

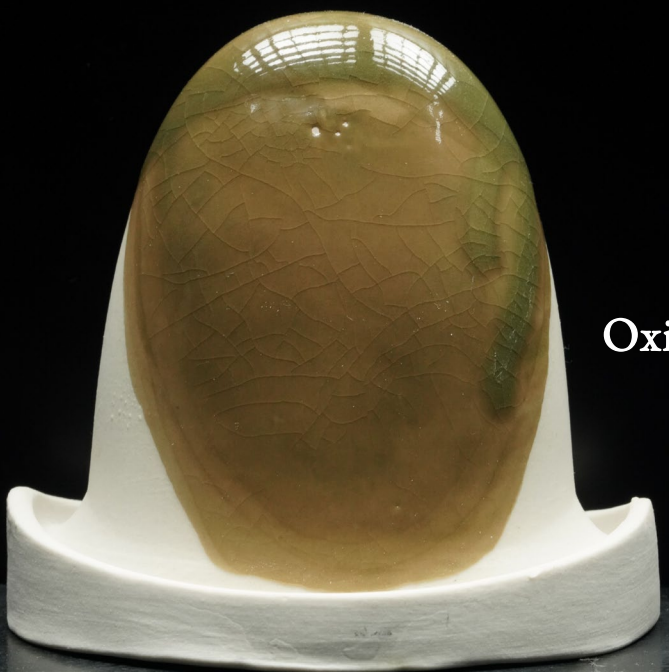
# 4321- $\Delta$ 10

## Lab 3-Sili-Closeness

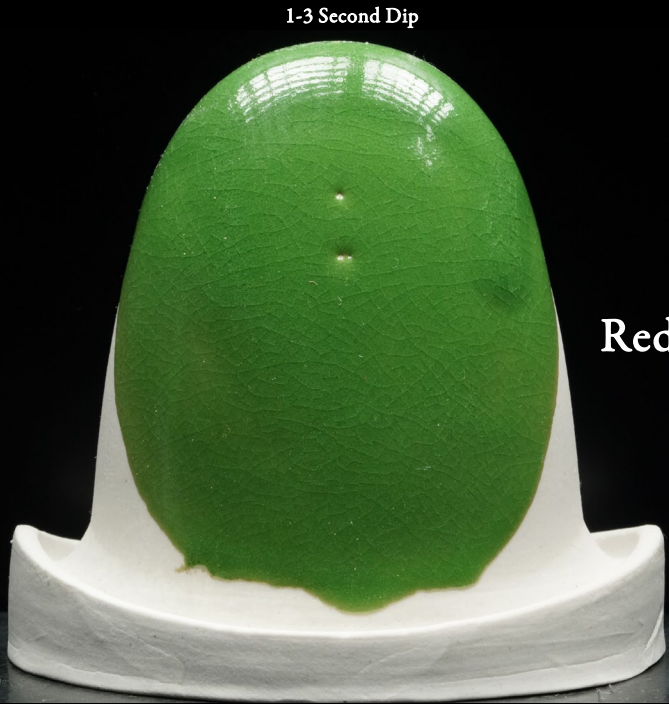
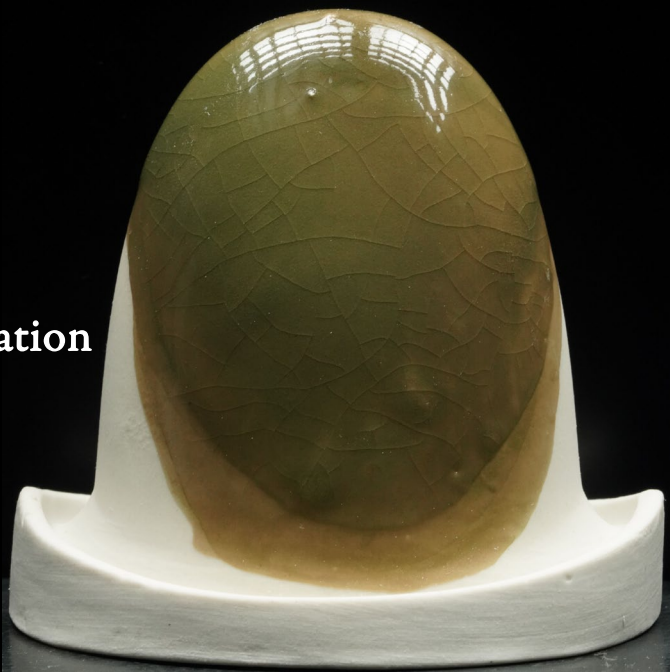
4321

Original  
062322-1

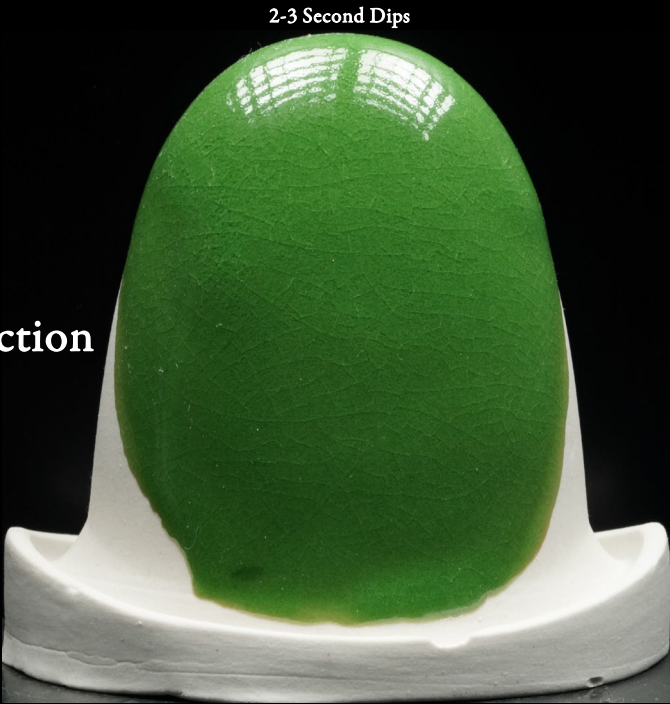
|              |       |
|--------------|-------|
| Neph Sy      | 40.00 |
| Whiting      | 20.00 |
| EPK          | 10.00 |
| Flint        | 30.00 |
| Chrome Oxide | 1.00  |
| Water        | 60    |



Oxidation

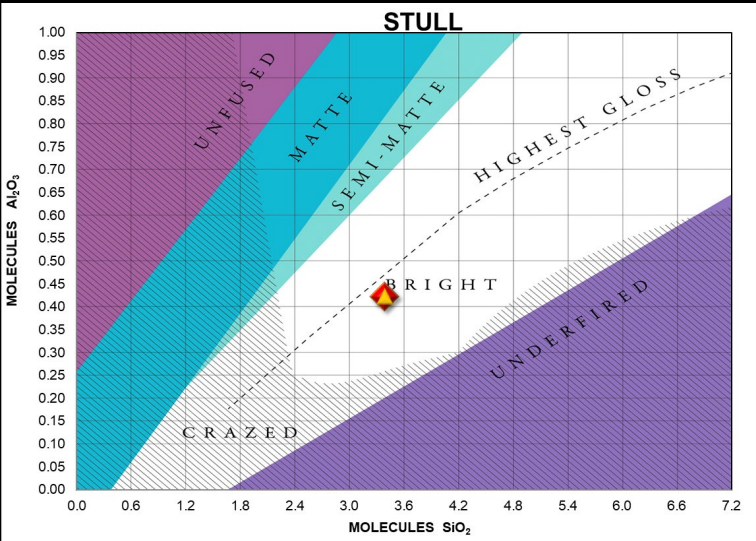


Reduction



UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.99 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.39                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.99 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.39                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |

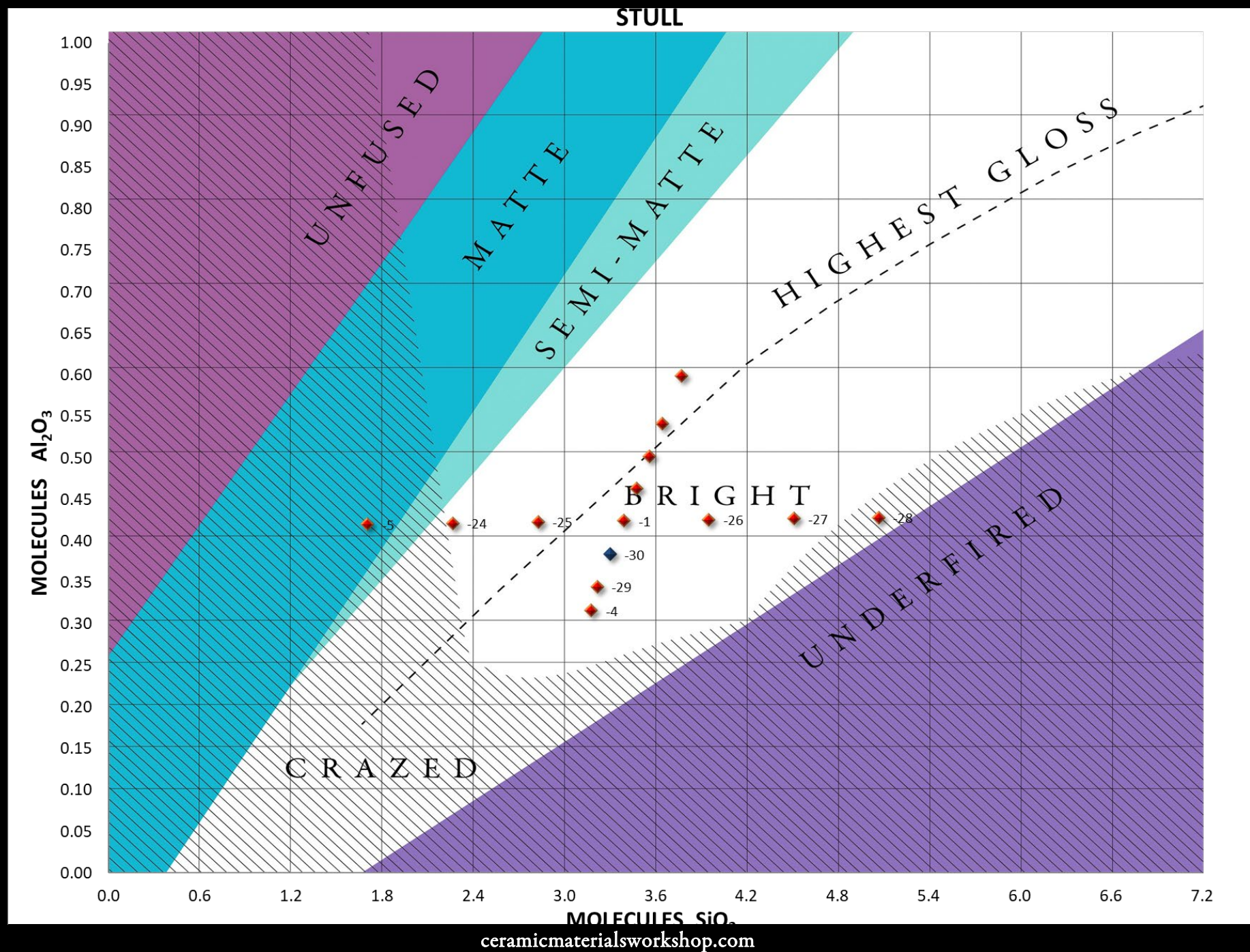


Ceramic  
Materials  
Workshop

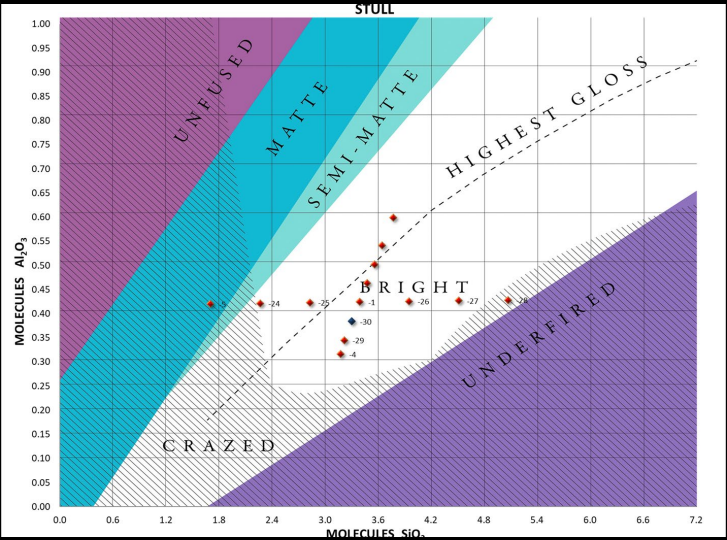
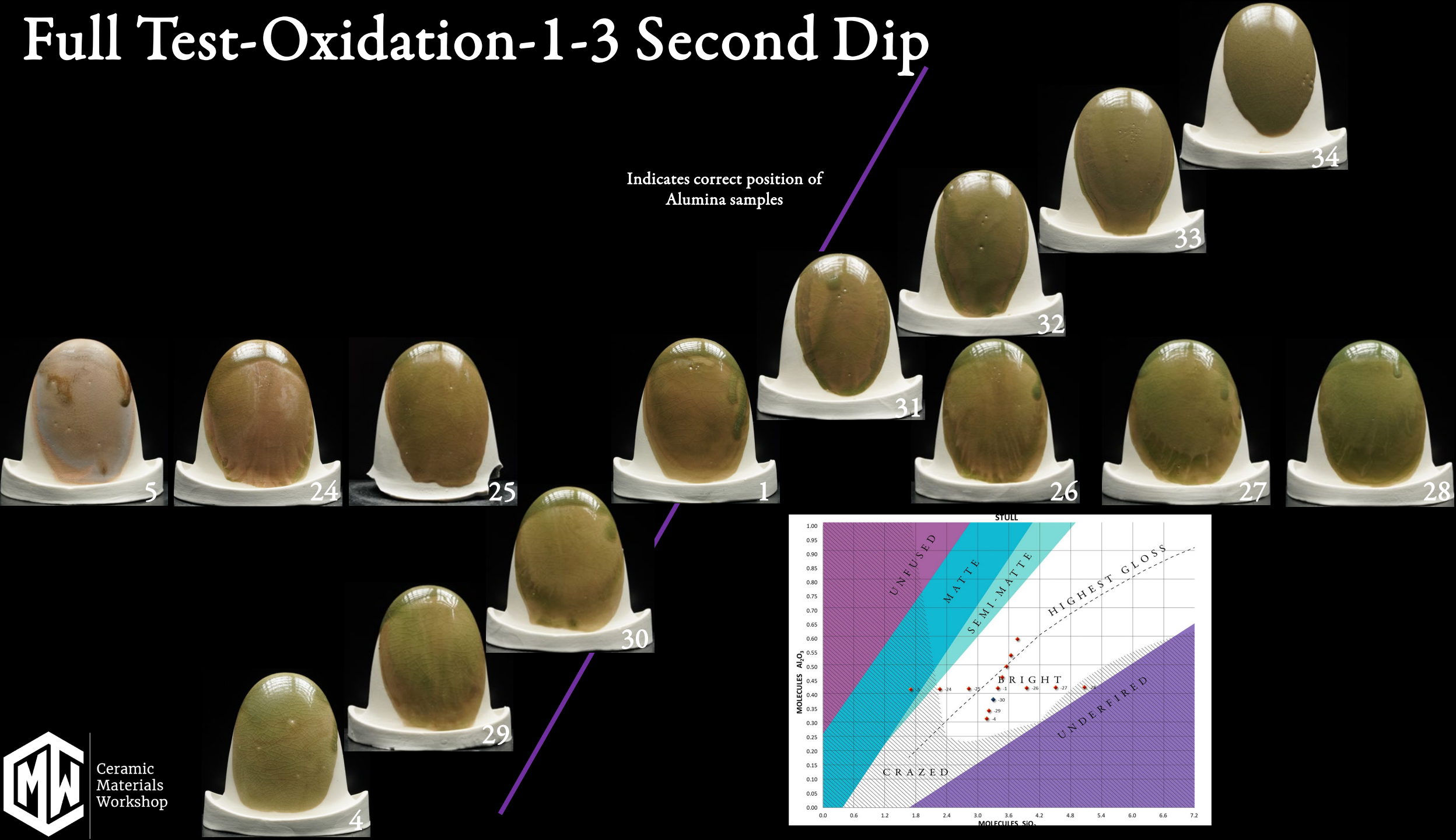
# UMF



