Hi-Velocity Systems™

Mini Duct Heating and Air Conditioning
Indoor Air Quality Systems

LEED CERTIFICATION

Leadership in Energy and Environmental Design (LEED®) certification is the recognized standard for measuring building sustainability.

Energy Saving PRODUCTS LTD

has invested 22 months to build a sustainable manufacturing facility under the LEED program. This program encourages the adoption of sustainable green building design techniques and construction practices.

THE FOLLOWING PAGES LIST THE LEED® POINTS WE WERE AWARDED, AND FOR WHICH AREA THEY APPLIED

Energy Saving Products New LEED Certified Manufacturing Facility

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System ® is the recognized standard for measuring Building Sustainability, awarded by the Canada Green Building Council. This program encourages the adoption of sustainable Green Building design techniques and construction practices.

Hi-Velocity Systems™

Energy Savings in a Complete Indoor Air Quality System

LEED CERTIFICATION

Individual Outlet Dampers allow for optimum zoning flexibility, while minimizing ductwork and maximizing comfort.

Make-up air unit installed to satisfy ventilation requirements and to ensure high levels of Indoor Air Quality.

A ***Solar Collector System*** is being incorporated to supply supplementary heat to the hot water tank and building heating system. These are constructed of a bank of tubes that absorb thermal energy from the sun and exchange this heat to water flowing through the tubes. This is done to reduce the load on the boilers and take advantage of our planets free energy.

69°

69°

The ***Hi-Velocity AIr Curtain*** in the loading bay reduces uncontrolled air exchanges, limiting thermal loss and gain when shipping doors are open.

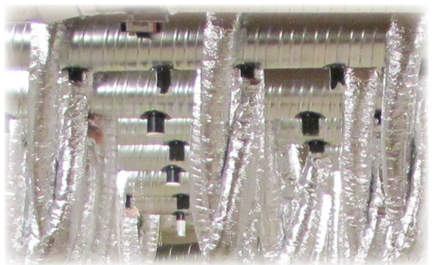
Hi-Velocity Drilled Outlets provide even temperatures from floor to ceiling through constant air circulation. This ensures a simple and cost effective way of distributing the conditioned air evenly.

In-Duct Dampers allow for a more practical approach to zoning larger areas.

Chilled Water Cooling Modules (WCM) allow for maximum zoning flexibility without concerns associated with conventional DX cooling.

Each air handling unit ***uses a Hi-Velocity Air Purification System (HE PS)***. This system utilizes photo-catalytic technology to eliminate VOC's, CO, and odours from the air. This provides optimum air quality to the occupied spaces, increasing IAQ.

By Energy Saving PRODUCTS LTD



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LEED® Points Awarded (Research and Development):

In order to promote more environmentally friendly means of transportation we have provided:

- Covered bike storage
- Shower and change room
- Prime parking spots for car pooling and alternate fuel vehicles

A large focus of the LEED program is the health, safety and comfort of the building occupants:

- This requires the building to have proper indoor air quality and meet ASHRAE Standard 62 with respect to ventilation requirements. Carbon dioxide detectors have been strategically installed to ensure that adequate amounts of fresh air are delivered to the conditioned space.

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LEED® Points Awarded (Mechanical Room):

All Hi-Velocity Fan Coils utilize Leading Edge Technology:

- Variable frequency drives (VFDs) provide a wide range of motor speeds and only consume the amount of power needed to achieve the desired speed. This provides optimum energy savings and power reduction when compared to standard furnace motors.

- When using VFDs in conjunction with the PWM zoning controller, motor power consumption can be reduced even further as motor speed is decreased to only provide air to the zones that need it.

- Fan energy savings are most significant on lower fan speeds such as circulation fan which is important to help stir, distribute and filter air. This means that the customer is able to maintain a higher level of indoor air quality without paying higher energy costs.

- Indoor air quality is further improved with the use of the HEPS – High Efficiency Air Purification System. This is a three stage filtration system which removes particulate matter, de-activates micro-organisms and eliminates VOCs (Volatile Organic Compound), CO as well as odours from the air.

Heating is accomplished by High Efficiency Condensing Boilers:

- These are equipped with outdoor reset capabilities which maximize boiler efficiency by adjusting the supply water temperature based on heating demand.

- A renewable energy system being incorporated in this building is a solar collector system to supply supplementary heat to the hot water tank and building heating system. These consist of a bank of tubes that absorb thermal energy from the sun and exchange this energy to water. This is done to reduce the heating load on the boilers by utilizing a renewable resource, and take advantage of our planets free energy.

All Cooling in the building is provided through Chilled Water:

- This is beneficial as water chillers utilize a reduced volume of refrigerant in order to provide cooling when compared to standard condensing units.

- All refrigerant is fully contained within the chiller, this greatly reduces the need for servicing and possibility of refrigerant leaks.

- In order to reduce ozone depletion, there are no CFC refrigerants used in the HVAC equipment.

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LEED® Points Awarded (Outdoors/Landscaping):

This building's construction site was selected to minimize environmental impact. This is accomplished by:

- The re-use of existing building location and foundation eliminates the need for excavation and pouring concrete for a new foundation.

