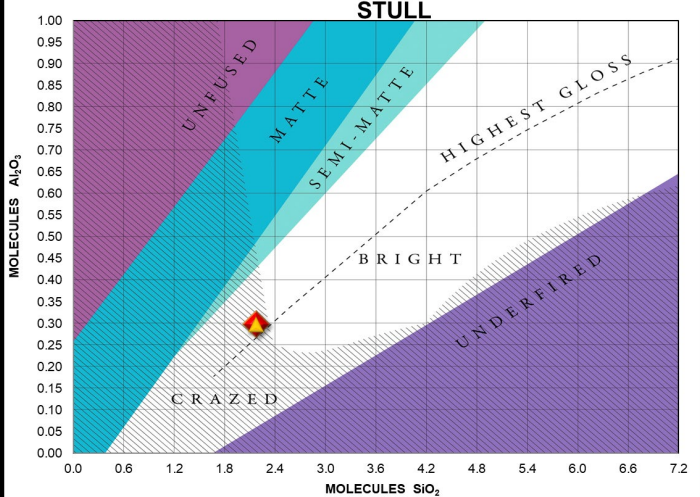


Reduction



UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.32 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.15	K ₂ O 0.06	MgO 0.00	CaO 0.38
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO	SrO 0.00	BaO 0.00
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.32 : 1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.15	K ₂ O 0.06	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO 0.00	BaO 0.00
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



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Heart of Glass

Chemical Match
Custer Feldspar
070922-36

Custer	57.62
Whiting	14.11
Zinc Oxide	12.54
EPK	7.67
Flint	8.06
Copper Carbonate	1.01
Water	70



1-3 Second Dip



2-3 Second Dips

Oxidation



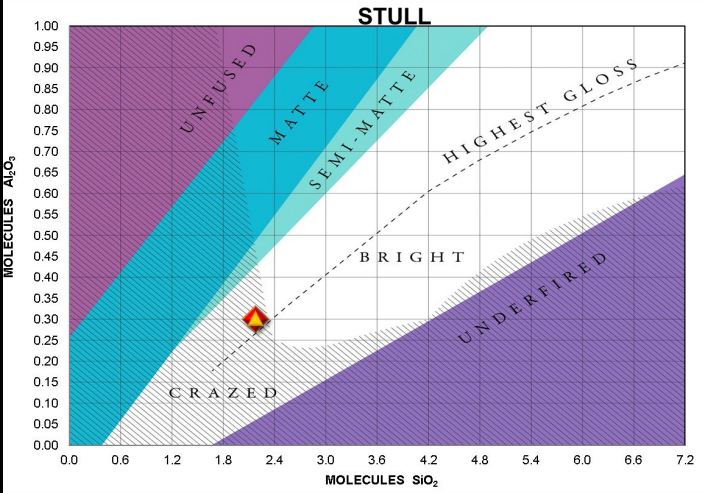
1-3 Second Dip



2-3 Second Dips

Reduction

SiO ₂ :Al ₂ O ₃ Ratio 7.19 :1		Alkali Metals 0.21		Alkaline Earths 0.79	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.05	K ₂ O 0.16	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



SiO ₂ :Al ₂ O ₃ Ratio 7.19 :1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.05	K ₂ O 0.16	MgO 0.00	CaO 0.36
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

Heart of Glass

Chemical Match
Mahavir Feldspar
070922-37

Mahavir	49.26
Whiting	14.30
Zinc Oxide	12.55
EPK	9.65
Flint	14.25
Copper Carbonate	1.01
Water	70



1-3 Second Dip

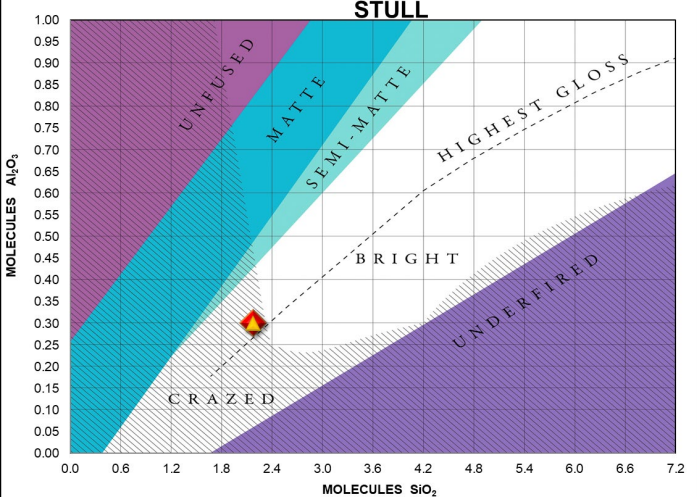


2-3 Second Dips



Reduction

SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.06	K ₂ O 0.16	MgO 0.01	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.06	K ₂ O 0.15	MgO 0.01	CaO 0.36
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

Heart of Glass

Chemical Match
Spodumene
070922-38

Spodumene	34.67
Whiting	15.34
Zinc Oxide	13.08
EPK	9.12
Flint	27.80
Copper Carbonate	1.01
Water	70



1-3 Second Dip



2-3 Second Dips

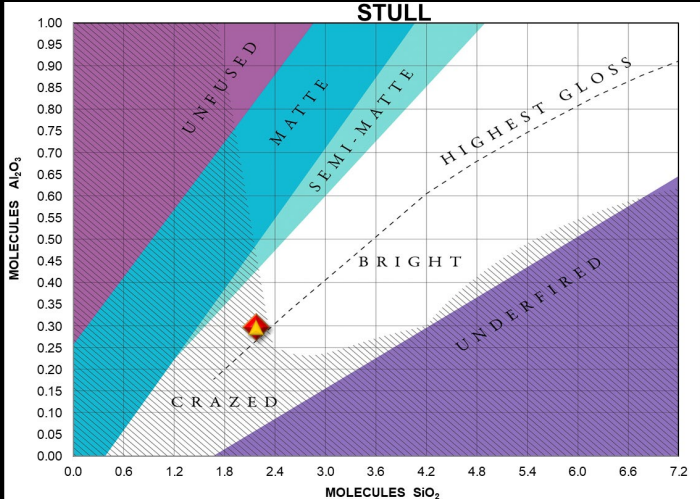


Reduction



Oxidation

SiO ₂ :Al ₂ O ₃ Ratio 7.29 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.00	K ₂ O 0.00	MgO 0.00	CaO 0.38
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



