

### Removes significantly more buildup at a reduced cost over traditional methods

GE Energy's Powerwave+ cleaning system enhances boiler operation and minimizes high maintenance expenses associated with other cleaning methods. This revolutionary technology provides significant advantages over traditional methods like sootblowing, rapping, manual shaking, blasting, and high-pressure water washing. Because the Powerwave+ effectively cleans using controlled and repeated impulses, cleaning can be performed online. Another advantage over traditional methods is that you'll benefit from less tube wear and avoid unnecessarily wasted steam and water.

Buildup, fouling, and slagging of heat transfer surfaces can cause tubes to become insulated with particulate. This diminishes convective heat transfer, resulting in reduced efficiency that requires more fuel to maintain steam output.

GE Energy's powerful impulse technology augments, or could potentially replace, current cleaning systems used to dislodge buildup and deposits on convection surfaces in boilers and heat exchangers. This approach provides a high level of penetration, and can dramatically increase performance compared to alternative methods like sootblowing, with reduced operating costs and minimized tube and shield damage.

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### Powerful online cleaning technology

- Removes thick and stubborn ash deposits better than traditional cleaning methods
- Reduces the need for steam soot blowing
- Enhances long-term operational ability
- Cleaning process doesn't require personnel to enter area where buildup occurs
- Fuel-efficient design has low operating cost with minimal maintenance
- Can be integrated into plant control systems, or operated in self-timed mode
- Increases heat transfer and overall efficiency of processes
- Operates online versus requiring an outage
- Extends time intervals between downturns caused by off-line cleaning, allowing more time for production
- Potentially less damage to boiler tubes
- Easy to install and maintain, with a small footprint that preserves valuable space
- Utilizes only small amounts of compressed air, fuel, and 110 VAC

## How it works

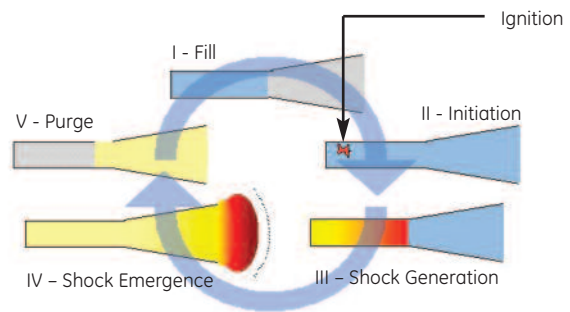
Using technology developed for the future of jet propulsion, impulses are created in a controlled, pulsed manner in order to direct cleaning waves at the collective surfaces. Its operation is easy to explain; the results of GE Energy's Powerwave+ are hard to replicate using currently available technologies.

A cleaning cycle from the Powerwave+ cleaner is the result of a complex process that is managed entirely by a fully automated, simple to use control system. Each burst consists of precise delivery of fuel and air to the combustion chamber followed by ignition of this mixture and acceleration from subsonic to supersonic mach-5 speeds. The supersonic impulse exits the Powerwave+ cleaner into the area of the boiler to be cleaned. This process is repeated up to 10 times per second, and the strength and frequency of operation is adjustable depending on the application. This shockwave penetrates in and around obstructions it encounters providing more complete surface contact.

The result of this controlled process is a much cleaner boiler with optimized heat exchange—with increased performance.

## Applications

Electrostatic Precipitators (ESPs)  
Heat Transfer Surfaces  
Material Handling  
Spray Dryers  
Coal Gasification  
Cement Air to Heat Exchangers  
Trash Burners  
Large Silos



Single pulse cycle of the Powerwave+



For more information, contact your GE Energy Sales Representative at 800.221.2222/+816.356.8400 (int'l) or visit us at [ge-energy.com/airquality](http://ge-energy.com/airquality)

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GEA-14858 (05/07)