

# Does Your Flue Gas Conditioning Process Impact Your Mercury Control Reliability, Operating Cost and Fly Ash Salability?



From expert evaluation and advice to best-in-class coal pile-to-stack solutions, ADA provides products and services designed to achieve worry-free compliance and advance **cleaner** energy.

It's at the heart of everything we do.



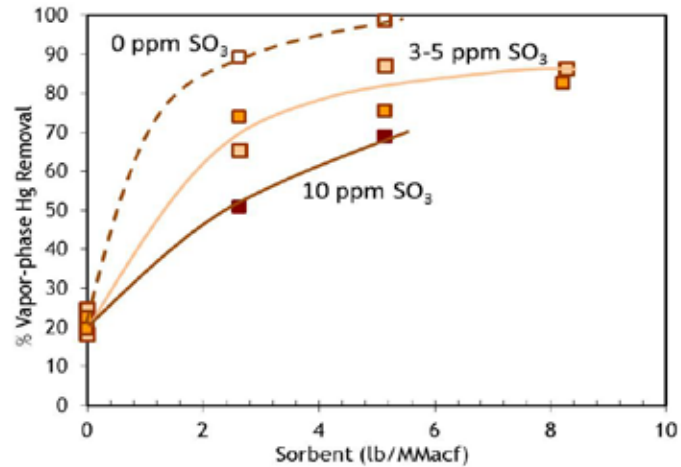
## ARE YOU USING MORE CARBON THAN NEEDED?

Meeting state and federal compliance levels for mercury is challenging, especially when you're managing more than just mercury. If you currently use  $\text{SO}_3$ -based flue gas conditioning (FGC) to improve the performance of your electrostatic precipitator, you are impacting the effectiveness of activated carbon for mercury control.

ADA's RESPond Technology is a FGC agent that modifies resistivity in coal-based fly ash, but does not affect the performance of powdered activated carbon for mercury control—thus significantly reducing Hg compliance costs.

RESPond is applied through a specially-designed additive injection system. This equipment is low in cost, reliable and simple to control. It uses little power and operates with a minimal amount of routine maintenance.

Call 720-598-3515 today and learn more about ADA's RESPond™ Technology!



Mercury removal as a function of brominated PAC injection at different levels of  $\text{SO}_3$  injection for flue gas conditioning.



ADA's dual-fluid atomizing nozzle technology



RESPond™ Injection Equipment

## ADA'S RESPOND™ FGC TECHNOLOGY

RESPond is a highly effective surface ash resistivity modifier for power plants operating cold-side electrostatic precipitators requiring flue gas conditioning.

RESPond provides a cost-effective alternative to other FGC agents when used in combination with activated carbon for mercury control.  $\text{SO}_3$ , the most common FGC agent, decreases the effectiveness of activated carbon. As a result, significantly higher ACI rates are required and the risk for noncompliance is elevated.

Replacing  $\text{SO}_3$  with RESPond not only supports opacity and particulate emissions compliance, it also reduces the costs of mercury control as well as the risks of mercury non-compliance.

### KEY BENEFITS

- Significantly reduces operating costs
- Minimal capital investment
- Reduces opacity
- Effective for ESPs with high resistivity fly ash
- Increased ash layer cohesion
- Cohesion effect may address re-entrainment issues
- Increased ESP power levels
- Larger effective temperature range than  $\text{SO}_3$  FGC systems
- Simple injection system

## PROVIDING SOLUTIONS FOR CHALLENGING INDUSTRY PROBLEMS

Plants firing lower sulfur coals often inject SO<sub>3</sub> to improve the resistivity of their ash to optimize particulate control. In the late 90's we discovered that SO<sub>3</sub> has a significant detrimental impact on activated carbon for mercury control.

Our patented RESPond FGC Technology provides the benefits of SO<sub>3</sub> as a flue gas conditioning agent for particulate control without the negative impacts on mercury control.

