

Working document on possible Commission Regulations implementing Directive 2009/125/EC with regard to professional refrigeration products

Brussels, 09.12.2011

PART 2 – BLAST CABINETS

Subject matter

This working document pursuant to Directive 2009/125/EC establishes Ecodesign requirements related to blast cabinets. The preparatory study showed that energy in use phase is the only significant environmental aspect which can be addressed through product design. Other Ecodesign parameters referred to in Annex I, Part 1 of Directive 2009/125/EC, are not considered as significant.

Definitions

Blast cabinets are considered as energy related products within the meaning of Article 2 (1) of Directive 2009/125/EC.

For the purpose of this working document the following definition shall apply.

A ‘blast cabinet’ is a refrigerated enclosure primarily intended to rapidly cool foodstuff down to chilled or frozen temperatures

‘Reach-in’

‘Pass-through’

‘Roll-in’

‘Trolley’

‘Foodstuff capacity’

The market for blast cabinets is primarily driven by food hygiene regulations, which are notably in place in France and the United Kingdom. The French market is estimated to account for ~25% of the EU market for blast cabinets. The French standard NF AC D40-003 establishes food hygiene rules and a detailed test protocol. The British market is regulated by the Department of Health Guidelines. These two sets of rules contradict each other as regards the required temperature cycle for chilling and freezing foodstuff:

– The NF AC D40-003 standard requires that foodstuff is cooled from +63°C to less than +10°C in 120 minutes or -18°C in 270 minutes

– The UK Department of Health Guidelines require that foodstuff is cooled from +70°C down to +3°C in 90 minutes or -18°C in 240 minutes

The UK rules are therefore more stringent and lead to measure higher energy consumption. The preparatory study recommends using the NF AC D40-003 as regards the test protocol. But the preparatory study is based on product data submitted by UK manufacturers and measured with the UK temperature cycles. Therefore, the present Regulation is based on the following temperature cycles:

- *Blast chilling cycle*: cools foodstuff from +70°C down to +3°C in 90 minutes
- *Blast freezing cycle*: cools foodstuff from +70°C down to -18°C in 240 minutes

Alternative temperature cycles can still be agreed upon, provided that the Commission is provided with corresponding product data.

Eco-design requirements

Products falling under the definitions of paragraph "Definitions" above in this document shall meet the ecodesign requirements set out in Annex I, including:

- Minimum energy performance requirements
- Product information requirements

The market for blast cabinets is primarily driven by food hygiene concerns. Energy consumption is usually not declared by manufacturers and energy efficiency is not a selling argument.

The preparatory study estimated that energy savings of ~35 to 37%¹ are cost-efficient for all types of blast cabinets, leading to an increase in the purchase price of blast cabinets by 7 to 11% on average (maybe overestimated), combined with a decrease of life cycle costs to the users by 2 to 6% over the product lifetime (8.5 years). This scenario is both very close to the calculated least life cycle cost and to the real BAT. In addition, the maximum energy reduction achievable by combining all technical improvement solutions identified by the preparatory study is 39%². Therefore, only Tier-1 minimum energy performance requirements are proposed, with entry into application on 1st of January 2014. This proposed scenario is estimated to allow savings of 1.4 TWh per year in 2020 and 2.1 TWh per year in 2025 compared to a “freeze” scenario.

Energy consumption in the use phase is by far the dominating impact over the life cycle in terms of Gross Energy Requirement (GER). However, direct emissions due to refrigerants account for 56% of the Total Equivalent Warming Impact (TEWI) of a blast cabinet over the product lifetime. This is notably due to dumped refrigerants at end of life. Plug-in blast cabinets account for 85% of the market in units. These are characterised by low refrigerant charge (~2 kg) and annual leakage rate (5%), but an End-of-Life dumped refrigerant percentage of 100%. Blast cabinets connected to a remote condensing unit account for 15% of the market in units. These are characterised by higher refrigerant charge (7-20kg) and annual leakage rate (12%), and an End-of-Life dumped refrigerant percentage of 50%.

R290 (propane) is an improvement option, but it is highly flammable and EN378 recommendations on the refrigerant charge shall be taken into account. Blast cabinets are mainly found in class B or C environments. The use of HC refrigerant is mainly applicable to (very) small plug-in blast cabinets with a smaller capacity than 20kg of foodstuff. CO₂ is an improvement option for blast cabinets connected to central refrigeration systems in climates where the ambient temperature does not exceed 15°C. Therefore, it is not applicable in the entire EU market.

