Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters

Lochinvar Water Heating Solutions

FACT SHEET


Lime Scale Buildup

Lime Scale Accumulation: The Energy Thief

Lochinvar® Helps SHIELD Commercial Water Heaters From Energy-Robbing Lime Scale Buildup

Background on Scale Buildup

Water is used in a wide range of commercial applications. Every day, businesses and facilities heat water to serve the needs of their customers and patrons. While restaurants, laundromats, hotels and car washes all require very large amounts of hot water to stay in business, nearly all companies rely on hot water in one way or another. Each year, a significant portion of their overhead is allotted to the fuel required to heat water, and everyday that allotment becomes slightly larger. However, many do not realize what they lose each year due to the negative by-products of heating water.

Water contains dissolved minerals, such as calcium-carbonate (lime), magnesium, silica, iron and phosphate. The amount of these dissolved minerals in water varies throughout the country and from municipality to municipality. However, 85 percent of this country's area is served with water containing concentrations of dissolved minerals sufficient to form scale.


"In-tank" flue tubes and heat exchangers suffer from lime scale buildup beginning from the first hours of operation.

When water is heated, it undergoes a chemical reaction that causes the dissolved minerals to "precipitate" out as solids. The amount of precipitant, or scale, is directly proportional to the volume of water used and its temperature.

In Brief:

Product:

SHIELD® Condensing Gas Water Heater

Topic:

Lime Scale Solutions for Commercial Water Heaters

Topic Sections:

- Background on Scale Buildup
- Harmful Effects of Scale
- Solution for Lime Scale
- Smart Design, SMART CONTROL™

SHIELD™
COMMERCIAL WATER HEATER

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SHIELD™ COMMERCIAL WATER HEATER

Product Features:

- 96% thermal efficiency
- Lime Scale free performance
- Inputs up to 500,000 Btu/hr
- Quiet operation
- Advanced SMART CONTROL™
- Six options for traditional and direct venting
- PVC, CPVC or Stainless Steel venting up to 100 equivalent feet
- 100 or 125-gallon tank models
- AHRI product listed

About Lochinvar

Lochinvar Corporation is a leading manufacturer of high-efficiency water heaters, boilers, pool heaters and storage tanks. Based in Lebanon, TN with facilities in Detroit, Orlando, Tampa, Pompano Beach and Dallas, Lochinvar stocks all products in all locations.

For more information regarding Lochinvar's line of high-efficiency water heaters, boilers and pool heaters, contact:

Lochinvar Corporation,
300 Maddox Simpson Parkway,
Lebanon, Tennessee 37090;
Phone: (615) 889-8900;
Fax: (615) 547-1000;
www.Lochinvar.com.

LOW NOx Certified

AHRI MEMBER

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Harmful Effects of Scale

Scaling will inevitably cause efficiency losses, malfunctions and total equipment failure. It is responsible for millions of wasted dollars each year in maintenance cost and energy consumption. Since most commercial water heaters transfer heat inside the tank through flue tubes or coil-type heat exchangers, the scaling wreaks havoc on them.

Scale has a very low thermal conductivity. In fact, it acts as a better insulator than a conductor for heat transfer. The thermal conductivity of a typical lime/scale deposit measured in Btu/hr/ft²/in/ºF ranges from three to seven. As a comparison, the thermal conductivity of copper is 2680 and steel is 460. It is easy to see that a heat transfer surface which has accumulated a scale build-up will have a less efficient heat transfer process. This means that the metal surface must be hotter for the same amount of heat to be passed through both the metal surface and scale accumulation then into the water. If enough scale is present, the metal overheats, causing distortion, embrittlement and eventual failure of the water heater. In fact, as little as one-fourth of an inch of lime scale on the heat exchanger can increase operating costs by 25 percent and cause tank failure in as little as two years.

Solution for Lime Scale

Designed to provide a 100 percent effective defense against the problem of lime Scale buildup, the new SHIELD™ Water Heater, introduced by Lochinvar® in October 2008, is equipped with the industry's most advanced stainless steel heat transfer system located outside of the tank, ensuring the same high efficiency and low operating costs throughout its life cycle. With inputs up to 500,000 Btu/hr, 96 percent thermal efficiency and storage up to 125 gallons, SHIELD has everything it takes to provide the ultimate green operation – without the risk of lime scale buildup.

Ideal for green commercial buildings, SHIELD provides low NOx ratings compatible with the most stringent air quality standards. The NEG/REG sealed combustion system allows the unit to operate with inlet gas pressure as low as four inches of water column and delivers a quiet, environmentally friendly supply of heat. For added flexibility, SHIELD offers rooftop or sidewall venting options, including conventional, direct vent and concentric direct vent, all using PVC or CPVC pipe with vent runs up to 100 feet.

Utilizing a fully modulating burner with 5:1 turndown, SHIELD can fire as low as 20 percent of maximum input when demand is lowest, and increase to 100 percent for peak-demand periods. This results in better overall efficiency and less cycling compared to "on-off" tank-type units that can only fire at full force.

Smart Design, SMART CONTROL™

In addition, SHIELD is equipped with an advanced water heater control, which makes system setup, service and operation a breeze. The innovative SMART CONTROL™ features a two-line, 16-character backlit LCD display that provides readouts of setup, system status and diagnostic information in words, not codes. SMART CONTROL also includes night setback, time clock, alarm contacts, runtime contacts and manual-reset high limit.

The outstanding life cycle, efficiency and performance of SHIELD can serve even the highest demand commercial applications through manifolded installation of multiple units. For example, five SHIELD SNA 500 models can provide a total storage of 625 gallons with maximum input of 2.5 million Btu/hr.

Another key advantage with SHIELD is that the storage tank features very high drawdown for more usable hot water, faster.

SMART CONTROL™

SHIELD™ COMMERCIAL WATER HEATER