NanoSonic, Inc.

FACILITIES INFORMATION
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NanoSonic's Green Offices

GREEN FEATURES

- LEED-Certified Green Building
- First tenant in Wheatland EcoPark
- Instrumented InSpire solar wall
- Light harvesting system
- Natural stormwater treatment
- Offices have beautiful views

Nanosonic's comprehensive experience with the underlying properties of materials – from thermoelectric energy conversion devices to ultrathin coatings for duct insulation – is helping us lead the way towards achieving marketable zero energy buildings by quantifying, reporting and controlling resource consumption in buildings -- starting with our own. NanoSonic's LEED-certified green building provides a test-bed for many of the energy-saving technologies that we develop such as building sensors, instrumentation and processes. Furthermore, as part of our commitment to sustainable operations, we share our experiences through various educational programs to help others understand how we've merged our business with environmental stewardship. This educational document briefly describes what makes our building "green."

NanoSonic maintains 30,000 square feet of laboratory and office space outside Pembroke, Virginia, near Virginia Tech's main Blacksburg campus. This main building is located within the Wheatland EcoPark, an environmentally-friendly office and light manufacturing industrial park and the first such environmental development in Southwest Virginia. The building is energy-efficient and a LEED-Certified Green Building using LEED NC 2.2 for New Construction. The LEED (Leadership in Energy and Environmental Design) green building certification program encourages sustainable building and development practices using rating systems that recognize projects that implement strategies for improved environmental and health performance.

Among the innovative features in NanoSonic's main building are an instrumented solar wall on the south side (above) and 'light harvesting' lighting control in the labs. The solar wall has sensors that measure temperature and automatically operate dampers when the inside

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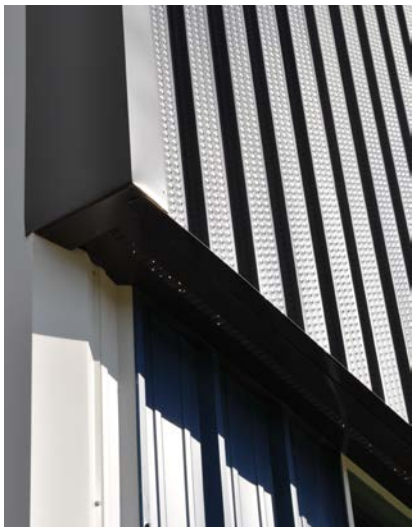
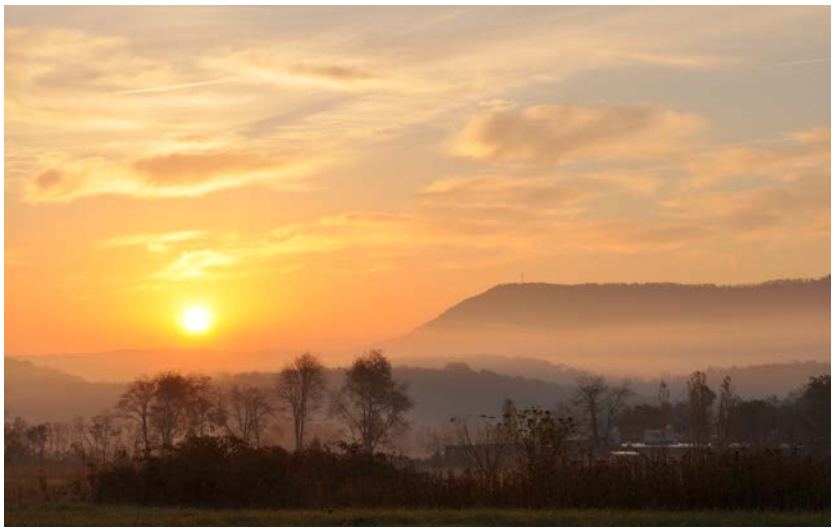
temperature is low enough and the outside air temperature coming from the wall is high enough. The south-facing exterior wall is covered with 3,618 square feet (336 m2) of InSpire from ATAS, a unique product that functions as a transpired solar collector. The system can contribute to almost 50 percent reduction in energy use. The aluminum InSpire wall panels are mounted a few inches from the building's outer wall. Solar-heated air at the surface of the panel is drawn through precision perforations where it rises between the two walls and enters the building's ventilation system. In the summer, the InSpire panels help by preventing normal solar radiation from striking the building's main wall. Hot air is thermally siphoned up the wall and vented through holes at the top of the system. During the summer months, bypass dampers allow fresh air to be drawn directly into the building, maintaining indoor air quality.

