Commercial Refrigeration Equipment
Safety Standards Evolution

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Marek Zgliczynski | IEC SC61C Chair | Embraco
General background to safety rules

**MAIN TYPES OF STANDARDS**

- *Group Standards* (or horizontal standards)
- *Product Standards* (or vertical standards)

**LEGAL APPLICABILITY OF STANDARDS**

Every country with National Laws may mandate compliance to safety standards, whilst in other countries they may be entirely voluntary.

**RULES OF PRECEDENCE**

As a general rule, if product standard is available, it should be used in preference to generic standard.
## Relevant international standards and flammable refrigerants limits

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>TITLE</th>
<th>APPLICATION</th>
<th>CHARGE LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 60335-2-24</td>
<td>Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers</td>
<td>Domestic refrigeration</td>
<td>Up to 150g of flammable refrigerant per circuit</td>
</tr>
<tr>
<td>IEC 60335-2-89</td>
<td>Particular requirements for commercial refrigerating appliances with an incorporated or remote condensing unit or compressor</td>
<td>Any refrigeration appliances used in commercial situations</td>
<td>Up to 150g of flammable refrigerant per circuit</td>
</tr>
<tr>
<td>IEC 60335-2-40</td>
<td>Particular requirements for electrical heat pumps, air conditioners and dehumidifiers</td>
<td>Any air conditioning and heat pump applications</td>
<td>Up to 1kg and 5kg depending upon application</td>
</tr>
<tr>
<td>ISO5149</td>
<td>Mechanical refrigeration systems used for cooling and heating - safety requirement</td>
<td>Any refrigeration, air conditioning and heat pumps: domestic, commercial and industrial</td>
<td>Variable, depending upon application</td>
</tr>
</tbody>
</table>
Equipments covered by IEC 60335-2-89

- Walk-in display cooler
- Draft beer coolers
- Bottle coolers
- Ice cream dispensers
- Reach-in cabinets
- Ice cream freezers
- Preparation counters
- Serve-over cabinets
- Multi-deck cabinets
- Gelato counters
- Gondola cabinets
- Blast freezers
- Water dispensers
- Walk-in rooms
- Ice makers
150g (5.3 oz) CHARGE LIMIT
LT PROPANE CABINETS CHARGE

Charge Limit 150 grams

Compressor Cooling Capacity (W) in LBP

R290 charge [kg]

750 lt
NT2180U
150 g
11.6 kWh/DAY
150g (5.3 oz) CHARGE LIMIT
MT PROPANE CABINETS CHARGE

ICE MACHINE

320 kg/day
NT2170U
150 g
10.6 kWh/100 kg
150g (5.3 oz) CHARGE LIMIT
MT PROPANE CABINETS CHARGE

Charge Limit 150 grams

Compressor Cooling Capacity (W) in MBP

2000lt
NEK6213U
114g X 2
7.2kWh/DAY

GLASS DOOR MERCIANDIZER
Details about TC61/SC61C/WG4

Initiation of WG4

According to decision 20 of the Tokyo plenary meeting of IEC SC61C on 13 November 2014, (IEC 60335-2-89-A2/Ed2: Household and similar electrical appliances – Safety - Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant unit or compressor) **WG4 was established to discuss the increase of the limit for the filling amount of flammable refrigerants.**
Time scale for including the WG4 proposal into the IEC 60335-2-89:

- **Nov 2014**: TOKYO, WG4 Creation
- **July 2015**: VIENNA
- **Sept 2015**: FRANKFURT
- **Oct 2015**: WELLINGTON
- **Jan 2016**: LONDON
- **Apr 2016**: BERLIN
- **Oct 2016**: FRANKFURT
- **Nov 2016**: DUBLIN
- **Apr 2017**: TURIN
- **June 2017**: STRATFORD UPON AVON
- **Aug 2017**: FRANKFURT
What direction is TC61/SC61C/WG4 going?
The risk with more than 150g flammable refrigerant must be the same as we have with the current limit of 150 g

1. The main factor used to minimize the creation of a flammable mixture around the appliance is the air-flow or/and specific design features.

2. Effectiveness of design and construction must be checked using a special leak test. The leak test was developed based on extended testing performed in Great Britain and in Germany and with support of German GIZ.

3. Additionally, outcomes of an AHRI project to assess the severity of negative events due to flammable refrigerants (both A3 and A2Ls), currently in progress in the US, will be taken into consideration.
The risk with more than 150g flammable refrigerant must be the same as we have with the current limit of 150 g

4 New Draft for Comments (DC) document that considers the 500g limit for propane charges and which will also allow the use of A2L safety class refrigerant alternatives, was circulated in June, 30 2017.

5 If a consensus is reached, the document will be submitted to the SC61C committee during Plenary Meeting of the SC61C in October 2017 in Vladivostok to go for first official vote as a Committee Draft (CDV). Positive Vote on CDV/FDIS will allow new charge limits introduction still in 2018

6 Experts in the Working Group 4 are representing major global manufacturers like AHT, Epta, Electrolux Professional, True Manufacturing, Emerson, Hussmann, Daikin, United Technologies, Whirlpool, Panasonic, Sanden, Porkka, etc

7 A new IEC standard for the maximum allowable flammable refrigerant charge would influence the adoption of the same standard in all regions “This would be a reference, the global standard.”
Thank you