The potential to promote low GWP refrigerants through product design requirements seems limited so far. A “bonus” would not effectively encourage the use of R290, which allows higher energy efficiency compared to R404A (~5% reduction in energy consumption). A ban of high GWP refrigerants would prejudice the outcome of other political debates at EU-level (in particular, F-Gas Regulation).

¹ Compared to the energy consumption of the Base Case

² After correction to take synergetic effects into account

Form of the Implementing measure

It is intended to propose a directly applicable Implementing Regulation under Directive 2009/125/EC. The proposed Regulation is not expected to have a particular impact on the EU acquis.

Measurement methods

As regards the method for measuring the energy consumption of blast cabinets, the Commission intends to mandate a new EN standard for the purpose of the present Regulation, on the basis of NF AC D40-003, and then publish it in the Official Journal, C series. This will require adaptation and extension of NF AC D40-003 to cover energy consumption.

As a reminder, the following testing conditions apply under NF AC D40-003 (not exhaustive):

- *Testing load*: smashed potatoes composed of potatoes paste flakes 11.5%, water 87.7%, salt 0.8% (percentages expressed in mass); the salted water is heated up to 75-80°C and then mixed with the potatoes; the mixture is added to package type trays³ and lidded, and can be used only once.
- *Loading*: the temperature inside the equipment shall be the same as in the testing room. The loading shall be done as fast as possible.
- *Temperature registration*: the room temperature and the temperature of the packages shall be registered every 5 minutes. The starting time of the test is when the temperature of the packages is equal to the initial reference temperature. The final time of test is when the temperature of the packages is equal to the final reference temperature.
- *Combined models*: two tests shall be conducted in each temperature cycle.

Conformity Assessment

A conformity assessment shall be carried out according to Chapter 8 of Directive 2009/125/EC, Annex IV (Internal design control) or Annex V (Management system for assessing conformity).

Market surveillance

When performing the market surveillance checks referred to in Directive 2009/125/EC, Chapter 3 (2), Member State authorities shall apply the verification procedure set out in Annex III of this working document.

Benchmarks

No benchmarks are proposed under the present Regulation.

Review

A review of the proposed requirements shall be presented to the Consultation Forum depending on technological progress and not later than 4 years after its entry into force.

³ carton with polypropylene weight 1.8kg, size equivalent to GN ½

Annex I: Ecodesign requirements

a) Minimum energy performance requirements

January 1, 2014 onwards, blast cabinets falling into the scope of the present Regulation shall comply with the following minimum energy performance requirements

Product design	Reference temperature of the blast cycle	Maximum energy consumption, in kWh per kg of foodstuff per cycle
Reach-in	Chilling	0.066
	Freezing	0.166
Roll-in or pass-through (trolley)	Chilling	0.074
	Freezing	0.186

Combined models shall comply with minimum energy performance requirements

b) Product information requirements

January 1, 2014 onwards, the following parameters shall be reported in the product documentation.

- Capacity, expressed in kg of foodstuff per cycle, and rounded to two decimal places
- Energy consumption, expressed in kWh per kg of foodstuff per cycle, and rounded to three decimal places
- Refrigerant charge
- Refrigerant fluid

Annex II: Measurement methods

For the purpose of compliance with the requirements of this Regulation, measurements shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art measurement methods, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

The appliance shall be tested with all accessories and ancillary equipments such as defrosting and lighting in the on mode and under normal working conditions.

Annex III: Verification procedure for market surveillance purposes

For the purposes of checking conformity with the requirements laid down in Annex I, Member State authorities shall test a single blast cabinet. If the measured parameters do not meet the values declared by the supplier within the ranges set out in Table 1, the measurements shall be carried out on three more blast cabinets. The arithmetic mean of the measured values of these three blast cabinets shall meet the values declared by the supplier within the range defined in Table 1.

Otherwise, the model and all other equivalent blast cabinet models shall be considered not to comply with the requirements laid down in Annex I (Ecodesign requirements).

Member States authorities shall use reliable, accurate and reproducible measurement procedures, which take into account the generally recognised state-of-the-art measurement methods, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

Table 1.

Measured parameter	Verification tolerances
Capacity	The measured value shall not be lower than the declared value by more than 5 %.
Energy consumption (in kWh per kg of foodstuff per cycle)	The measured value shall not be greater than the declared value by more than 5 % and shall not exceed the maximum value set in Annex I by more than 5%