SiO ₂ :Al ₂ O ₃ Ratio 7.29 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.00	K ₂ O 0.00	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O 0.21	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

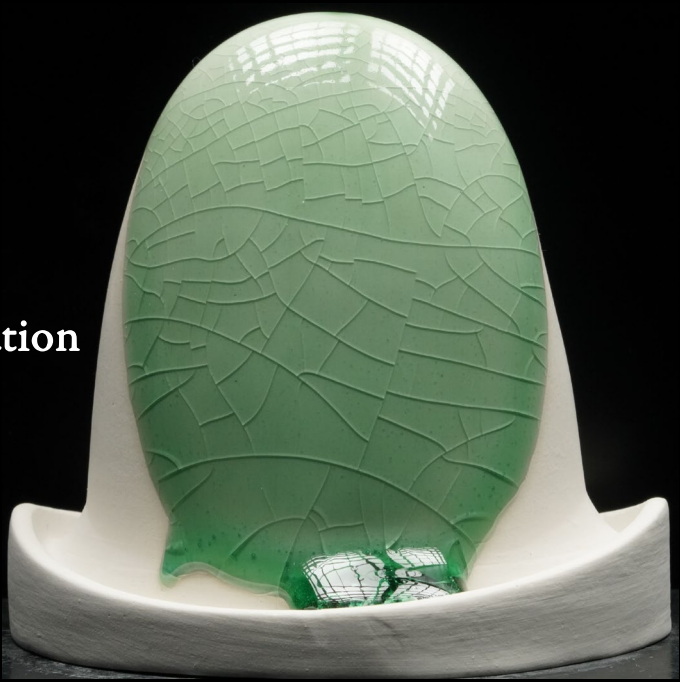
Heart of Glass

Chemical Match
Frit 3110
070922-40

3110	30.50
Whiting	10.85
Zinc Oxide	12.49
EPK	30.42
Flint	15.74
Copper Carbonate	1.01
Water	60



1-3 Second Dip



2-3 Second Dips

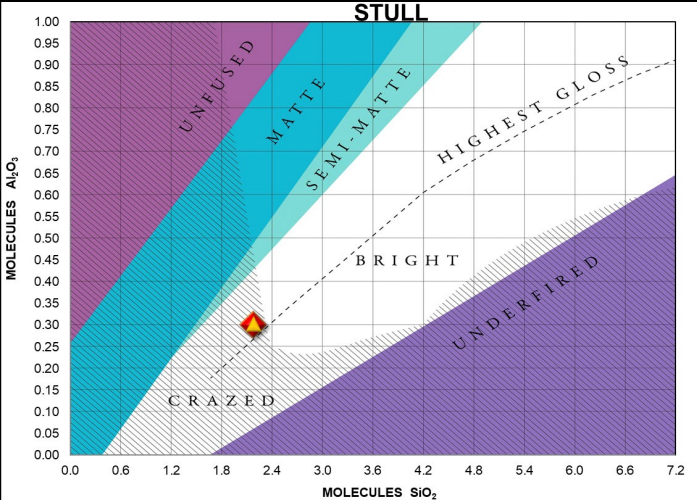


Reduction



UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.19 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.23	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.20	K ₂ O 0.02	MgO 0.00	CaO 0.37
B ₂ O ₃ 0.03	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.19 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.19	K ₂ O 0.02	MgO 0.00	CaO 0.36
B ₂ O ₃ 0.03	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

