

National Tile Contractors Association

September 2010

TileLetter

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ON THE COVER:
Schlüter Systems L.P.

**Moving your business forward
in today's economy**

**The Seventh Annual *TileLetter* Awards
Special Recognition winners**

Countertops and backsplashes

Real women in tile



Dedicated to education
and industry service

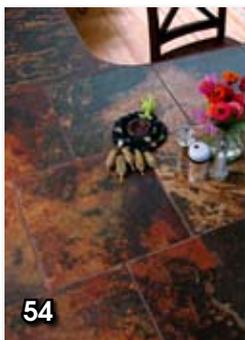
TileLetter

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Modular screed system with ceramic tile helps maximize energy efficiency of geothermal heating and cooling

Schlüter's Quebec headquarters aims for LEED® Gold Certification with energy-efficient design

By Sean Gerolimos, technical services manager, Schlüter Systems

Schlüter Systems' North American subsidiary was founded in 1986, with U.S. and Canadian offices located in Plattsburgh, N.Y. and Montreal, Québec, respectively. Strong growth over the next 20 years made it one of the largest operations in the Schlüter Systems international group, second only to the home company in Germany.

In 2008, construction of a new Canadian headquarters in Ste-Anne-de-Bellevue, Québec (west of Montreal) began. The 60,000 square-foot facility consists of three stories of office space, a large training center, a multimedia studio, and a sampling department. Over 65,000 square feet of tile was installed as floor and wall coverings.

The facility is in a natural setting facing the Saint-Lawrence Valley Natural History Ecomuseum near the McGill University Faculty of Agriculture and Environmental Sciences. Schlüter

Systems understood that the project needed to respect the environment established by its neighbors, and used it as an opportunity to demonstrate that corporations and nature can co-exist harmoniously. To accomplish this, Schlüter joined forces with a multidisciplinary team of architects, engineers, and consultants specializing in green building technologies. This article focuses on efforts to minimize energy use at the facility.

Geothermal heating and cooling

One of the primary design criteria for the new facility was to maximize energy efficiency. Heating and cooling of the space in the Canadian headquarters is largely accomplished through hydronic radiant-heated and radiant-cooled floors in conjunction with geothermal heat pumps.

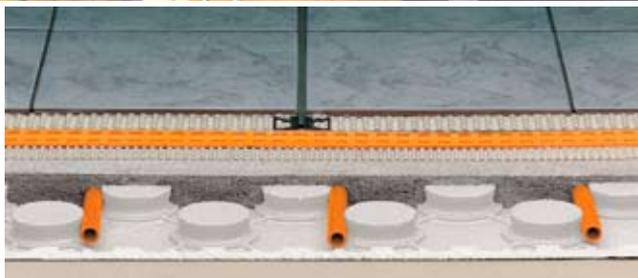
Geothermal heat pumps transfer energy to and from the earth and the

building via the water in the hydronic system. Thus, the earth is used as a heat source during winter and a heat sink during summer. This process is more efficient than conventional heating methods because the temperature of the earth is warmer than the outside air during the winter months and cooler than the outside air throughout the summer.

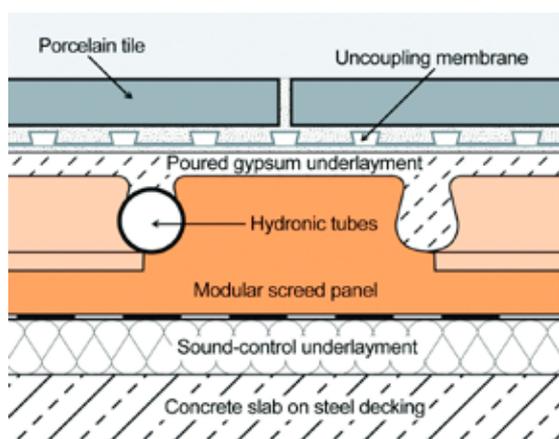
A similar principle was applied where a 200-foot long, 3-foot diameter tunnel was excavated behind the facility for the purposes of air exchange. Air temperature in the so-called “Canadian tunnel” remains consistently warmer than the outside air during winter, and cooler than the outside air during summer, thus reducing the amount of work required of the heating and cooling systems to maintain comfortable indoor temperatures.