The south wall is a transpired solar collector that helps reduce our heating and cooling needs. NanoSonic offices have views of the beautiful countryside in rural Pembroke, Virginia.

For the light harvesting, there are light sensors located in the laboratories and skylights. When it's sunny, light streams through the skylights and the interior lighting throttles back halfway; when it's cloudy, the interior lights are full on – the staff enjoy seeing the interior lights toggle on and off as big puffy clouds and wind alternately block the sun outside. The staff also enjoys mountain and pasture views from windows that look out over 130 acres of EcoPark farmland helping maintain a certain balance of high technology and nature.

Occupancy sensors are located throughout the building and in each office. They enable the lighting and heating systems to automatically turn on when motion is sensed and off when there is no motion. This conserves energy by automatically turning the lighting and heating off when

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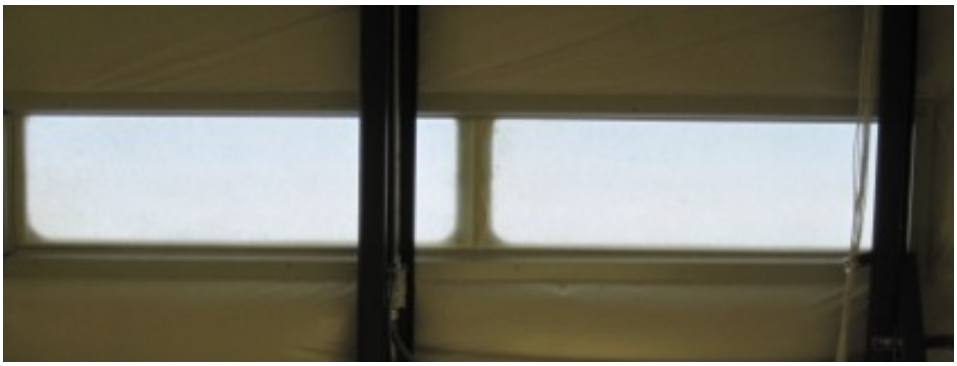
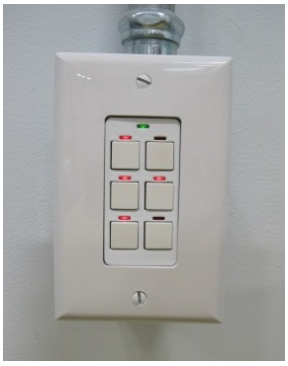
no one is in the office space and also allows these systems in infrequently used areas to remain off unless someone is in the area.

We use our green building as a test bed for the development of other energy-efficient, non-toxic materials and systems, such as a low-power wireless building monitoring system that will be able to sense HVAC air flow, temperature, light intensity, detect smoke and gauge power consumption. By commercializing such high-performance computing measurement systems, our goal is to help other companies achieve greener buildings by reducing energy consumption and operational costs in their properties, too.





Skylights in laboratory areas (above, left) are linked to light sensors (above, right) to allow the lighting system to toggle on and off as sufficient sunlight is available.

Green Building Features:

- The building is oriented so that windows in primary office and breakroom spaces are on the south side, with some east and west, for best daylighting and views. Minimal windows are placed on the north side of the building to limit infiltration of winter wind and cold.
- The solar wall on most of the south side has been measured to show a maximum differential of ambient temperature-to-delivered temperature from the wall of about 55 degrees, i.e. 20 degrees outside with 75-degree air coming into the ductwork.
- Bicycle racks are provided to facilitate bike commuting.
- The loading dock area is air-sealed to minimize interference with the total building HVAC.
- Stormwater runoff from the site is channeled into a natural depression with natural weirs to slow the flow and prevent erosion. Even in the heaviest rains, there has been no standing water in this bioswale.
- Windows are low-E coated for better, more energy-efficient performance – they reduce undesirable heat gain in summer and reduce heat loss in winter while still allowing in lots of daylighting.
- Skylights in laboratory areas are linked to indoor light sensors, so that indoor lights gradually turn off as skylights provide sufficient lighting for safe light.

