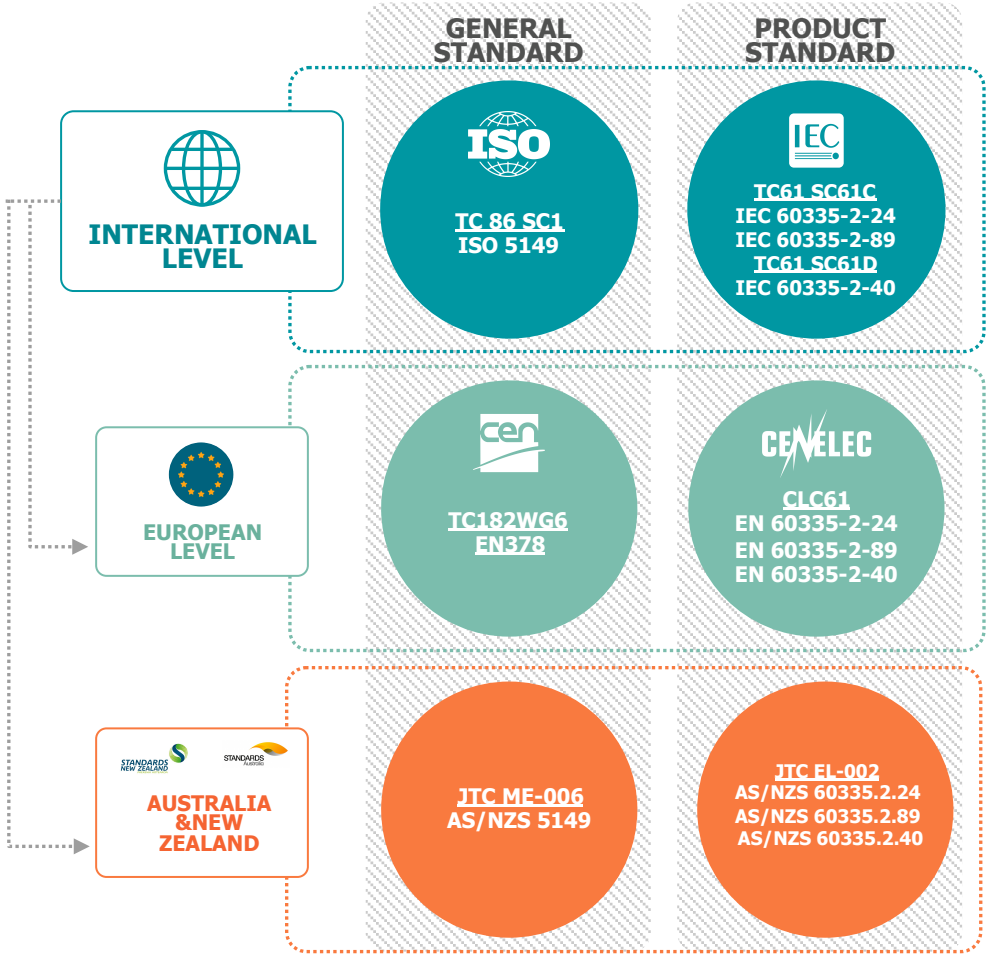
# Commercial Refrigeration Equipment Safety Standards Evolution

Marek Zgliczynski | IEC SC61C Chair

# 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

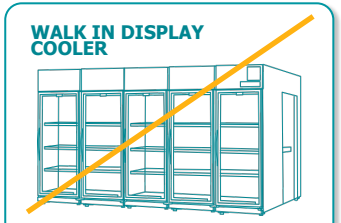
*As a general rule, if product standard is available, it should be used in preference to generic standard.*

# Relevant international standards and flammable refrigerants limits

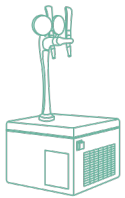
| STANDARD | TITLE | APPLICATION | CHARGE LIMIT | |
|---|---|---|---|---|
| IEC 60335-2-24 | Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers | Domestic refrigeration | Up to 150g of flammable refrigerant per circuit | 150g OK |
| IEC 60335-2-89 | Particular requirements 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

