



## DRY SORBENT INJECTION (DSI) FOR SO<sub>2</sub> REMOVAL

### EPA's Latest Regulations Impacting Coal-Fired Units

#### The Plant Challenge: Reduce SO<sub>2</sub> Emissions

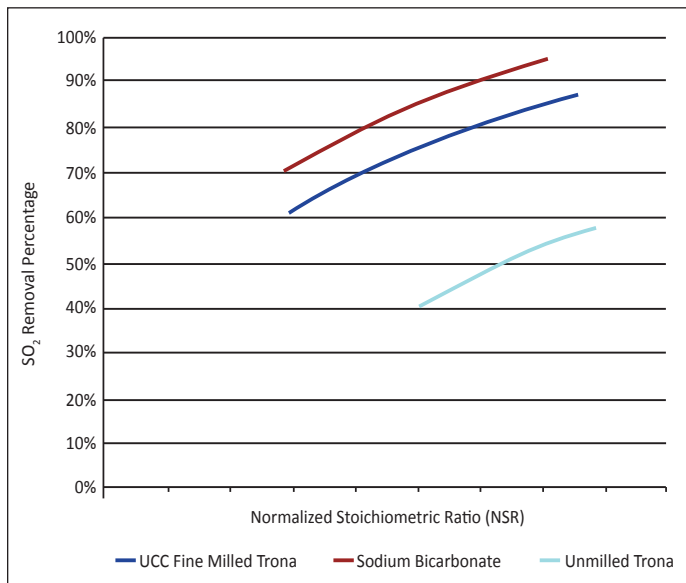
Most coal-fired units that are not currently scrubbed are facing several new regulatory requirements for reducing SO<sub>2</sub> emissions. These new regulations include the alternative SO<sub>2</sub> limit under the EGU MACT, the Cross State Air Pollution Rule (CSAPR), new NAAQS limits, as well as state rules and consent orders.

#### The UCC Solution: UCC Is the Industry Leader

UCC DSI has substantial experience using either trona or sodium bicarbonate to achieve moderate to high SO<sub>2</sub> emissions removal at a fraction of the capital cost of a scrubber. UCC DSI minimizes sorbent costs with our unique VIPER™ Mill technology. The VIPER Mill is an in-line system for reducing the sorbent particle size, while maintaining high injection rate capacities and preventing sorbent degradation.

Typical performance achieved with UCC DSI technology for PRB coal is shown below.

#### SO<sub>2</sub> Removal - PRB



#### Affects on ash removal/disposal

Since injection rates can be relatively high for SO<sub>2</sub> removal, modifications to existing ash removal systems may be needed. UCC, with over 90+ years of ash handling experience, can evaluate the plant's current ash removal capacities as well as conduct lab-scale material handling property tests of the ash/sorbent by-product mixture. We can then recommend any needed changes to accommodate the increased ash load and changed material flow characteristics from sorbent injection.

#### The Benefits

UCC is leading the industry in dry sorbent injection for SO<sub>2</sub> removal. Our experience and technology results in the most economical and efficient systems for our customers. The figures below shows how UCC DSI's VIPER Mill technology greatly reduces sorbent costs!

#### SO<sub>2</sub> Economics - Eastern Bituminous Coal

Unmilled Trona vs. UCC Fine Milled Trona

Unit (MW)	Sulfur lb/mmbtu	SO <sub>2</sub> Reduction (% Removal)	Unmilled (ton/hr)	VIPER Mill Fine Milled (ton/hr)	Annual Savings*
50	1.6	60%	2.4	1.7	\$ 993,384
100	1.6	60%	4.8	3.4	\$1,986,768
150	1.6	60%	7.2	5.1	\$2,980,152

#### SO<sub>2</sub> Economics - PRB

Unmilled Trona vs. UCC Fine Milled Trona

Unit (MW)	Sulfur lb/mmbtu	SO <sub>2</sub> Reduction (% Removal)	Unmilled (ton/hr)	VIPER Mill Fine Milled (ton/hr)	Annual Savings*
100	0.8	60%	1.5	1.1	\$ 638,604
250	0.8	60%	3.8	2.7	\$1,617,797
500	0.8	60%	7.5	5.3	\$3,193,020

\* Base on Trona at \$180/ton