

The Taco Innovation & Development Center: **Designing a sustainable facility from the ground up.**





IDC resident trainers include John Barba, Dave Holdorf (top image) and Rich Medairos (at left).

The Taco IDC: A Powerful Combination of Comfort Technology & Education

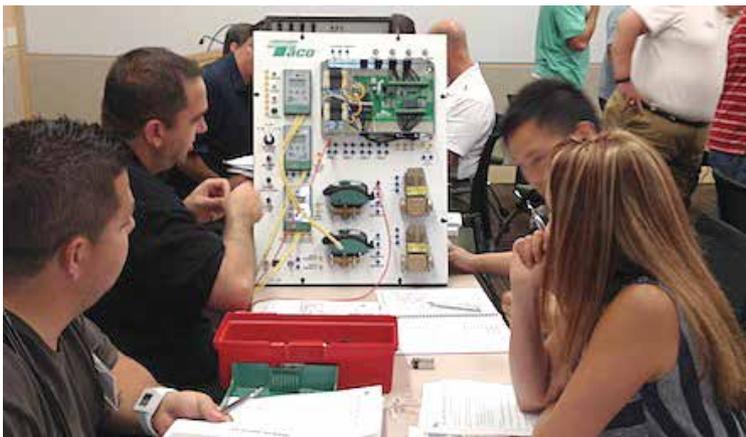
Opened in 2012 after two years of planning and construction, the LEED Gold certified Taco Innovation & Development Center (IDC) is a 24,000 sq. ft. addition to the Taco factory and company headquarters located in Cranston, RI. It contains various classrooms, including a main 50-seat tiered classroom on its first level.

The second level contains a large conference room, library and office spaces.

Dedicated to instruction and education, and replacing an outmoded Learning Center which was opened in the main building in the early 1990s, the IDC serves Taco employees for job-related training and personal educational pursuits (GED, college-level courses) and as a training center for visiting industry professionals to include plumbers, mechanical contractors and engineers.

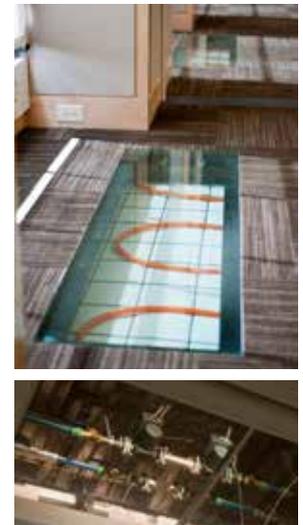


Classes for Taco's residential focused FloPro Team training program and commercial focused Taco University for mechanical contractors and engineers take place regularly in the IDC. In fact, you'll find busy classrooms on almost any work day at Taco.



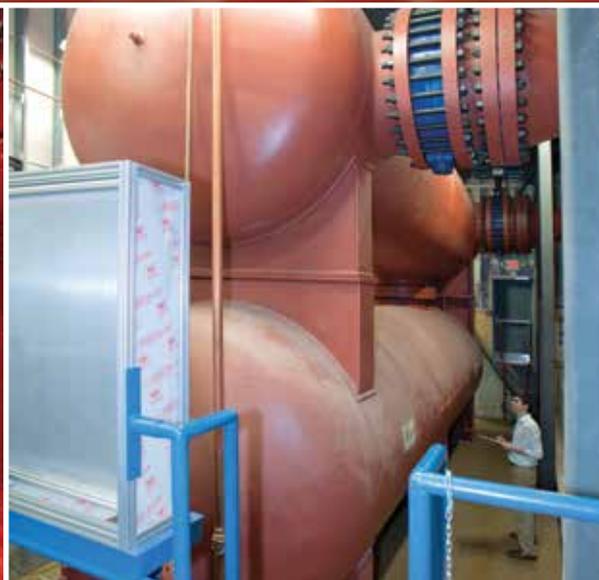
A Living Laboratory for Hydronics

Designed as a "living laboratory" showcase for energy saving and sustainable products and systems, the IDC employs a range of best-in-class HVAC industry products and Taco specific hydronic application products. Taco products are both operational and, by design, selectively visible in the IDC's floor, walls and ceiling for close-up viewing, hands on learning and teaching purposes.



Products and systems installed in the IDC include:

- Active and passive chilled beams with Taco's LoadMatch® single-pipe circulators and LOFlo® injection mixing blocks
- Radiant ceiling heating & cooling
- Fan coils
- Water source heat pumps
- Perimeter radiation/radiant floor heating
- Solar hot water
- Snow melt
- Variable speed pumping
- Taco iWorX® web-based building management controls



Mechanical Room Design Goal & Features

The IDC's 1,800 sq. ft. mechanical room is the building's largest demonstration and teaching space. Tied to a pre-existing heating plant utilizing a series of condensing boilers for pumping 3 million BTU's to the mechanical room for heating and seasonal snow melt, the IDC mechanical room features color coded mechanical systems for easy identification. Along a wide pathway throughout the room, Taco showcases how its products integrate into various operating systems.

