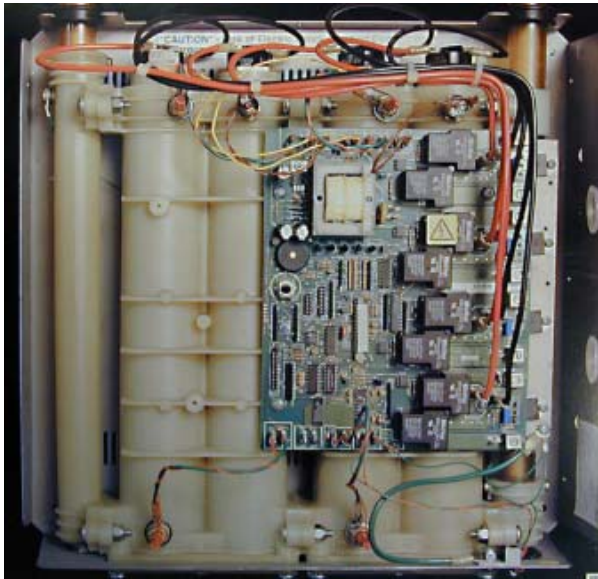


DuPont Engineering Polymers

The Water Heater for the 21st Century: A No-Tank Unit That *Really* Stands Up



Ample hot water for laundry day at home...



...or for commercial use, at this German-style restaurant, for example.

Description/Application

The new Seisco® tankless electric water heater addresses the reliability and capacity problems of earlier on-demand water heaters.

Microtherm, Inc. engineered the unit with an innovative design that eliminates moving parts and has a heating chamber assembly with seven parts injection molded from DuPont™ Zytel® nylon resin, a rugged protective cover of DuPont™ Crastin® PBT thermoplastic polyester resin and a highly responsive electronic controller with dual backups for key heat control functions.

Benefits Gained

Reliability. The Seisco® heater minimizes overheating, flow switch failures, minimum flow and pressure requirements, limited capacity and other problems that have plagued its forerunners, according to Microtherm. The heating chamber assembly made with Zytel® 77G33HS1L provides optimum resistance to thermal and mechanical stress, hydrolysis, corrosion and mineral buildup.

Uniform water temperature. The Seisco® has an innovative control system that varies power to deliver hot water at constant temperature, according to

Microtherm. It thus avoids overheating at low flow, a common problem with earlier on-demand water heaters.

Saves energy. The Seisco® uses less energy than electric tank water heaters and many gas-powered units, according to Microtherm.

Unlimited supply. The Seisco® provides a continuous supply of hot water to meet peak demands for homes or business.

Saves space. Replacing a bulky hot water tank, the Seisco® takes less than 0.6 ft³ (<0.02 m³) of space. It is typically mounted on a wall.

Meets industry standards. Zytel® 77G33HS1L complies with NSF Standard 61 requirements for contact with potable hot water. The heaters also pass applicable UL tests, according to Microtherm.

(more details on back)



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New Water Heater Meets Stringent Demands, Thanks to Zytel® Nylon

Exhaustive independent testing indicates a service life of at least 10 years for the Seisco® tankless water heater.

Bradley Consulting Group, College Station, Texas, conducted the tests. The Group's president, Dr. Walter L. Bradley, professor of mechanical engineering at Texas A&M University, is a highly respected authority in failure analysis and material evaluation.

Dr. Bradley and his colleagues designed a rigorous test regime (see table) to predict long-term durability in a relatively short time by using higher-than-normal temperatures, flow rates and pressures. The water was

chlorinated to 3 ppm, as much as double the level of normal water supplies. In more than 2,000 hours of testing conducted to date, the heaters have handled as much water as they would during 10 years of domestic use. The temperature and pressure levels and cycling conditions employed in the tests were much more severe than those encountered in normal operation. Fast-acting solenoid valves control flow during testing to create severe water hammer impact on the heater's components.

The water heater assembly's components made of Zytel® 77G33HS1L nylon resin showed no damage and continued to operate perfectly, according to Bradley Consulting.

Standard models of Seisco® heaters are available with power ratings from 6 to 28 kW. The 28 kW model can raise water temperature by 78°F (43°C) at a flow rate of 2.5 gpm. (9.5 l/min.), or by 63°F (35°C) at 3.0 gpm (11.4 l/min.), according to Microtherm.

The Seisco® has a water chamber assembly consisting of seven injection molded parts: two identical one-piece modules with dual heating chambers molded into each, removable bottom covers for each module, an output tube, an inlet tube fitting and a clamp. Standard heating elements screw into the chambers, and parts are bolted together. The entire unit is designed for easy access for cleaning or replacement of heater elements.

Materials Selected and Why

For the heating chamber components, DuPont™ Zytel® 77G33HS1L meets needs for strength, toughness, thermal stability, water resistance, dimensional stability, compliance with NSF and UL requirements, and ease of molding.

The heater cabinet's dust cover is molded from Crastin® PBT ST830FR thermoplastic polyester resin. This material meets needs for strength, toughness, impact resistance and a UL94 5V rating at 2.7 mm that is crucial to UL® listing of the heater.

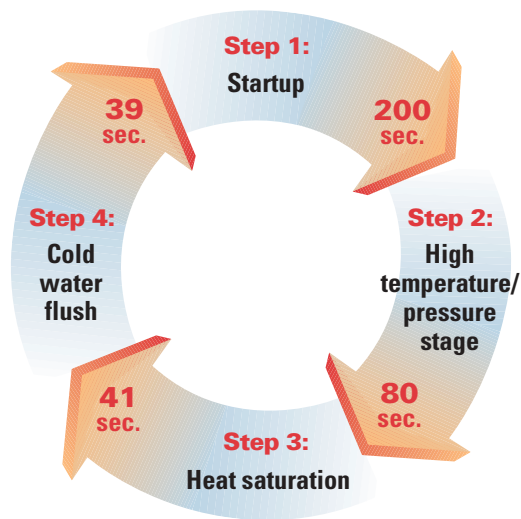
For More Information on Water Heaters...

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For More Information on Materials...

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Call: 800-441-0575
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Water Heater Test Cycle



Step 1: Startup. Cool water from Step 4 (75°F, 24°C) is replaced by preheated water at 140°F (60°C). The hot water is pressurized at 125 psi (8.6 bar) and circulated at 4 gpm (15 l/min).

Step 2: High-temperature/pressure stage. Recirculation at 4 gpm is abruptly stopped, producing a high-pressure water hammer. Water is heated to 180°F (82°C), and pressure increases to 140 psi (9.6 bar).

Step 3: Heat saturation. Heat from the hot water generated in Step 2 saturates the walls of the surrounding chamber.

Step 4: Cold water flush. The discharge valve opens, causing pressure to drop instantly from 140 psi (9.6 bar) down to 30 psi (2.1 bar). Hot water at 140°F (60°C) is flushed out and replaced with cool water at 75°F (24°C).

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