



ATMO
sphere

Business Case for
Natural Refrigerants

Refrigeration Equipment International **Safety Standards** Evolution

Regulations and Standards Panel

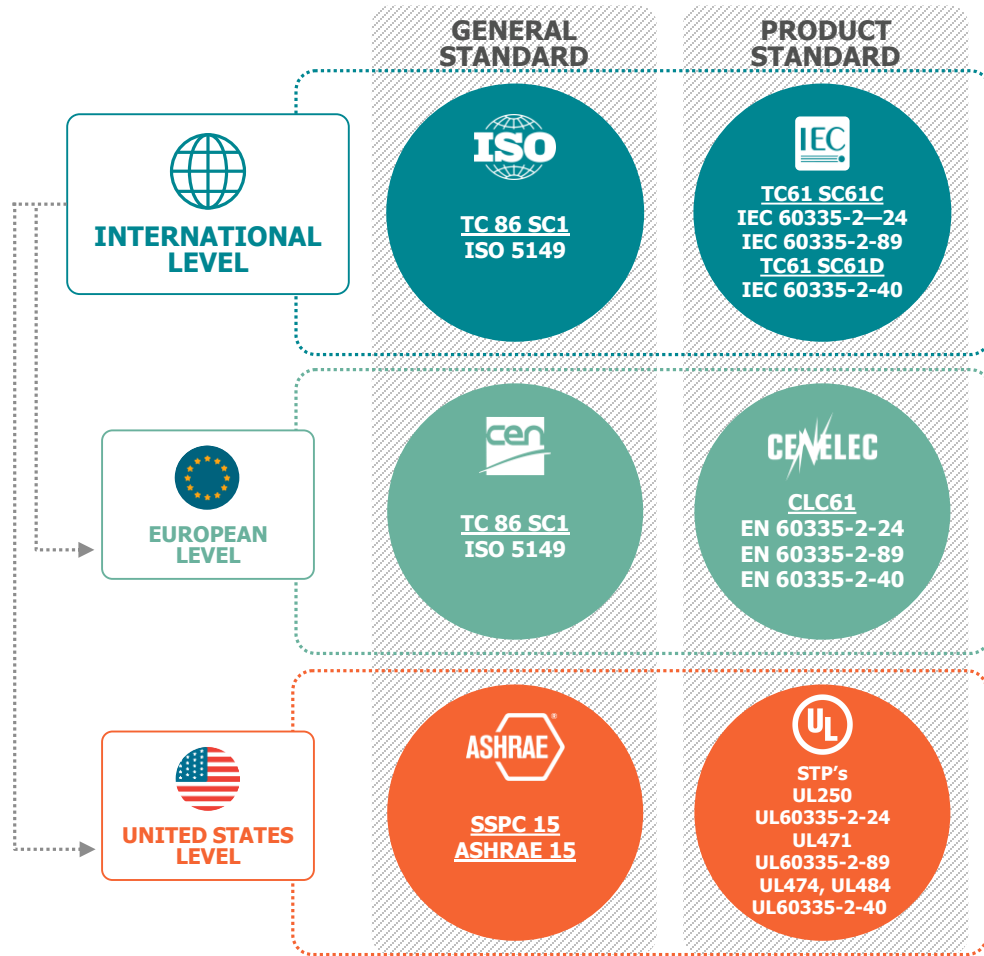


Marek Zgliczynski | IEC SC61C Chair | Embraco

embraco

COMMITTEES & STANDARDS

International and Regional



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

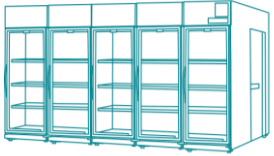
As a general rule, if product standard is available, it should be used in preference to generic standard.

Relevant international standards and flammable refrigerants limits

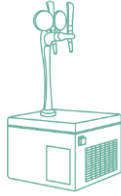
STANDARD	TITLE	APPLICATION	CHARGE LIMIT	
IEC 60335-2-24	Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers	Domestic refrigeration	Up to 150g of flammable refrigerant per circuit	150g OK
IEC 60335-2-89	Particular requirements for commercial refrigerating appliances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