Ceramic  
Materials  
Workshop

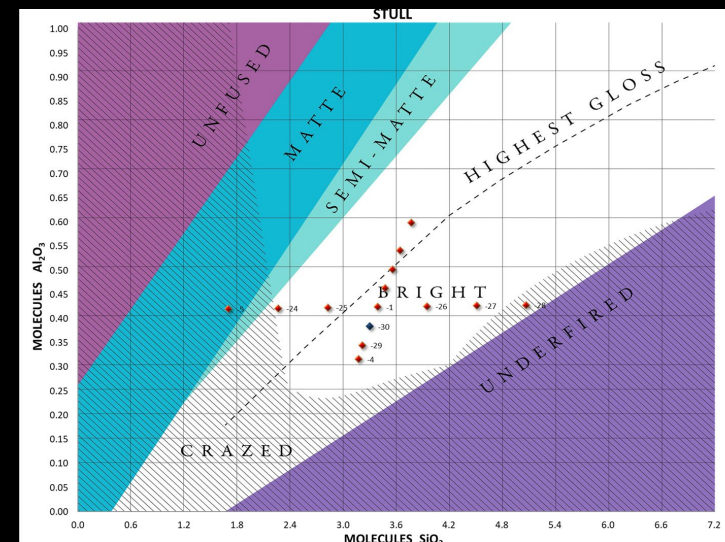
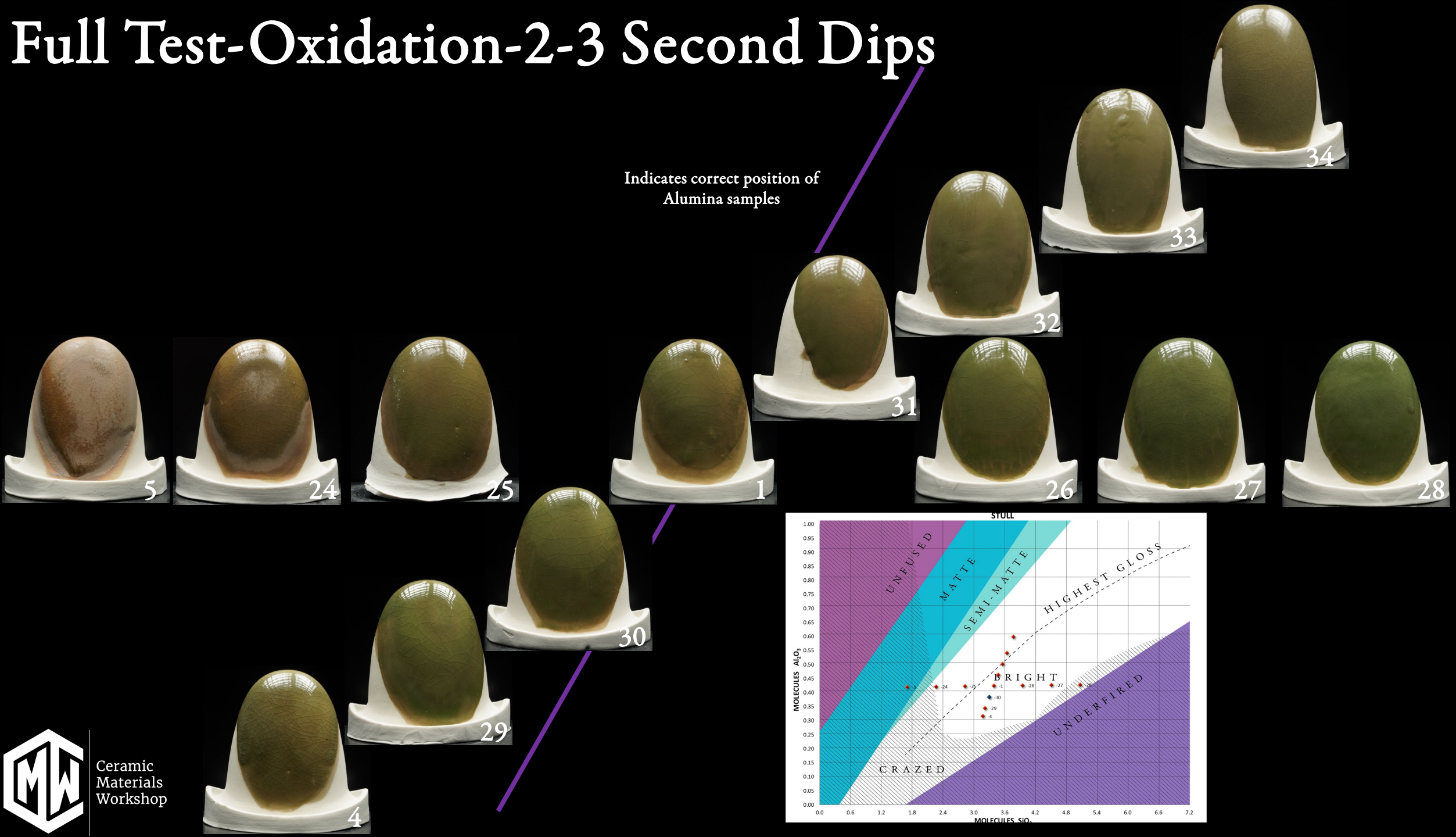


# Full Test-Oxidation-1-3 Second Dip

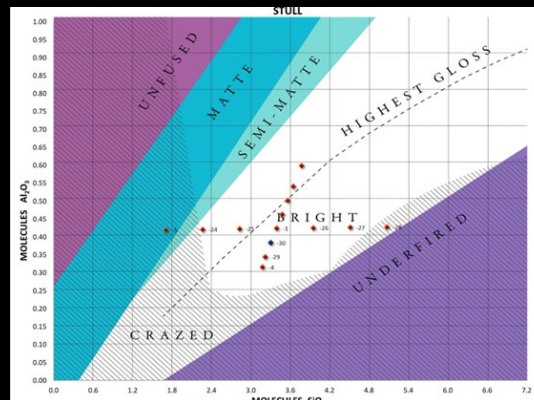


# Full Test-Oxidation-2-3 Second Dips

Indicates correct position of  
Alumina samples



# Silica Variations-Reduction



# Alumina Variations-Reduction

1-3 Second Dip



062322-4



062322-29



062322-30



062322-1



062322-31



062322-32

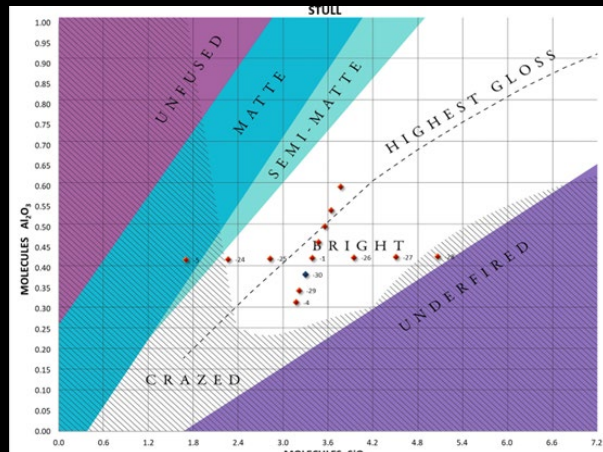
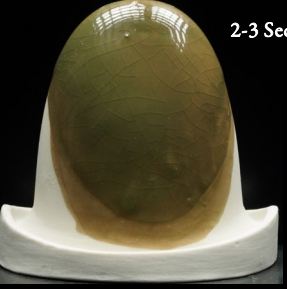


062322-33



062322-34

2-3 Second Dips



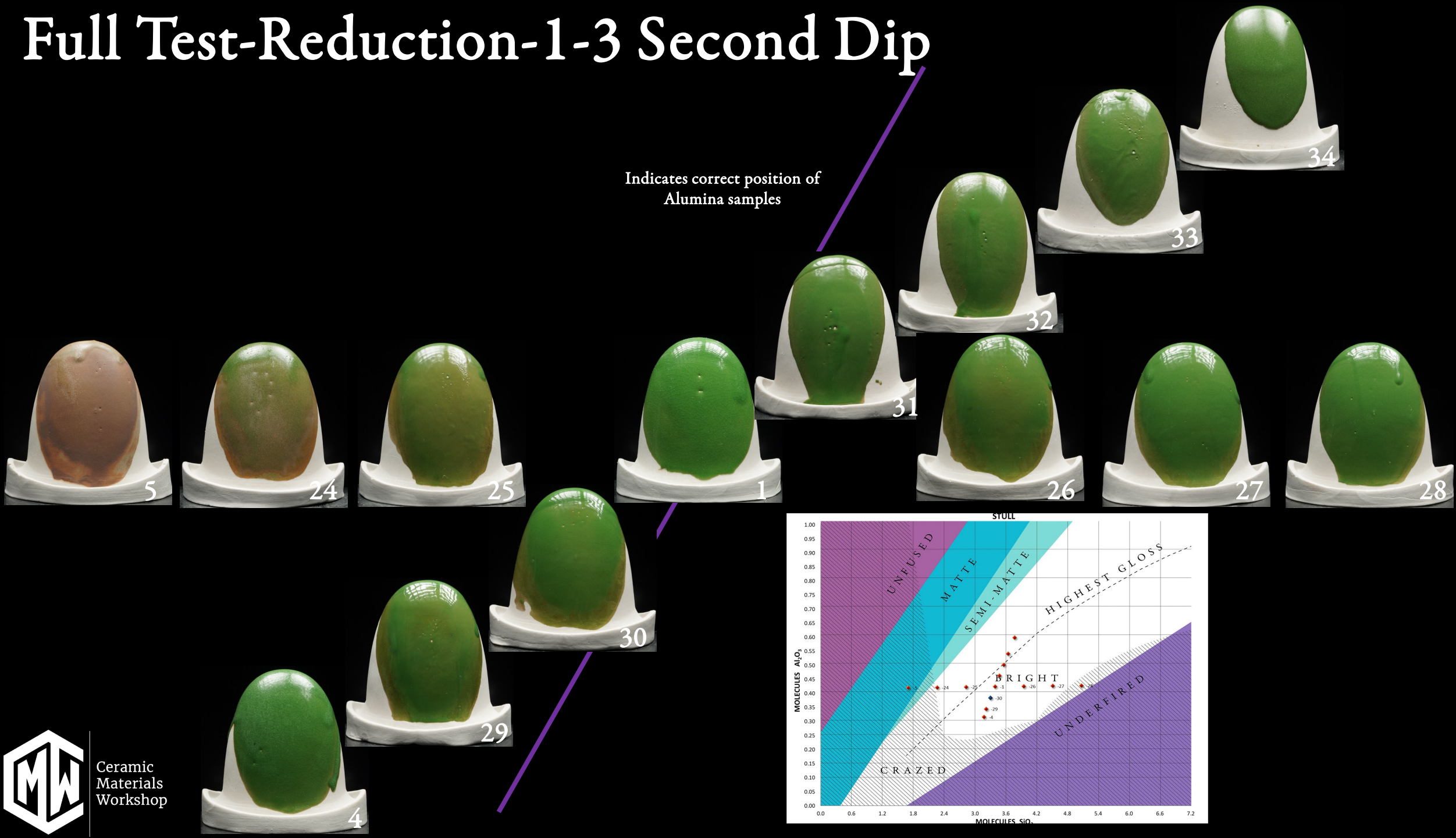
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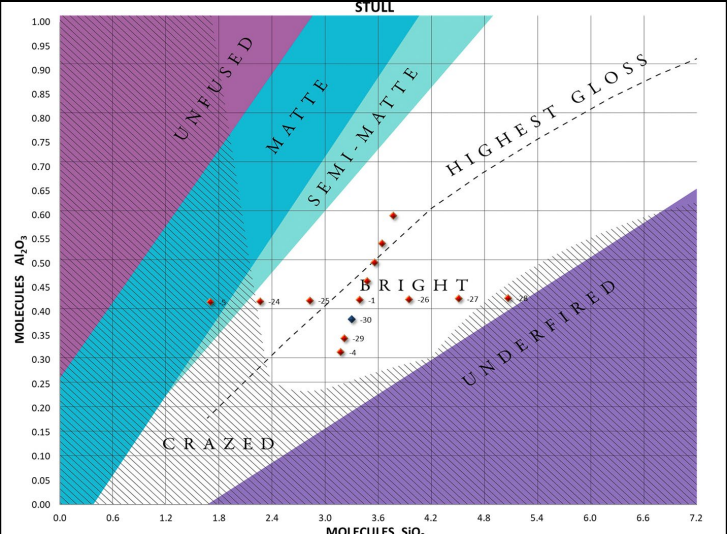
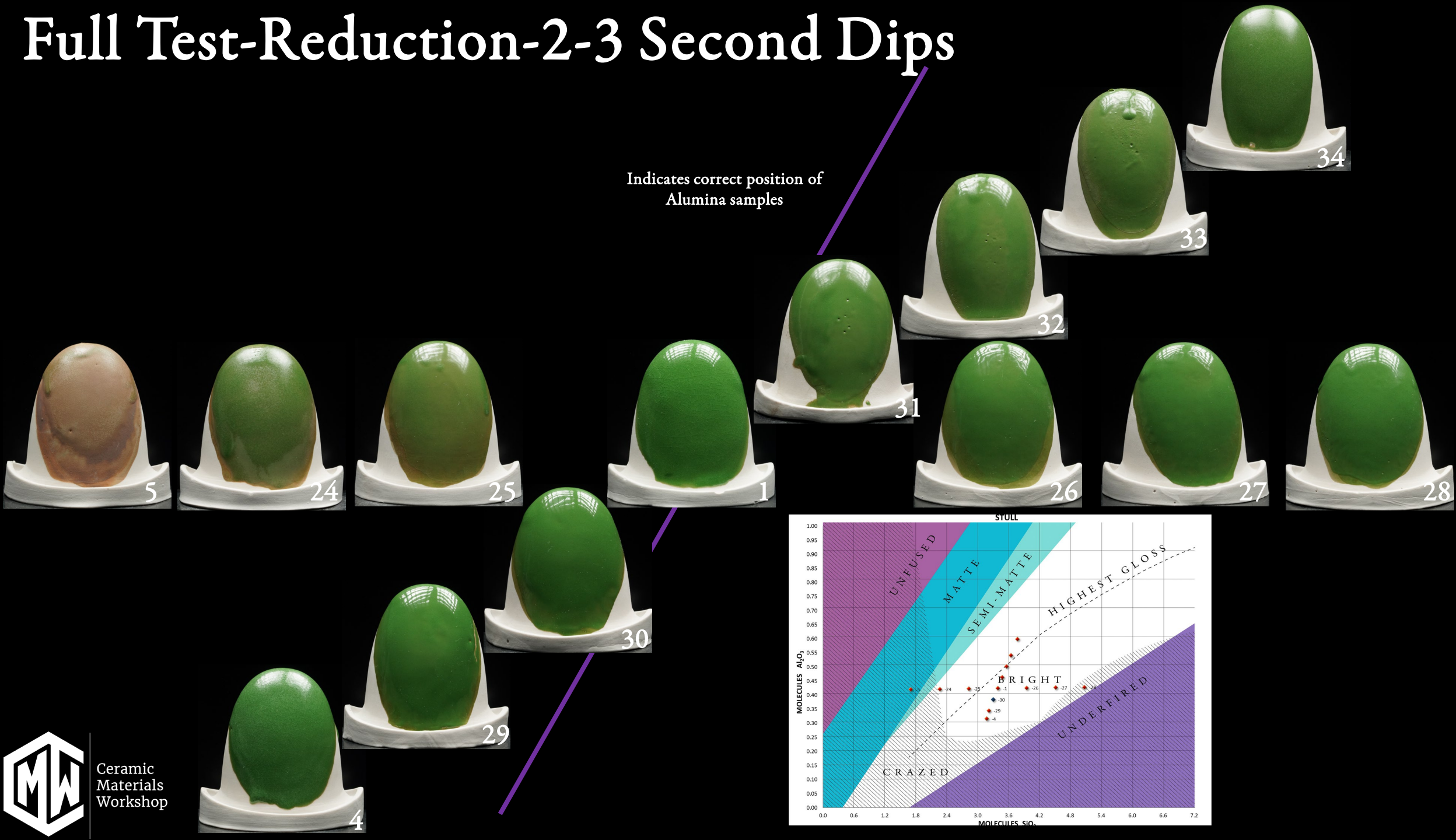
Ceramic  
Materials  
Workshop

