

# CARNES®

## BENEFITS OF ENERGY RECOVERY

### INDOOR AIR QUALITY

The Indoor Air Quality (IAQ) of a building can have broad, potentially harmful, implications for occupants that live, work, or study there every day. IAQ is a measurement of the amount of undesirable substances in the air that can have adverse health effects such as Volatile Organic Compounds (VOC), carbon monoxide, natural gas, mold, bacteria, and particulates, just to name a few. The harmful effects that can result from poor IAQ range from health issues and lack of general wellbeing, to decreased mental acuity and productivity.



### Health and Wellness Effects

Acute allergies, headaches, coughs, asthma, skin irritations, and breathing difficulties, as well as chronic illnesses such as cancer, liver disease, kidney damage, and nervous-system failure.



### Cognitive Function Effects

Studies by the Harvard School of Public Health and the Lawrence Berkeley National Laboratory found that carbon dioxide (CO<sub>2</sub>)—a constituent of exhaled breath—negatively impacted thinking and decision-making at levels commonly found inside homes and buildings.

- Researchers have found the scores increase by as much as 10% on standardized tests when ventilation rates are doubled.<sup>1</sup>



### Productivity Losses

Worker sickness and absenteeism cause serious losses for businesses of every type, which is estimated to cost the U.S. economy \$168 billion annually.

- By doubling the ventilation rate from 20 CFM to 40 CFM per person, at a cost of just \$32 per person per year, productivity improves by as much as \$6,500 per person per year.<sup>2</sup>

<sup>1</sup> “Frequently Asked Questions about Improved Academic Performance,” U.S. Environmental Protection Agency (EPA), <https://www.epa.gov/iaq-schools/frequently-asked-questions-about-improved-academic-performance>.

<sup>2</sup> Source of data and statements: Int. J. Environ. Res. Public Health 2015, 12 (11), 14709-14722.

# ENERGY SAVINGS

Energy Recovery (ER) media works by drawing heat and moisture from exhaust air and transferring it to an outside air supply. Based on the specific application, the efficiency of this energy transfer can be as high as 80%. Proper application of energy recovery significantly reduces the heating and cooling load requirements for a building's primary air handler, which allows for use of smaller, less costly equipment.

The added cost of the energy recovery unit pays for itself by reducing energy costs. In some instances, paying for itself in only a few months.

- ◆ Save up to \$2,000.00 for every installed ton of cooling (including equipment costs).
- ◆ Save up to \$0.50 or more per therm of heating, and up to \$0.10 per KWH of cooling. This can result in annual savings that range into the thousands of dollars!
- ◆ Payback time for the investment of a Carnes Energy Recovery Unit is shown (below) by region.



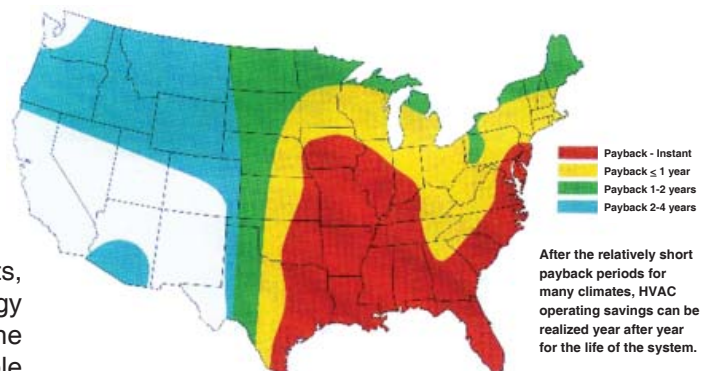
## Meet Design Requirements



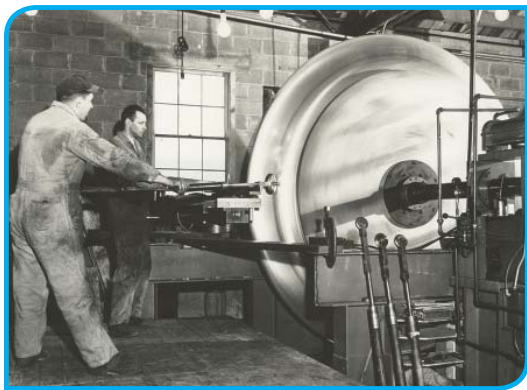
ASHRAE – ER Products can help engineers meet the Guidelines for energy and ventilation in ASHRAE Standards 90.1, 189.1 and 62.1.



LEED – For buildings with LEED requirements, ER Products help to achieve the proper energy efficiencies to acquire LEED Credits in both the EA and EQ categories. Packaging is available from the factory that meets LEED requirements.



# WHY CHOOSE CARNES



## Our Commitment

Carnes Company has been doing business for over 75 years, and has been supplying Energy Recovery solutions since the technology's early days. Through the years, we have been committed to providing the best quality and service for all of the products we produce. Although no one with the last name Carnes has worked here for several years, at its core, Carnes Company is still a family business. When you call, you'll speak to a real person, who genuinely wants to help you find the solution you are looking for...