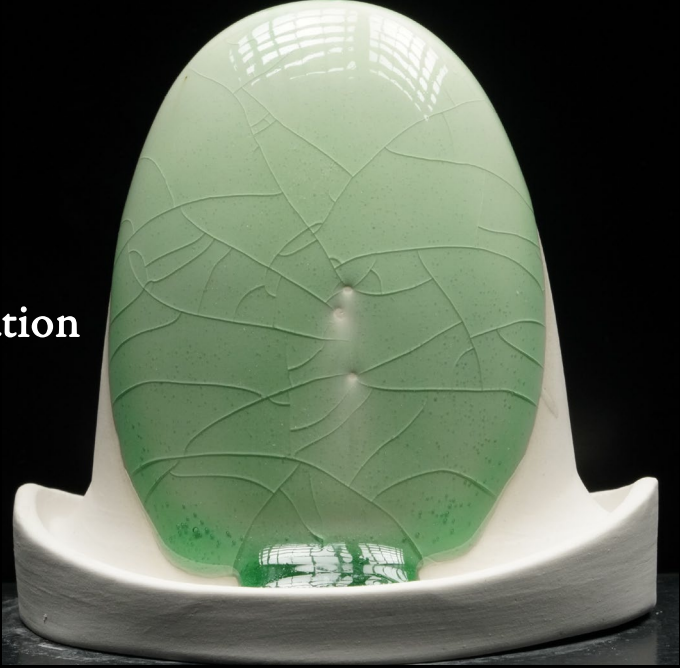
Heart of Glass

Chemical Match
Lithium Carbonate
070922-42

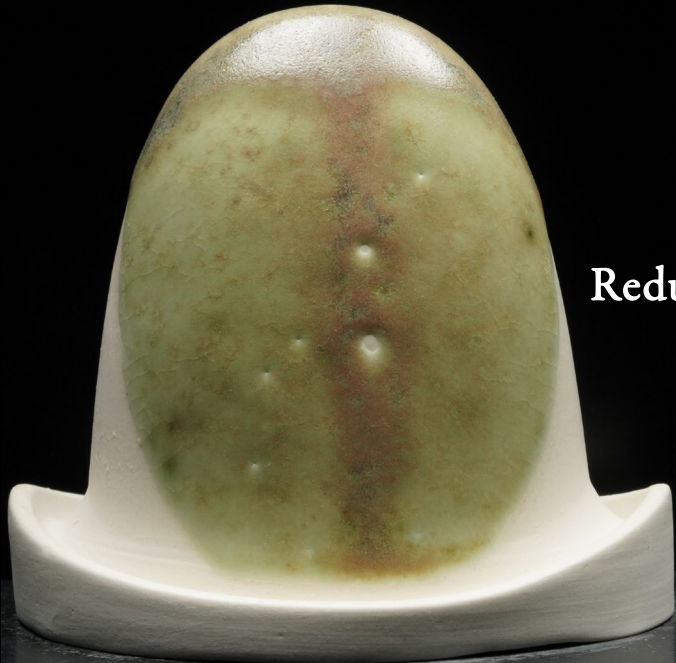
Lithium Carb	6.18
Whiting	13.86
Zinc Oxide	12.13
EPK	32.96
Flint	34.87
Copper Carbonate	1.01
Water	70



1-3 Second Dip



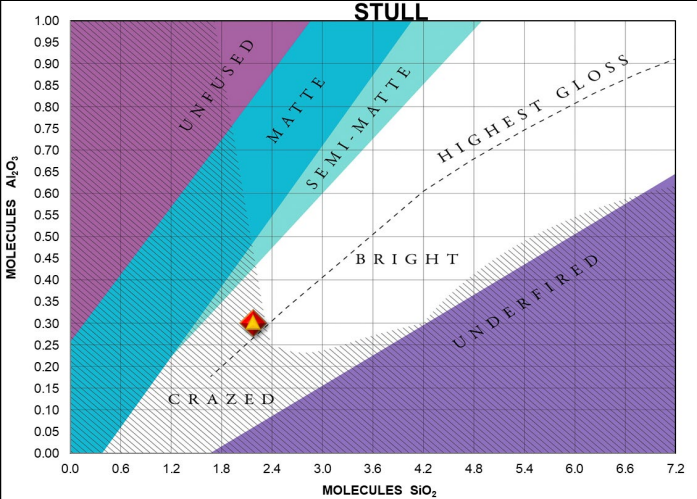
2-3 Second Dips



Reduction



UMF		Alkali Metals		Alkaline Earths	
SiO ₂ :Al ₂ O ₃ Ratio 7.16 : 1		0.22		0.78	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.31	Na ₂ O	K ₂ O 0.00	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF		Alkali Metals		Alkaline Earths	
SiO ₂ :Al ₂ O ₃ Ratio 7.16 : 1		0.24		0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O	K ₂ O 0.00	MgO 0.00	CaO 0.36
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.38	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



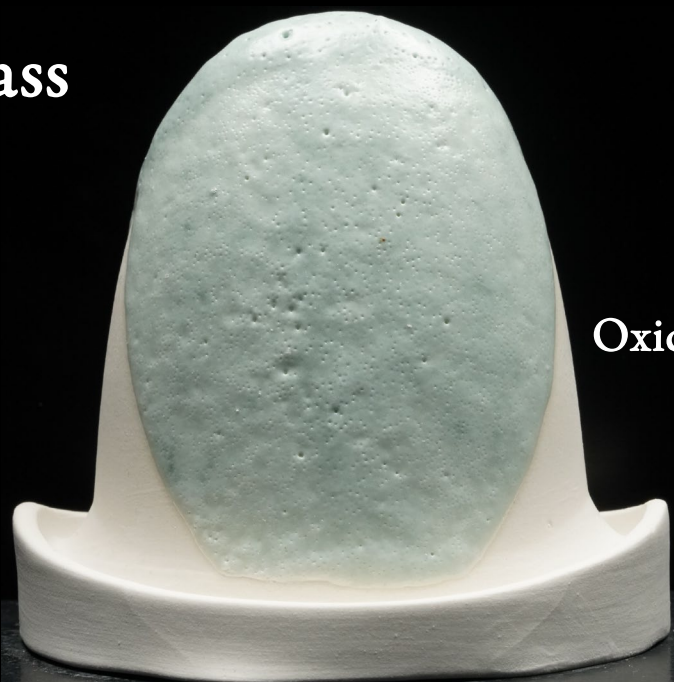
Ceramic
Materials
Workshop

Heart of Glass

Chemical Match
Talc

070922-43

Neph Sy	44.18
Talc	18.86
Zinc Oxide	13.58
EPK	9.04
Flint	14.33
Copper Carbonate	1.01
Water	80



1-3 Second Dip



2-3 Second Dips



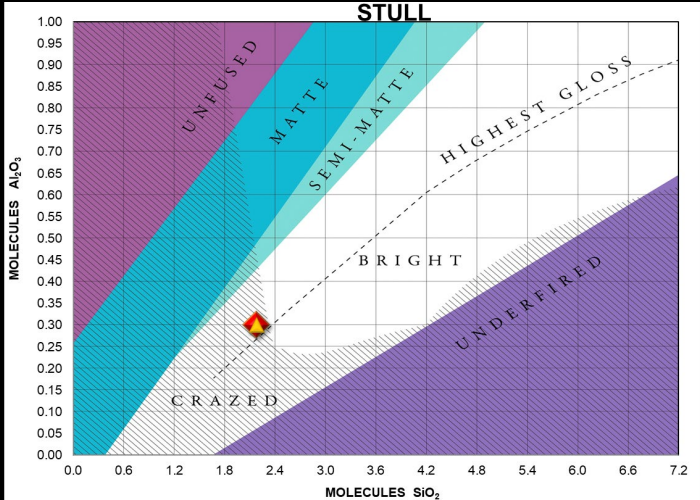
Reduction



Oxidation

UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.33	CaO 0.04
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.32	CaO 0.03
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO

