1 Professional Refrigerated Storage Cabinets

1.1 Scope
Professional refrigerated storage cabinets are products that are specifically designed to store, but not to display, chilled and frozen foodstuffs.

1.2 Definitions
Professional refrigerated storage cabinets are widely used in the catering industry to store frozen or chilled foodstuffs (including super-chilled or partly-frozen foodstuffs), but a door, lid or drawer shall be opened to view or access the contents of the cabinet.

Professional refrigerated storage cabinets are available in a range of different designs and efficiencies. The ECA Scheme aims to encourage the purchase of higher efficiency products.

The ECA Scheme covers three categories of product:

- Single door (vertical) professional refrigerated storage cabinets with one solid door or drawer accessing the same compartment.
- Double door (vertical) professional refrigerated storage cabinets with two solid doors or drawers accessing the same compartment.
- Under counter and counter (counter type) professional refrigerated storage cabinets with one or more solid doors or drawers accessing the same compartment.

Investments in professional refrigerated storage cabinets 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 shall meet the eligibility requirements as set out below. The ECA Scheme aims to encourage the purchase of higher efficiency products.

1.3 Requirements

1.3.1 Eligibility requirements
To be eligible, products shall:

- Be designed to store chilled or frozen foodstuffs, whilst maintaining them within prescribed temperature limits.
- Be fitted with solid-faced lids, drawers or doors that:
  - Are normally kept closed, but can be opened to access the contents of a single compartment.
  - Obscure the contents of the cabinet from view when closed.
  - Enable users to access the contents of any part of the interior without stepping into the refrigerated space.
Be a ‘plug in’ type cabinet with an integral refrigeration system (i.e. incorporating a compressor and condensing unit).

Have a gross internal volume between 68 and 1,495 litres; where the gross internal volume is as defined as the volume within the inside walls of the cabinet or of a compartment without internal fittings, with any doors being closed.

Be CE marked.

1.3.2 Performance requirements

Products shall have an Energy Efficiency Index (EEI) that is less than, or equal to, the thresholds set out in Table 1.1 below, which depend on the type of cabinet, number of doors/drawers, cabinet overall external height and temperature classification.

Table 1.1 Performance thresholds for professional refrigerated storage cabinets

<table>
<thead>
<tr>
<th>Type</th>
<th>Overall external height (mm)</th>
<th>Chilled (M1)</th>
<th>Frozen (L1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single door professional refrigerated storage cabinets (vertical)</td>
<td>≥ 1,050</td>
<td>≤ 50.0</td>
<td>≤ 60.0</td>
</tr>
<tr>
<td>Double door professional refrigerated storage cabinets (vertical)</td>
<td>≥ 1,050</td>
<td>≤ 60.0</td>
<td>≤ 65.0</td>
</tr>
<tr>
<td>Under counter and counter professional refrigerated storage cabinets (counter)</td>
<td>&lt; 1,050</td>
<td>≤ 30.0</td>
<td>≤ 55.0</td>
</tr>
</tbody>
</table>

“≤” means "less than or equal to"

“<” means "less than"

“≥” means “greater than or equal to”

Where:

- The Energy Efficiency Index (EEI) is defined as the ratio between AEC (Annual Energy Consumption of the cabinet in kWh/year) and SAEC (Standard Annual Energy Consumption of the cabinet in kWh/year).
- The overall external height shall be based on the ‘as-installed’ product height.

1.4 Measurement and Calculations

1.4.1 Measurement standards

The following standard shall be used for measuring and calculating product performance:

- BS EN 16825:2016 “Refrigerated storage cabinets and counters for professional use. Classification, requirements and test conditions.”

Equivalent test standards will be accepted as an alternative to testing in accordance with BS EN 16825:2016 where the resulting performance data can be shown to be equivalent to that obtained under BS EN 16825:2016.
1.4.2 **Performance metrics**

The Energy Efficiency Index (EEI) of a product shall be calculated using the equation below:

\[
EEI = \left( \frac{AEC}{SAEC} \right) \times 100 = \left( \frac{(E_{24h} \times 365)}{(M \times V_n + N)} \right) \times 100
\]

Where:

- \(E_{24h}\) = the energy consumption of the cabinet over 24 hours, as defined in BS EN 16825:2016 (measured in kWh)
- \(V_n\) = net volume of the appliance, which is the sum of net volumes of all compartments of the cabinets (measured in litres). Net volume is as defined in Section 6.1 of BS EN 16825:2016. The net volume shall be calculated as follows: the usable shelf area that food can be loaded onto, multiplied by the usable height into which food can be loaded minus an allowance for the height of the shelves, minus any other protrusions into the usable space.
- \(M\) and \(N\) are scaling coefficients with values defined in Table 1.2 below.

