

Commercial Refrigeration Equipment **Safety Standards** Evolution



Marek Zgliczynski | IEC SC61C Chair



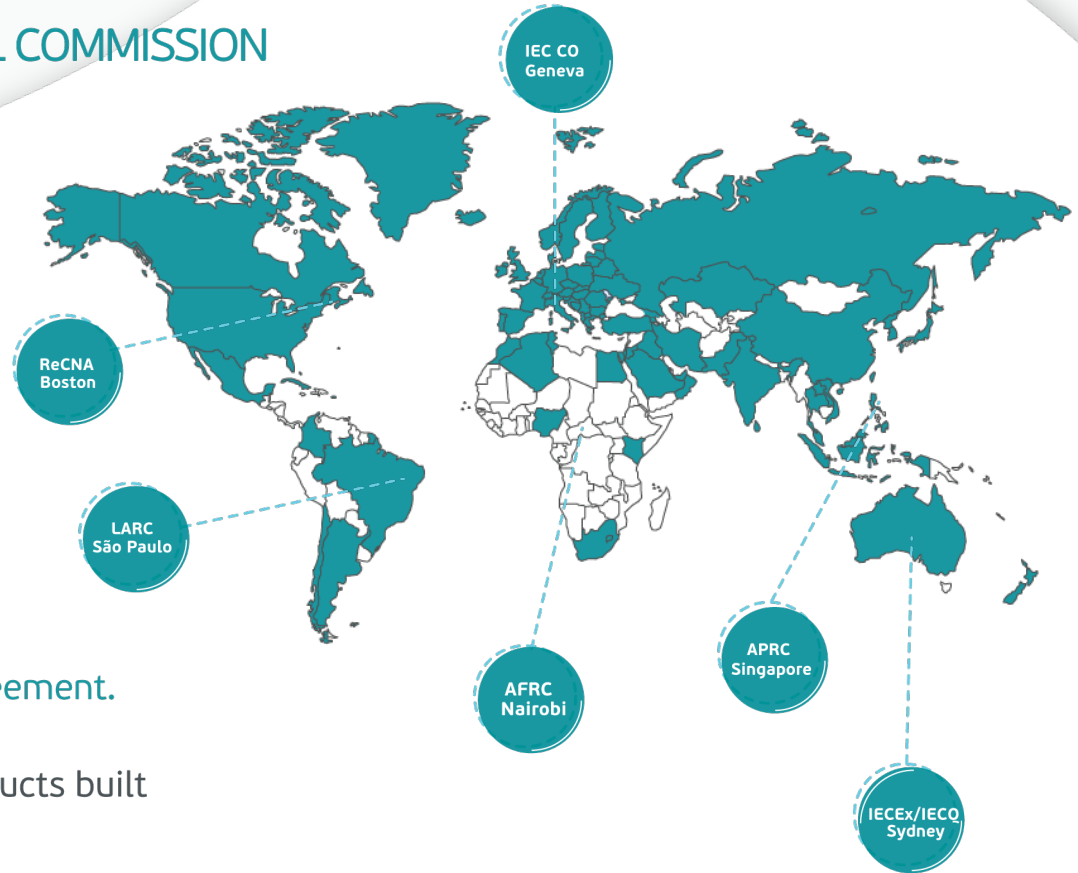
INTERNATIONAL ELECTROTECHNICAL COMMISSION

GLOBAL REACH: 171 COUNTRIES

The IEC is a global not-for-profit quasi-governmental organization that was founded in 1906. It is neutral and independent and brings together 170 countries that cover over 99% of the world population.

It fully satisfies the requirements of the World Trade Technical Barriers to Trade Agreement.

Nearly all countries in the world accept products built according to IEC International Standards.



GLOBAL KNOWLEDGE PLATFORM

20,000 Experts

200 TC/SCs

10,000 International Standards

4 Conformity Assessment Systems

1 million Certificates issued

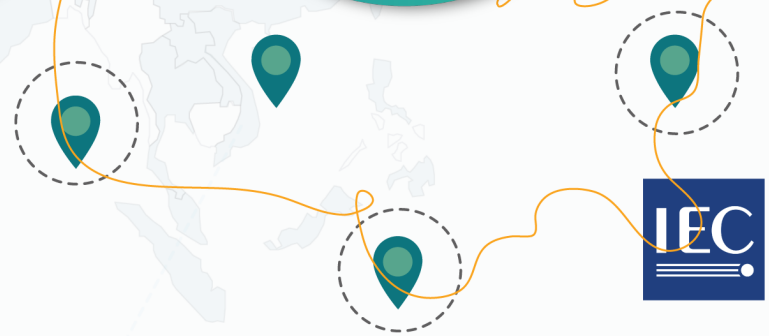


IEC NATIONAL COMMITTEE

84 IEC members -
National Committee
(one per country)

Selects all technical
areas the country wants
to participate in (voting,
commenting, experts)

Coordinates
national position
and nominates
global experts



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.

