

# REX TCS™ Thermal Control System Cuts Energy by 33% on Plastic Extruder at PACTIV

## CASE STUDY

A new barrel heater design reduces energy use, improves temperature control and is easy to install. Focus on Energy measurements show Pactiv Corporation in Chippewa Falls, Wisconsin cut heater band energy use by 33% on a large plastic extrusion machine with five heating and cooling zones. The new heater band uses radiant heat to raise barrel temperature and airflow between the barrel and the heater to reduce barrel temperature. Temperatures can be more tightly controlled by insulating heated thermal mass from the barrel.

“The ease of installation of these heaters is a key benefit for us” says Mike Arrigoni of Pactiv Corporation. “Since barrel heaters normally require routine replacement, reducing downtime for replacement is very important.”

“We were skeptical at first that something this simple could have the projected impact. After testing and measuring the results, we hope to install them on the rest of our extruders” says Mike Arrigoni. “We worked with Rex Materials Group to complete the first installation, and will be able to finish the remaining installations ourselves”.

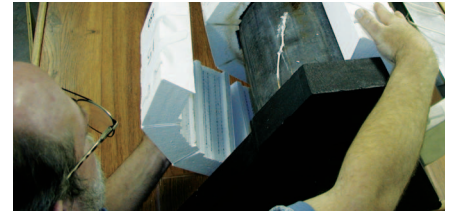
### OPPORTUNITY

Pactiv’s extrusion operation was already well run. Despite this, they seek continuous improvement and work with the Focus on Energy Program as a resource to identify new opportunities. Rex Materials, Inc. proposed using the REX TCS thermal control system as an energy saving alternative to replace the existing traditional water-cooled system for barrel heaters. REX TCS had been implemented in a handful of facilities outside of Wisconsin, but not yet within the state. As a leader, Pactiv partnered with the Focus on Energy Program to trial the technology and participate in a formal technology measurement and verification assessment.



REX TCS™ installed on extruder barrel at Pactiv Corporation

PROJECT SUMMARY	
Project Cost	\$14,200
Energy Savings	\$4,400
Focus Incentive	\$6,700
Energy Payback	1.7 years



REX TCS™ are used in place of standard ceramic heater bands and are quick to install.

### RESULT

The radiant barrel heaters reduced energy, eliminated cooling water, and longer life will reduce maintenance and downtime. A good part of the savings come from reducing the temperature settings of the five barrel heaters that were tested. By saving 89,000 kWh hours per year, the annual energy cost reduction pays for the project cost in about 3 years. With the Focus on Energy incentive, the payback was 1.7 years.

### TECHNOLOGY BENEFITS AND CONSIDERATIONS

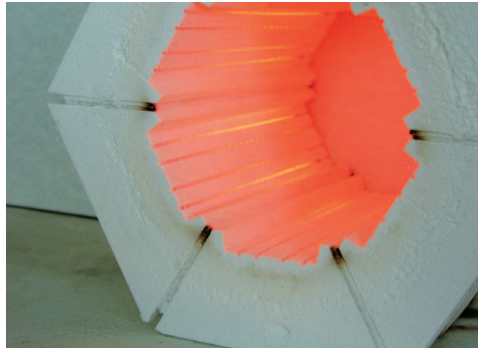
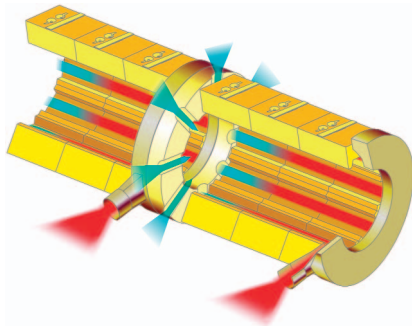
Barrel heater bands are necessary to control temperature in extrusion and injection molding. Water is sometimes used to rid the barrel from excess shear heat. The thermal momentum of traditional heaters, requires that continuous heating and cooling adjustments be part of the normal operation for maintaining the system within the specified temperature range.

The radiant heat supplied by the REX TCS does not have this “thermal momentum” so temperature overshoot is prevented. This improved control minimizes the amount of cooling necessary and sometimes allows a temperature set-point reduction that further reduces energy use.