# Full Test-Reduction-1-3 Second Dip

Indicates correct position of Alumina samples



# Full Test-Reduction-2-3 Second Dips



# Silica Variations-Reduction



062322-5

062322-24

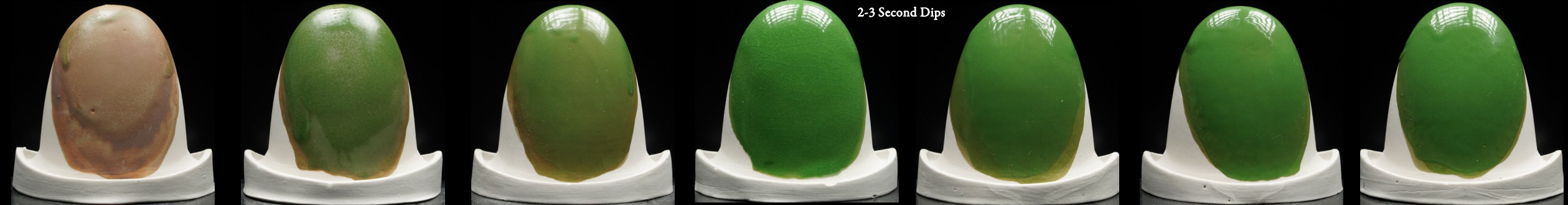
062322-25

062322-1

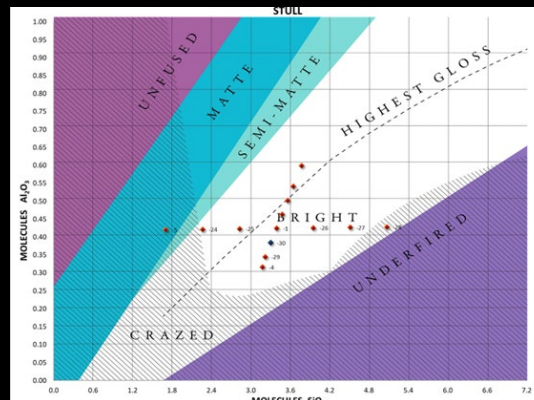
062322-26

062322-27

062322-28

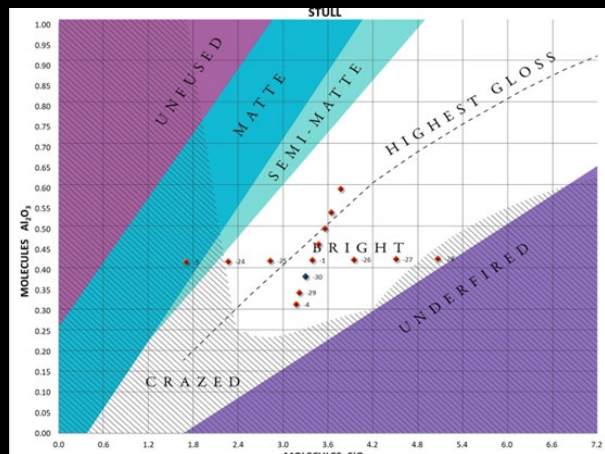
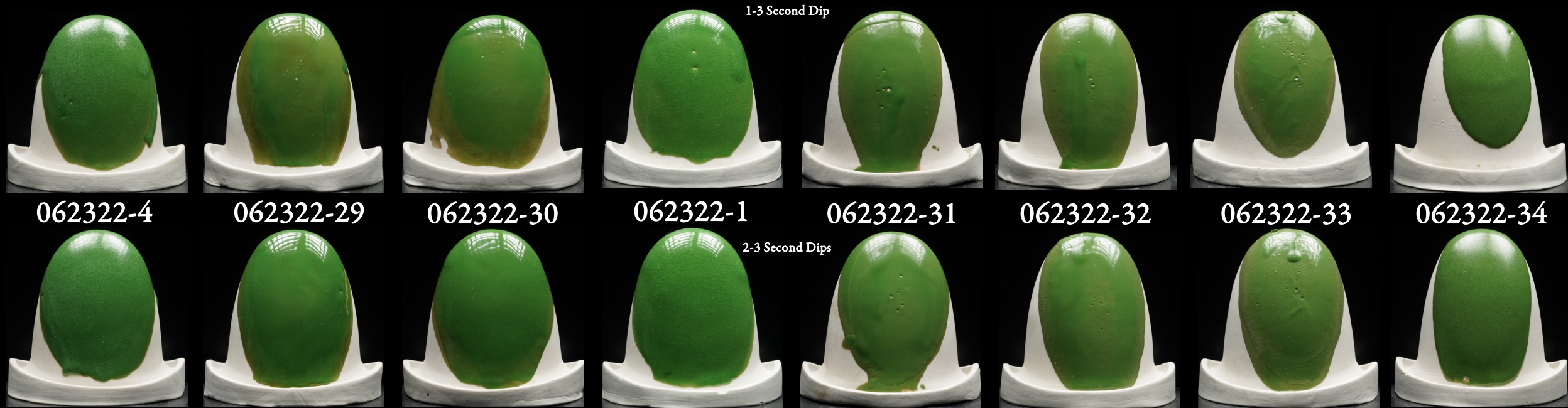


Ceramic  
Materials  
Workshop

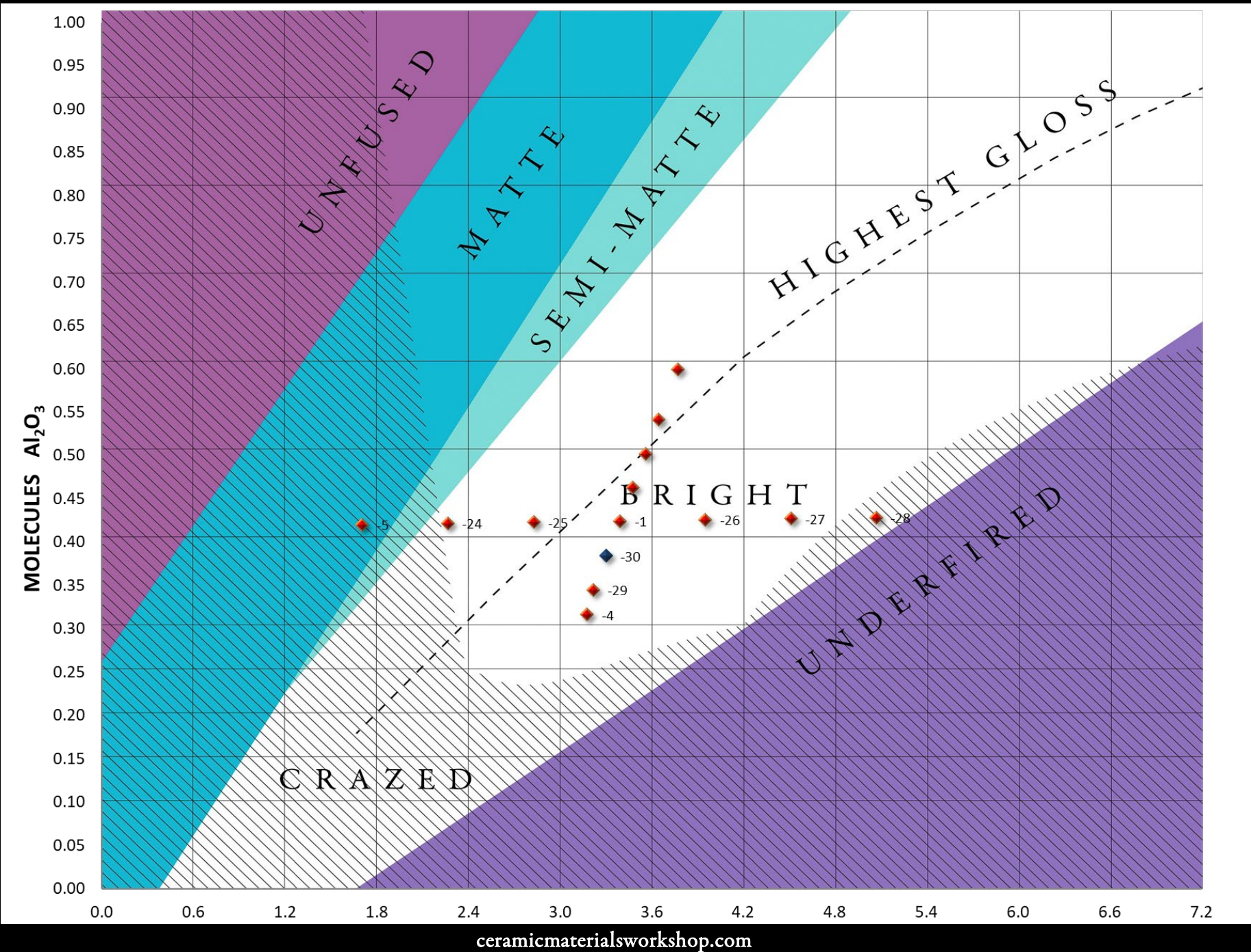


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# Alumina Variations-Reduction



