

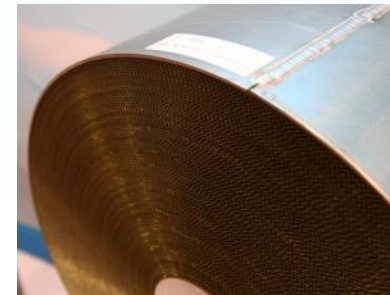
Energy Recovery Wheels by DME-EUMT

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January 2015

Energy Recovery Wheels

Product Range and main features:

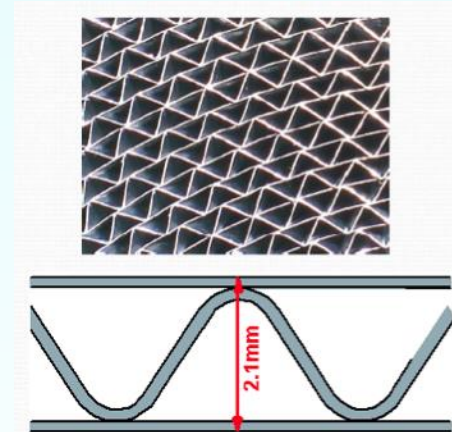
- Rotor sizes ranging from 500 mm to 5000 mm
- Rotor length 200, 240 or 280 mm
- Foil thickness 0.06 mm or 0.1 mm
(non-standard thicknesses available)
- Various coatings depending on application
- Casing or “slide-in” construction
- Standard DME-EUMT design or eustoms built to replace any maker



Energy Recovery Wheels

Construction details - rotor element

Normal corrugation height	2.1 mm
Low corrugation height	1.7 mm
Extra low corrugation height	1.4 mm
High corrugation height	2.7 mm

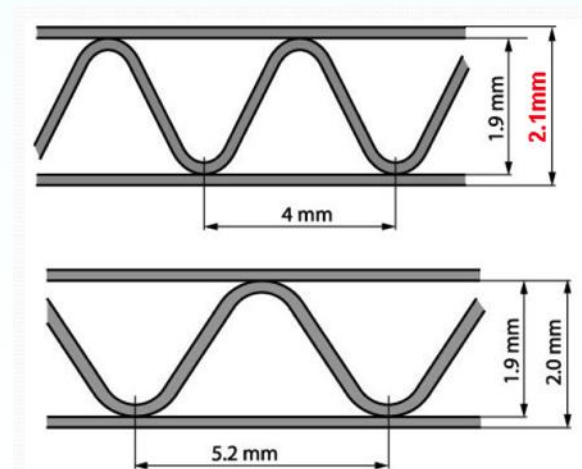


DMT Construction:

Corrugation length 4 mm
 Separation foil 0.2 mm

Competition:

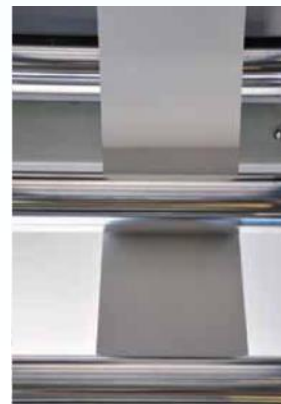
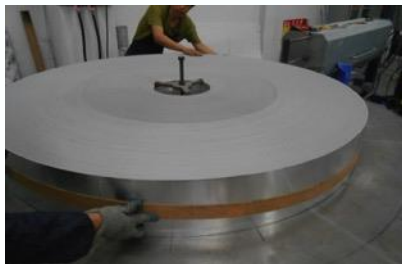
Corrugation length 5.2 mm
 Separation foil 0.1 mm



Energy Recovery Wheels

Construction details - foil material

- Standard aluminium (A1)
- Standard aluminium, hygroscopic (AE1)
- Epoxy coated aluminium (AC1)
- Epoxy coated aluminium, hygroscopic (AEC1)
- Molecular sieve coated aluminium (AM1)
- Molecular sieve coated aluminium, epoxy coated (AMC1)



