

CORE ERV – Frequently Asked Questions

1. What is the temperature range that the CORE ERV can tolerate?

The CORE Exchanger has been freeze tested down to -20°C (-4°F) and up to 55°C (131°F) for residential CORES and up to 65°C (149°F) for commercial CORES while maintaining 0.5% exhaust transfer and no drop in heat or humidity transfer performance.

2. What is the maximum pressure differential that the CORE can handle?

The recommended maximum differential pressure is 10" w.c. for X-pleat products and 4" w.c. for Mustang.

3. Is there a maximum allowable pressure drop?

The CORE Exchanger has no maximum allowable pressure drop. The general range of selections for commercial CORES fall between 0.5" w.c. and 2" w.c. and residential CORES between 0.1" w.c. and 0.3" w.c.

4. Can the plates be mounted horizontally?

Yes. However, if condensation or frost is expected at design conditions we advise the designer to incorporate a slight tilt to enable drainage.

5. Can the aluminum parts be treated for corrosion resistance? (epoxy coating, stainless)

No, CORE does not currently offer standard coating options for the aluminum components. However, contact us at sales@core.life for special project applications.

6. Does CORE make HRV CORES?

CORE produces ERV CORES and counter-flow HRV CORES.

7. Does CORE have performance software?

Yes, the CORE selection software is available through our website at <http://selection.core.life/eRep/>. We provide training for using the software upon request. Additionally, we can provide a DLL for our software to OEMs to incorporate our CORES into their selection software. Our CORES are incorporated as an option within design software of numerous air handling unit manufacturers (see question #16).

8. How do you maintain the CORE?

We recommend washing the CORE with low pressure water every six months to flush out any particulate that may have passed through the air filter.

9. How much does a CORE cost?

The price of a CORE Exchanger is dependent on the size, materials used, and quantity ordered. Contact your system manufacturer's representative or sales@core.life for pricing.

10. What testing has CORE done on "freeze tolerance" of the CORE?

The CORE has gone through (20) freeze-thaw cycles from -20°C to +20°C (-4°F to 68°F) with no measurable change in performance, air leakage under pressure, or exhaust air transfer characteristics.

11. What is the maximum pressure differential that you maintain 0.5% Exhaust Air Transfer Ratio (EATR)? What is the EATR at higher pressure differential? Where does the membrane rupture occur?

Maximum pressure differential with 0.5% EATR: In our recent AHRI testing we did it to +/- 2" of pressure differential.

We are beginning testing across a wider band of pressures and will update this point upon completion. The membrane has been tested to 40" w.c. without rupture.

12. How is the ERV CORE controlled? Is there a switch to turn it on or off?

The ERV CORE is a passive device with no controls required. The ERV system will have

some controls for fans and other components in the unit.

13. How big is the overall CORE with drain clearances, mounts, etc?

Generally, allowing 1" of clearance for mounts is a good idea. The CORE selection software shows nominal sizes and does not include clearances. Contact sales@core.life for further information regarding mounting details for your particular unit.

14. Do you sell directly to reps or only through OEMs?

We only sell directly to OEMs. See question #15 for a list of OEMs that carry our CORES.

15. Which HVAC OEMs supply HVAC units that come with the CORE?

The OEMs that carry CORE ERV CORES in commercial and residential applications are:

- Daikin Applied
- Valent
- Engineered Air
- Innovent
- MicroMetl
- Aldes
- XeteX
- Reversomatic
- Honeywell
- Enerzone
- Imperial
- Zehnder
- Systemair

- Goodman
- CGC Group
- Ingenia
- Haakon

16. Which OEMs provide CORE ERV CORES in their system selection software?

Currently, Daikin Applied, Valent, Aldes, and MicroMetl have integrated our CORES into their selection software. Our other OEMs are working to get our CORES into their selection software. In the meantime, contact your OEM or sales@core.life with any sizing or application inquiries.

17. What is the largest flow rate in an active application? What are the maximum flow rates and face velocities?

CORE ERV CORES are in active applications up to 40,000 cfm. For most applications face velocities range from 300-500 fpm. Typical pressure differentials range from 0.1" w.c. up to 2.0" w.c.

18. How much can I downsize the A/C unit with switching from sensible only technology to a technology that recovers sensible and latent?

The rule of thumb is the cooling system can be downsized by 30%. For a more precise prediction of the change in the cooling load, contact our sales department (sales@core.life) or use our software to estimate energy savings for specific design conditions.

19. Would your technology be appropriate for locker rooms, pools, etc?

The answer is: "it depends". If the pool or locker room in question is a space that would benefit from dehumidification, then an HRV (sensible heat-only device) would be a better choice. However, if there are other areas in the facility that would benefit from using the excess humidity from the pool or locker area then an ERV would help.

