Refrigerated Display Cabinets: the meaning of TEC / TDA

TEC = Total Energy Consumption   (kWh / day)
TDA = Total Display Area (EN-ISO 23953)   (m^2)

For a Refrigerated Display cabinet, the value TEC / TDA represents the energy use per unit of display area. It is therefore a good basis for representing the energy efficiency of a cabinet, and the value is used as basis for determining the energy label of a refrigerated display cabinet.

TEC

TEC is the Total Energy Consumption of a Refrigerated Display Cabinet, given in kWh / day

TEC is determined under test conditions, which means the cabinet is loaded with test packages and placed in a stable climate; in this case at a temperature of + 25 °C and air Relative Humidity of 60 %.

TEC = DEC + REC

DEC = Direct Electrical Energy Consumption (for lights, fans, etc) in kWh / day. Lights on 12 hours per day. EN-ISO 23953
REC = Refrigeration Energy Consumption (the energy consumption a the refrigeration system) in kWh / day

REC

REC is the Refrigeration Energy Consumption, in kWh / day.
It is the calculated consumption of an "imaginary standard refrigeration system", that delivers the cold needed for the cabinet.

$$REC = (24h - t_{defrost}) * HER * \frac{(35 - T_0)}{(0,34 * (T_0 + 273,18))}$$

T_0 = Evaporating temperature (in °C). EN-ISO 23953
$t_{defrost}$ = sum of defrost periods in one day (in hours)
HER = Heat Extraction Rate (average cooling capacity, excluding defrost periods) in kW. EN-ISO 23953

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The heat extraction rate is the average cooling capacity (in kW) over a 24 hour period, excluding the defrost periods. It is typically lower than the "capacity" indicated by the manufacturer, as this is often the maximum cooling capacity.
The figure on the right is an illustration of the HER value in relation to the instantaneous capacity for an "on/off" controlled refrigerated display cabinet.
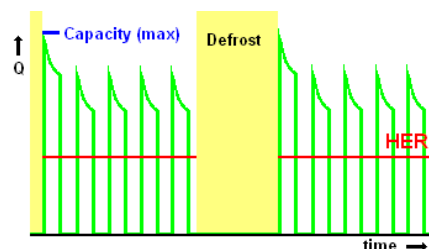
TDA

TDA is the Total Dsiplay Area of the cabinet, in m2. The method to calculate TDA is given separately. The measurement can be done simply with a centimeter, outside the test environment. EN-ISO 23953