

# CASE STUDY

Emerado Centennial School – Middle School  
General Building Ventilation



Lowest Operating Cost of any School in the Province!\*

## School Ventilation

Adequate ventilation has long been an important consideration when designing HVAC systems for schools. Ventilation is extremely important for reducing many problems that can occur from mold growth, and off-gassing of materials in the space causing potential illness, to high CO2 levels causing drowsiness, and in turn low performance for students and teachers alike.



## The Mandate

Although the importance of ventilation is well known, it is one of the most costly aspects of operating a building. In cold climates heating outdoor air to usable temperatures takes a tremendous amount of energy, and can account for as much as 50% of the operating costs.

For Emerado School, the mandate was given to provide a system design that offered the best of both worlds, high ventilation for a quality learning environment, while minimizing capital expenditures and operating costs. Given the harsh Manitoba winter climate (-30 deg F design) this was a daunting task given the traditional energy recovery options available at the time.

## The Solution

To minimize impact of high ventilation rates on the operating costs an innovative choice was made – a Tempeff Dual Core ERV. With a performance rating of over 85% efficiency even at outdoor air temperatures lower than -30 deg F, the Dual Core unit was an ideal choice to minimize operating costs and simplify system design.



## RG 16000 on Emerado School

This unit helped the school consume less than 13 kWh/ft<sup>2</sup>/year!

The unit was sized for 8000 CFM of outdoor air, and was controlled by the BMS.

Discharge temperatures at low ambient still exceeded **53 deg F** due to **frost free operation!**

## The Results

After the project was completed and allowed to operate for 2 full heating and cooling seasons the engineer of record analyzed all the utility bills for the school. Taking all of the different bills they consolidated to a common unit – using kWh/Ft<sup>2</sup>/year. They found that the school had the lowest operating cost in the entire province, consuming less than **13 kWh/ft<sup>2</sup>/year**. This is especially impressive considering the harsh Manitoba climate where the school was located in (-30 deg F design temperature). Comparing to all schools in the entire country, Emerado still finished in the top 10%, even when compared to schools in a much milder climate.

The energy consumption noted is for entire school, and the Dual Core unit is only supplying ventilation air. However the engineer did state that without the Dual Core unit, the ventilation load would have accounted for 50% of the operating cost, thus the Dual Core unit contributed a significant portion towards low operating costs.

Due to the high efficiency and frost free operation the engineer was also able to simplify the overall system design due to the elimination of defrost strategies and oversized reheat considerations. This contributed significantly to the relatively low mechanical construction costs, where they were able to keep costs around **\$25 per square foot** (costs in Canadian dollars, circa 2006)

### Tempeff North America Ltd.

12-2130 Notre Dame Ave.  
Winnipeg, MB  
R3H 0K1  
[www.tempeffnorthamerica.com](http://www.tempeffnorthamerica.com)

P: (204) 783-1902  
F: (204) 633-0496

As a result of the success at Emerado, most new schools built in the province are adopting the Dual Core technology to help reduce operating costs, and allow an optimal learning environment for the staff and students. Many *retrofits* are also using Dual Core products to aid older schools in reducing energy consumption!

**Consult your local Tempeff Representative to assist you in reducing your operating costs!**

\*At Time of Publication

**DUAL CORE™ TECHNOLOGY**