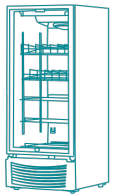
WALK IN DISPLAY COOLER



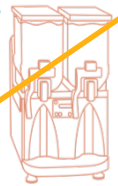
DRAFT BEER CCOLERS



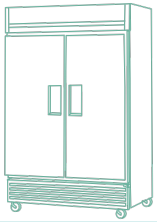
BOTTLE COOLERS



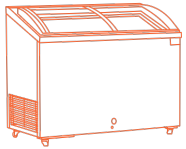
ICE-CREAM DISPENSERS



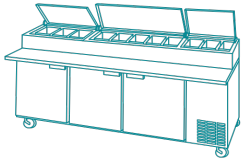
RECH-IN CABINETS



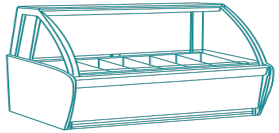
ICE-CREAM FREEZERS



PREPARATION COUNTERS

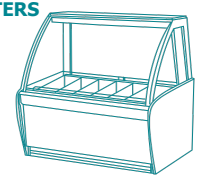


SERVE-OVER CABINETS

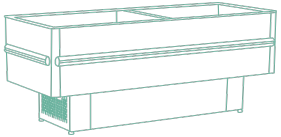


MULTI-DECK CABINETS

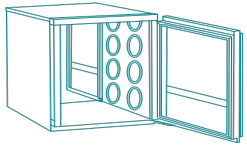
GELATO COUNTERS



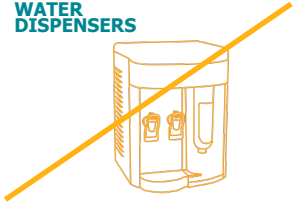
GONDOLA CABINETS



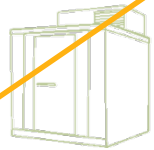
BLAST FREEZERS



WATER DISPENSERS



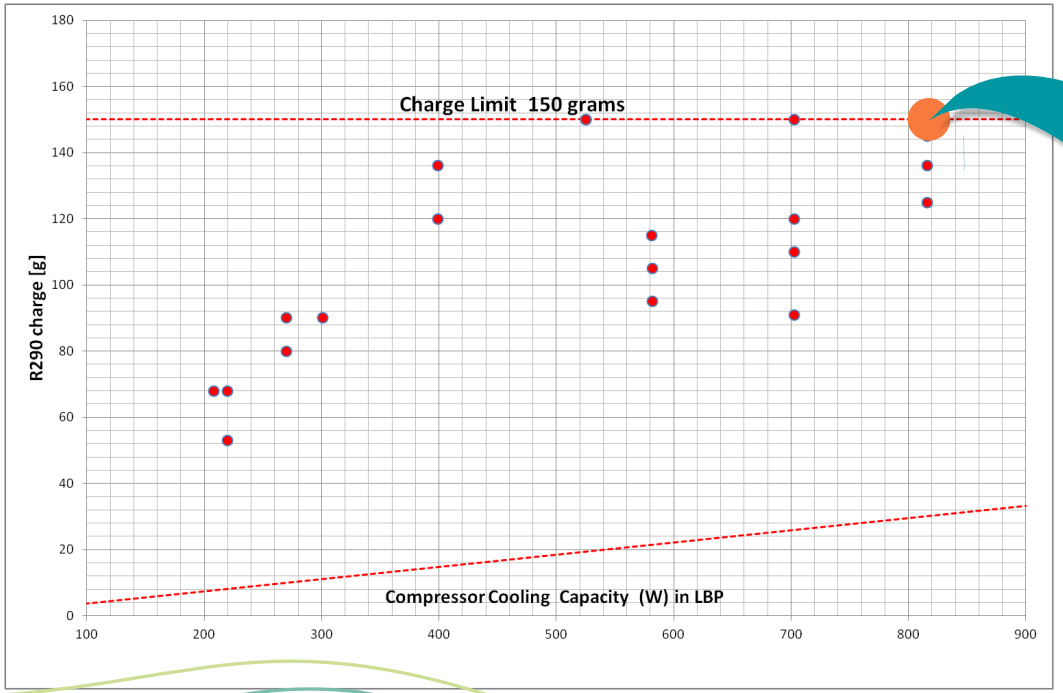
WALK-IN ROOMS



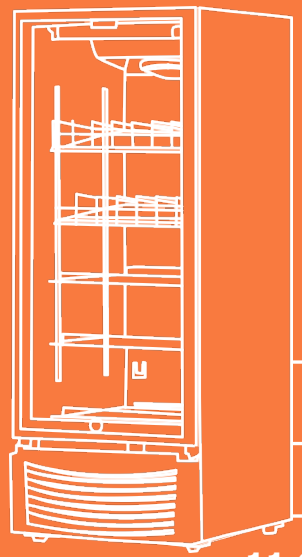
ICE MAKERS

