

## See the light

Looking to save energy? One supplier says it could be as easy as changing light fixtures.

*Editor's note: To learn about the latest in energy saving light fixtures, Refrigerated & Frozen Foods spoke with Neal Verfuert, president and chief executive officer for Orion Energy Systems Ltd., Manitowoc, Wis.*

**Refrigerated & Frozen Foods: Let's say that a temperature-controlled building operator – a food processor or cold storage warehouse – hasn't purchased industrial lighting for some time. In what ways have lighting technologies changed?**

**Neal Verfuert:** Prior to 2001, HID (High Intensity Discharge) lighting was standard in food processing plants and warehouses. With lamp temperatures operating up to 1,200° F and the fixture consuming 465 watts of energy, HID lighting significantly increases cooling costs and doubles the cost of energy for light output.

**R&FF: What happened in 2001 to change that situation?**

**Verfuert:** That's when Orion developed a compact modular fixture that is designed to maximize fluorescent light output, while maintaining a cool 120°F temperature and using only 221 watts of power — half the power as the industry standard HID lighting while producing about 50 percent more light.

**R&FF: What are building operators' primary objections to new lighting expenditures? How do you address those concerns?**

**Verfuert:** Our biggest challenge is "old thinking." When a customer hears

that a product will save them 50 percent in energy costs, they think it's too good to be true, particularly for freezer applications where fluorescent lighting hasn't held up to the extreme temperatures. Often times, we will install a few sample lights in a facility along with a device that measures the kilowatts being used to prove that it really does work.

With installations now in place for as long as four years, this objection is becoming easy to overcome.

**R&FF: Please elaborate on your cold temperature technology.**

**Verfuert:** We believe that we developed the first low temperature energy-efficient fixture for use in refrigeration and freezer application. The optimum temperature for the air around a fluorescent bulb is around 120°F. By enclosing the fixture, we have found a way to maximize the heat emitted from the lamp to keep the ballast and lamps at the optimum temperature — even in environments as low as -20°F — while still maintaining adequate light levels. The average savings for energy and reduced cooling costs are typically 75 percent of previous energy consumption and customers have reported significant improvement in pick times.

**R&FF: How do you distinguish your company's lighting technologies and services from competitors in the field?**

**Verfuert:** We believe that our technology is superior because of extensive research and development. Our fixtures are tested in a proprietary thermal test



The industry standard, high intensity discharge lighting is associated with lamp temperatures up to 1,200°F — with a fixture consuming 465 watts of energy.

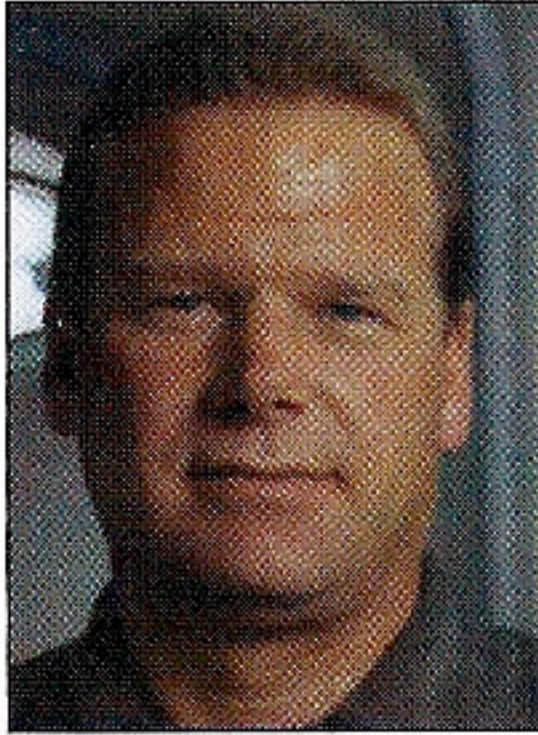


New lighting technologies offer brighter light with less energy and a lower lamp temperature.

chamber — in temperatures as low as -60°F. They are analyzed to determine what design gives the highest output in a given cold temperature environment. For that matter, all Orion fixtures are designed to deliver the most amount of light for the least amount of energy.

**R&FF: What, specifically, makes your technology different?**

**Verfuert:** Energy can only be converted to three things: heat, vibration and work (in this case light). We have found a way to take the amount of energy that is wasted on heat and vibration and turn it into light. There are several factors in our patented



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— Neal Verfuert, Orion Energy Systems

design that contribute. For starters, the geometry of the reflector (manufactured with a roll former) harvests and focuses light to create a superior zonal cavity effect – as opposed to other fixtures on the market that are formed on a break press and result in inefficient use of light.

Second, our proprietary aluminum I-Frame conducts heat five times better than the steel that is used to frame other fixtures on the market. There also are special airflow vents – strategically placed on the I-Frame – to create airflow to cool the ballast.

The fixture's light-weight and "plug-and-play" design reduces installation and maintenance time and costs. This feature also allows for cost-effective future field upgrades – such as motion sensors or other load-shedding controls.

**R&FF: You've mentioned load-shedding controls. In what ways are lighting fixtures integrated with other energy savings initiatives?**

**Verfuert:** We say that Orion creates a "virtual power plant" inside the walls of each facility by displacing and controlling both base load and peak load energy capacity. After all, the least expensive source of power, is power that doesn't have to be created at all.

In a typical industrial, commercial or warehouse situation, Orion's energy and lighting solutions result in a

minimum 50 percent energy cost savings for lighting at a customer's facility while simultaneously increasing the quality of light and the quantity of light output by 50 percent when compared to the industry standard high intensity discharge fixture. We call this, "energy savings without compromise."

Now, we're executing the next phase of our business model through demand-response initiatives, an integrated system that is proven to dramatically reduce and control peak load demand, at times literally taking our customers off the grid when power is most expensive.

The system includes our Apollo Light Pipe, which – when installed in a ceiling – can transmit enough usable sunlight at times to be used as a sole

### Read all about it!

Energy consumption for all lighting in the United States is estimated to be 8.2 quads, or about 22 percent of the total electricity generated nationwide, according to the U.S. Department of Energy (DOE). Because lighting represents one-fifth of national electrical consumption, DOE selected lighting as one of the principal target markets for development of more efficient technologies.

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[www.eere.energy.gov/buildings/tech/lighting/index.html](http://www.eere.energy.gov/buildings/tech/lighting/index.html)

source of lighting. Integrated with our compact modular fixture, ambient light sensors and smart building control technology, the components communicate back and forth regarding current and required light levels to automatically turn lights off and on again as needed.

The environmental benefits are dramatic. Since 2001, Orion's technology has reduced electricity demand by 272 megawatts, and as a result reduced carbon dioxide emissions by 3.3 million tons.

**R&FF: Our readers include both food plant processors and warehouse operators. How do you distinguish lighting fixtures for those markets?**

**Verfuert:** Plant lighting needs may differ from those in warehousing. For example, because areas in a warehouse often are unoccupied, motion sensors are an excellent option for turning lights on and off, depending on the motion in a given area. Optimal light levels can be achieved – when needed – by having all lights turned on or lights can be turned partially or completely off when areas are unoccupied.

It is important to concentrate light levels in the right place in a warehouse because this is key to increasing pick time. Mistakes often are made when foot candles are measured at the floor level rather than at the label level where optimum light is required for readability.

Foot-candle requirements for food plants are typically higher and constant during operation. Color temperature and Color Rendering Index (CRI) can be very important for complex assembly tasks. **RFF**