20. Do you produce a CORE with an integrated fan?

We do not produce an integrated fan unit currently. We have partnered with a number of companies that produce integrated fan units in a variety of sizes. Please contact us at sales@core.life for recommendations on your specific application.

21. Do your CORES require frost protection? If it freezes, how does it defrost? Will frost clog the CORE?

Depending on the application and operating conditions, the CORE ERV CORE may need frost protection. Frost formation depends on the level of humidity in the exhaust stream and incoming air temperature. The CORE selection software will highlight situations where frost control should be a consideration.

To defrost the CORE, typically a bypass damper allows cold outdoor air to pass around the CORE, or a preheat coil ensures the temperature of outdoor air is above the frost point before entering the CORE. Some smaller systems temporarily suspend the supply of outdoor air and recirculate the warm return air through the CORE until it has thawed.

If the CORE does freeze up it will not be damaged by freezing and thawing cycles.

If it occurs, severe frosting in the CORE will block airflow, increasing system pressure drop.

22. How does the CORE Exchanger handle defrost?

The CORE Exchanger does not have built in defrost. In climates with freezing and condensing conditions the ERV system defrosts the CORE with one of the following methods:

Bypass – a bypass is opened on the inlet side of the ERV system to route part of the cold incoming air around the ERV CORE.

Recirculation damper – If the supply damper is closed, the exhaust is fed into the inlet of the ERV system and it is thawed with the heat of the warm air on both sides of the CORE.

Heating coil – A heating coil is added to the inlet to raise the temperature of the outside air above the frost point.

23. Do you offer on-site training, webinars, etc? How else do you support your customers?

We provide the following support for our customers:

- On-site training on our technology and energy recovery in general
- On-site and web-based training on our custom sizing software
- Assistance with performance calculations of our CORES

24. What kind of flame resistance are you currently certified for? What do they mean?

Our CORES are certified to UL723 for commercial use and UL94HB for residential use. These tests measure the flame spread speed and smoke emissions of the CORE and membrane and are referenced in North American codes and standards.

CORE Exchanger comply with UL723 flame certification with a flame spread index that shall not be over 25 and a smoke index shall not be over 50.

25. Do you make custom sized CORES?

Yes. Our X-pleat CORE sizes can be varied by the millimeter (both plate size and width) to meet the full spectrum of geometric constraints of our customers. Our Mustang CORES come in 6 standard sizes.

26. In simple terms, how does the CORE membrane allow water vapor to cross-over but not the gases?

The mechanics of the transport of water vapor through the CORE membrane is based on the “selective transfer” of water vapor. In simple terms, the CORE polymer membrane selects water vapor molecules and passes them through the film. Other gasses and

particles that are not “selected” by the membrane are not transferred.

This is unlike “gated” materials that have small holes that act like a strainer to prevent certain gasses or liquids from passing through. The absence of holes in the CORE membrane allows it to maintain 0.5% Exhaust Air Transfer.

27. How do you know the membrane will not grow mold and bacteria?

For our membrane to meet European hygiene standard VDI 6022, it is required to pass mold and bacteria resistance certifications (ISO 846A and ISO 846C with a rating of 0). The CORE membrane has a unique built-in antimicrobial that prevents mold or bacteria growth.

Paper-based CORES are made of a cellulose material that act as food for mold and bacteria.

28. What building types are particularly suitable for the CORE ERV and why?

Buildings that benefit the most from a CORE Exchangers need any of the following:

- Have high ventilation rates
- Have extreme climate zones
- Hot humid summers and/or dry cold winters
- With cross-over concerns (bathroom exhaust applications)
- Require low maintenance, durability, hygiene (water washable, freeze tolerant, antimicrobial)
- Cities with progressive building codes or high energy prices

Examples include:

- Schools or institutions
- Healthcare or long-term care facilities

- Long-term Care
- High-Rise Residential
- Vivariums (Animal facilities)
- Arenas

29. How is the CORE Exchanger different than other CORES made from paper or other polymers?

The CORE Exchanger differs from other paper or polymer CORES in the following ways:

- Mold and bacteria resistance (ISO 846 tested with a rating of 0), which is unique from all other CORES
- Water washable - Paper CORES are not water washable
- Freeze tolerant - Paper CORES buckle and tear when frozen
- Available in a large CORE format for large commercial applications, unique to all other CORES . *New* 1 m Mustang plate size
- Robust frame and construction, 4" w.c. for Mustang
- Low pressure drop, other polymer CORES have grates that impede airflow. X - pleat can widen the plate spacing. Mustang has up to 50% lower supply air p.d.
- Low crossover from exhaust - Some paper materials can have crossover issues

30. What is the difference between a cross-flow and counter-flow CORE?

In a cross flow CORE, the inlet and exhaust streams flow at 90 degrees to each other through alternating crossed layers. A counter-flow CORE has streams flowing opposite to one another in parallel alternating layers. The efficiency of a counter-flow CORE is higher, however the geometry of counter-flow is more complicated to manufacture and has a higher pressure drop.