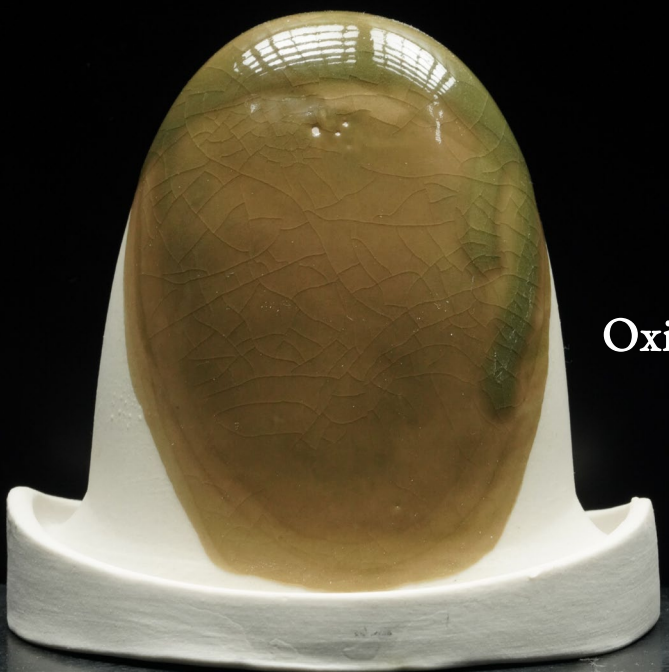
ceramicmaterialsworkshop.com



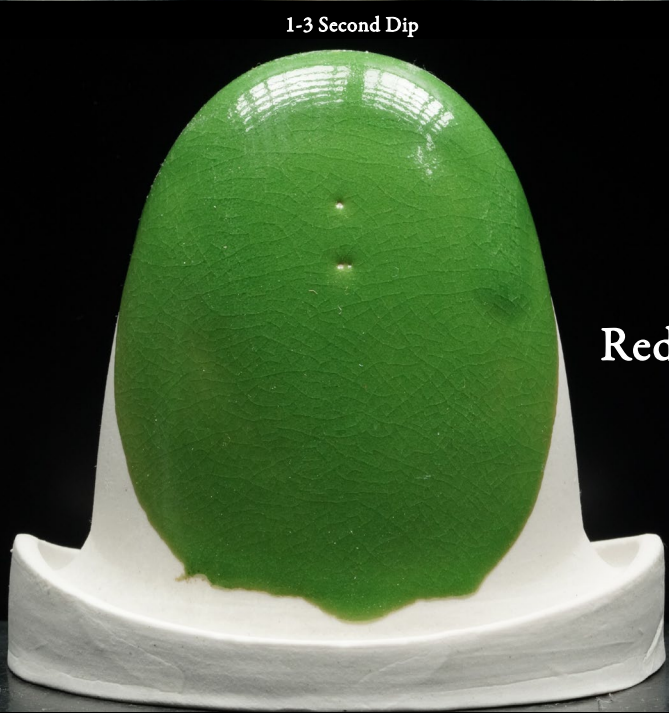
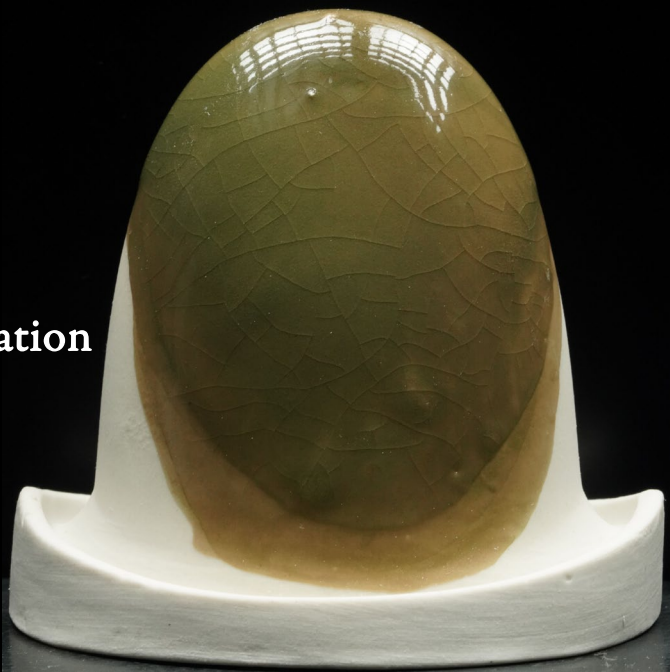
4321

Original  
062322-1

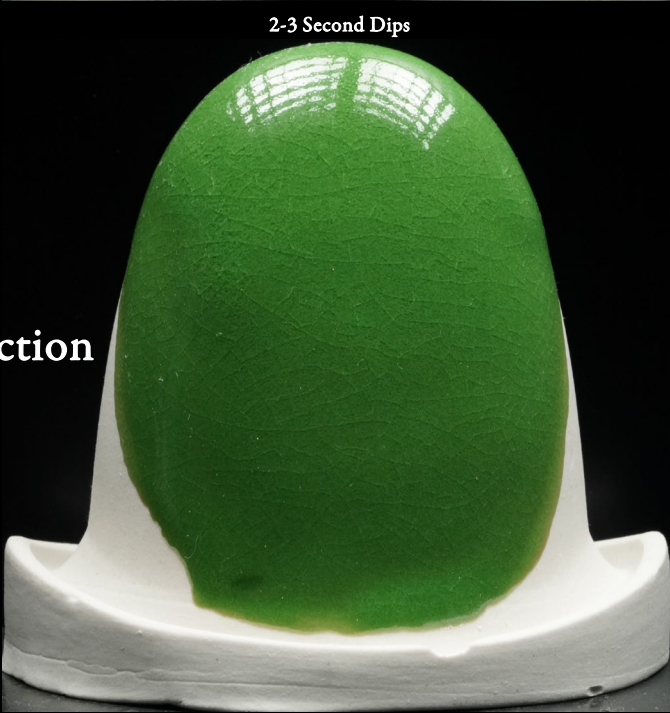
|              |       |
|--------------|-------|
| Neph Sy      | 40.00 |
| Whiting      | 20.00 |
| EPK          | 10.00 |
| Flint        | 30.00 |
| Chrome Oxide | 1.00  |
| Water        | 60    |



Oxidation

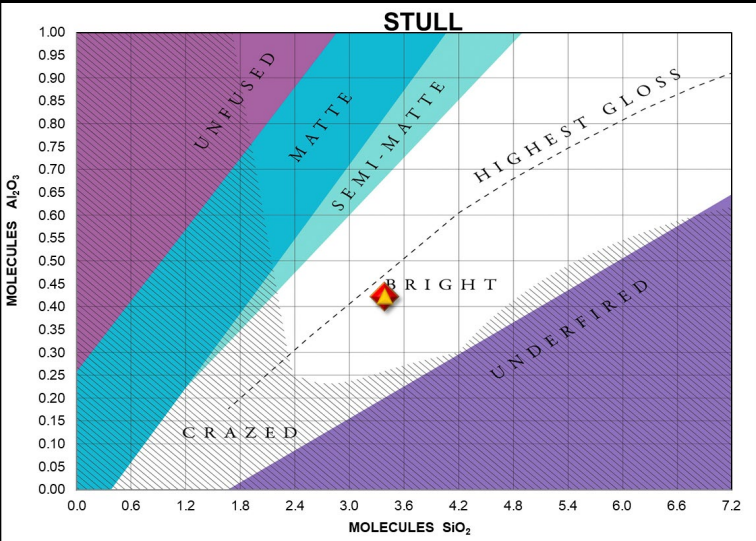


Reduction



UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.99 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.39                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.99 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.39                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



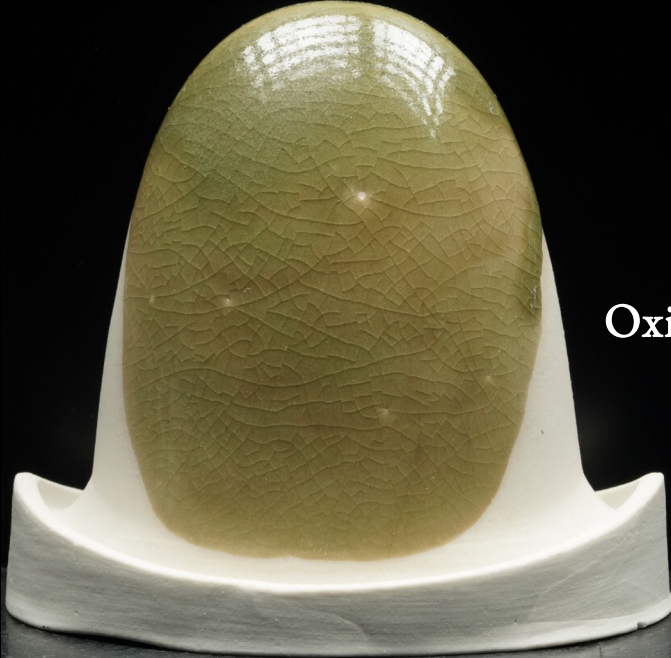
Ceramic  
Materials  
Workshop

4321

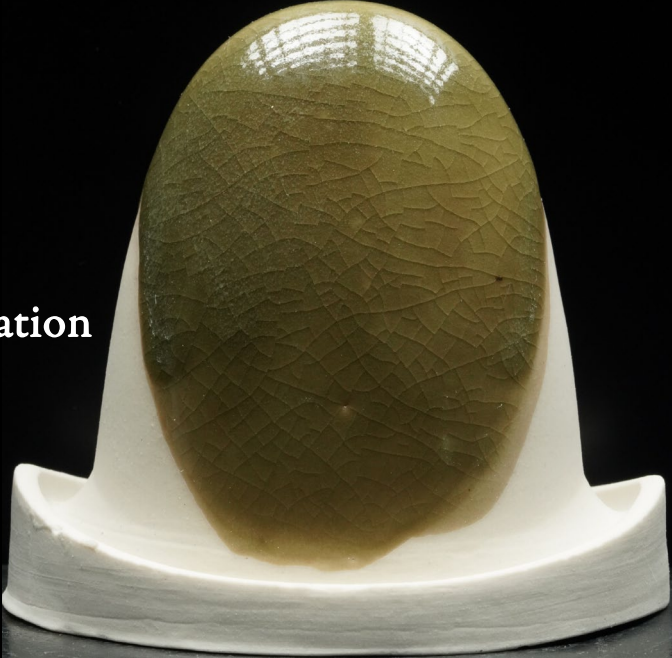
w/o Kaolin

062322-4

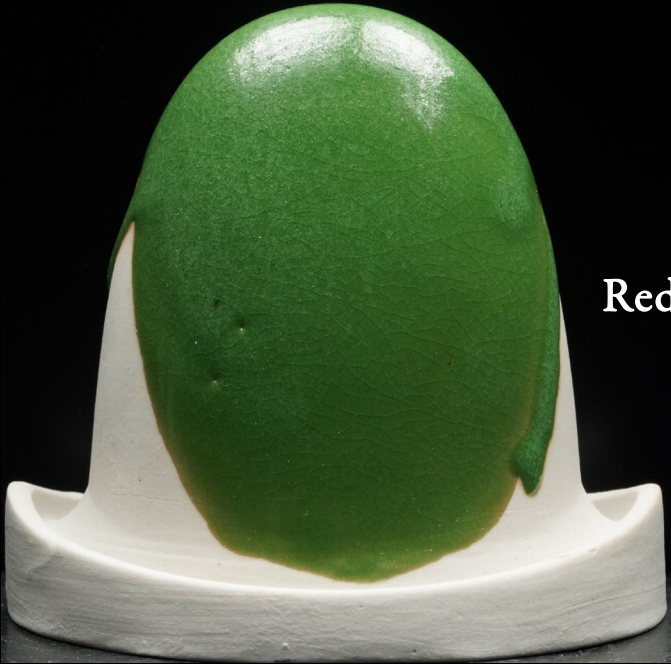
|              |       |
|--------------|-------|
| Neph Sy      | 43.54 |
| Whiting      | 21.77 |
| EPK          |       |
| Flint        | 32.66 |
| Bentonite    | 2.02  |
| Chrome Oxide | 1.01  |
| Water        | 60    |



1-3 Second Dip



2-3 Second Dips

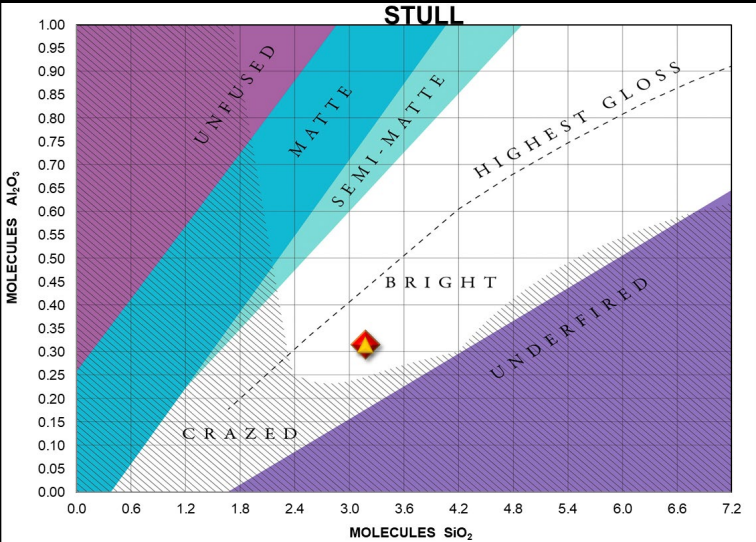


Reduction

Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>10.05 : 1 |                                                      | Alkali Metals<br>0.30          |                          | Alkaline Earths<br>0.70 |             |
|---------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.18                                            | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.32 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.06 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                       | Al <sub>2</sub> O <sub>3</sub><br>0.32               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                            | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.00 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                              | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>10.05 : 1 |                                                      | Alkali Metals<br>0.30          |                          | Alkaline Earths<br>0.70 |             |
|---------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.18                                            | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.32 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.06 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                       | Al <sub>2</sub> O <sub>3</sub><br>0.32               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                            | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.00 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                              | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

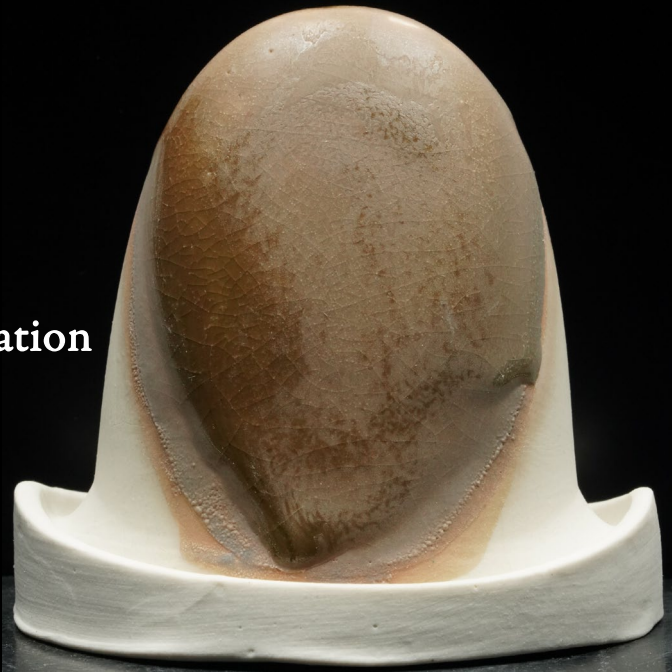
4321

w/o Silica  
062322-5

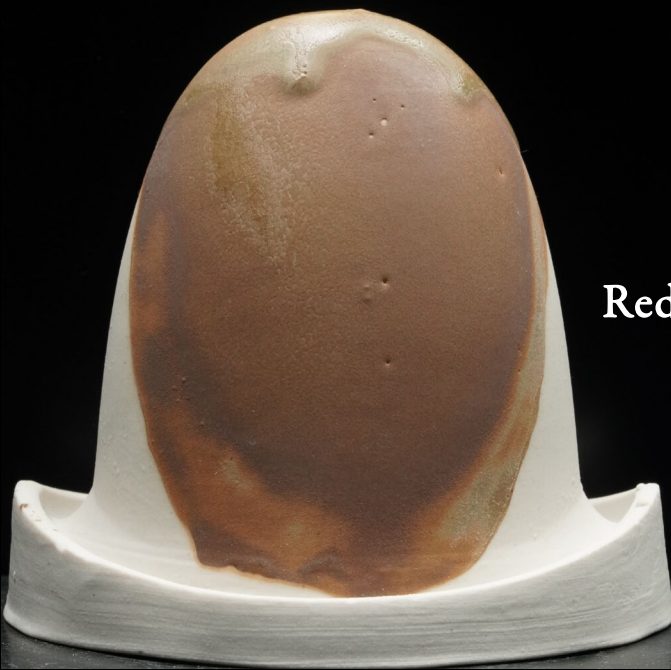
|              |       |
|--------------|-------|
| Neph Sy      | 57.14 |
| Whiting      | 28.57 |
| EPK          | 14.29 |
| Flint        |       |
| Chrome Oxide | 1.01  |
| Water        | 70    |