Equipments covered by IEC 60335-2-89

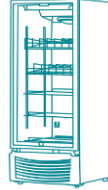
WALK IN DISPLAY COOLER



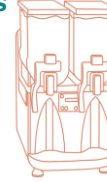
DRAFT BEER COOLERS



BOTTLE COOLERS



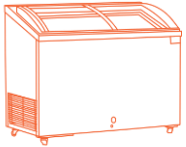
ICE-CREAM DISPENSERS



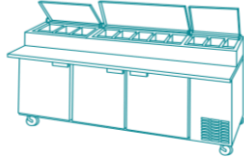
RECH-IN CABINETS



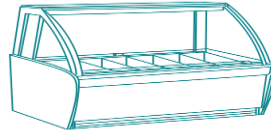
ICE-CREAM FREEZERS



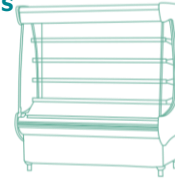
PREPARATION COUNTERS



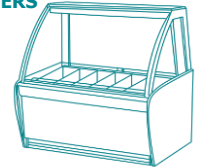
SERVE-OVER CABINETS



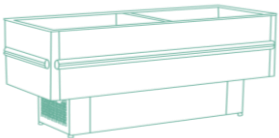
MULTI-DECK CABINETS



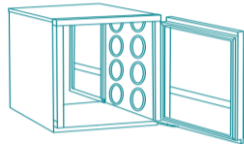
GELATO COUNTERS



GONDOLA CABINETS



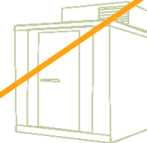
BLAST FREEZERS



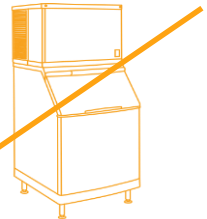
WATER DISPENSERS



WALK-IN ROOMS



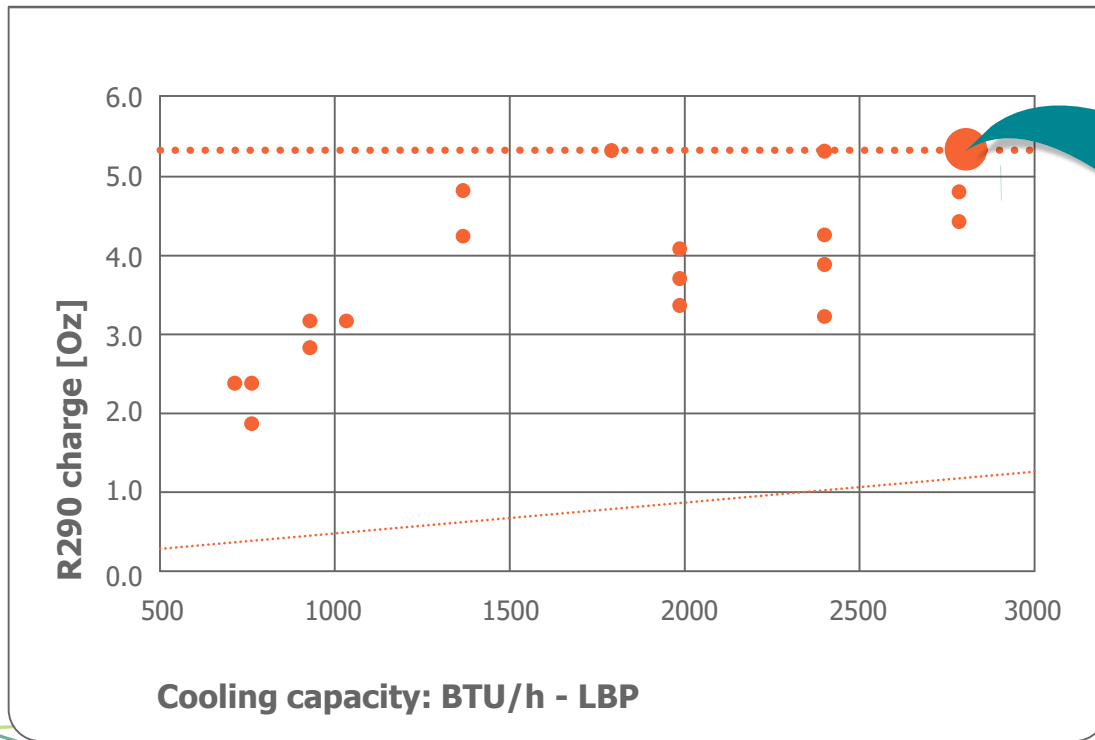
ICE MAKERS





150g (5,3 oz) CHARGE LIMIT

LT PROPANE CABINETS CHARGE



VERTICAL FREEZER



26 cuft

NT2180U

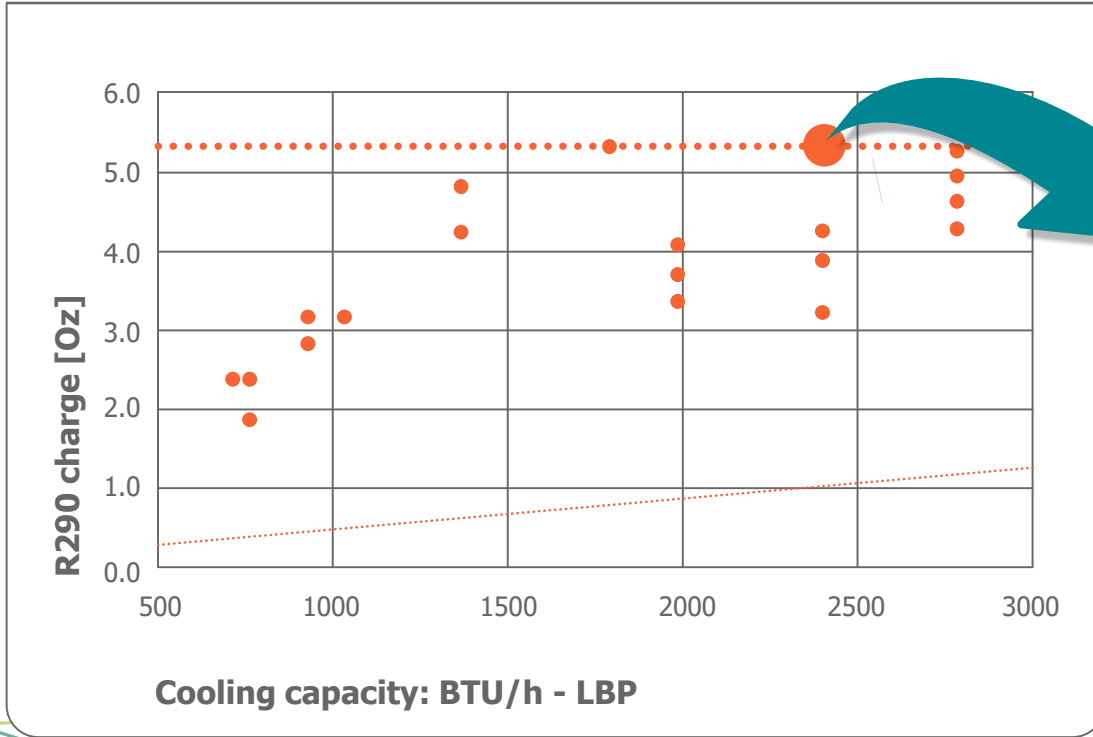
5,3 oz

11,6 kWh/DAY

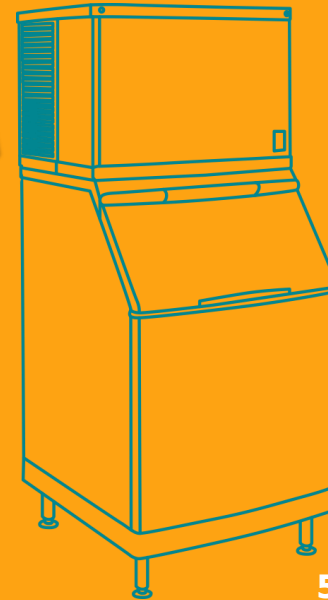


150g (5,3 oz) CHARGE LIMIT