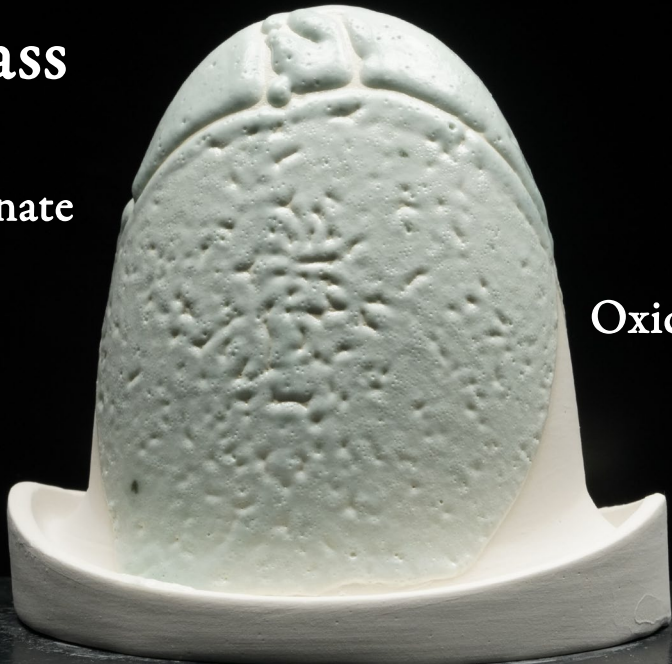


Ceramic
Materials
Workshop

Heart of Glass

Chemical Match
Magnesium Carbonate
070922-44

Neph Sy	42.79
Mag Carbonate	12.09
Zinc Oxide	13.03
EPK	8.47
Flint	23.62
Copper Carbonate	1.01
Water	120



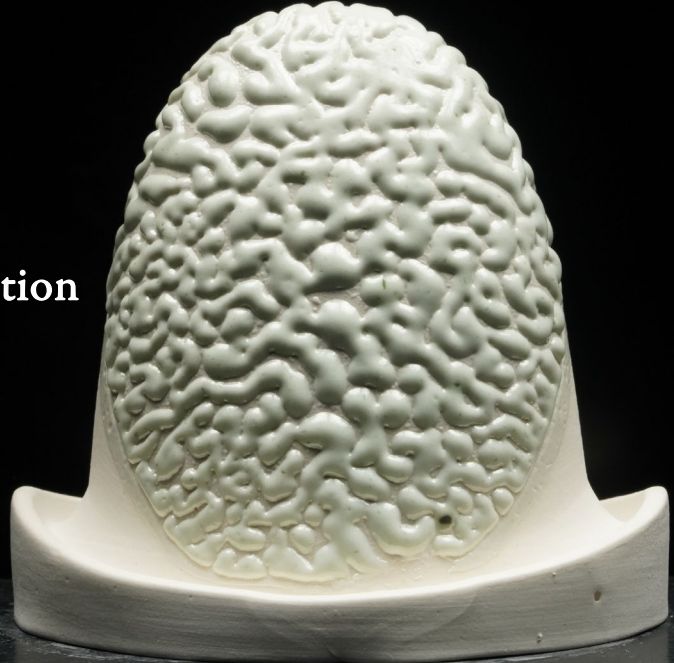
1-3 Second Dip



2-3 Second Dips



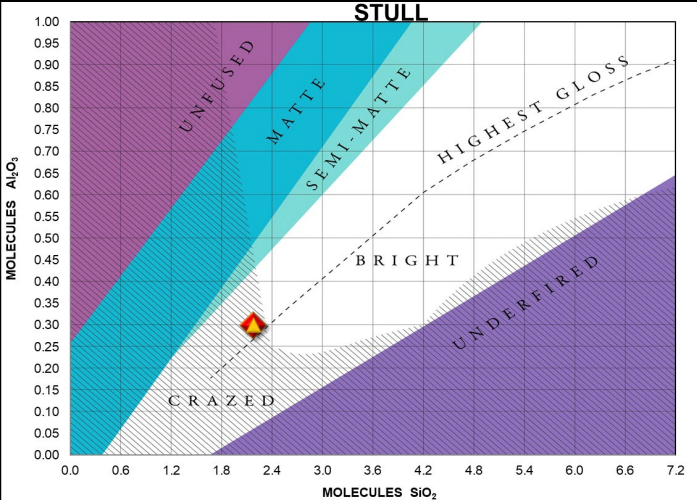
Reduction



Oxidation

UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.25 : 1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.18	K ₂ O 0.05	MgO 0.37	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.25 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.36	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

Heart of Glass

Chemical Match
Dolomite
070922-45

Neph Sy	42.78
Dolomite	13.19
Zinc Oxide	12.90
EPK	8.11
Flint	23.01
Copper Carbonate	1.01
Water	60



