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BOILER TECH UPDATE

MAY 1, 2005

Definition:

• Thermal Efficiency-

The btu output (in steam or hotwater) divided by the btu input of a boiler shows the thermal efficiency of the boiler, usually 80 to 98 percent. It can be a lower value on older boilers or poorly maintained boilers.

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NEW

CLEAVER-BROOKS WEBSITE:

www.cleaver-brooks.com

Check it for the news about the Boiler Bucks II contest to be announced soon!

**Don't forget to
schedule your
annual cleaning!**

Cleaver-Brooks Leads The Way In Biogas Combustion!!!

With oil and natural gas costs continuing to rise, more attention is being given to alternate energy sources. Two very attractive alternatives are **Digester Gas** and **Landfill Gas**. Both are methane derivatives created by decomposition of waste byproducts.

Landfill Gas is collected from local landfills (municipal waste) and piped to nearby energy users for consumption. The consumers purchase it just like they would buy natural gas.

Digester Gas is created through decomposition of animal or vegetable waste. Reducing the waste (through decomposition) produces an environmental benefit, because less waste is sent to waste processing facilities. Most agricultural facilities that have digesters have a use for the energy created by the process and the residual product is a desirable fertilizer.

Other industrial facilities like refineries and polystyrene plants also create by-product gases suitable for use as a boiler fuel.

Delval Equipment and Cleaver-Brooks are your experienced leader in biogas combustion. We have been providing biogas-burning boilers for over twenty years!

Cleaver-Brooks' patented dual canister burner housing neatly packages the capability for burning two gaseous fuels into one burner without the need to change air-fuel settings every time you switch fuels.

There are many satisfied customers in the area that have biogas-burning Cleaver-Brooks boilers (see the Customer List on Page 2). Also, one of the leading Consulting Engineers specializing in biogas systems uses Cleaver-Brooks boilers exclusively.

Delval Equipment and Cleaver-Brooks are your experienced leader in this, and other areas of boiler and burner systems!



Water Treatment...Don't Forget Your Softener!

Facilities engineering and maintenance personnel constantly struggle with the negative effects that hard water has on all types of water handling and water using equipment. Hard water affects all types of equipment, from dishwashers and laundry equipment to boilers, cooling systems and process equipment.

Hardness is defined as the total of the calcium and magnesium salts dissolved in a water supply. The term "hardness" originally referred to these dissolved minerals making the water hard to wash in – the calcium and magnesium ions react with alkalinity in soap, making it harder to lather and rinse. Hard water requires more detergent to get dishes or clothes clean.

More critical and costly problems are caused by hard water used in boiler and cooling systems. In these systems, hardness precipitates out of solution and forms hard scale deposits in piping and heat exchange equipment. Scale deposits act as insulation, decreasing heat transfer efficiency and resulting in wasted fuel or electricity. In steam boilers, scale on boiler tubes causes over-heating of the tubes and often results in tube failures, requiring expensive repair or replacement. Scale and other hard water-related problems are estimated to cost business and industry upwards of a billion dollars per year.

Fortunately, hard water-related problems can be largely eliminated through the use of a water softener to remove hardness from a water supply. Water softeners use the principle of ion exchange to remove hardness, or "soften" the water. As hard water passes through a softener, calcium and magnesium ions are exchanged for sodium ions. The exchange process takes place on the surface of synthetic resin beads, which have been "regenerated" or rinsed with a concentrated solution of sodium chloride – common salt. In a properly operating softener, this ex-

change will be virtually complete – the hardness level in the softened water will be less than one part per million (ppm). This will be the case even when incoming water hardness levels are extremely high – 500 ppm or greater. A softener system will save most facilities significant amounts of money in decreased detergent use in kitchens and laundries, decreased chemical and blowdown costs in boiler systems and decreased maintenance and repair costs in all types of water-using systems. And, softeners are relatively inexpensive to install and operate, and are trouble-free and reliable if correctly maintained.

A good softener maintenance program is based on two precepts: first, the regeneration procedure must be done correctly, and second, the softener resin beads must be clean and in good physical condition.

Most softeners today are regenerated automatically, based either on a time clock, or on how much water has passed through as measured by a water meter. The entire regeneration procedure consists of a backwash cycle, a brine cycle, during which the sodium chloride brine solution is passed over the resin bed, and slow and fast-rinse cycles. A complete, correct regeneration procedure is accomplished if the flow rates in all the regeneration cycles fall within manufacturer's specifications, *and* the specified amount of totally saturated brine is drawn through the resin bed over the proper time span.

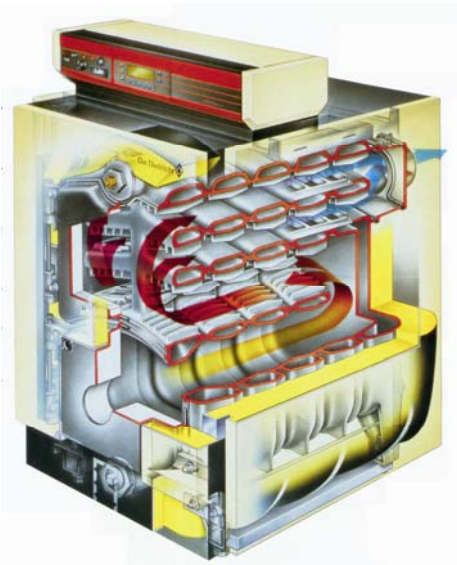
To assure correct regeneration is being accomplished, the facility engineer should have an elution study performed on his softener system. During an elution study, the brine concentration is determined, and backwash, brine draw and slow and fast rinse flow rates are measured. Based on this data, an elution curve is developed that indicates whether the regeneration procedure is correct, and, if not, what alterations need to be made to assure proper regeneration.

A UNIQUE CAST IRON BOILER FROM DELVAL

Delval Equipment proudly announces that we have been appointed as the exclusive representative for DeDietrich cast iron boilers.

Available in capacities from 152 horsepower down to residential sizes, DeDietrich boilers have the highest thermal efficiencies of any cast iron boiler, and are very resistant to thermal shock and section cracking, because they are actually made with a flexible eutectic cast iron.

DeDietrich also uses cast iron push nipples to join the sections together. You will never have to replace one of our boilers due to the failure of a rubber "O" ring. They are available assembled, or in loose sections, for assembly in the boiler room.



Cut-away View



DeDietrich Model GT400A

Because the DeDietrich boiler can operate with low outlet temperatures and return temperatures as low as 105 degrees Fahrenheit, it is an ideal selection for radiant heat and domestic hot water applications. DeDietrich is becoming the boiler of choice for performance contractors, school districts, apartments and commercial buildings.

Depending on your load profile, you can select one boiler, two boilers with a lead-lag controller, or multiple boilers staged by the building's energy management system- the modular concept.

Let us show you the cast iron boiler built for the twenty-first century!