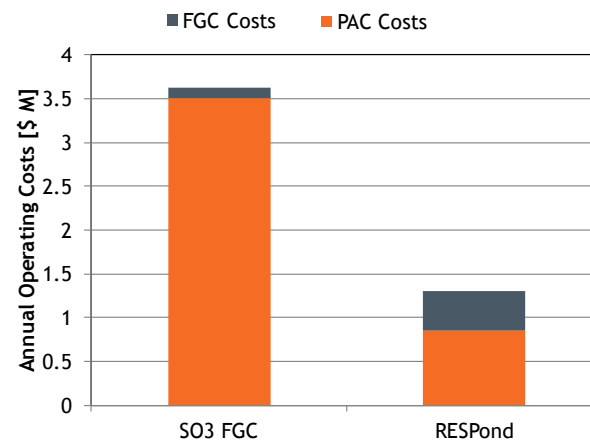
RESPond (a liquid FGC agent) is injected as a finely atomized spray into the flue gas or industrial off-gas immediately upstream from the ESP. The sprayed additive coprecipitates with the ash onto the ESP collection plates. The application rate is dependent upon precipitator size, particulate loading, ash resistivity, ash cohesivity and other site-specific factors.

Use of RESPond is not recommended where process temperatures are above 450°F, or for injection upstream from an air heater.

**Extensive plant testing has demonstrated that it is possible to achieve up to 85% reduction in PAC usage while meeting Hg resulting in 60% savings in operating cost while meeting Hg compliance regulations.**

## ADVANTAGES OF RESPond

- Eliminates interference with activated carbon for mercury control associated with SO<sub>3</sub> injection
- Significantly reduces total sorbent and reagent costs to comply with mercury and particulate emission limits
- Reduces risks of opacity excursions
- Improves ESP performance with optimal ash resistivity
- Does not affect salability of ash as a cement replacement in concrete
- Improves salability of fly ash
- Treated ash is collected with no reported balance-of-plant issues
- As-needed injection, for use with problem coals—particularly those with high alkaline, high pH ash



Typical PM and Hg Operating Cost Reduction for example 250 MW unit.

## ADVANCING CLEANER ENERGY THROUGH STATE-OF-THE-ART SOLUTIONS

ADA-ES, Inc., an Advanced Emissions Solutions, Inc. company, was founded in 1996 to provide emissions control solutions for the coal-fired utilities industry. Since then, ADA has established one of the most highly recognized teams of industry experts, and is the most recommended and trusted name in the emissions control industry, especially in mercury.

For nearly two decades, ADA has conducted more than 100 mercury control demonstrations at coal-fired power plants, and sold 140 activated carbon injection systems for mercury control. Our portfolio of products has grown to address limitations in coal composition, balance-of-plant impacts from alternate approaches, and operational challenges introduced by other technologies. We were the first to understand these environmental issues, provide a range of commercial solutions to the industry, and today have the most mercury control systems in operation in the US.

ADA delivers an important combination of hands-on experience, industry expertise, demonstrated commercial products, and commitment to collaborating with customers. Our track record includes securing more than 30 US patents with additional US and International patents pending and receiving numerous prestigious industry awards for emissions control technology and systems. So no matter the challenges our customers face, ADA will continue to focus its significant expertise and resources to innovating for a cleaner energy future.

Learn more about ADA, our products and services at [www.adaes.com](http://www.adaes.com). Make us your partner in advancing cleaner energy.