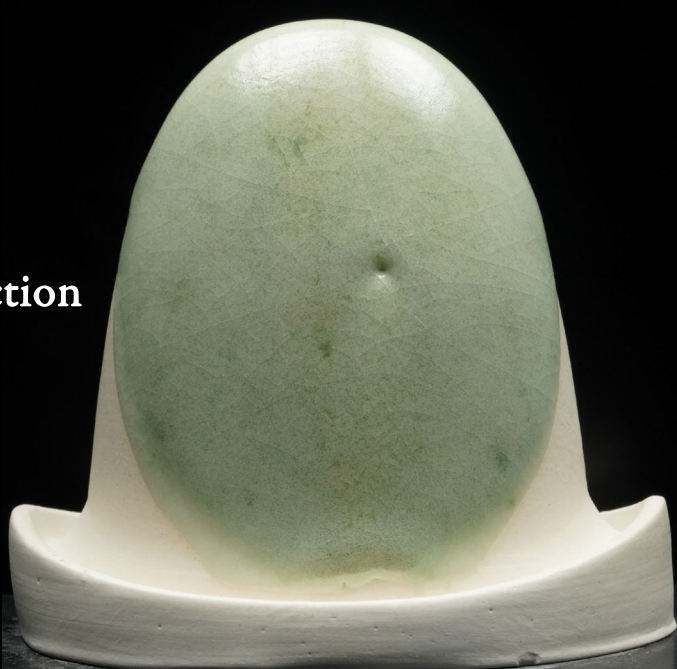
1-3 Second Dip



2-3 Second Dips

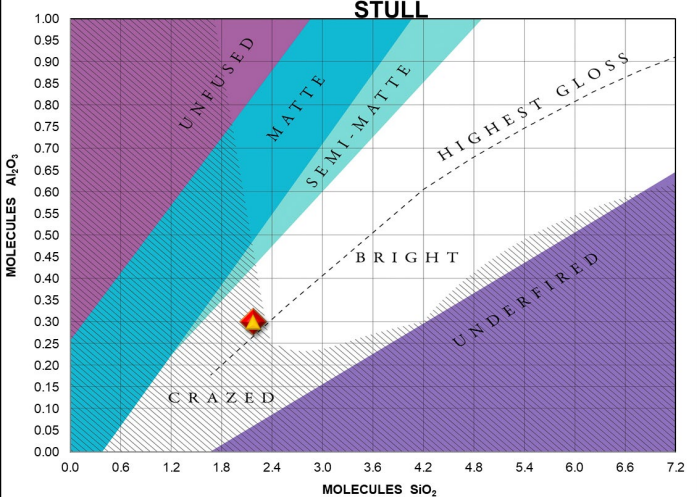


Reduction



Reduction

UMF SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.18	K ₂ O 0.05	MgO 0.18	CaO 0.19
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.18	CaO 0.18
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

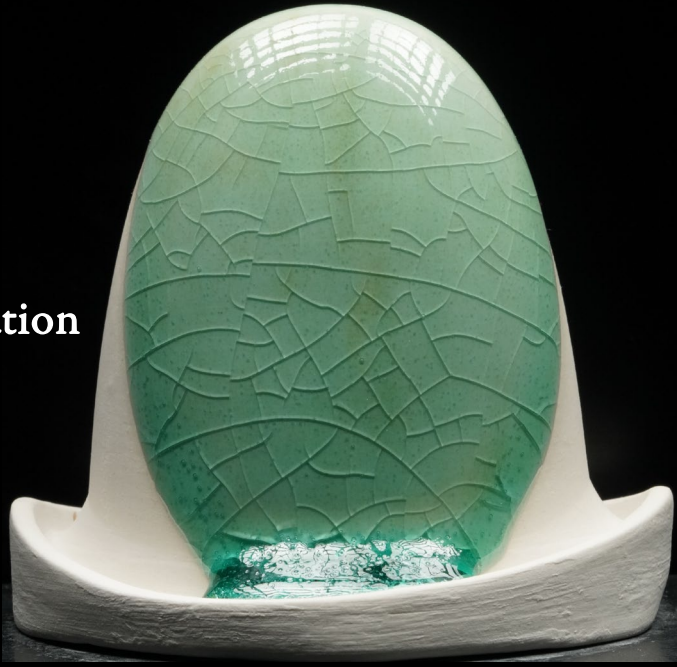
Heart of Glass

Chemical Match
Wollastonite
070922-46

Neph Sy	43.82
Wollastonite	18.58
Zinc Oxide	13.59
EPK	8.86
Flint	15.16
Copper Carbonate	1.02
Water	60

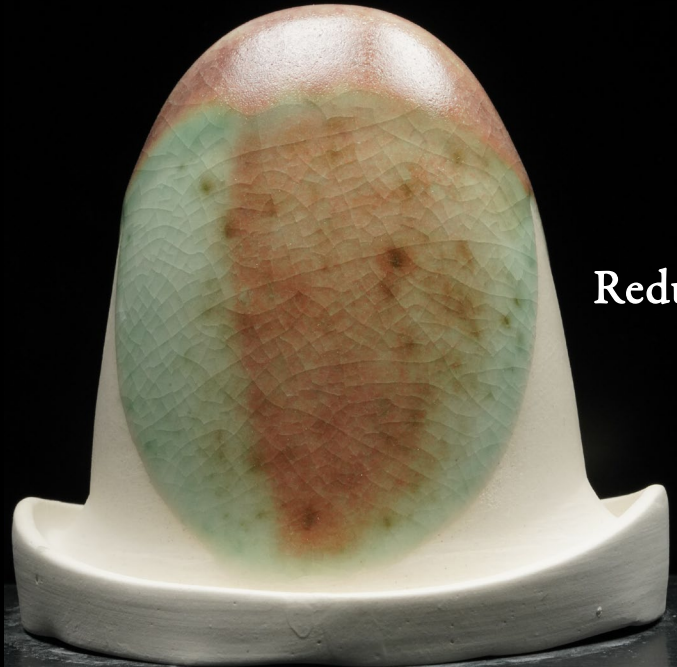


1-3 Second Dip



2-3 Second Dips

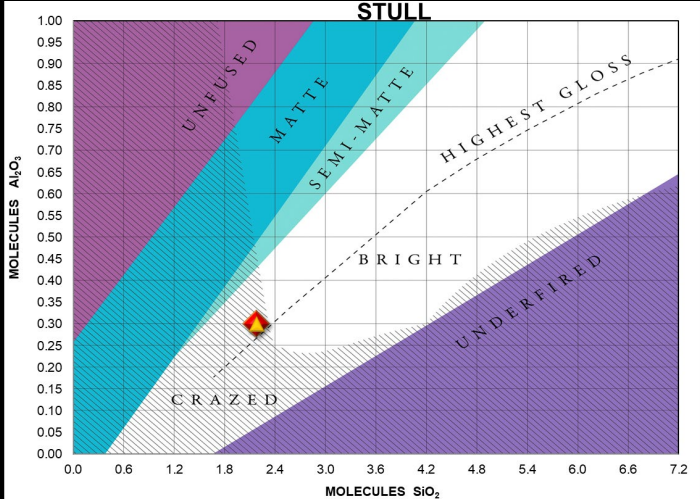
Oxidation



Reduction



SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.23		Alkaline Earths 0.77	
SiO ₂ 2.22	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.01	CaO 0.35
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.01	CaO 0.35
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