## Technology

- ◆ Carnes' ER products utilize wheels and cores that are sourced only through innovative leaders in the field of energy transfer media, and all of our media are designed to provide the most efficiency energy transfer possible.
- ◆ 3-Angstrom Molecular Sieve (ER Wheel media only) – The 3-Angstrom Molecular Sieve is still the most selective latency transfer method available. Larger sieves allow for molecules other than water to be transferred from your exhaust air stream, back into your supply air. By only accepting molecules of 3-angstrom or smaller, this method transfers only H<sub>2</sub>O, leaving behind the impurities & other chemicals that other, larger sieves may place back into your air stream!
- ◆ The motors in Carnes' ER units are designed to maximize efficiency. Our ECM's are top of the line, and we are already looking to the next generation of electrically commutated motors. At Carnes, we are constantly pursuing the most efficient solutions available to meet your energy recovery needs...

## Certifications

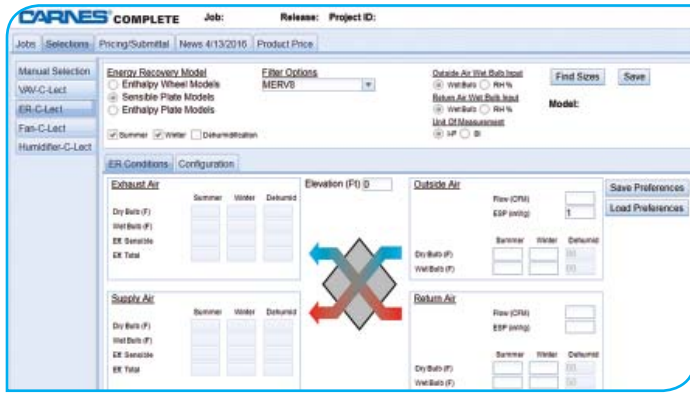


- ◆ AHRI 1060 – Certifies the Energy Recovery Performance of the units.
- ◆ UL Listed – This listing ensures the safety of the unit as it pertains to all electrical components.
- ◆ NFPA-90A – This is a set of standards for the Installation, Operation and Maintenance of air conditioning equipment, intended to protect life and property from fire, smoke, and gases. Our units meet all standards.

# CARNES COMPLETE

<http://webapp.carnes.com>

Carnes Complete is a web-based selection software used for every stage of a project, from design to placing an order. Pricing and order placement are only available to official Carnes Representatives and Distributors, however, guest accounts are available, which still offer powerful tools to any engineer or contractor.

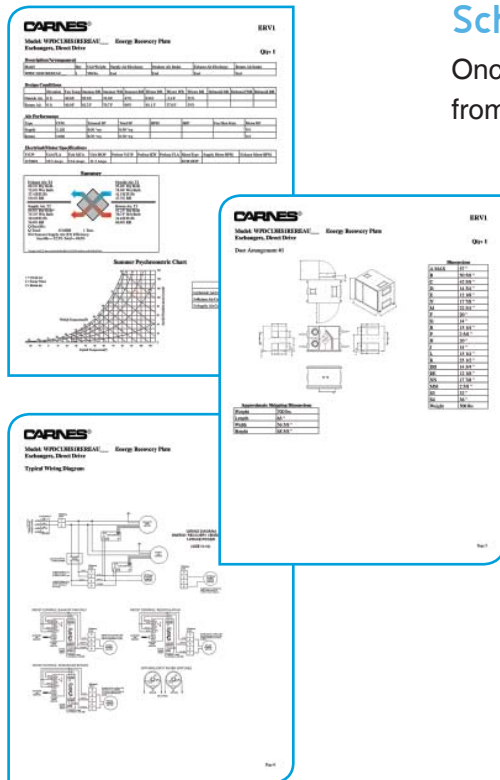


## ER-C-Lect

This section of the selection software allows you to enter the design criteria for an Energy Recovery unit, and receive a list of units that could be applied. That list will also tell you the energy transfer efficiency of each option, in order to help you identify the unit that best fits the needs of your project. Once you've selected the best unit type and size, the selection software walks you through the available options and accessories, allowing you to select exactly what you need and leave out what you don't.

## Schedule Generation

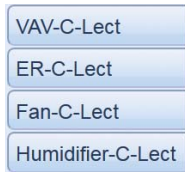
Once you've selected and saved the unit, you can generate a schedule directly from the same software. It's as easy as that.



## Submittals

For any product selected by performance, Carnes Complete will allow you to generate submittals available to guest accounts in Carnes Complete...

- ◆ VAV-C-Lect (VAV Terminals)
- ◆ ER-C-Lect (Energy Recovery)
- ◆ Fan-C-Lect (Fans & Ventilators)
- ◆ Humidifier-C-Lect (Humidifiers & Accessories)



- To set up a Guest Account, go to <http://webapp.carnes.com>, click on "Create Guest Account" and complete the form.

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