Euro-Hydronics

by John Siegenthaler

The newest and most refined hydronic heating technology available anywhere in the world was on display this past March at the International Sanitation and Heating Exhibition in Frankfurt, Germany. The ISH Show, as it is known, runs every other year and attracts more than 2,000 exhibitors spread out over about 2.5 million square feet of floor space. If you want to glimpse the future of heating technology in the United States, this is the place to see it.

Hydronic heating is by far the most common method of heating in Europe. Combine this with higher fuel costs, rigid emissions standards, and a seemingly universal commitment to delivering comfort, and the stage is set for some innovative products.

Super Efficiency

A readily apparent priority of European boiler manufacturers is minimizing emissions. In Germany, every heating system is checked by a government inspector on a yearly basis. If the system doesn't meet the stringent government emissions standards, its owner has 10 days to correct the situation, or the boiler is shut down.

This obviously provides incentive for low-emission designs. Many of the manufacturers offer a line of gas-fired condensing boilers that can attain better than 95% efficiency. The acidic condensate from such boilers, however, must be chemically neutralized before being released into a sewer. The corrosive nature of the condensate also requires specialized exhaust systems. One product that caught my attention was a *glass* chimney system assembled in sections (see Figure 1). The condensate runs down the chimney and is collected in a special fitting, then routed to a plastic jug filled with a neutralizing material.

SCHOTT-ROHRGLAS

Figure 1. *Condensing boilers that run at 95% efficiency are not uncommon in Europe, but the acidic condensate from such boilers must be chemically neutralized. This noncorrosive glass chimney from Schott-Rohrglas has a special fitting to collect the condensate and route it to a reservoir filled with neutralizing pellets.*

Advanced Boilers

Most European boilers come with microprocessor control systems that, among other things, automatically adjust water temperature to variations in outdoor temperature. Other functions include programmable heating schedules, domestic water heating priority, variation in burner on/off differentials, temperature boost following a setback period, and clocks that are automatically set by a government radio signal (Figure 2).

Leading boiler manufacturers are now offering "fuzzy logic" to automatically "learn" how a given building performs, and then optimize the heating system for those conditions.

It was obvious that European manufacturers give lots of attention to the appearance of heating equipment. Modernistic cabinets designed and built with meticulous attention to details and high-quality finishes make some boiler and hot-water heaters look like

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Figure 2. *This combination boiler and domestic-hot-water heater features a preassembled pump/valve module (on top in black) and a built-in microprocessor that can be programmed for outdoor temperature reset, preset heating schedules, and boost after setback.*

they came off a set for *Star Trek*. Most boilers have a swinging door to allow full access to, and easy cleaning of, the combustion chamber and flue-gas passages. I did not see *any* boilers with refractory-lined combustion chambers. Oil and power-gas burners fire directly into cast-iron or stainless-steel chambers for better heat transfer. Many manufacturers also offered a stackable boiler/domestic-hot-water tank combination that takes up very little mechanical-room space.

Other eye-catching amenities included circulators with electronic variable-speed controls that automatically adapt to changing system loads, lightweight modular fuel-oil storage tanks made from polyethylene rather than steel, and preassembled and prewired hydronic heating modules that minimize on-site labor.

No Fin-Tube

Noticeably absent was fin-tube baseboard — the American hydronic staple. Nearly all European systems use either heated floors or panel radiators.

Panel radiators typically have their own thermostatic valve to allow precise temperature control in each room. These radiators are available in almost any size, shape, and color imaginable. Many can be augmented with stylish accessories, such as towel bars, mirror mounts, and knobs for hanging (and warming) clothes. Most companies also offer several artistically inspired "towel warmer" radiators for bathrooms (Figure 3). Similar models are available in this country through Runtel, N.A. (P.O. Box 8278, Ward Hill, MA 01835; 800/526-2621).

Cross-linked polyethylene (PEX) tubing is extensively used not only for floor heating, but for connecting panel radiators, and for domestic hot- and cold-water service. Hundreds of different connectors are available to make the transition from PEX tubing to rigid piping and valves. The use of copper tubing for such routine applications seems to be very limited. ■

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Figure 3. *High-tech panel radiators are everywhere, while fin-tube baseboard is nonexistent. This radiator and towel warmer has a built-in thermostatic valve — a common zone control for European hydronic systems.*