The mechanical room design goal was to optimize hydronic-side design in pumping and heat transfer systems and to remove/add as much heat as possible using chilled beams, flat panel wall radiation and radiant floor systems. All equipment and systems are controlled by Taco's proprietary iWorX web-based building management controls product line and monitored by a host of sensors and meters located throughout the building.

IDC mechanical systems include:

- Radiant cooling and heating
- LOFlo injection mixing technology
- LoadMatch single-pipe technology
- Active and passive chilled beams
- Demand ventilation control systems
- Rooftop cooling towers
- Rooftop energy recovery systems
- Lighting controls
- BTU metering
- Energy metering
- Active and passive solar heat gain controls system

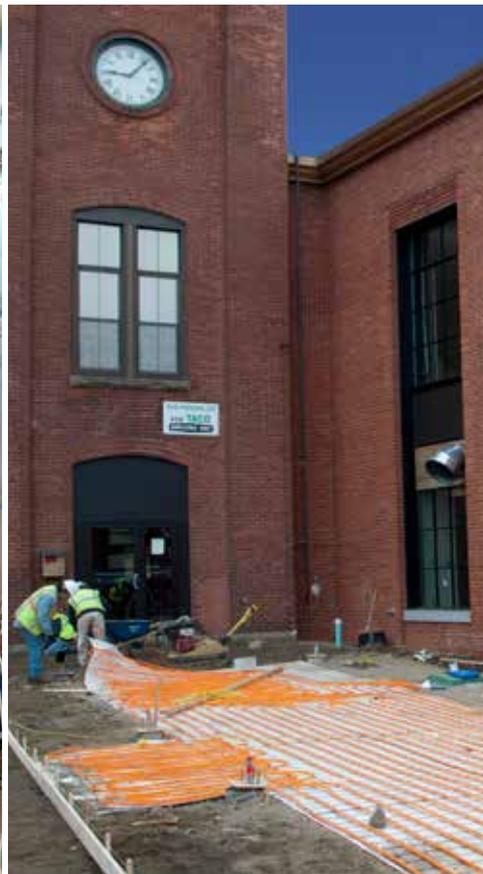


A Focus on Energy Savings & Sustainability

In designing the IDC, Taco certainly had LEED certification in mind, but the project design team managers did not design strictly for the sake of LEED points. The objective for the IDC was to design the most comfortable, efficient building possible and then see how the design translated into LEED points. As a result, not everything that Taco wanted to accomplish with the building fit into the LEED scorecard for points.

In doing so, the building's design strategy went beyond LEED to achieve a highly energy efficient, highly sustainable green building. LEED certification was viewed as a recognized public validation of the building but was not the sole goalpost for the project.

As a manufacturer of many of the heating and cooling equipment components and systems that went into the building, Taco wished to use them for technology demonstration purposes in order to show engineers, architects and building owners what could be achieved with the current level of hydronic-based comfort technology.



Sustainable design features include:

- Enhanced building envelope beyond code
- High performance glass
- Reflective white roofing
- Snow melt system
- Electric vehicle charging station
- Radiant flooring
- VOC free carpeting
- Advanced lighting controls & day lighting
- Robust energy recovery systems
- Use of renewables: solar & geothermal
- Chilled beam technology supported by Taco LoadMatch & LOFlo systems
- Variable speed pump drives
- Demand ventilation control system
- BTU energy metering
- IAQ monitoring & control
- Recycling

Monitoring Energy Use

The performance of the IDC's mechanical and electrical systems have been monitored continuously via dedicated measurement and verification systems. Since the building's opening in mid-2012 several new measurement stations have been added including hydronic BTU metering systems, electrical sub-meters and building automation monitoring systems.

These measurement systems have allowed Taco to monitor energy consumption in real time and compare actual energy measurements against an initial energy model provided by The Green Engineer, LLP consulting firm, which established a series of ECMs (*Energy Conservation Measures*) for the building.

In fact, the IDC's operational performance since its opening has far exceeded expectations for indoor comfort, quiet operation and energy efficiency.

IDC LEED Scorecard

The IDC achieved 62 points out of a total of 79 points to earn LEED Gold certification from the USGBC.



Points were awarded under the following categories:

Sustainable Sites.....	20
Water Efficiency	4
Energy & Atmosphere.....	15
Materials & Resources	6
Indoor Environmental Quality	10
Innovation & Design Process.....	5
Regional Priority Credits	2
	<hr/>
	62

Of note, the IDC garnered 15 out of a possible 20 points total in the Energy & Atmosphere category and 8 out of 11 possible points for optimization of energy performance.

Fulfilling the IDC's Promise

The IDC has been a busy place since it opened and has provided training and education to Taco's workforce as well as thousands of visitors attending a broad curriculum of courses to date for residential, commercial and controls. And it has proved particularly useful (indeed enlightening) as a demonstration model to visiting architects, commercial building developers and facility managers, showing them what is possible today in achieving a most comfortable, quiet, and highly energy efficient building.



To learn more about Taco factory and on-line training visit www.TacoComfort.com