

# **WATER REDUCTION STUDIES**

## **Natural Hydraulic Lime**

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## Water Reduction Studies:

**St Astier NHL 3.5**

**American Casein Company – Cascrete®SL**

**Bench top study to determine water reduction capabilities of Cascrete®SL Super-Plasticizer in non-aggregate formulation:**

### Procedure:

**Mixes of NHL 3.5 were made to establish a control flow diameter. Cascrete SL was later added to formulation at 1% against dry NHL. Product was mixed for 4 minutes in Hobart Mixer. Finished material was metered into open-ended cylinder to full. Cylinder was lifted and flow diameter was measured. Flow diameters were compared. Ladder mixes were then made, reducing the mix water incrementally until a flow diameter comparable to the control was developed. Water reduction was then calculated.**

**Formula:**

**#1**

<b>St. Astier NHL 3.5</b>	<b>110 grams</b>
<b>Water</b>	<b>73.3 grams</b>

**#2**

<b>St. Astier NHL 3.5</b>	<b>110 grams</b>
<b>Water</b>	<b>73.3 grams</b>
<b>Casecrete®SL</b>	<b>1.1 grams</b>

**#3 (calculated from ladder study)**

<b>St. Astier NHL 3.5</b>	<b>110 grams</b>
<b>Water</b>	<b>55 grams</b>
<b>Casecrete®SL</b>	<b>1.1 grams</b>

## Observations:

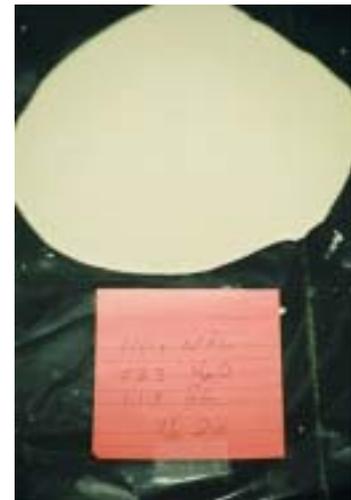
All mixes blended smoothly. SL reaction became obvious two minutes into mixing time. Complete plasticization occurred at four minutes mixing time.

Mix #1 dropped smoothly and measured a 3- $\frac{1}{4}$  inch flow diameter.

Mix #2 exhibited significant flow enhancement, measuring 7- $\frac{1}{2}$  inch flow diameter.

The ensuing ladder study indicated that a 25% reduction of water would yield comparable flow to that of the control.

Mix #3 (with a 25% water reduction) measured 3- $\frac{1}{4}$  inch flow diameter. Surface of the material appeared smoother than the control. There was minimal cratering of the sample, as can be seen by the photographs.



**Bench top study to determine water reduction capabilities of Cascrete®SL Super-Plasticizer in non-aggregate formulation:**

**Conclusions**

**Reductions of at least 25% on mix water can be anticipated with the use of Cascrete®SL when mixing NHL without aggregate. Strength increases can be anticipated as well. Additionally, Cascrete®SL can afford significant flow improvements for jobs such as internal wall repair or grouting without sacrificing product strengths. Slight retardation should be expected when utilizing Cascrete®SL. 25% water reduction should not be considered the maximum potential. Jobs site applications have experienced even higher potential water reduction. This laboratory test, while informative, is not definitive. On site modifications should and can be made to adapt to the specific property needs.**



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