WHY THERMAL STORAGE?

Why couple thermal energy storage with heating equipment that utilizes cord-wood or other biomass fuels? Doing such yields significant benefits when one is trying to utilize a difficult to control fuel. In particular, thermal energy storage:

- Eliminates the short cycling of burners thus reducing emissions. In conventional wood heating equipment wood combustion produces maximum emissions during the “idle” cycle. Also, by minimizing the on/off cycle, maintenance is reduced.

- Allows any burner to be set up for steady state continuous peak combustion efficiency because the burner does not have to cycle as demand for heat increases. The burner simply “charges” the thermal storage.

- Allows a continuous exact match of heat output to widely varying loads of any building or process. This is very important during the “fringes” of any heating season when a typical wood burner is grossly oversized because it is based upon the largest heating load during winter conditions.

- Allows interfacing biomass fuels with off peak electric heating. Provides a convenient secondary fuel at very reasonable rates.

- Thermal storage allows interfacing with other intermittent energy sources such as solar thermal and wind generated energy.

- Allows simple connection to fan coil units (make-up air and prime heating), hot water baseboard, cast iron and European style radiators, and radiant floor delivery systems with a single thermal storage unit.

- Allows for burner maintenance, repair or cleaning without a loss of heating ability because the thermal storage can carry the load for a period of hours without burner input.

Thermal energy storage may be provided via a separate storage tank piped to the burner unit (boiler), or as an integral unit with the burner. The integral unit approach provides greater simplicity, lower first and maintenance costs, easier installation, greater efficiency and greater safety. If the thermal storage is non-pressurized, the benefits are even greater because safety is further improved and the following equipment is eliminated: air separator, pressure reducing fill valve, back-flow preventer and expansion tank.

DECTRA CORPORATION has been providing GARN WHS® wood heating equipment with integral non-pressurized thermal storage with every unit sold since 1978. This approach has SOLVED many wood heating problems and yielded consistent CUSTOMER BENEFITS. For instance:

- A high independently verified efficiency. GARN WHS® equipment was independently tested for efficiency and certified in 1986 at 70% and 2006 at 75.4%.

- GARN WHS® efficiency produces fewer emissions. This results in less smoke, less wood burned, less ash and less wood handling.
Because of internal energy storage, **GARN WHS®** further increases safety by not requiring an active fire overnight.

In fact, a paper published in Sweden in April 2004*, concludes that emissions can be reduced 95% by *properly connecting* a conventional wood fired hydronic heater to a heat storage tank and allowing the unit to operate at its continuous peak combustion efficiency.

**This is exactly how every **GARN® WHS** unit manufactured since 1976 is designed to operate!**

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* Emission characteristics of modern and old-type residential boilers fired with wood logs and wood pellets by Linda S. Johansson, Bo Leckner, Lennart Gustavsson, David Cooper, Claes Tullin and Annika Potter

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