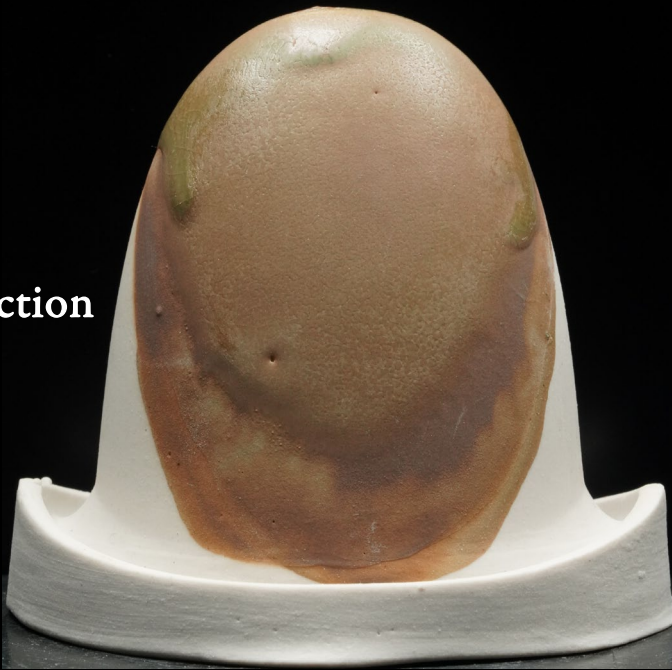
1-3 Second Dip



2-3 Second Dips



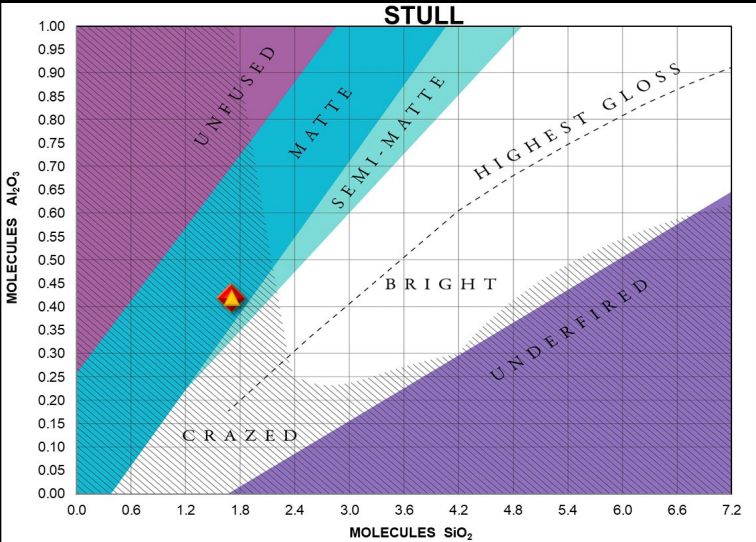
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>4.06 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>1.70                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>4.06 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>1.70                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

4321

Mapping  
Silica 2

062322-24

|              |       |
|--------------|-------|
| Neph Sy      | 50.00 |
| Whiting      | 25.00 |
| EPK          | 12.50 |
| Flint        | 12.50 |
| Chrome Oxide | 1.00  |
| Water        | 60    |



1-3 Second Dip



2-3 Second Dips

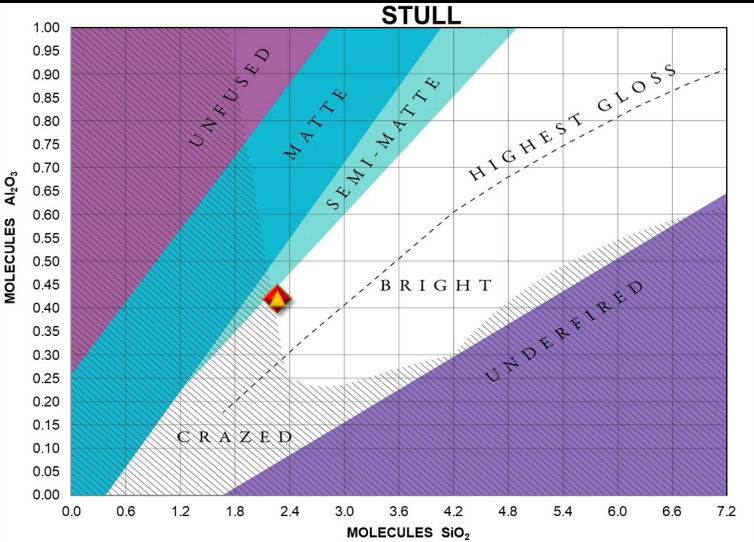


Reduction

Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>5.38 :1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|-------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>2.27                                          | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                     | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                          | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                    | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>5.38 :1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|-------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>2.27                                          | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                     | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                          | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                            | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

4321

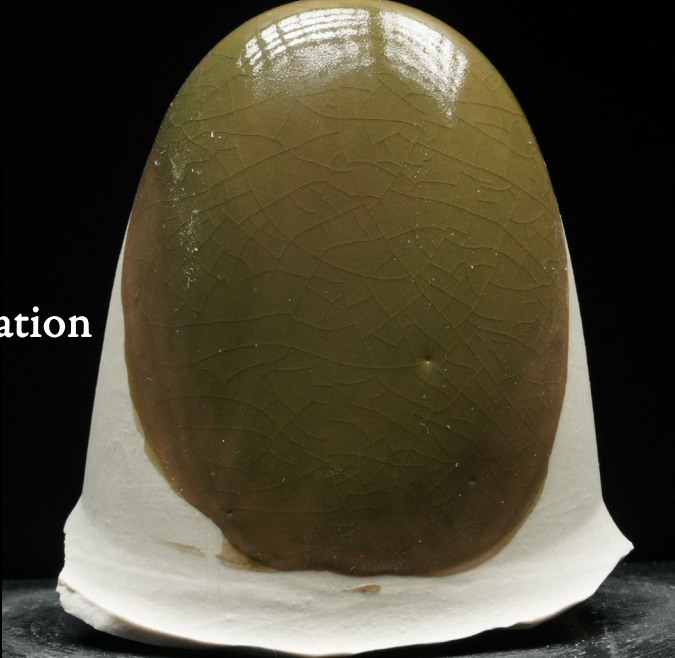
Mapping  
Silica 3

062322-25

|              |       |
|--------------|-------|
| Neph Sy      | 44.44 |
| Whiting      | 22.22 |
| EPK          | 11.11 |
| Flint        | 22.22 |
| Chrome Oxide | 1.00  |
| Water        | 60    |



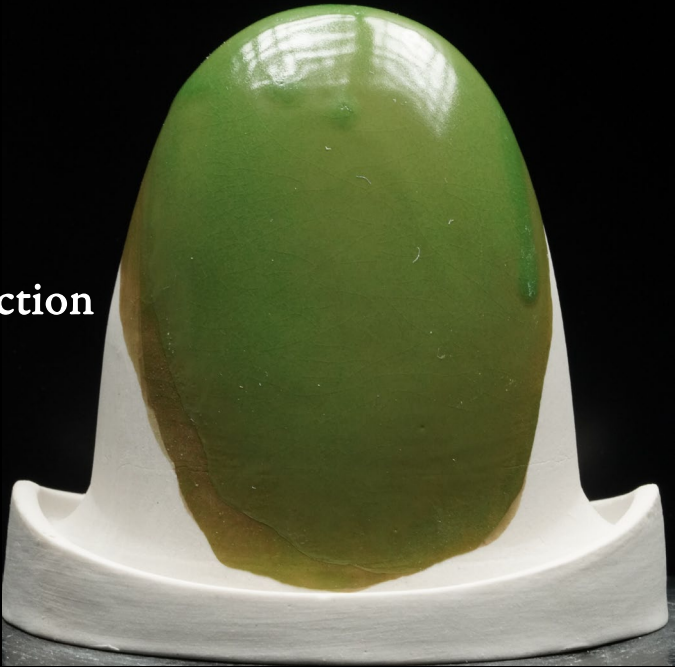
1-3 Second Dip



2-3 Second Dips



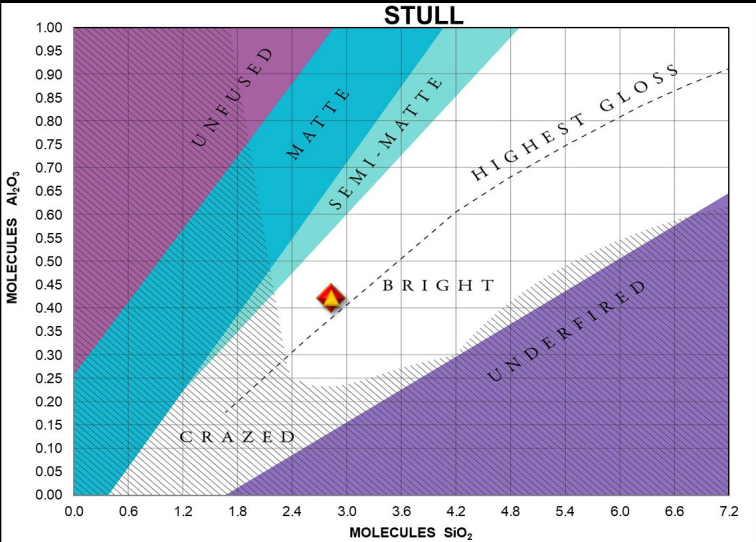
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>6.69 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>2.83                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>6.69 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>2.83                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.42 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



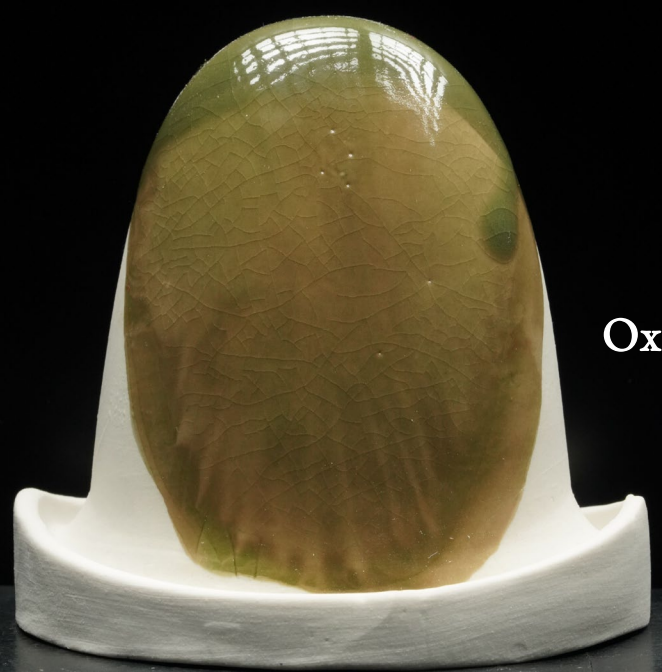
Ceramic  
Materials  
Workshop

# 4321

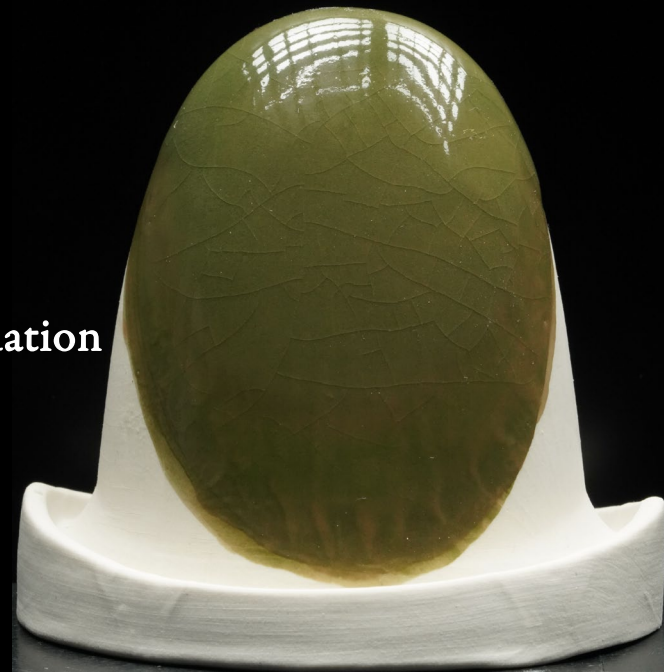
## Mapping Silica 5

062322-26

|              |       |
|--------------|-------|
| Neph Sy      | 36.36 |
| Whiting      | 18.18 |
| EPK          | 9.09  |
| Flint        | 36.36 |
| Chrome Oxide | 1.00  |
| Water        | 60    |



