

# Process Line Maintenance

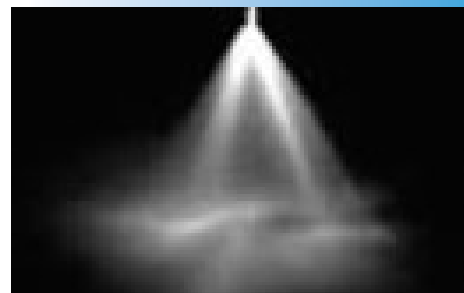
Chemetall's full-line of descaling products and solutions

*Realize real cost savings. Save energy. Increase sustainability.*

## Nozzle and pipe descaling

### Maximize your spray efficiency

- Scale, soils, and particles deposit on the inside of the nozzle and restrict flow uniformity from the nozzle.
- These photos compare the spray pattern of a clogged nozzle versus an unclogged nozzle.
- Cross section of a pipe before and after descaling.



**Clogged nozzle**

## Heat exchanger descaling

### Maximize your heat exchanger efficiency

- Scale forms when water salts in the solution settle and plate on the outside of the heater tube.
- The scale builds and becomes thicker over time and acts as an insulator, preventing the heat from the heater tube from reaching the solution.
- Scale build up leads to a higher usage of natural gas.

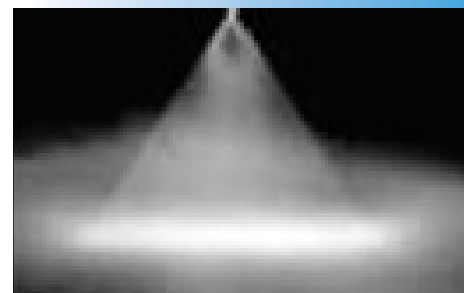
### How scale can affect cost efficiency

A washer with an 1/8 of an inch of scale on the heater tube could cost an additional \$50,000 per year for gas.

*Effective descaling may save up to \$12,500 per year for gas.*

### Potential percentage of increase in natural gas usage due to scale.

Scale Thickness (Inches)	Natural Gas Usage Increase
1/32	8%
1/16	12%
1/8	25%
1/4	40%
3/8	55%
1/2	70%



**Unclogged nozzle after using Chemetall solutions**



**Cross-section of a pipe before (left) and after (right) descaling**

**BASF**  
We create chemistry

**Chemetall**  
expect more<sup>+</sup>



## *Innovative products and solutions from Chemetall*

### **Gardoclean R1700F**

- + Liquid caustic-based product
- + Used for steel or stainless steel
- + Temperatures 120 to 160°F
- + Typically used at 5 to 20 % by volume
- + Safer and less fuming than muriatic (hydrochloric) acid-based descalers
- + Use Gardobond Additive H 7230 to neutralize

### **Gardobond Additive H7002/2**

- + Peroxide-based
- + Used for stainless steel for biological removal
- + Typically used at 3 to 5 % by volume
- + Breaks down to water and oxygen

***Our experts are here to help!***

### **Gardacid P4309**

- + Liquid inhibited sulfuric acid product
- + Used for stainless steel
- + Inhibited to minimize attack on mild steel
- + Typically used at 3 to 5 % by volume
- + Temperatures up to 140°F
- + Use Gardobond Additive H 7212 to neutralize

### **Gardobond Additive H7140/1**

- + Liquid nitric acid product
- + Used only for stainless steel
- + Available in polyethylene containers
- + Typically used at 5 to 50 % by volume
- + Temperatures up to 120 °F
- + Safer and less fuming than commodity nitric or muriatic (hydrochloric) acid-based descalers
- + Use Gardobond Additive H 7212 to neutralize

***Cut it. Clean it. Coat it. Control it. Conserve it.***

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