

Forced Air Pre-Coolers

Date added to ETL 2003 (Revised 2009).

1. Definition of Technology

Forced air pre-coolers are products that are specifically designed to cool water or process liquid by means of a heat exchanger, over which air is forced by a fan, prior to transfer to a refrigeration system.

2. Technology Description

Forced air pre-coolers (or 'air-blast pre-coolers') normally consist of a finned tube heat exchanger and a cooling fan. The cooling fan is used to force air over the heat exchanger, and to cool water and other process liquids as they passed through the heat exchanger.

Forced air pre-coolers can be used to reduce load on refrigeration systems by cooling water and other process liquids, prior to their transfer into the refrigeration system.

The ECA Scheme encourages the purchase of forced air pre-coolers that are free standing and incorporate a by-pass mechanism that automatically redirects the water or other process liquid being cooled around the pre-cooler, and turns off the cooling fan when ambient air temperature is higher than water or process liquid inlet temperature.

Forced air pre-coolers that are sold as an integrated part of a mechanical chiller are not included in this category, but are covered by the 'Packaged Chillers' sub-technology of the ETL.

Investments in forced air pre-coolers can only qualify for Enhanced Capital Allowances if the specific product is named on the Energy Technology Product List. To be eligible for inclusion on the Energy Technology Product List, products must meet the eligibility criteria as set out below.

3. Eligibility Criteria

To be eligible, products must:

- Incorporate a heat exchanger designed to cool water or other process liquids.
- Incorporate a fan which forces air over the heat exchanger.
- Incorporate a series of control valves (or "by-pass mechanism") that re-direct the water or other process liquid around the pre-cooler in response to a control signal.
- Incorporate a controller that operates the by-pass mechanism and controls the fan at times when the ambient air temperature is higher than the water/process liquid inlet temperature.
- Conform with the requirements of the EU Pressure Equipment Directive PED 97/23/EC in respect of its design, manufacture and testing procedures, or be CE marked.

Performance criteria

Eligible products must have:

- A minimum energy efficiency rating (EER) that is greater than or equal to (\geq) 2.9, across the range of operating conditions where it is designed to provide cooling.
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Where $EER = \text{net cooling capacity (kW)} / \text{effective power input (kW)}$.

Required test procedures

Product performance must be demonstrated by assessing the variation in net cooling capacity and electricity consumption with ambient temperature and inlet water/process liquid temperature, and calculating the product's minimum energy efficiency rating. This calculation must take account of the electricity used by both the fan and the controller.

The performance of the product's heat exchanger must be measured in accordance with the procedures set out in EN 305:1997 and EN 306:1997.

Representative Testing

Where applications are being made for two or more products that are variants of the same basic design, heat exchanger test data may be submitted for a single representative model, provided that all variants:

- Use air to liquid heat exchangers of the same constructional design.
- Have the same general arrangement of fans and heat exchangers.
- Are constructed from materials with same heat transfer characteristics.
- Have the same (+/- 5%) or better energy efficiency as the representative models.

It should be noted that:

- If a manufacturer voluntarily removes the representative model from the Energy Technology Product List (ETPL) then other products linked with that representative model may or may not be permitted to remain on the ETPL.
- If any product submitted under these representative model rules is later found not to meet the performance criteria when independently tested, then all products based on the same representative model will be removed from the ETPL.

4. Scope of Claim

Expenditure on the provision of plant and machinery can include not only the actual costs of buying the equipment, but other direct costs such as the transport of the equipment to site, and some of the direct costs of installation. Clarity on the eligibility of direct costs is available from [HMRC](#).