1-3 Second Dip



2-3 Second Dips

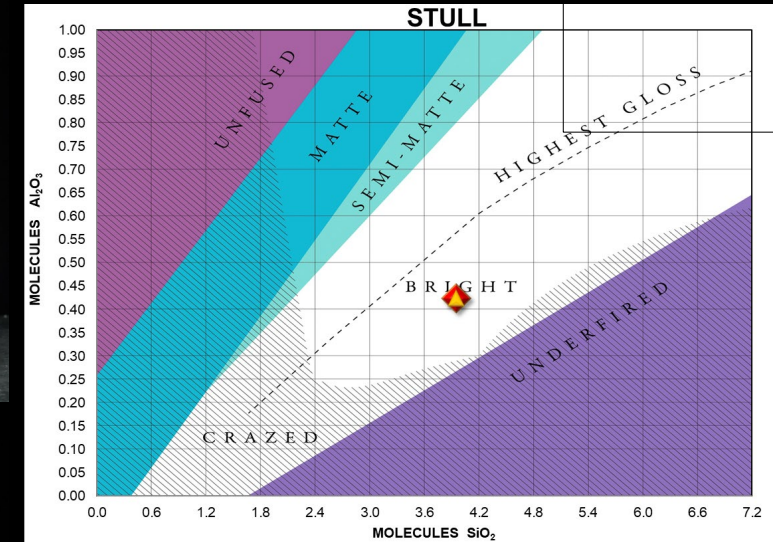
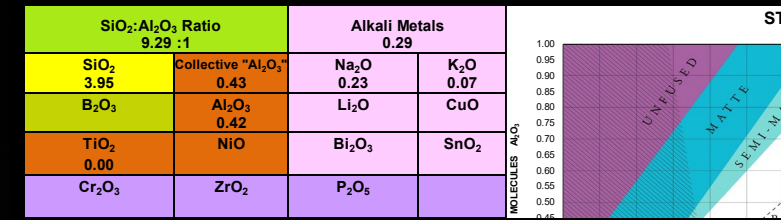


Reduction



Oxidation

### UMF



### EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>9.29 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.95                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.43 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

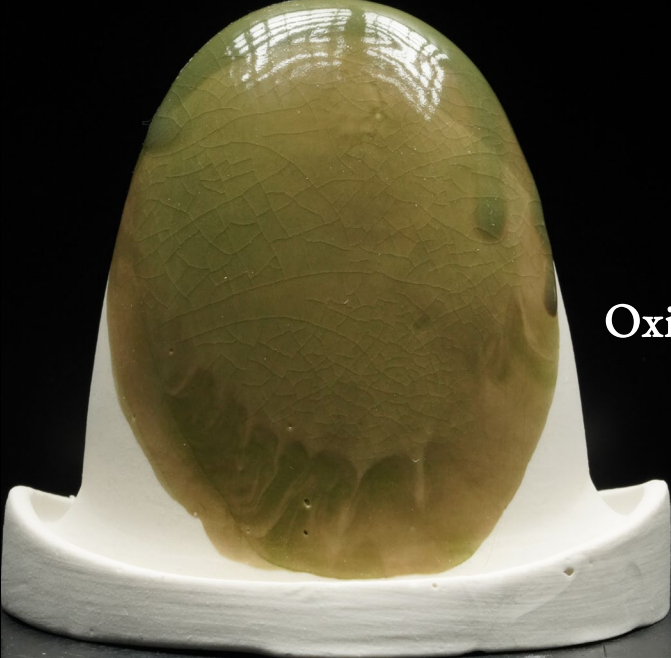
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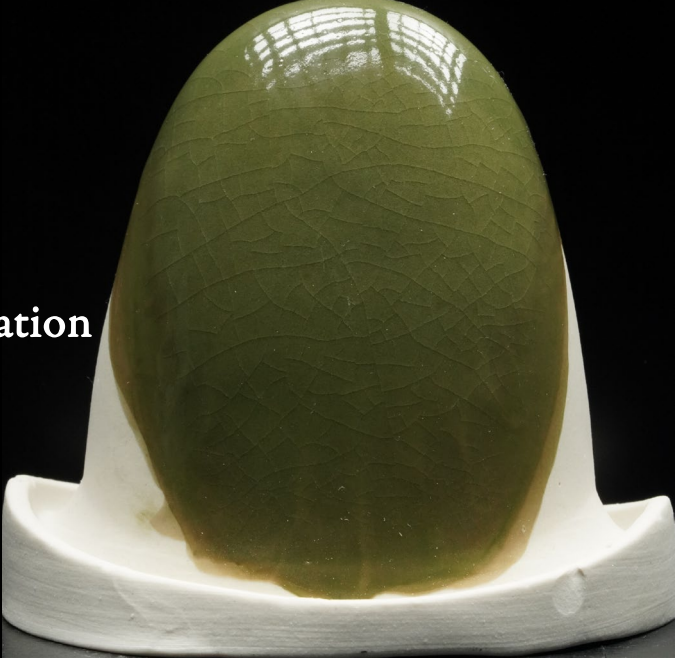
Mapping  
Silica 6

062322-27

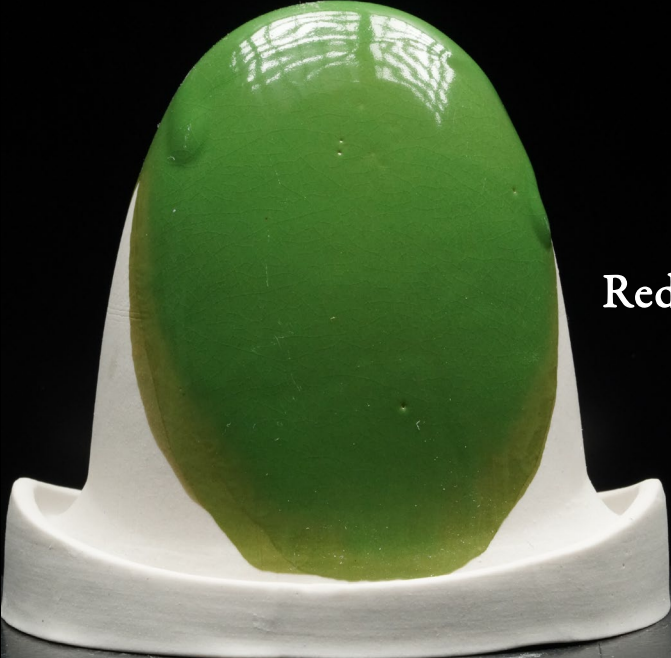
|              |       |
|--------------|-------|
| Neph Sy      | 33.33 |
| Whiting      | 16.67 |
| EPK          | 8.33  |
| Flint        | 41.67 |
| Chrome Oxide | 1.01  |
| Water        | 60    |



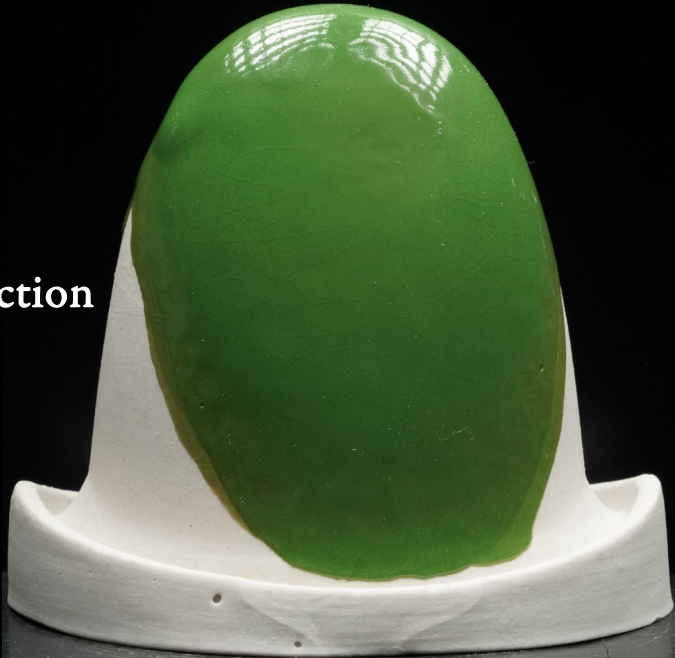
1-3 Second Dip



2-3 Second Dips



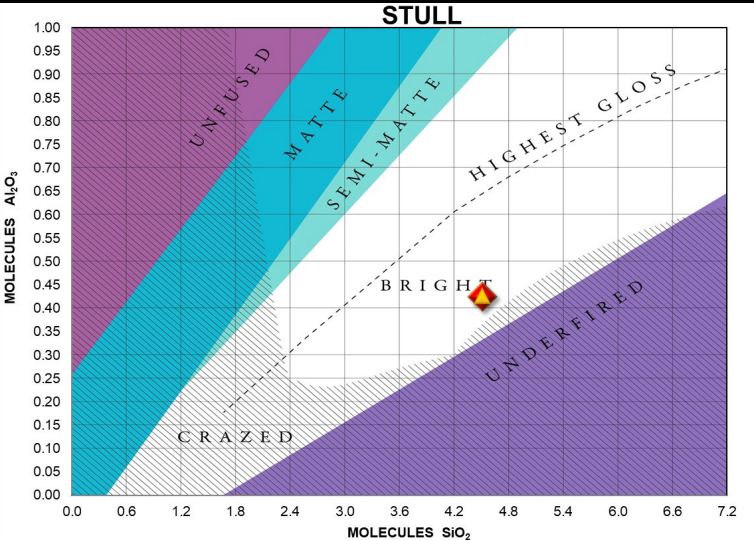
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>10.57 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|---------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>4.51                                            | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.43 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                       | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                            | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                      | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>10.57 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|---------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>4.51                                            | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.43 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                       | Al <sub>2</sub> O <sub>3</sub><br>0.42               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                            | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.03                              | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



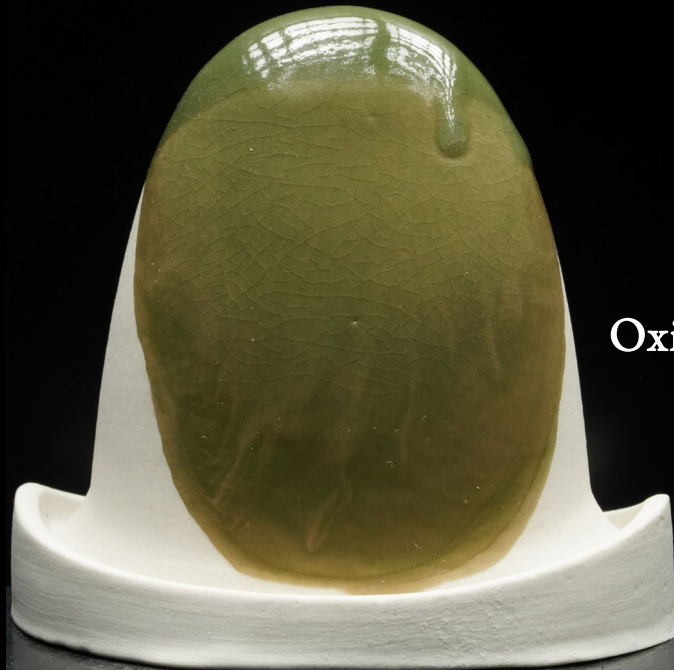
Ceramic  
Materials  
Workshop

4321

Mapping  
Silica 7

062322-28

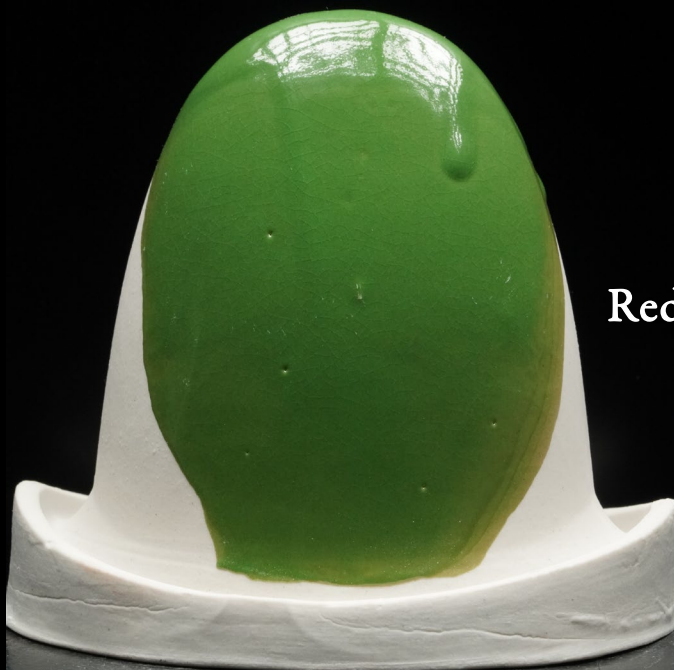
|              |       |
|--------------|-------|
| Neph Sy      | 30.77 |
| Whiting      | 15.38 |
| EPK          | 7.69  |
| Flint        | 46.15 |
| Chrome Oxide | 1.01  |
| Water        | 60    |



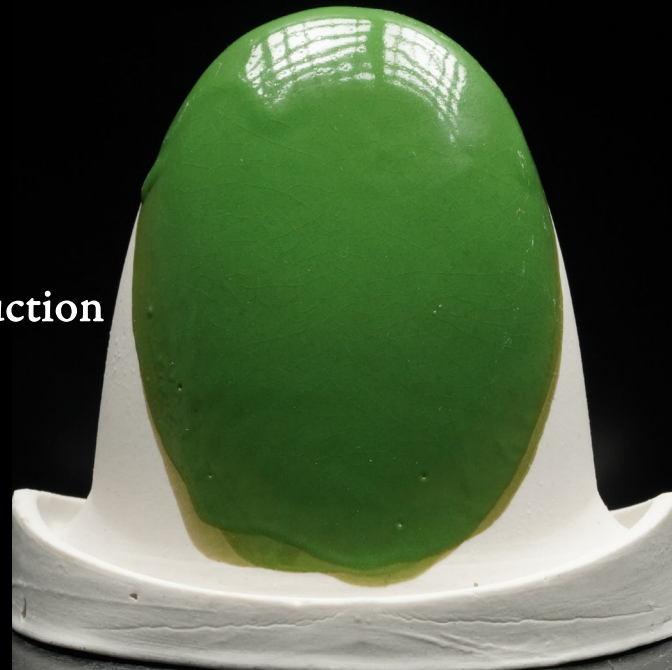
1-3 Second Dip



2-3 Second Dips



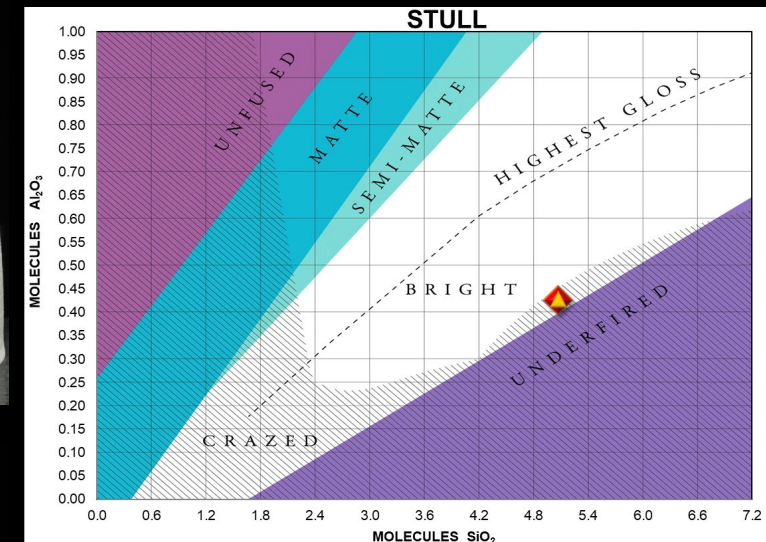
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>11.84 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|---------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>5.07                                            | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.43 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                       | Al <sub>2</sub> O <sub>3</sub><br>0.43               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                            | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                      | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>11.84 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|---------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>5.07                                            | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.43 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                       | Al <sub>2</sub> O <sub>3</sub><br>0.43               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                            | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.03                              | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |

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Materials  
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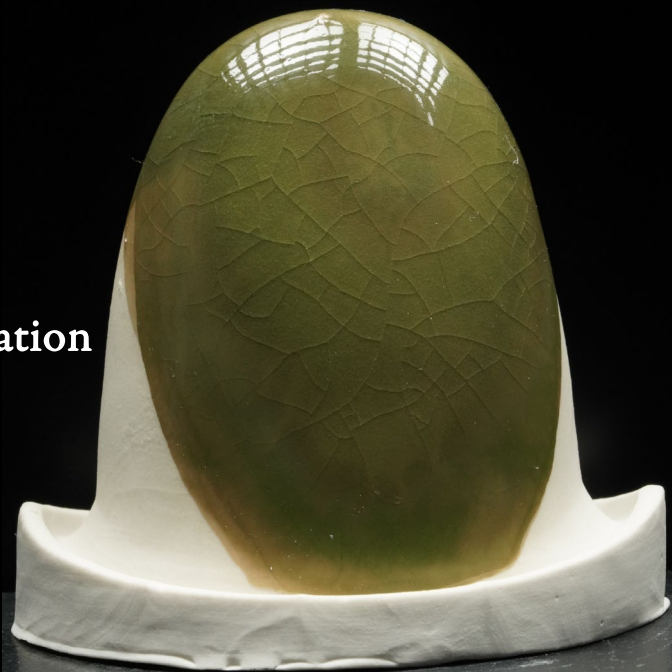
Mapping  
Kaolin 2

062322-29

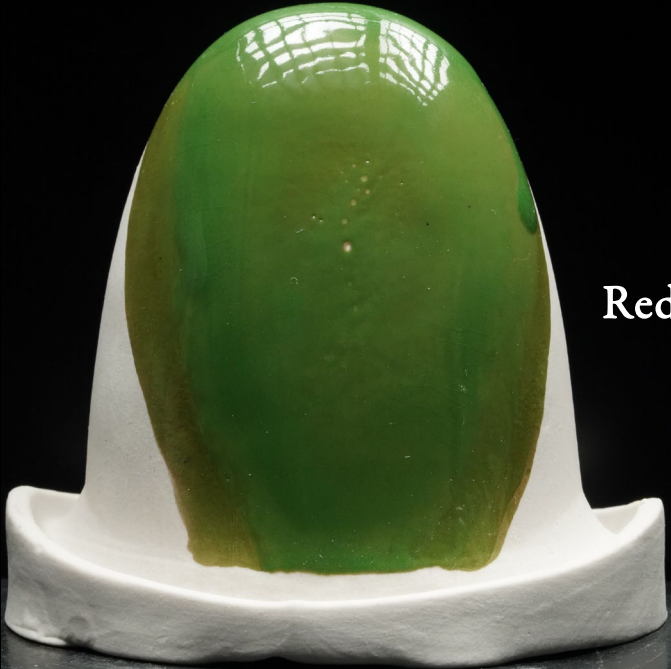
|              |       |
|--------------|-------|
| Neph Sy      | 42.87 |
| Whiting      | 21.44 |
| EPK          | 3.54  |
| Flint        | 32.16 |
| Chrome Oxide | 1.01  |
| Water        | 60    |



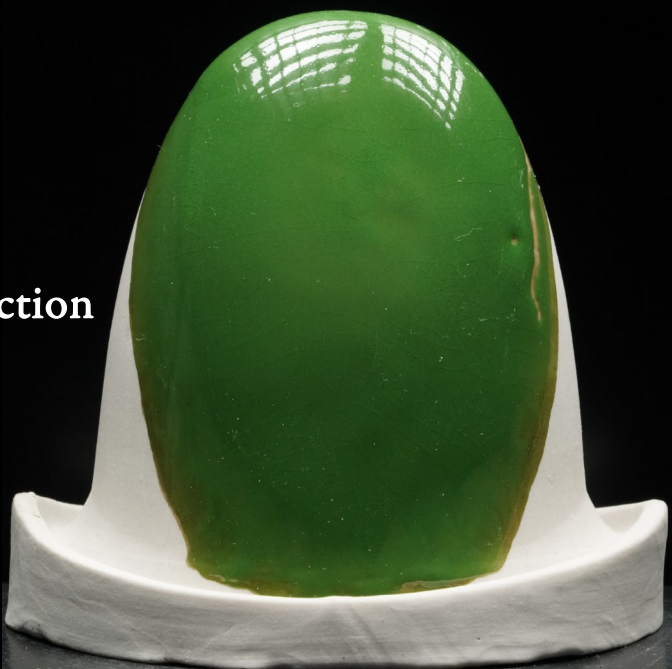
1-3 Second Dip



2-3 Second Dips



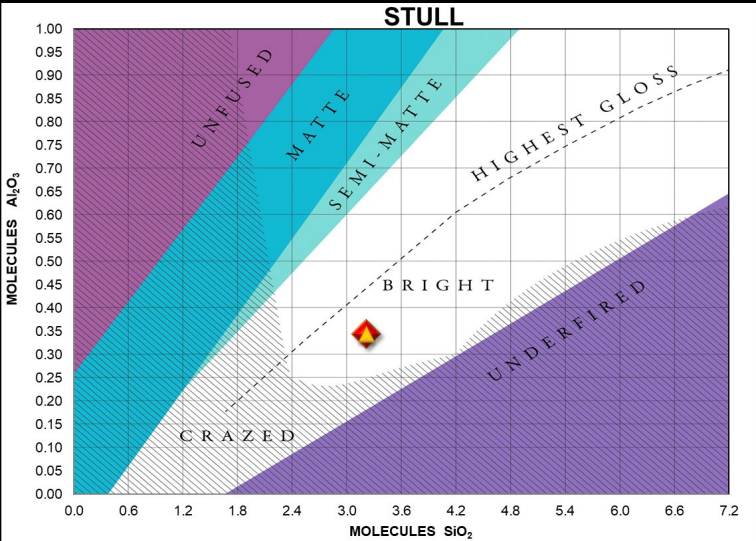
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>9.33 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.22                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.34 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.34               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.00 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>9.33 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.22                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.34 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.34               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.00 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |

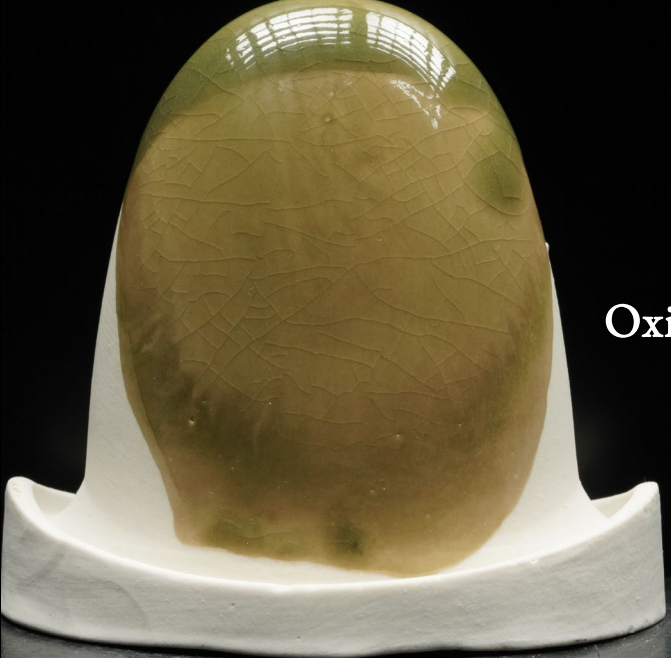


Ceramic  
Materials  
Workshop

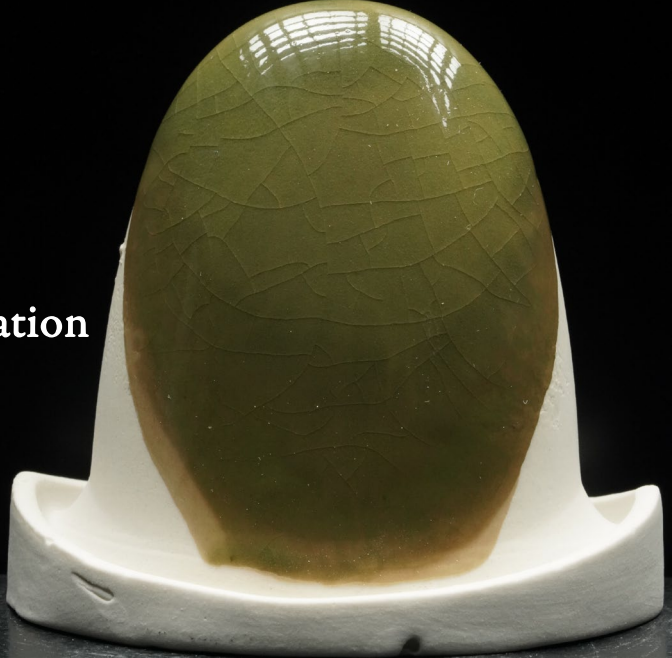
4321

Mapping  
Kaolin 3  
062322-30

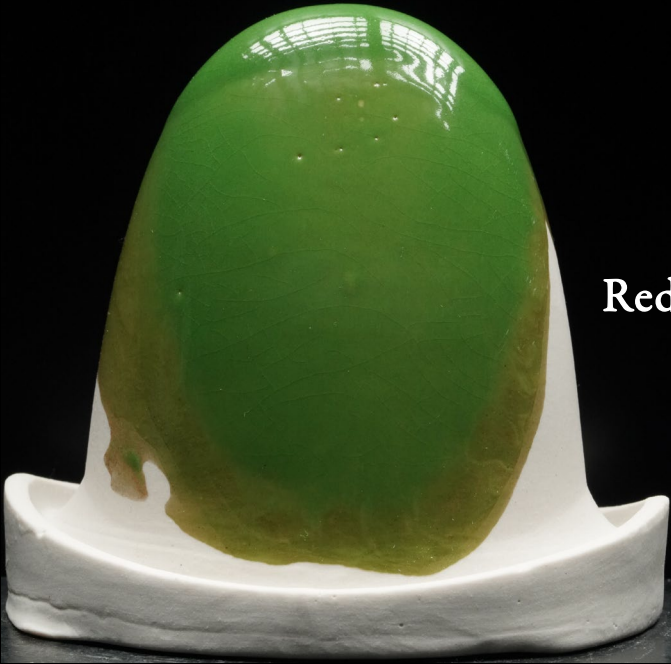
|              |       |
|--------------|-------|
| Neph Sy      | 41.41 |
| Whiting      | 20.70 |
| EPK          | 6.83  |
| Flint        | 31.05 |
| Chrome Oxide | 1.01  |
| Water        | 60    |



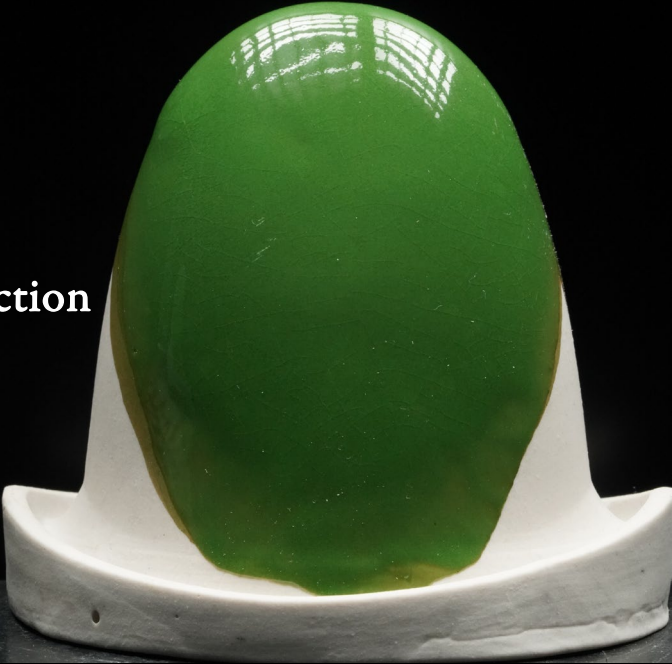
1-3 Second Dip



2-3 Second Dips



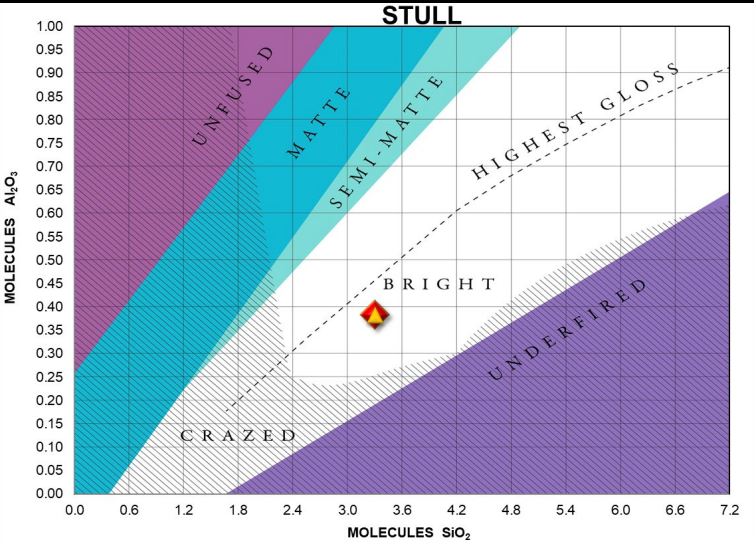
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>8.60 :1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|-------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.30                                          | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.38 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                     | Al <sub>2</sub> O <sub>3</sub><br>0.38               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                          | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                    | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>8.60 :1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|-------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.30                                          | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.38 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.70 |
| B <sub>2</sub> O <sub>3</sub>                                     | Al <sub>2</sub> O <sub>3</sub><br>0.38               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                          | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                            | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

