



## DRY SORBENT INJECTION (DSI) FOR SO<sub>3</sub> REMOVAL

### SO<sub>3</sub> Removal for Units with SCRs and/or Wet Scrubbers

#### The Plant Challenge: Reduce SO<sub>3</sub> Emissions

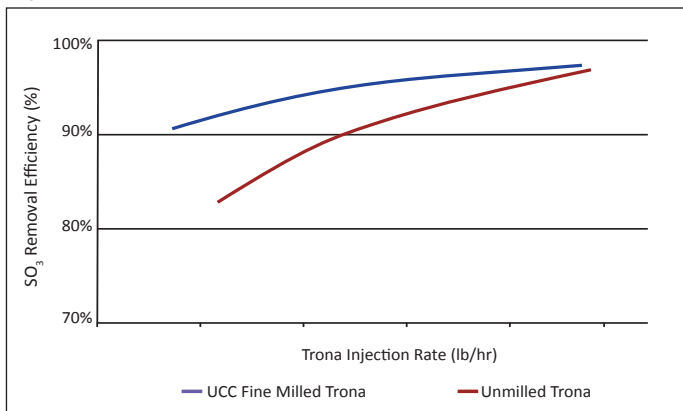
Coal-fired units that have installed SCRs and/or wet scrubbers now may find that they are required to reduce SO<sub>3</sub> emissions. This may be required to meet New Source Review regulations or to eliminate a visible blue or brown plume caused by sulfuric acid mist emitted at the stack. Additionally, some plants may also want to reduce SO<sub>3</sub> levels to prevent air heater or duct corrosion issues.

#### The UCC Solution: DSI Systems are a Reliable Solution

UCC has substantial experience using either hydrated lime or trona injection for SO<sub>3</sub> removal, with injection at multiple locations in the flue gas path. UCC has shown that SO<sub>3</sub> levels at the stack can be reduced to < 3 ppm with milled trona. Additionally, UCC's VIPER™ Mill technology has been proven to reduce trona use by 50 percent or more, which can save utilities millions of dollars over the life of the system.

Typical performance achieved with UCC DSI technology is shown below.

#### SO<sub>3</sub> Removal, FGD Inlet - Unmilled vs. UCC Fine Milled Trona

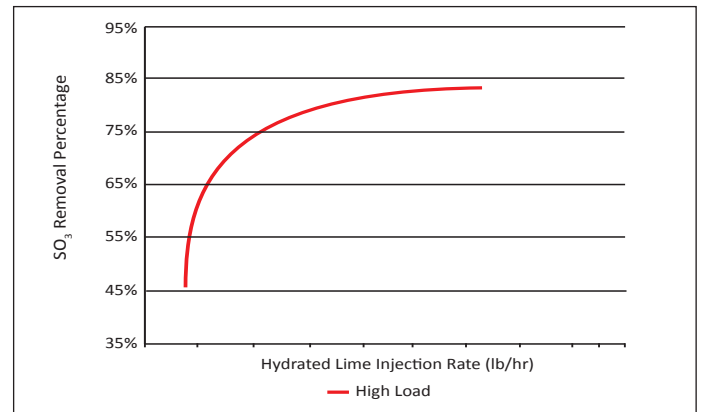


#### Effects on ash removal/disposal

Since injection rates are low for SO<sub>3</sub> removal, modifications to existing ash removal systems are generally not needed. Sale of ash containing hydrated lime injection by-products is also usually not affected. However, sale of

ash for beneficial re-use may be impacted when using trona. Minimizing the amount of trona injected into the stream with in-line mills or other techniques may be enough to retain ash sales in many applications.

#### Hydrated Lime Injection Performance



#### The Benefits and ROI:

UCC is leading the industry in dry sorbent injection for SO<sub>3</sub> removal. Our experience and technology results in the most economical and efficient systems for our customers. The figures below show how UCC VIPER Mill technology greatly reduces sorbent cost.

#### Unmilled vs. UCC Fine Milled Trona

Unit (MW)	SO <sub>3</sub> (ppm)	SO <sub>3</sub> Reduction (% Removal)	Unmilled (ton / hr)	VIPER Mill Fine Milled (ton/hr)	Annual Savings*
700	25	90%	0.7	0.4	\$ 425,736
700	35	90%	1.0	0.5	\$ 709,560
700	50	90%	1.3	0.6	\$ 922,428

#### Coarse Milled vs. UCC Fine Milled Trona

Unit (MW)	SO <sub>3</sub> (ppm)	SO <sub>3</sub> Reduction (% Removal)	Coarse Milled (ton / hr)	VIPER Mill Fine Milled (ton/hr)	Annual Savings*
700	25	90%	0.5	0.4	\$ 141,912
700	35	90%	0.6	0.5	\$ 184,486
700	50	90%	0.9	0.6	\$ 390,258

\* Base on Trona at \$180/ton