Energy Recovery Wheels

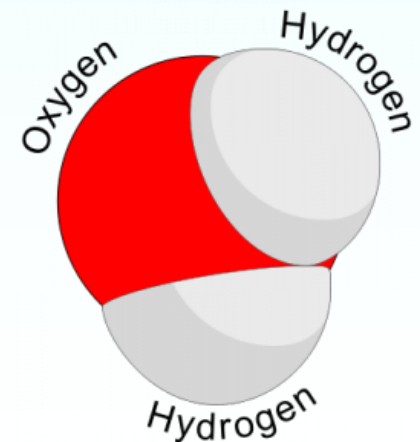
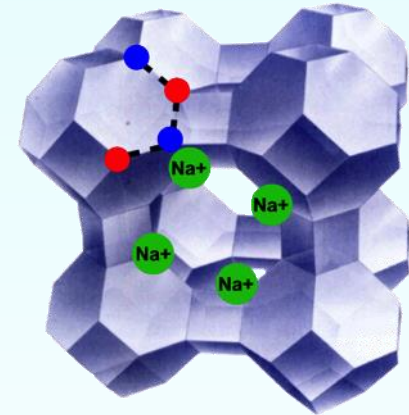
Molecular sieve coating

Zeolite molecular sieves are crystalline, highly porous materials, which belong to the class of aluminosilicates. These crystals are characterized by a three-dimensional pore system, with pores of precisely defined diameter. By using different ions - Sodium, Potassium, Calcium, etc. the pore size can be adjusted to match the specific intended use.

By using Potassium, a pore diameter of 3 Å is achieved. Water molecules measures app. 2.75 Å and due to the polarity of water molecules they are adsorbed preferentially. The precise pore diameter ensures that no other molecules, for instance VOCs are adsorbed, as they all have significantly larger molecules.

Compared to previous desiccant ERWs this gives:

- Increased efficiency, up to 86%
- Better air quality and comfort due to:
 - Minimum carry over of VOC's
 - Increased humidity in winter conditions



Energy Recovery Wheels

- Transfer of sensible energy (heat)
- Transfer of latent energy (moisture)

Efficiencies reaching up to 83%

Example:

Enthalpy efficiency 63,5%

Temperature efficiency 63,8%

Humidity efficiency 63,3%

One AHU with an air flow of 9.36m³/sec

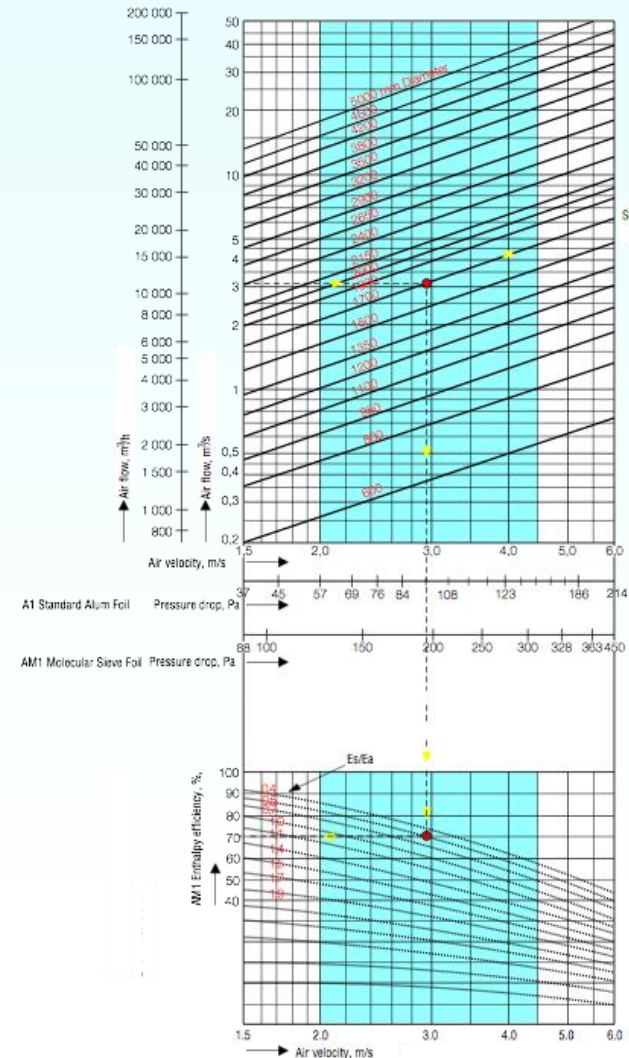
Ambient condition 35°C / 80% RH

Supply air 22°C / 50% RH

Cooling capacity without ERW 747 kW

Cooling capacity with ERW 328 kW

AM1 Molecular Sieve Type Enthalpy Efficiency Curves



Energy Recovery Wheels

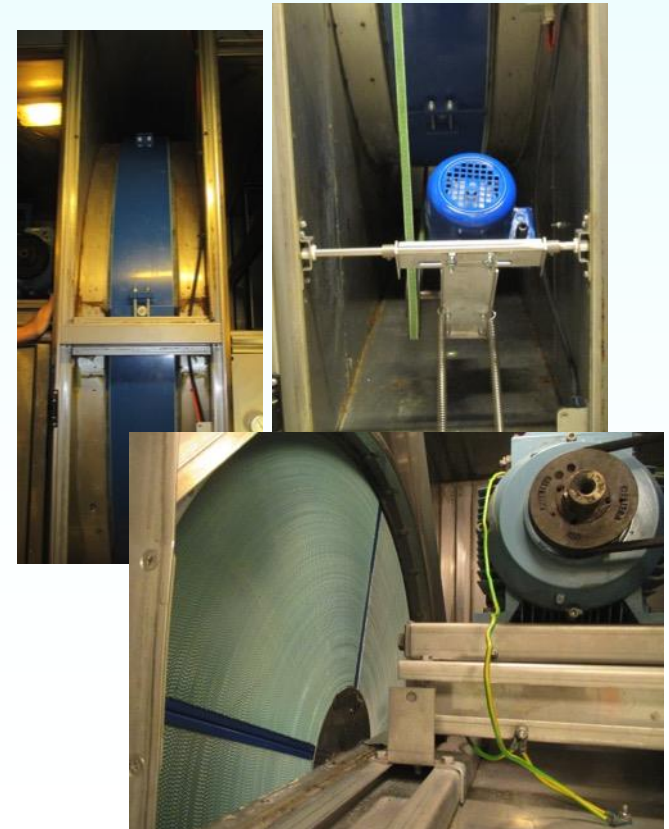
DME-EUMT Replacement ERWs

The replacement wheels for have been modified to improve not only the energy efficiency but also the mechanical construction to ensure a longer life-time.

The original wheels and similar replacement wheels have been suffering from frequent bearing failures and due to construction a bearing replacement was close to impossible without destroying the wheel itself.

Differences:

- Hub, spoke plates and periphery plates with increased thickness for better stability
- Rotor elements not glued onto the hub / spoke plates i.e they can be removed and refitted for maintenance
- Increased shaft / bearing diameter
- Modified casing and foundations to improve serviceability
- New stronger drive units with better foundations



Energy Recovery Wheels

Problems - original design



ERWs tilting due to bearing failure



Smaller ERWs with bearings internally in the hub



Larger ERWs with bearings mounted inside beam

Energy Recovery Wheels

Problems - original design



Rotor elements glued, spoke-plates and hub of thin sheet-metal



Drive units failing due to small dimensions and unstable foundations



Rotor elements corroding rapidly due to harsh environment

Energy Recovery Wheels

Increased shaft / bearing diameter



Energy Recovery Wheels

Stronger hub, spoke- and periphery-plates



Energy Recovery Wheels

Epoxy coating of rotors to increase life-time



Energy Recovery Wheels

New stronger drive units with new foundations