<table>
<thead>
<tr>
<th>Climate class 4 (30°C 55%RH)</th>
<th>Value for M</th>
<th>Value for N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical chilled (single or double door)</td>
<td>1.643</td>
<td>609</td>
</tr>
<tr>
<td>Vertical frozen (single or double door)</td>
<td>4.928</td>
<td>1,472</td>
</tr>
<tr>
<td>Counter chilled</td>
<td>2.555</td>
<td>1,790</td>
</tr>
<tr>
<td>Counter frozen</td>
<td>5.840</td>
<td>2,380</td>
</tr>
</tbody>
</table>

1.4.3 **Test Requirements**

Cabinets shall be able to conform to the temperature classifications set out in Table 1.3 below, when tested to BS EN 16825:2016 in climate class 4 (30°C, 55% RH).

<table>
<thead>
<tr>
<th>Temperature classification</th>
<th>The highest temperature (\Phi_\alpha) of the warmest (M)-package equal to or lower than °C</th>
<th>The lowest temperature (\Phi_\beta) of the coldest (M)-package equal to or higher than °C</th>
<th>The lowest temperature (\Phi_\alpha) of the warmest (M)-package equal to or lower than °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chilled cabinets (M1)</td>
<td>+5</td>
<td>-1</td>
<td>-</td>
</tr>
<tr>
<td>Frozen cabinets (L1)</td>
<td>-15</td>
<td>-</td>
<td>-18</td>
</tr>
</tbody>
</table>

Cabinets shall be tested in a test room conforming to BS EN 16825:2016. Cabinets shall be tested according to the requirements for “Commercial Service Refrigerated Cabinets and Counters intended for use in commercial kitchens” in BS EN 16825:2016 with the following test conditions:

- **Loading:** as described in BS EN 16825:2016. For cabinets with shelves, the minimum number of shelves to be used is calculated by dividing by 300mm the vertical distance from the surface of the lowest shelf or loadable surface to the load limit line. The number of shelves resulting shall be rounded to the nearest lowest integer, with a minimum of one shelf.
to be used. The lowest height shelf should be located at the lowest available height fitting.

- **Temperature test**: as described in BS EN 16825:2016, specifically section 5.3.4

- **The energy consumption of the cabinet over 24 hours (E24h)** of cabinets fitted with integral condensing units shall be measured in accordance with sections 5 and 6 of BS EN 16825:2016, and to the accuracy specified in section 5.3.2.7 of BS EN 16825:2016.

### 1.4.4 Rounding

For the avoidance of doubt test data should be presented to 1 decimal place. As an example, a frozen, single door vertical professional refrigerated storage cabinet with an EEI of 60.1 would be deemed to not meet the performance requirements.

### 1.5 Verification for ETL Listing

Any of the following testing routes may be used to demonstrate the conformity of products against the requirements:

- In-house testing – Self-tested and verified or cross-checked by an independent body
- Witnessed testing
- Independent testing
- Representative testing (see clause 1.5.1)

Further information regarding the first three routes can be found in Guidance Note 5 on the ETL product testing framework¹.

### 1.5.1 Representative Testing

Where applications are being made for two or more cabinet models that are variants of the same basic design, test data may be submitted for a single ‘representative model’. The rules in Table 1.4 shall be used to select the representative model that should be performance tested.

**Table 1.4** Rules for selecting the representative model for performance testing

<table>
<thead>
<tr>
<th>Variation between models</th>
<th>Selection rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmetic differences to the exterior</td>
<td>Any model may be selected to be the representative model.</td>
</tr>
<tr>
<td>Heaters (door, trim etc.), fans, defrosts, lighting and other accessories</td>
<td>The model with the greatest energy consumption shall be the representative model.</td>
</tr>
<tr>
<td>Cabinets with the same refrigeration system components but different refrigerants</td>
<td>The model with the greatest energy consumption shall be the representative model.</td>
</tr>
<tr>
<td>Two or more of the above variations</td>
<td>The rules set out above shall be combined when selecting the representative model.</td>
</tr>
</tbody>
</table>

It should be noted that:

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- 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.

### 1.6 Conformity testing

Products listed on the ETL may be subject to the scheme’s conformity testing programme in order to ensure listed models continue to meet the ETL requirements.

### 1.7 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.

### 1.8 Review

#### 1.8.1 Indicative review date

This specification is scheduled for review during the 2022/23 review cycle.

#### 1.8.2 Illustrative future direction of the requirements

The Energy Technology List aims to capture the upper quartile of products with regards to energy efficiency. As professional refrigerated storage cabinet technology improves, future requirements will be revised to cover this portion of the market.