MT PROPANE CABINETS CHARGE



ICE MACHINE



704 lb/day

NT2170U

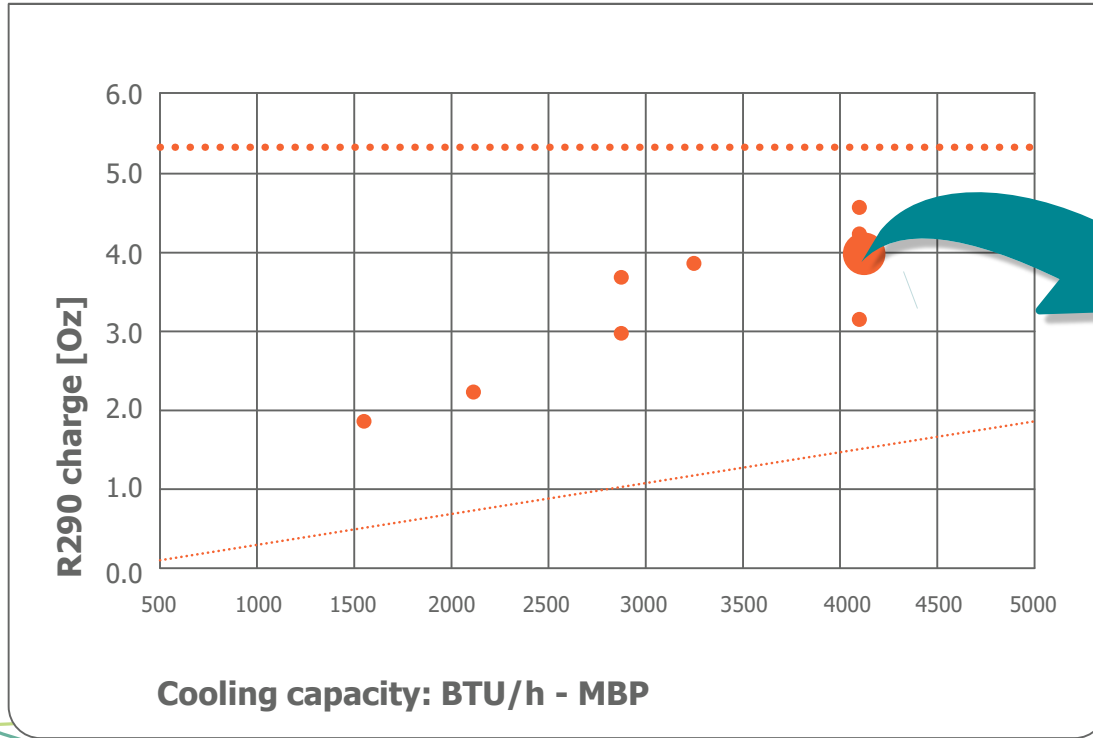
5,3 oz

5,3kWh/100 lb

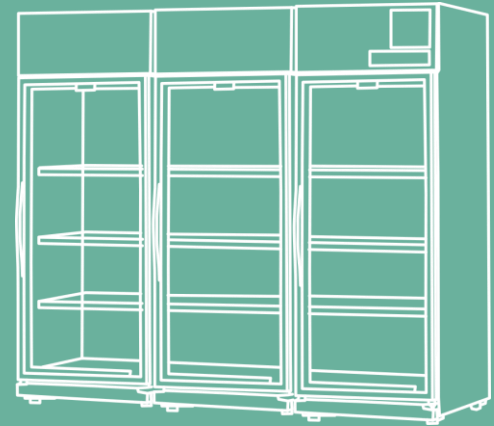


150g (5,3 oz) CHARGE LIMIT

MT PROPANE CABINETS CHARGE



GLASS DOOR MERCHANDIZER



72cuft

NEK6213U

4oz X 2

7.2kWh/DAY

Details about TC61/SC61C/WG4

AT BE BR CZ DE FI GB
IT JO JP NZ SK MY US

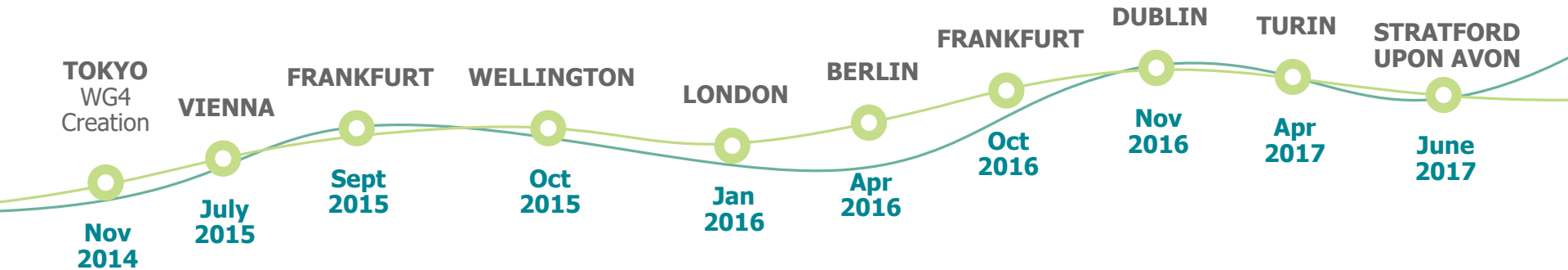
14
countries
30
members

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:



A line art illustration in yellow and white on an orange background. It depicts three stylized human figures in business attire. On the left, a man in a suit and tie is shown in profile, facing right. In the center, a woman in a business dress is shown in profile, facing left. On the right, another man in a suit and tie is shown in profile, facing left. The figures are composed of simple, overlapping lines. The text 'What direction is TC61/SC61C/WG4 going?' is written in white, bold, sans-serif font, positioned to the right of the central figure. A large white question mark is located at the bottom right of the image.

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**.

2 Its effectiveness **must be certified using a special leak test**. The leak test was developed with the help of specialized laboratories in Great Britain and in Germany.

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 slightly flammable A2L safety class refrigerant alternatives, **will be circulated in June 2017.**

5 If a consensus is reached, **the document will be submitted to the SC61C committee** to go to the first official vote as a Committee Draft (CDV) during Plenary Meeting of the SC61C in October in Vladivostok.

6 The majority of experts in the Working Group 4 are representing U.S. manufacturers like **True Manufacturing, Emerson, Hussmann and United Technologies, Whirlpool**

7 A new IEC standard for the maximum allowable flammable refrigerant charge **would influence the adoption of the same standard in the U.S.** "This would be a reference, the global standard."



Thank you



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