Flooring assembly supports energy savings

Heat pumps operate at highest efficiency when water temperatures are kept relatively low. Therefore, to maximize energy efficiency in such a heating and cooling system, it is essential to optimize delivery of the energy to the space. This was accomplished through a simple and elegant solution.



The studs on the modular screed panel limit curing stresses and form a grid pattern to hold the hydronic heating tubes.



The modular screen assembly helps ensure durability of the tile covering, optimizes radiant heat transfer to the space and reduces sound impact transmission.

The flooring assembly consisted of the following components:

- 4-inch (100 mm) -thick concrete slab on steel decking
- 3/16-inch (5 mm) -thick recycled foam sound-control underlayment
- Expanded polystyrene foam modular screed panel with hydronic tubes
- Poured gypsum underlayment
- Uncoupling membrane
- Porcelain tile

Modular screed systems provide a stable and supporting base for tile coverings. The panels feature studs that divide the screed (e.g., portland cement

mortar bed or poured gypsum underlayment) into smaller square modules, thereby confining shrinkage and curing stresses to control cracks and curling. The studs on the panel also form a grid pattern to accept hydronic heating tubes when a heating screed is to be installed.

Since the screed mass to be heated is relatively small, the floor heating can be well-regulated and operated at a low temperature range, provided that the floor covering does not interfere. In general, ceramic and stone tiles are the ideal floor covering materials for use over radiant-heated floors. These materials are durable, hygienic, and have low thermal resistance. Therefore, the heat contained in the thermal mass (i.e., poured gypsum underlayment) is allowed to radiate freely to objects in the space above.

70 percent energy savings

Traditional office buildings in Montreal's West Island that are similar in size and use to the Schlüter Systems headquarters typically have energy costs between \$3.75 and \$4.00 per square foot for their total energy consumption. Based on current data, the new facility is projected to consume energy at a rate of approximately \$1.10 to \$1.20 per square foot. Thus, integration of the geothermal heat pumps,

modular screed, and ceramic tile covering has produced approximately 70 percent in energy savings over conventional heating systems.

The Schlüter Systems Canadian headquarters is an excellent example of how ceramic tile applications are con-

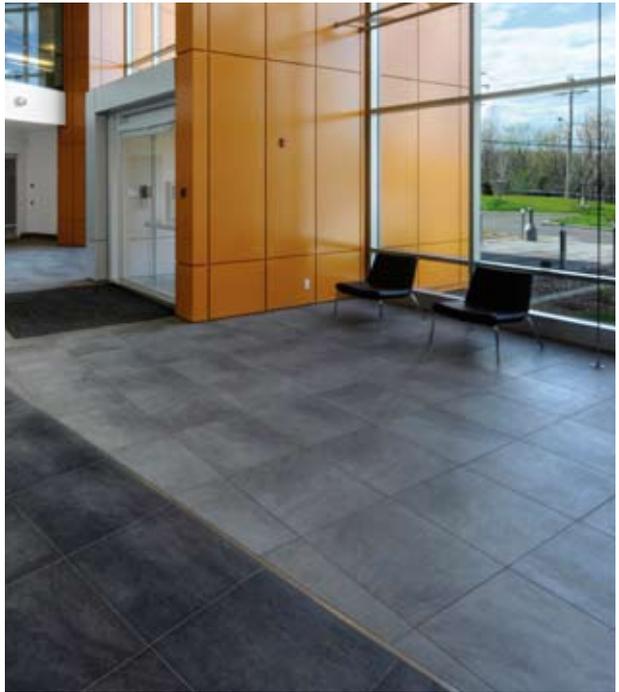


Schlüter joined forces with a multidisciplinary team of architects, engineers, and consultants specializing in green building technologies to minimize energy use at its Montreal-area headquarters.



Heating and cooling of the space in the Canadian headquarters is largely accomplished through hydronic radiant-heated and radiant-cooled floors in conjunction with geothermal heat pumps.

sistent with green building practices. Efficiency of the heating and cooling system is dependent upon the low thermal resistance of the tile covering in combination with the modular screed assembly. Ceramic tile produces no VOC emissions, does not harbor dust, and is easy to clean, thus contributing to overall indoor air quality. Thanks in part to the energy efficiency achieved and various other commonsense green practices, Schlüter Systems expects the new facility will receive LEED® Gold Certification.



Tile reigns: 65,000 square feet of tile was installed in the 60,000 square foot building.



Ceramic and stone tiles are the ideal floor covering materials for use over radiant-heated floors.