- Choosing a site that was previously developed land which is not prime farmland, ecologically sensitive or habitat for threatened and endangered species.

- Ensuring that plants and trees used in landscaping are local, adaptive and drought resistant, which means they require no irrigation.

- All top soil used for landscaping is either recycled or reused.

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LEED® Points Awarded (Warehouse):

- The building utilizes ***600 volts as a primary power supply, dropping this voltage down to 347 volts to supply the entire T5/T8 lighting system***. This has the advantage of running with lower amperage draws, thus reducing the number of circuits, wire gage and materials required.

- In order to further decrease power consumption within the building warehouse, ***lighting is equipped with motion sensors*** which will cycle the lights on and off based on occupancy.

- The building has an ***easily accessible and convenient recycling area*** that allows for easy recycling of paper, corrugated cardboard, glass, metal and plastic during building operation, which we have continued to use after completion.

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LEED® Points Awarded (Shipping/Receiving):

This building has made use of both recycled and reused materials:

- The exterior wall insulation used is Cellufibre insulation that consists mostly of recycled cardboard.
- The existing concrete foundation from old building was reused to eliminate need for new concrete.
- Reused and recycled materials make up at least 10% of the total value of the building materials used.

This building makes use of an air curtain to reduce thermal loss and gain when shipping doors are open:

- An air curtain creates an air barrier that prevents uncontrolled air exchanges.
- This helps contain heat in the winter and cooling in the summer
providing a much more comfortable work environment for occupants.

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LEED® Points Awarded (Production):

Creating a Smaller Footprint:

- In order to reduce cooling loads during the summer months we used highly reflective roofing material. This is done to reflect thermal heat away from the building.
- In order to reduce heating loads during the winter months each air handling unit utilizes a Heat Recovery Ventilator (HRV). These transfer thermal energy from the air being exhausted to the fresh air being brought into the building. This will help to minimize the ventilation load in the winter as well as the summer.
- All HRVs are equipped with 7 day programmable timers which turn off during un-occupied times to reduce power usage when fresh air is not required. This further reduces energy consumption as fresh air is not being unnecessarily heated or cooled.

To help increase the demand for Building Materials and Products extracted, processed and manufactured within our region, largely local materials have been used in the construction of this building:

- This supports the use of indigenous resources and reduces the environmental impact resulting from the transportation of materials.
- At least 20% of construction materials used in the building have been extracted and manufactured within 800KM of the project site.

Some examples of Local Materials used are:

- Steel structure, siding and framing
- Spray Insulation for walls
- Wood used for sub flooring
- Drywall

Some types of Fire Suppression Systems and refrigerants used in Air Conditioning contribute to Ozone Depletion and Global Climate Change:

- We have installed a fire suppression system which does not utilize any type of environmentally harmful pollutants. Instead only water is used within the system.
- All air conditioning for the building is done through water chillers which utilize environmentally friendly refrigerant 410a, meaning it has a greatly reduced impact on ozone depletion when compared to CFC and HCFC refrigerants. There have been no CFC or HCFC refrigerants used for the building's various mechanical systems.

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LEED® Points Awarded (Upstairs Office Area):

This Building has been Designed to Maximize Occupant Comfort Levels and Productivity:

- Productivity is promoted by the fact that most of the offices within the building have a direct view to the outdoors.

- Comfort is achieved by providing 75% of the building occupants with individual comfort controls.

- The majority of offices within the building have their own designated thermostat which means that temperature can be individually set within each office by the occupant.

- The design and installation for all zoning systems has been made simple with the use of the PWM zoning controller which senses the static pressure inside the S/A duct and adjusts fan speed up or down accordingly, reducing energy usage.

- All adhesives, sealants, paints, coatings and flooring systems consist of minimal volatile organic compounds (VOC's). This is to reduce the quantity of indoor air contaminants that are odorous, irritating and harmful to the comfort and well-being of installers and occupants. It is the commissioning agent's responsibility to ensure that the materials actually being installed within the building were in fact LEED® compliant. However, this task was made much more efficient by utilizing the extensive knowledge, expertise and experience that each specific trade with their suppliers brought to the project.

- The project also had a LEED® accredited professional. This accredited professional gave guidance through the design, construction and certification process.

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LEED® Points Awarded (Washrooms):

All plumbing fixtures in the building are low flow fixtures which help to:

- Reduce the amount of potable water used within the building.

- Reduce the amount of sewage conveyed to water treatment plants.

- Lower building operating costs.

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LEED® Points Awarded (Rooftop):

A renewable energy system being incorporated in this building is a ***solar collector system*** to supply supplementary heat to the hot water tank and building heating system. Three banks of tubes will be installed on the roof, which will absorb thermal energy from the sun and exchange this energy to water. This will reduce the heating load on the boilers by utilizing a renewable resource, and take advantage of our planets free energy.

An efficient solar heating system will make the best use of whatever sun is available. To produce heat, the sun doesn't have to shine brightly. A parked car, for example, warms up on a cloudy day. Solar collectors work much the same. Highly-efficient collectors can utilize even the smallest amount of solar radiation.