To learn more about Focus on Energy, call 800.762.7077 or visit [focusonenergy.com](http://focusonenergy.com)

## ABOUT PACTIV CORPORATION

Pactiv Corporation is a leader in the consumer and foodservice/food packaging markets it serves. Pactiv's foodservice/food packaging offering is one of the broadest in the industry, including both custom and stock products in a variety of materials. Pactiv's Chippewa Falls facility produces products for the U.S. foodservice/food packaging market.



**Rex TCS does not depend on barrel contact to conduct heat to the barrel. High radiant energy release from the exposed heater elements permit much faster heat up and response time than conductive type band heaters. Channels under the radiant heater allow cooling air to make direct contact with the barrel. This eliminates the need for cooling water and the hot air can be externally vented, reducing the cooling load during the summer, or reclaimed, reducing the space heating needs in the winter. The hot air could also be reclaimed and used to preheat resin.**

## FOCUS PRESCRIPTIVE INCENTIVE

To encourage broader use of this technology, Focus is offering an incentive of \$50 per existing heater band kW, up to 50% of project costs, to install a Rex TCS™ Thermal Control Solution system. Eligible Wisconsin users of plastic processing equipment, including injection molding, profile and sheet extrusion and blow molding may apply. Contact your Focus on Energy Advisor to learn more about this incentive.

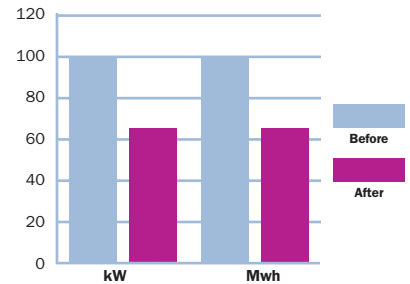
## TECHNOLOGY DESCRIPTION

The Rex TCS™ Thermal Control Solution has radiant heaters embedded in ceramic insulation. The high radiant energy release from the exposed element directs all of the heat into the barrel of a plastic extrusion or injection molding machine. Complete barrel coverage assures that the heat is contained, heating the barrel faster with up to 70% less required electrical energy.

This containment makes the heat cycle much more energy efficient and faster without having to maintain tight contact, the way conventional heater bands work. The unique cooling system draws ambient air directly across the barrel for faster cooling. The exhausted hot air can heat the facility (or keep it cooler by exhausting to the outside). The hot air can also be used to preheat resins. Unlike water cooling where corrosion is an issue, this cooling system can operate for years without maintenance.

The Rex TCS™ substantially reduces the amount of heat loss to the work environment, increasing employee comfort and reducing air conditioning costs.

## ENERGY AND DEMAND SAVINGS PACTIV HEATER BAND RETROFIT



## PROJECT TEAM

### ■ Pactiv Corporation

ordered and installed the Rex Materials Group TCS™

### ■ Focus on Energy

conducted measurement and verification and provided a demonstration grant

### ■ Rex Materials Group

provided energy analysis, provided the technology and guaranteed the savings

## HOW CAN FOCUS ON ENERGY HELP YOU?

Focus on Energy provides free, specialized energy Best Practice support for Wisconsin industrial energy efficiency projects. Services include project grants, feasibility studies, evaluation of options, measurement and evaluation of savings, energy best practice training and tools for managing energy.

Companies that want to improve their plastics processing with energy efficient technology should contact a Focus on Energy Advisor. Focus will review the planned projects with an eye to maximizing savings from the upgrades.

Companies may also contact a Focus Program Ally for project support. Equipment designers and service providers who are not already Focus Program Allies may become an ally by contacting Focus.

To get started, contact Focus on Energy at 800.762.7077 or visit [focusonenergy.com](http://focusonenergy.com).

Focus on Energy works with eligible Wisconsin residents and businesses to install cost effective energy efficiency and renewable energy projects. Focus information, resources and financial incentives help to implement projects that otherwise would not be completed, or to complete projects sooner than scheduled. Its efforts help Wisconsin residents and businesses manage rising energy costs, promote in-state economic development, protect our environment and control the state's growing demand for electricity and natural gas. For more information, call **800.762.7077** or visit [focusonenergy.com](http://focusonenergy.com).



**focus on energy™**

*The power is within you.*