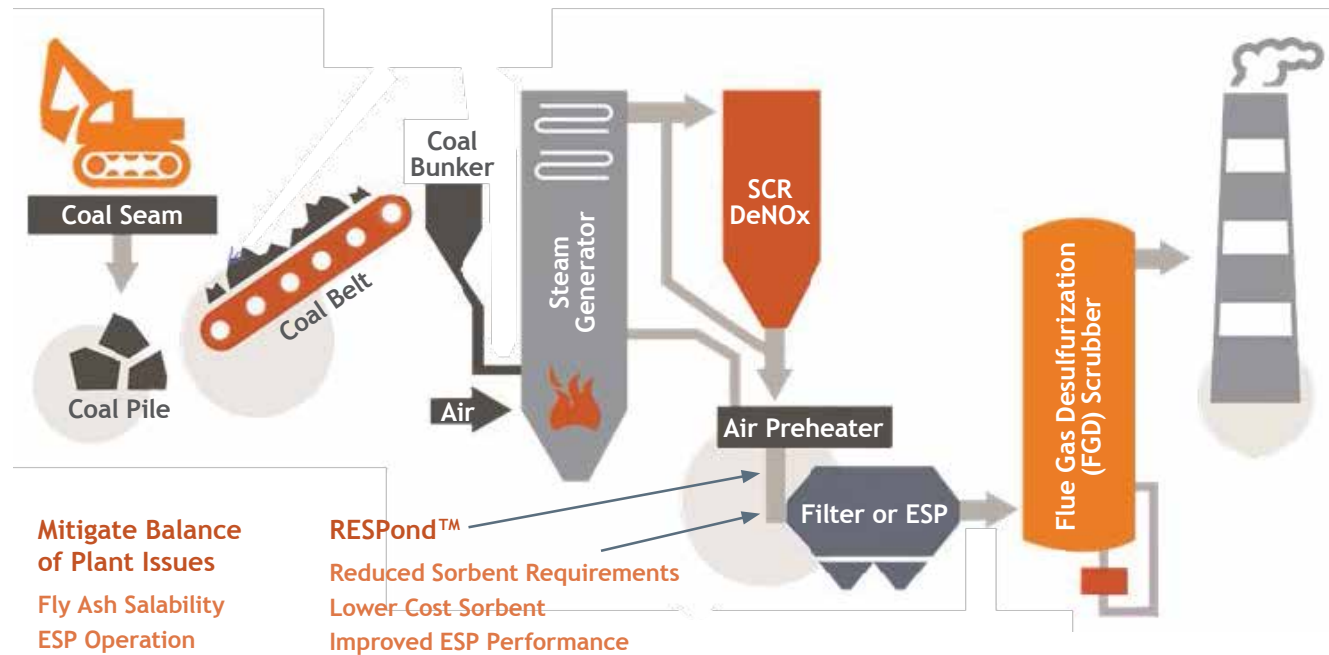
## ADA - YOUR TRUSTED ADVISOR

ADA assists plants by helping them determine the best solution for their unit-specific operations. We evaluate many factors affecting mercury removal to help you determine the optimal control strategy for your plant. Key factors include:

- Coal properties, including halogen, sulfur and mercury content
- Boiler operation, load profile, flue gas temperatures, etc.
- Emissions control equipment and operating practices
- Relative costs and potential performance limitations of various control strategies
- Potential balance-of-plant impacts
- Environmental regulations for plant discharges (air, water, solids)

Our team has supported plants evaluating mercury control options since 1990, including conducting mercury control demonstrations at more than 100 plants. We developed mercury control technologies to reduce operating costs and potential balance-of-plant impacts. We have internationally recognized mercury control experts on staff. Put our expertise to work for you to save money and reduce risks of non-compliance.

Contact us today to learn more about ADA's RESPond™ Technology and our other products and services.



## WHY ADA?

*No one has a better understanding of coal pile-to-stack power plant operations than ADA. As the recognized thought leader in the industry with significant process experience, ADA is the expert in providing unit-specific recommendations that support environmental compliance and reduce costs. ADA offers forward-thinking solutions driven by the needs of the coal-fired utility industry.*

*Our products and services include:*

M-Prove™ Coal Additives | RESPond® Flue Gas Conditioning  
ADAir-Mixer™ | ACI | DSI