Heart of Glass

Chemical Match
Strontium Carbonate
070922-47

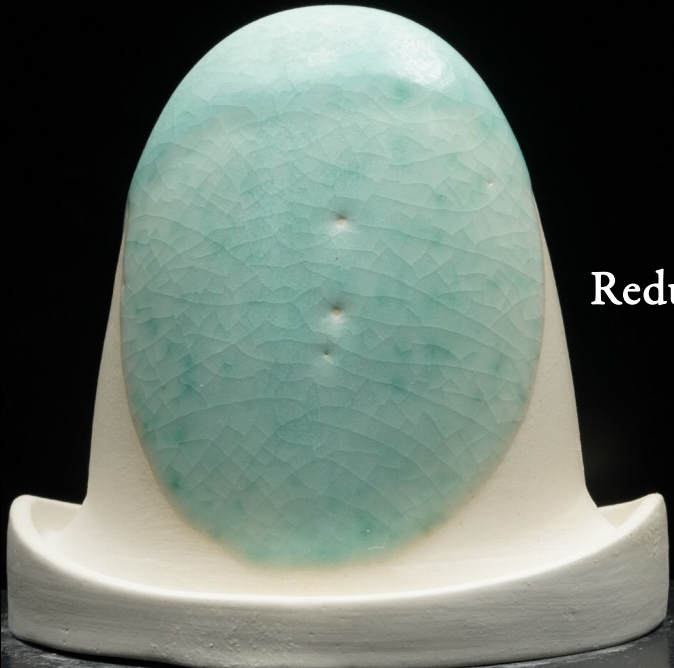
Neph Sy	38.23
Strontium Carb	19.86
Zinc Oxide	11.93
EPK	8.08
Flint	21.89
Copper Carbonate	1.00
Water	60



1-3 Second Dip



2-3 Second Dips

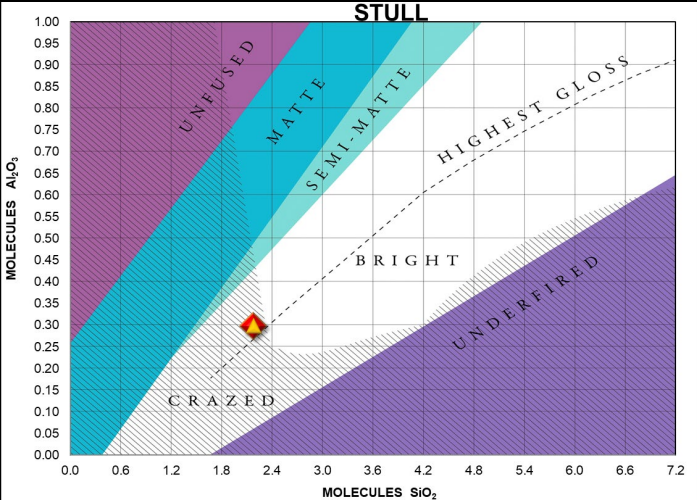


Reduction



UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.29 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.23	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO	SrO 0.37	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.29 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO 0.36	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



Ceramic
Materials
Workshop

Heart of Glass

Chemical Match
Barium Carbonate
070922-48

Neph Sy	35.46
Barium Carb	24.93
Zinc Oxide	11.18
EPK	7.81
Flint	20.62
Copper Carbonate	1.01
Water	80



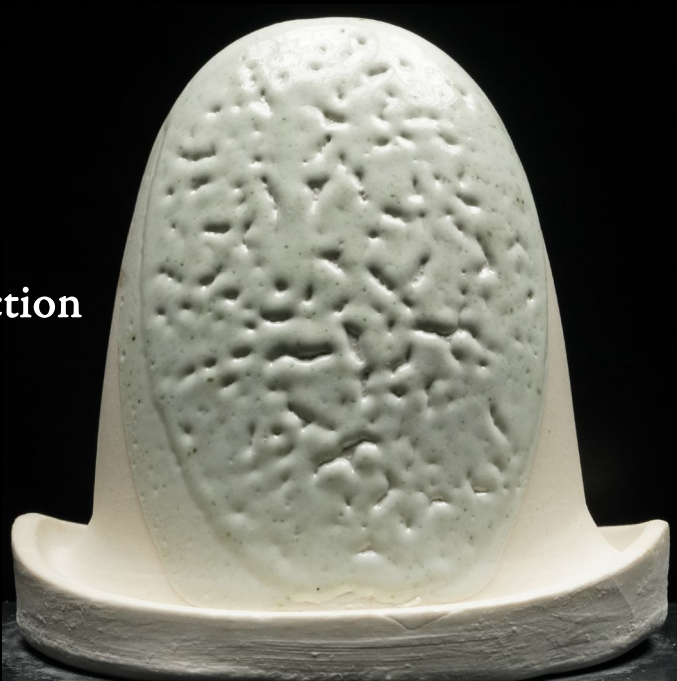
1-3 Second Dip



2-3 Second Dips



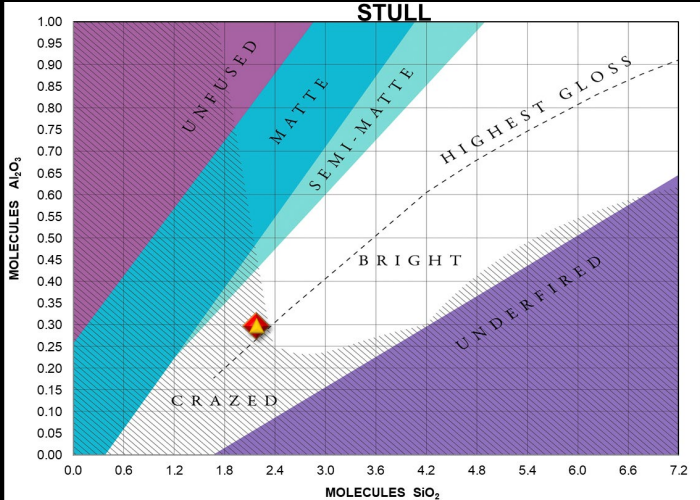
Reduction



Oxidation

UMF

SiO ₂ :Al ₂ O ₃ Ratio 7.29 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.23	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO	SrO	BaO 0.37
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF

SiO ₂ :Al ₂ O ₃ Ratio 7.29 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO 0.36
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO

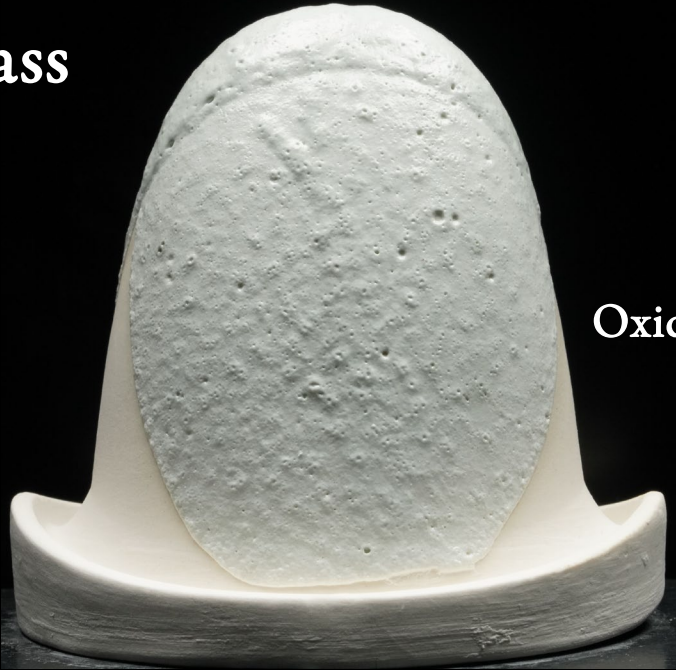


Ceramic
Materials
Workshop

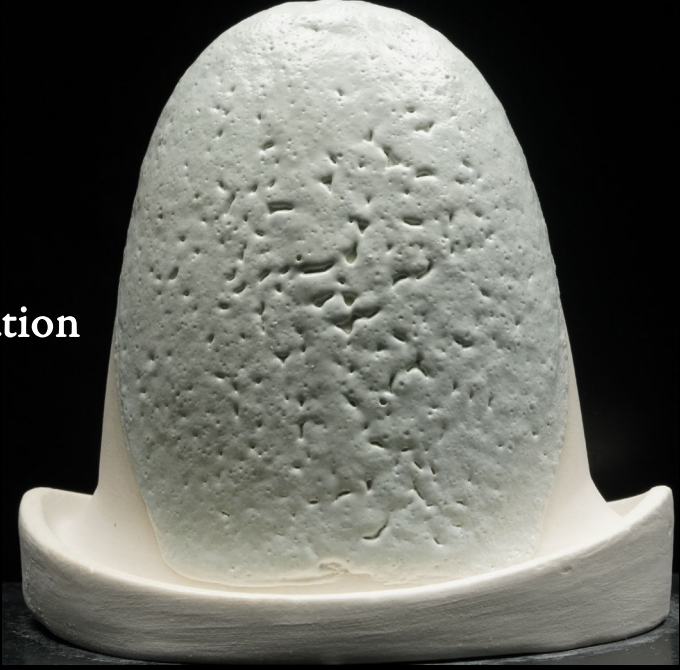
Heart of Glass

Chemical Match
Zinc Oxide
070922-49

Neph Sy	42.51
Zinc Oxide	
Zinc Oxide	25.02
EPK	8.79
Flint	23.68
Copper Carbonate	1.01
Water	80



1-3 Second Dip



2-3 Second Dips

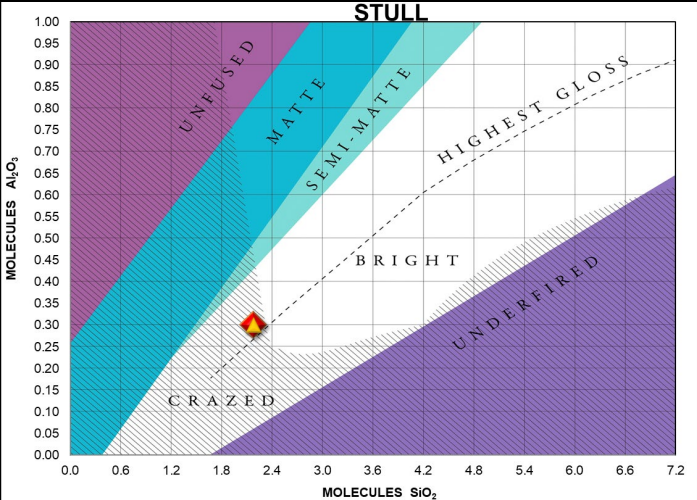


Reduction



Oxidation

UMF SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.23	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.76	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO



EUMF SiO ₂ :Al ₂ O ₃ Ratio 7.23 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.30	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.01
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.75	FeO 0.00
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅		MnO ₂	CoO