31. What are the advantages and disadvantages of enthalpy plates over wheels?

The advantages of an enthalpy plate over a wheel are:

- Robustness – Latent efficiency does not drop over time as it does in wheels that experience desiccant loss
- Low maintenance – Enthalpy plates have no motors, belts, bearings, or other mechanical elements that would otherwise require frequent maintenance
- Water Washable – Can be washed to restore optimum performance
- Less Headroom – Fixed Plate ERVs are flexible in three dimensions unlike wheels and can fit better in spaces with low headroom
- 0.5% Exhaust air leakage – CORE ERV are AHRI certified to maintain 0.5% exhaust crossover. Wheels range from 5% - 18% without purge

The disadvantages of an enthalpy plate over a wheel are:

- Wheels have higher latent efficiency, initially
- Wheels grow in diameter (2 dimensions) and are more compact
- Wheels scale more effectively than plates in extremely large air flows

32. What are the advantages and disadvantages of enthalpy plates over sensible only aluminum or plastic plates?

The advantages of an enthalpy plate over a sensible-only plate are:

- Humidity Transfer – An enthalpy plate will keep humidity in the building in dry climates, preventing skin from drying out and woodwork from cracking, and dehumidify the building in humid climates.
- Higher Efficiency – An enthalpy plate captures the energy that is in the moisture in the air (latent). Sensible plates do not. In cooling climates sensible plates can only recover around 20-25% of available energy, whereas enthalpy plates can recover 50% or more.

- Capital Cost Savings - The air conditioning system (and humidification if applicable) can be downsized due to decreased load.
- Less defrost – Transferring humidity lowers the frost point of the exhaust stream allowing more continuous operation and energy savings.
- No Need for Drainage – Operating at a lower dew point means a CORE ERV can operate in applications without a drain that would require drainage for sensible-only devices, which saves money, eliminating the need for a drain pan or physical drain in the building.

The disadvantages of an enthalpy plate over a sensible-only plate are:

- Passive Humidity Transfer – It is not possible to turn off humidity transfer in applications where the ventilation system is removing humidity from the space, such as pools or shower rooms. In applications with excessive humidity, an ERV CORE can be used to humidify the outside air that is going into an adjacent office or other humidity-poor space.
- Tolerance of Harsh Environments – Metal plate HRV technologies are appropriate for kitchen flues, paint rooms, and any applications where the CORE would be exposed to volatiles that could damage the membrane of the CORE.
- Moderate Climate Zones – In the Pacific Northwest the humidity indoors is roughly the same as the outdoors. Therefore, there is less benefit to having an ERV CORE over an HRV CORE, especially if it has high sensible effectiveness.

33. Does the CORE ERV come with by-pass?

The CORE Exchanger does not come with a bypass. The bypass in an ERV System is a separate damper with controls designed by the OEM.

34. What are the unique features of the CORE Exchanger?

- Selective Humidity Transfer – Our patented membrane material selectively transfers humidity and heat while maintaining 0.5% exhaust crossover.
- Patented Manufacturing System – CORE uses a proprietary pleating system for creating robust CORES without gluing or cutting to maximize the heat transfer area in the CORE and eliminate opportunities for leakage.
- Custom Sizing – CORE Exchangers can be sized for your application to the millimeter.
- Anti-microbial – The anti-microbial in our membrane makes our technology particularly attractive to schools, hospitals, long-term care and high-rise residential buildings.
- Robust polymer material that is water washable and not damaged by frost.

35. What sizes can I get the CORE ERV in?

Standard sizes are easily selected in our online software, as well as custom options that can be adjusted to the millimeter.

36. Does it matter which way I orient my CORES?

Heat and humidity transfer is not impacted by the orientation of the CORE. However, if orienting the CORE horizontally, it is desirable to have the CORE on a slight slope for drainage in the event that there is condensing water on the CORE.

37. Does CORE have software for sizing the CORES and predicting performance?

Yes. Register online at <http://selection.core.life/eRep/> or contact sales@core.life for details and training.

38. What is the typical lead-time for your CORES?

The typical lead time for a CORE Exchanger is 6-8 weeks. Contact sales@core.life for up-to-date estimates for specific products.