



# Canada's *Energy Efficiency Awards 2000*

## Finalist

### **Category:**

Equipment and Technology –  
Energy-Using Equipment

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## *VFC 50-130 Boiler*

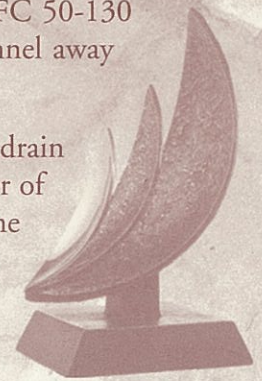
Thanks to IBC Technologies Inc. of Vancouver, British Columbia, homeowners have one more option for heating their homes and water. It's an efficient, natural gas-powered condensing boiler that can adjust its heat outputs to match its load requirements. The VFC 50-130 Boiler has special appeal to people who care about the environment and keeping their costs down.

To begin with, the boiler is 92.4-percent fuel efficient. It reduces emissions of carbon dioxide (CO<sub>2</sub>) by 16 to 30 percent and nitrogen oxides (NO<sub>x</sub>) by 85 percent (less than 20 parts per million) – good news for people trying to reduce their greenhouse gases. A flexible model for homeowners, the single-sized boiler can heat homes of various sizes, from condominiums to large houses. Its energy consumption is up to 30 percent less than that of comparable equipment.

IBC has linked an automotive-style fuel-air mixture control (a sort of electronic fuel injection, using airflow metering) with a metal fibre burner in order to achieve stable combustion over a wide throttle range. The burner itself sponsors surface combustion – like patio heaters at outdoor restaurants – providing the superior NO<sub>x</sub> numbers. Part of the boiler's name – VFC – stands for "virtual fuel cell," reflecting its environmental attributes. In fact, it produces only 5.3 percent more CO<sub>2</sub> emissions than a fuel cell (including its front-end fuel preparation process) working at its maximum theoretical efficiency.

The top fuel efficiencies are achieved by capturing heat energy from moisture within the combustion products – heat that's normally lost up the exhaust stack. IBC Technologies had to overcome the problem of corrosion: combustion equipment that operates in the condensing temperature zone is subject to surface condensation, which tends to corrode the surfaces of the heat exchanger. The VFC 50-130 makes good use of materials, configuration and operating algorithm to control and channel away the extracted moisture, preventing corrosion and extending the boiler's life.

Seamless, bare stainless steel tubes aligned in a vertical downflow orientation help drain condensation away. The boiler's significant throttle turndown works to reduce the number of on-off cycles, relieving the vessel from the corrosive effect of many wet-dry events. When the unit does shut down, the fan is used in an ultra-low flow mode to ensure that residual



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moisture within the boiler doesn't flow back to foul the ignitor and burner areas. The design is efficient even at partial load, because of its electronic controls, metal fibre burner and direct current (DC) blower motor.

The VFC 50-130 Boiler costs \$1,200 more than an 80-percent efficiency boiler. Still, at today's natural gas prices, the consumer's annual savings in energy costs are about \$300, so the simple payback period is approximately four years. All in all, this boiler's an option worth considering.



## VFC 50-130 Boiler

Thanks to IBC Technologies Inc.'s advanced burner technology, homeowners have one more option for heating their homes and water. It's an efficient natural gas-powered condensing boiler that can adjust its heat output to match its load requirements. The VFC 50-130 boiler has special appeal to people who care about the environment and want their costs down.

To begin with, the boiler is 92.4 percent fuel efficient. It reduces emissions of carbon dioxide (CO<sub>2</sub>) by 16 to 30 percent and nitrogen oxides (NO<sub>x</sub>) by 85 percent (less than 20 parts per million) – good news for people trying to reduce their greenhouse gases. A flexible model for homeowners, the single-sized boiler can heat homes of various sizes, from condominiums to large houses. Its energy consumption is up to 30 percent less than that of comparable equipment.

IBC has linked an automotive-style fuel-air mixture control to its burner (using airflow metering) with a metal fibre burner in order to achieve stable combustion. The burner itself is a metal fibre burner – the same technology providing the superior NO<sub>x</sub> numbers. Part of the boiler's name – VFC – stands for Variable Fuel Control, meaning its environmental attributes. In fact, it produces only 3.5 percent NO<sub>x</sub> (including its front-end fuel preparation process) working at its maximum capacity.

The boiler is achieved by capturing heat energy from exhaust gases and recycling it back up the exhaust stack. IBC Technologies had to be creative in the design of the equipment that operates in the condensing temperature range. The boiler's design tends to enclose the surface of the heat exchanger. The boiler's configuration and operating algorithm to control and optimize the boiler's performance condition and ensuring the boiler's fuel efficiency. The boiler is designed in a vertical downflow configuration. The boiler's electronic window works to reduce the boiler's heat loss. The boiler's electronic effect of many wet-dry cycles. The boiler's electronic effect of many wet-dry cycles. The boiler's electronic effect of many wet-dry cycles.

**Category:**  
Boilers and Technology  
Boiler Equipment

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