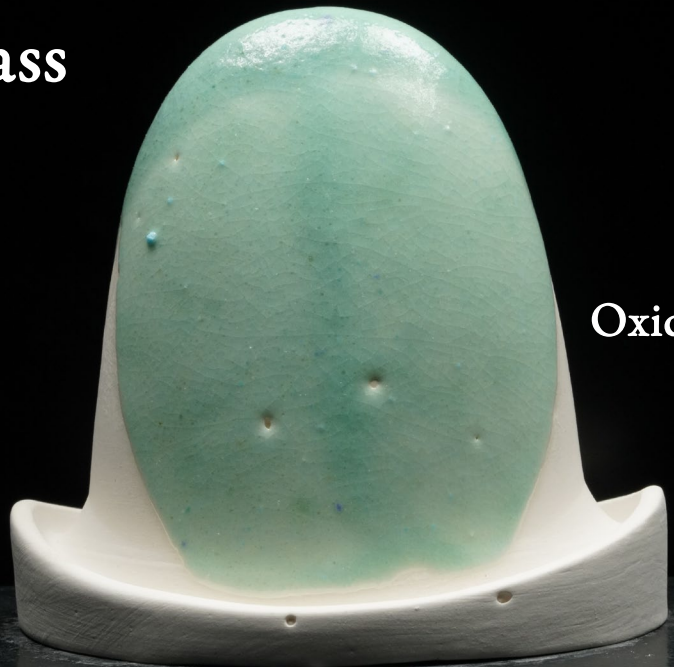


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Heart of Glass

Chemical Match
Bone Ash
070922-50

Neph Sy	38.84
Bone Ash	18.86
Zinc Oxide	12.08
EPK	8.72
Flint	21.50
Copper Carbonate	1.01
Water	80



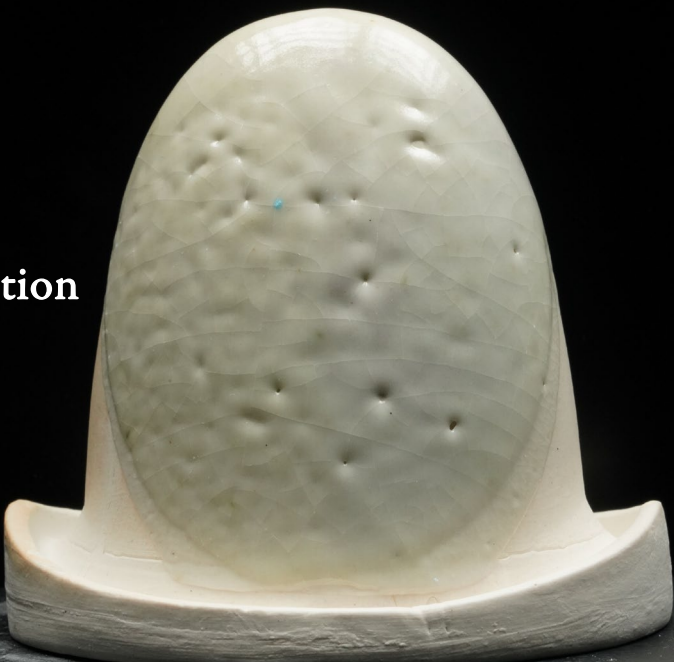
1-3 Second Dip



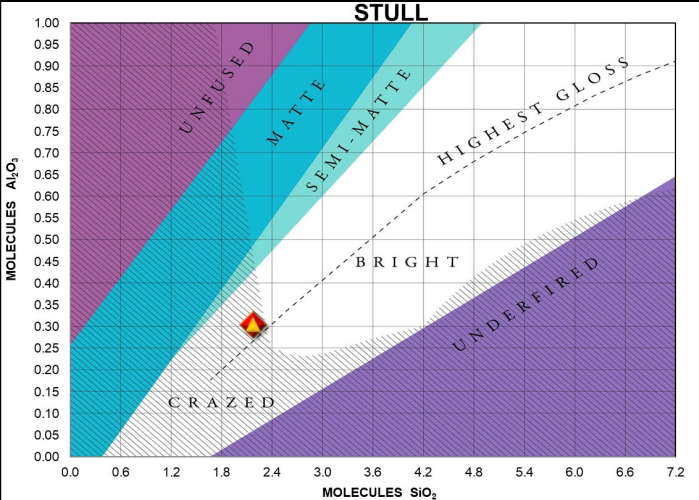
2-3 Second Dips



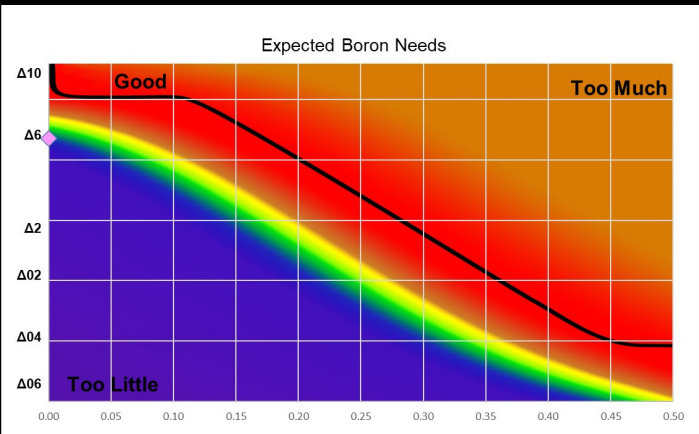
Reduction



SiO ₂ :Al ₂ O ₃ Ratio 7.12 : 1		Alkali Metals 0.22		Alkaline Earths 0.78	
SiO ₂ 2.23	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.37
B ₂ O ₃	Al ₂ O ₃ 0.31	Li ₂ O	CuO	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.40	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅ 0.20		MnO ₂	CoO



SiO ₂ :Al ₂ O ₃ Ratio 7.12 : 1		Alkali Metals 0.24		Alkaline Earths 0.76	
SiO ₂ 2.18	Collective "Al ₂ O ₃ " 0.31	Na ₂ O 0.17	K ₂ O 0.05	MgO 0.00	CaO 0.36
B ₂ O ₃	Al ₂ O ₃ 0.30	Li ₂ O	CuO 0.02	SrO	BaO
TiO ₂ 0.00	NiO	Bi ₂ O ₃	SnO ₂	ZnO 0.39	FeO 0.01
Cr ₂ O ₃	ZrO ₂	P ₂ O ₅ 0.20		MnO ₂	CoO



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