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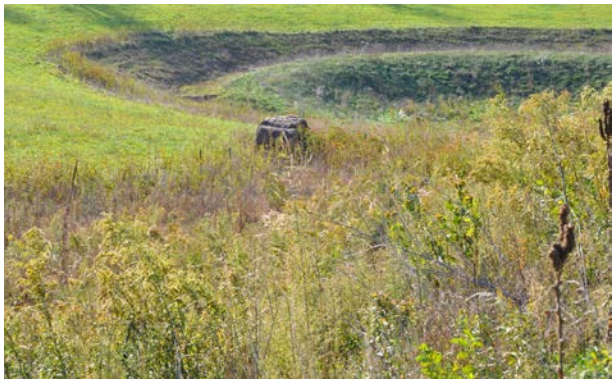
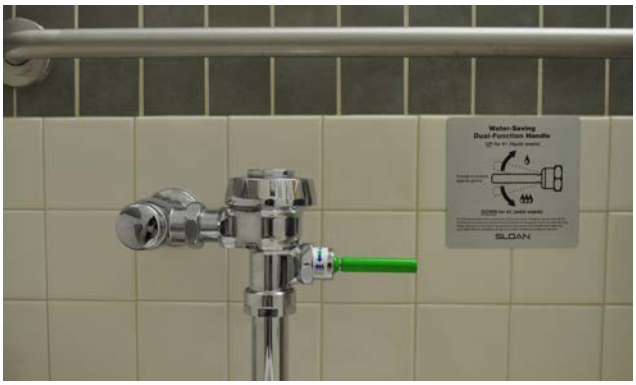
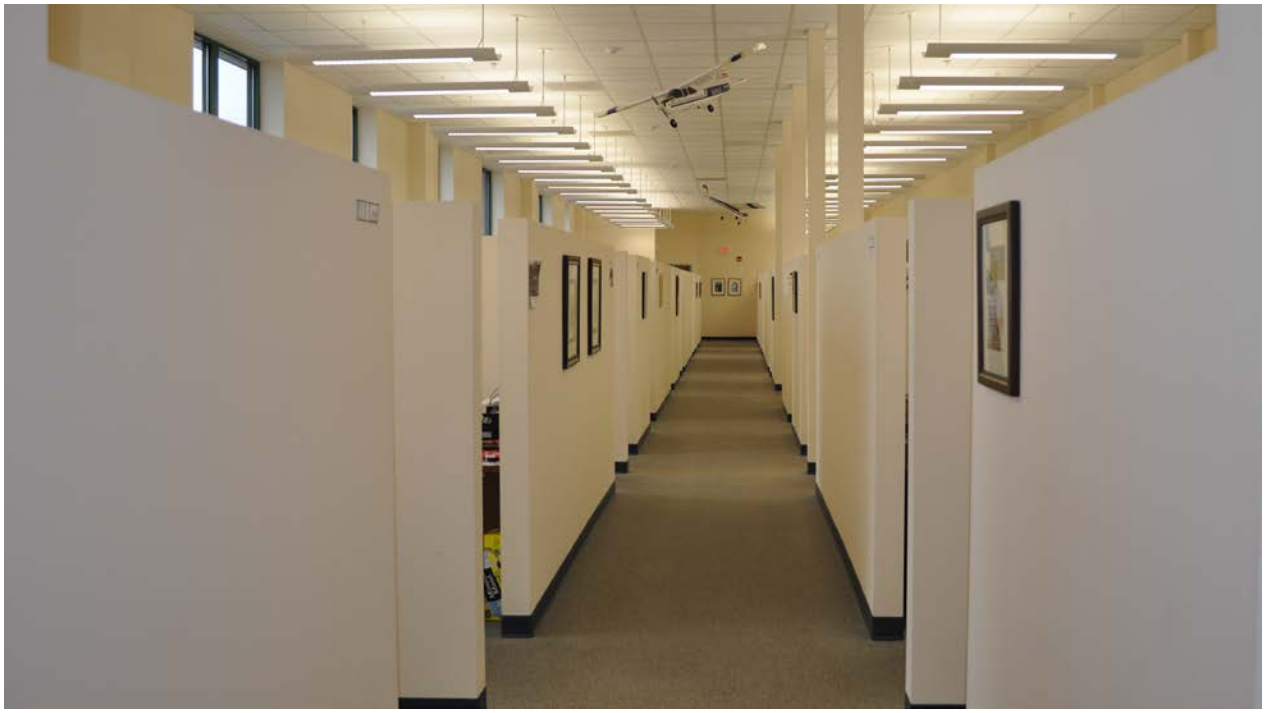




Stormwater is naturally slowed and filtered in an adjacent "sinkhole" on-site. Toilets are dual-flush.

- Toilets conserve water by using separate flush modes for liquids and solids.
- All indoor lighting is energy efficient.
- Automatic lighting and heat control set-backs are informed by occupancy sensors and time of day.
- Outdoor lighting uses low-voltage safety fixtures.
- The building displays signage that describes its sustainable features to help visitors, employees and school children understand what makes our building "green."



Daylighting is facilitated with large windows on the south wall and supplemented by sensored lighting that automatically turns off and on based on motion detection.

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