# 150g (5,3 oz) CHARGE LIMIT

## LT PROPANE CABINETS CHARGE




**VERTICAL FREEZER**



**750 lt**

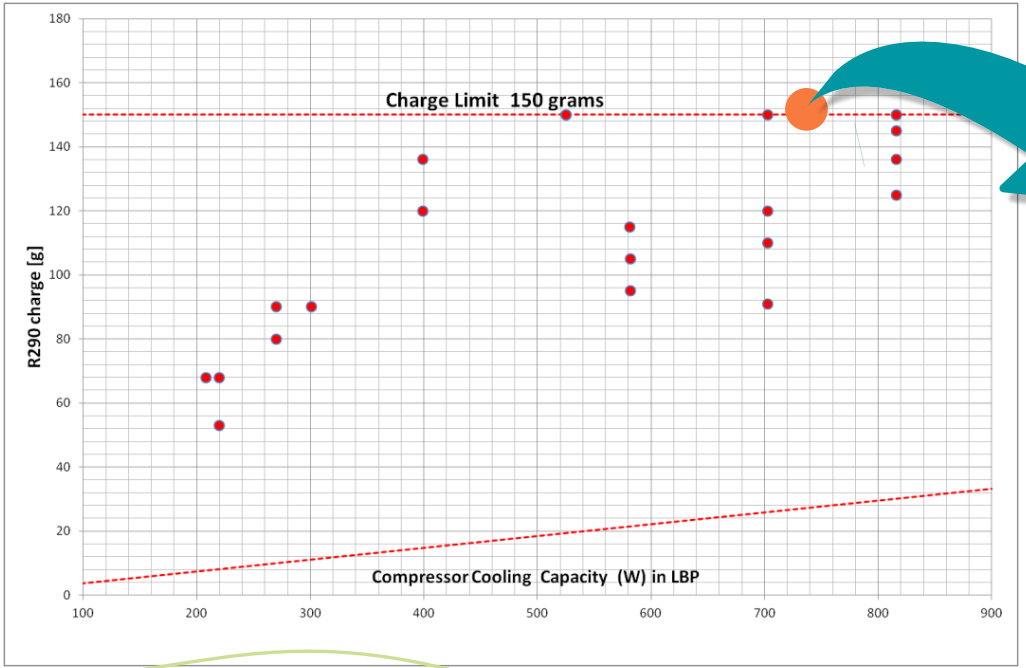
**NT2180U**

**150 g**

**11,6 kWh/DAY**

# 150g (5,3 oz) CHARGE LIMIT

## MT PROPANE CABINETS CHARGE




**ICE MACHINE**

**320 kg/day**

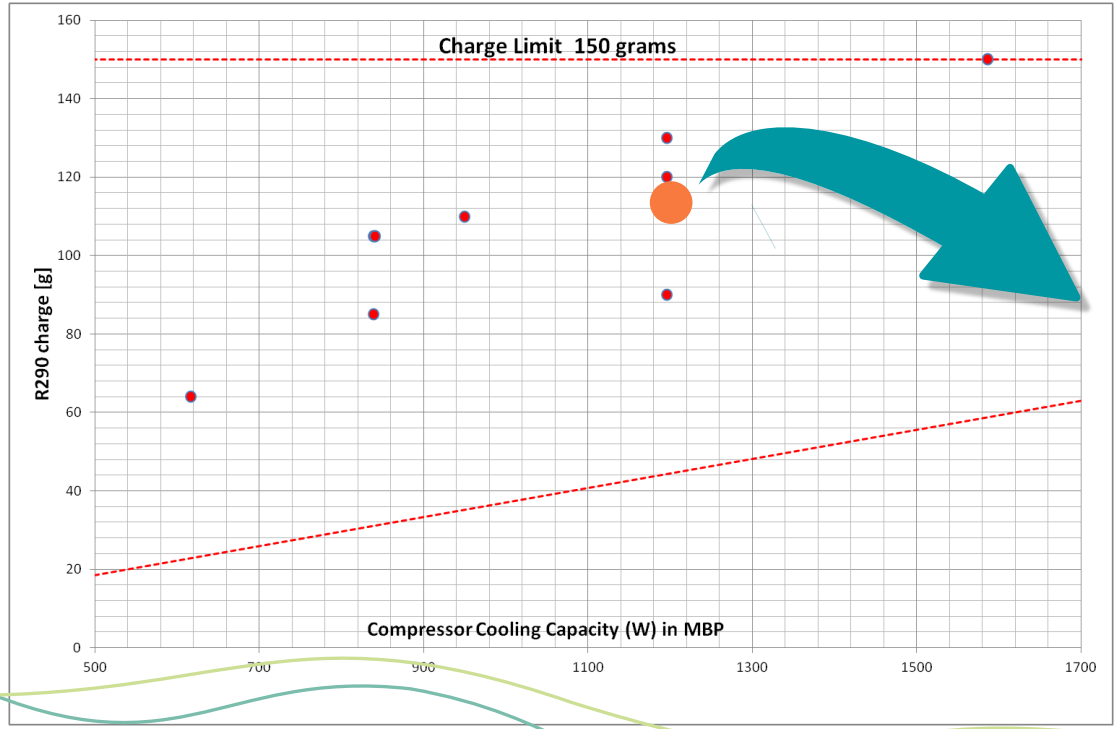
**NT2170U**

**150 g**

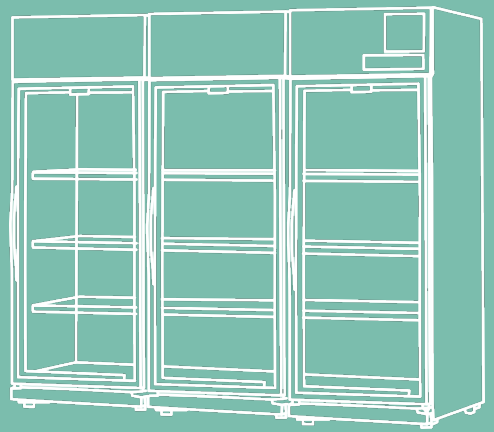
**10,6kWh/100kg**

# 150g (5,3 oz) CHARGE LIMIT

## MT PROPANE CABINETS CHARGE




### GLASS DOOR MERCIANDIZER



| | |
|---|---|
| 2000lt | NEK6213U |
| 114g X 2 | 7.2kWh/DAY |

# Details about TC61/SC61C/WG4

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

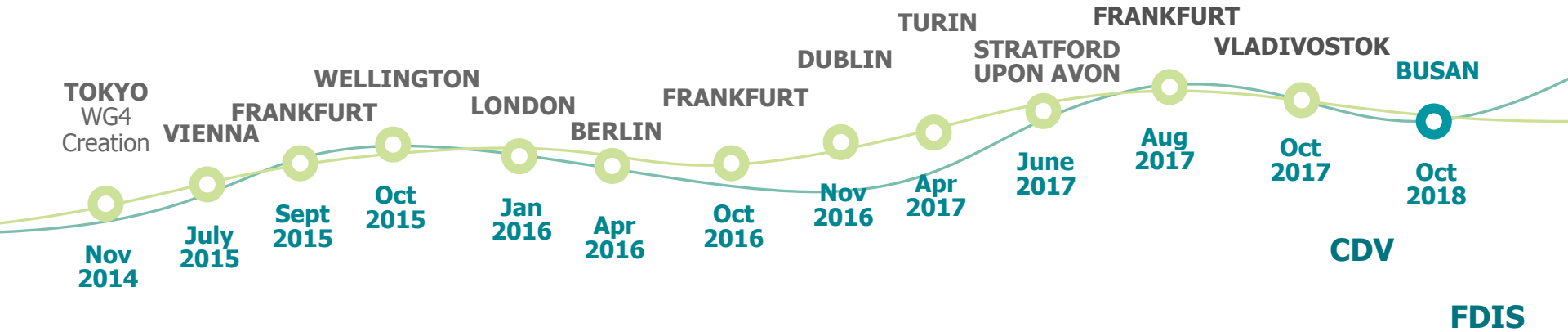
**16**
countries

**29**
experts

## 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:



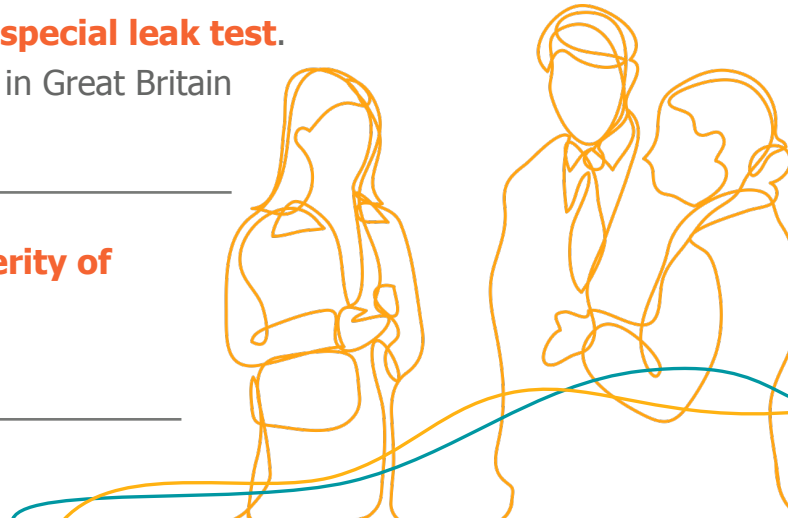
# What direction is TC61/SC61C/WG4 going?

# 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 arround 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 of 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** (A2Ls), was 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 **During plenary SC61C meeting in Vladivostok, WG4** proposal was **accepted** to go for the first vote as **CDV (Committee Draft for Vote),** that considers the **500g** limit for propane charges and which will also allow the use of A2L safety class refrigerant alternatives

5 International vote on **CDV** will close on **July, 13 2018**. **If positive**, in October 2018 proposed standard amendment could go for final vote as **FDIS (Final Draft of International Standard),** to be published in **2019**

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