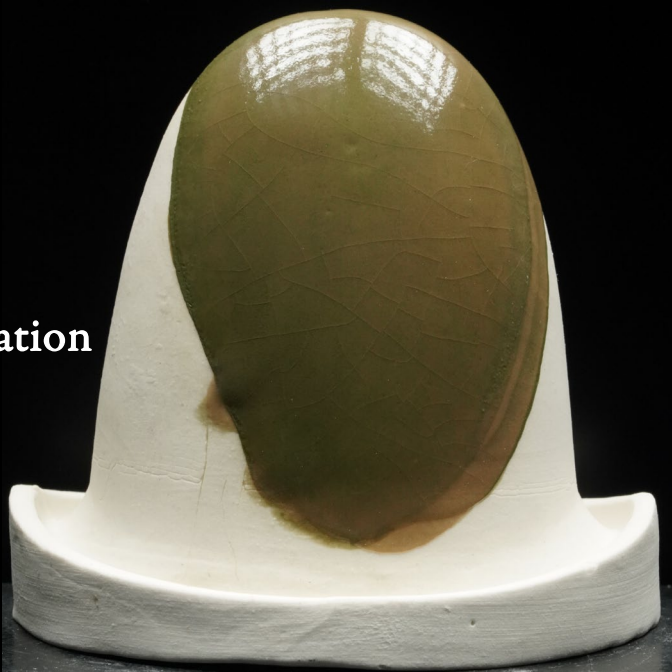
4321

Mapping  
Kaolin 5  
062322-31

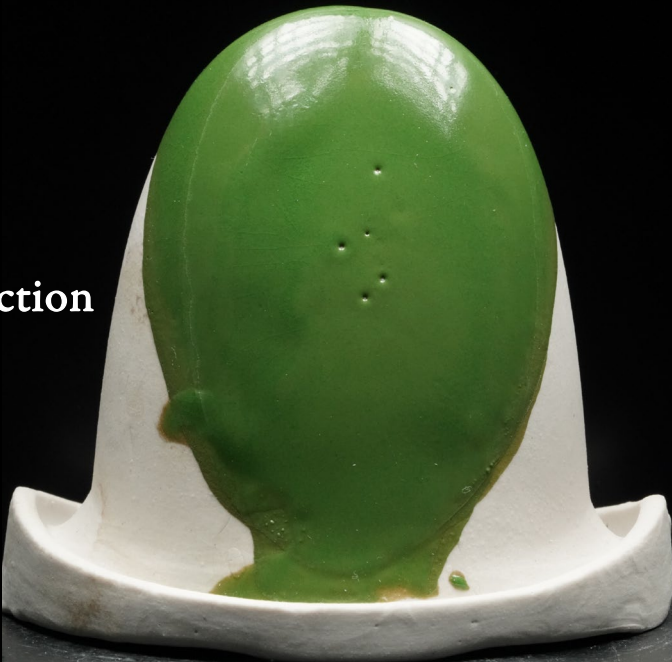
|              |       |
|--------------|-------|
| Neph Sy      | 38.72 |
| Whiting      | 19.36 |
| EPK          | 12.88 |
| Flint        | 29.04 |
| Chrome Oxide | 1.01  |
| Water        | 70    |



1-3 Second Dip



2-3 Second Dips

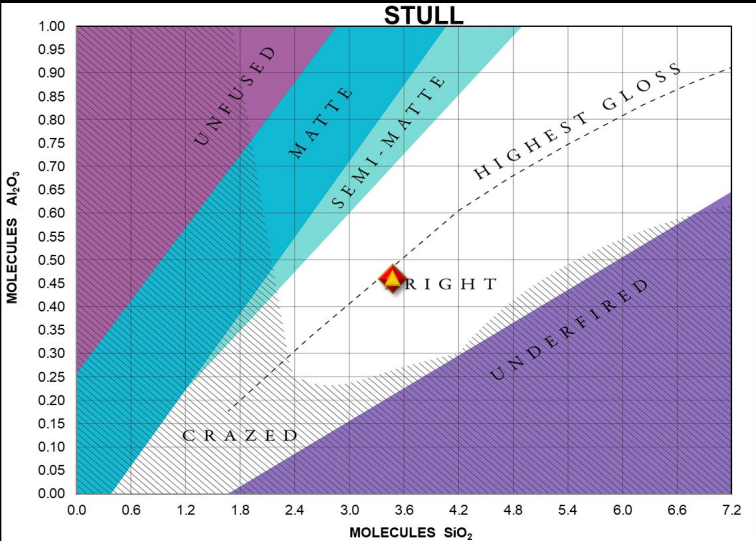


Oxidation

Reduction

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.51 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.48                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.46 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.46               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.51 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.48                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.46 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.46               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

4321

Mapping  
Kaolin 6

062322-32

|              |       |
|--------------|-------|
| Neph Sy      | 37.52 |
| Whiting      | 18.76 |
| EPK          | 15.57 |
| Flint        | 28.14 |
| Chrome Oxide | 1.00  |
| Water        | 70    |



1-3 Second Dip



2-3 Second Dips

Oxidation



1-3 Second Dip

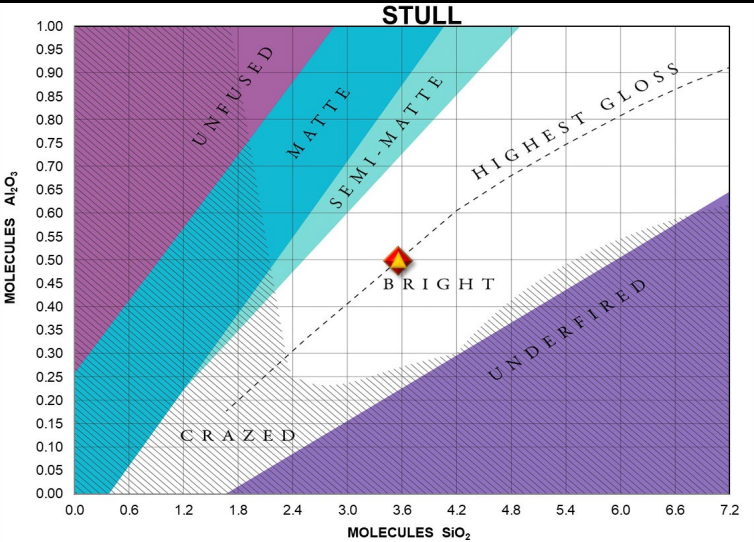


2-3 Second Dips

Reduction

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.10 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.56                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.50 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.50               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>7.10 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.56                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.50 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.50               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

4321

Mapping  
Kaolin 7

062322-33

|              |       |
|--------------|-------|
| Neph Sy      | 36.36 |
| Whiting      | 18.18 |
| EPK          | 18.18 |
| Flint        | 27.27 |
| Chrome Oxide | 1.00  |
| Watre        | 60    |



1-3 Second Dip



2-3 Second Dips



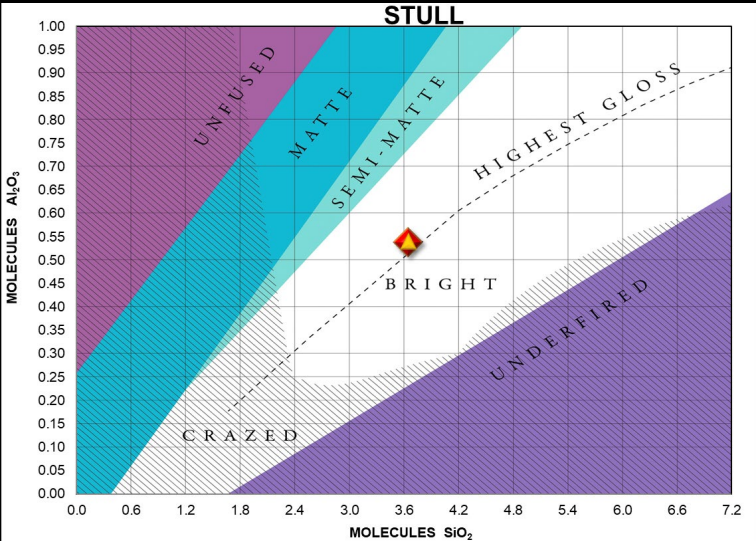
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>6.74 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.65                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.54 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.54               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                     | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>6.74 : 1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.65                                           | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.54 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                      | Al <sub>2</sub> O <sub>3</sub><br>0.54               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                           | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.02                             | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop

4321

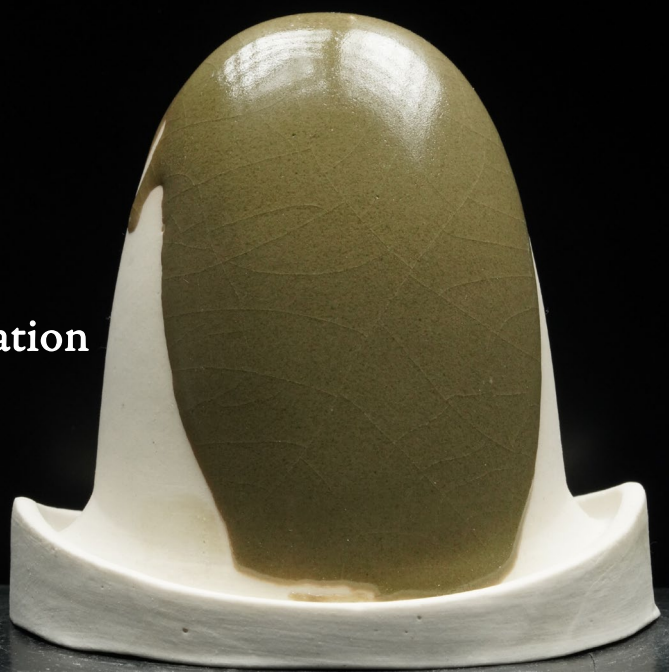
Mapping  
Kaolin 8

062322-34

|              |       |
|--------------|-------|
| Neph Sy      | 34.78 |
| Whiting      | 17.39 |
| EPK          | 21.74 |
| Flint        | 26.09 |
| Chrome Oxide | 1.00  |
| Water        | 60    |



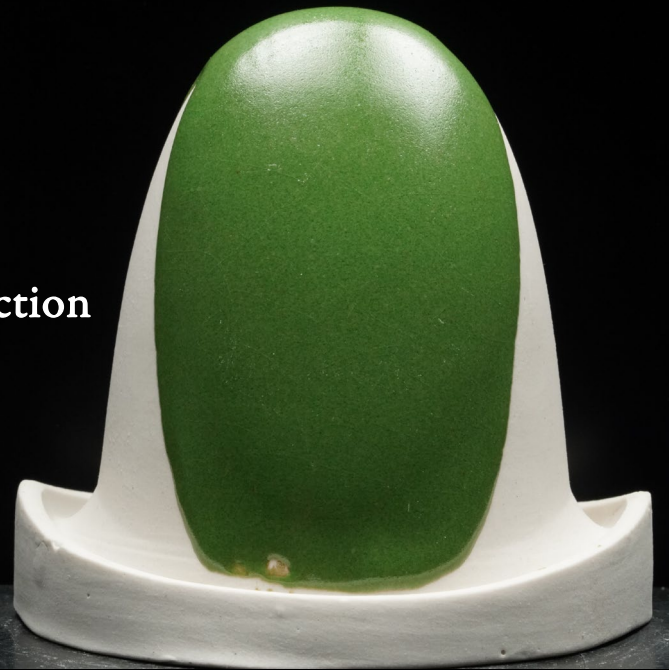
1-3 Second Dip



2-3 Second Dips



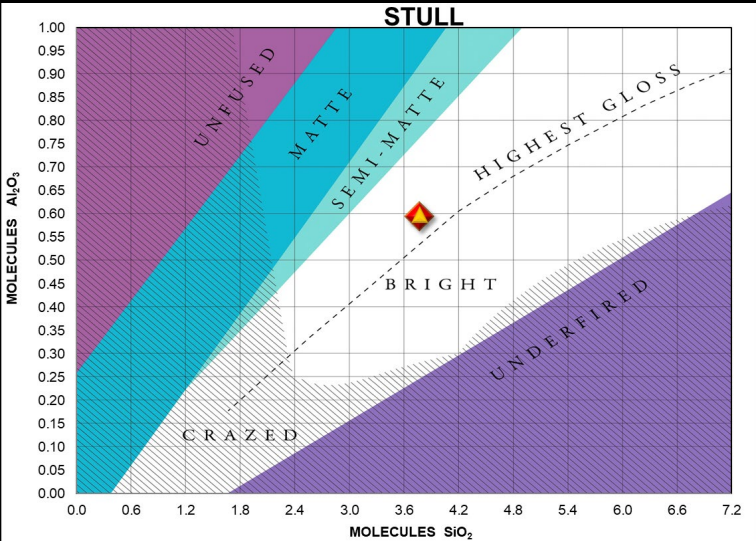
Reduction



Oxidation

UMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>6.30 :1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|-------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.77                                          | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.60 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                     | Al <sub>2</sub> O <sub>3</sub><br>0.59               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                          | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub>                                    | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



EUMF

| SiO <sub>2</sub> :Al <sub>2</sub> O <sub>3</sub> Ratio<br>6.30 :1 |                                                      | Alkali Metals<br>0.29          |                          | Alkaline Earths<br>0.71 |             |
|-------------------------------------------------------------------|------------------------------------------------------|--------------------------------|--------------------------|-------------------------|-------------|
| SiO <sub>2</sub><br>3.77                                          | Collective "Al <sub>2</sub> O <sub>3</sub> "<br>0.60 | Na <sub>2</sub> O<br>0.23      | K <sub>2</sub> O<br>0.07 | MgO<br>0.00             | CaO<br>0.69 |
| B <sub>2</sub> O <sub>3</sub>                                     | Al <sub>2</sub> O <sub>3</sub><br>0.59               | Li <sub>2</sub> O              | CuO                      | SrO                     | BaO         |
| TiO <sub>2</sub><br>0.00                                          | NiO                                                  | Bi <sub>2</sub> O <sub>3</sub> | SnO <sub>2</sub>         | ZnO                     | FeO<br>0.01 |
| Cr <sub>2</sub> O <sub>3</sub><br>0.03                            | ZrO <sub>2</sub>                                     | P <sub>2</sub> O <sub>5</sub>  |                          | MnO <sub>2</sub>        | CoO         |



Ceramic  
Materials  
Workshop