COMMITTEES & STANDARDS

*International
and Regional*


**INTERNATIONAL
LEVEL**

**GENERAL
STANDARD**



TC 86 SC1
ISO 5149

**PRODUCT
STANDARD**



TC61 SC61C
IEC 60335-2-24
IEC 60335-2-89
TC61 SC61D
IEC 60335-2-40


**EUROPEAN
LEVEL**



TC 86 SC1
ISO 5149

CENELEC

CLC61
EN 60335-2-24
EN 60335-2-89
EN 60335-2-40


**UNITED STATES
LEVEL**



SSPC 15
ASHRAE 15



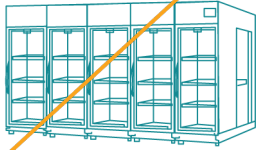
STP's
UL250
UL60335-2-24
UL471
UL60335-2-89
UL474, UL484
UL60335-2-40

RELEVANT INTERNATIONAL STANDARDS AND FLAMMABLE REFRIGERANTS LIMITS

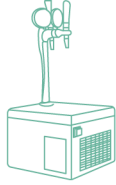
STANDARD	TITLE	APPLICATION	CHARGE LIMIT	
IEC 60335-2-24	Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers	Domestic refrigeration	Up to 150g of flammable refrigerant per circuit	150g OK
IEC 60335-2-89	Particular requirements for commercial refrigerating appliances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

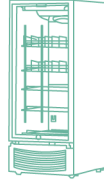
Walk in Display Cooler



Draft Beer Coolers



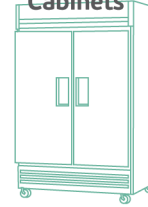
Bottle Coolers



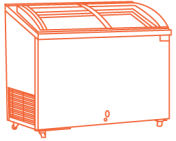
Ice- Cream Dispensers



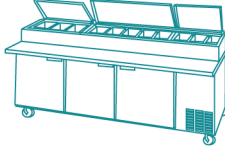
Rech-In Cabinets



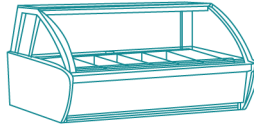
Ice Cream' Freezers



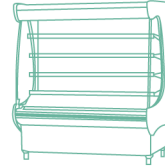
Preparation Counters



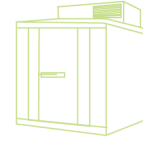
Serve-Over Cabinets



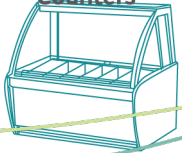
Multi-Deck Cabinets



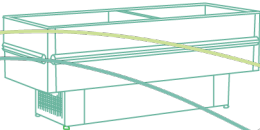
WALK-IN Rooms



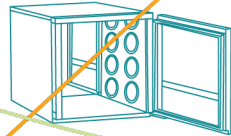
Gelato Counters



Gondola Cabinets



Blast Freezers



Water Dispensers



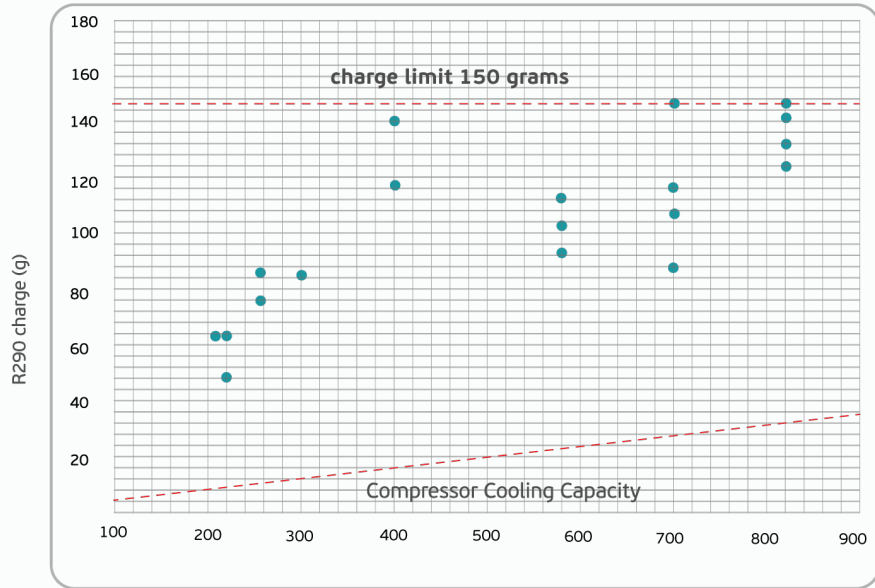
Ice Makers



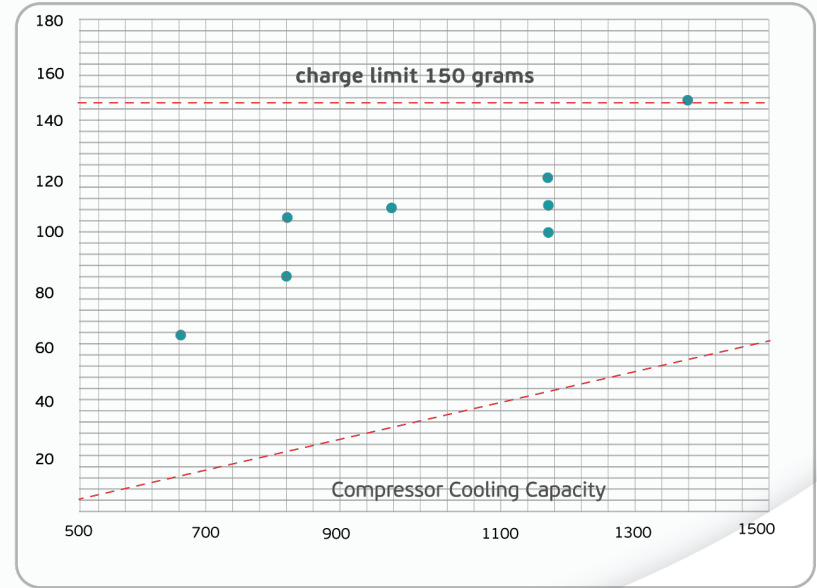


150G (5,3 OZ) CHARGE LIMIT

R290 APPLIANCE CHARGE VS COOLING CAPACITY



MAX COOLING CAPACITY 0.8KW IN LT



MAX COOLING CAPACITY 1,5KW IN MT

Details about IEC TC61/SC61C/WG4

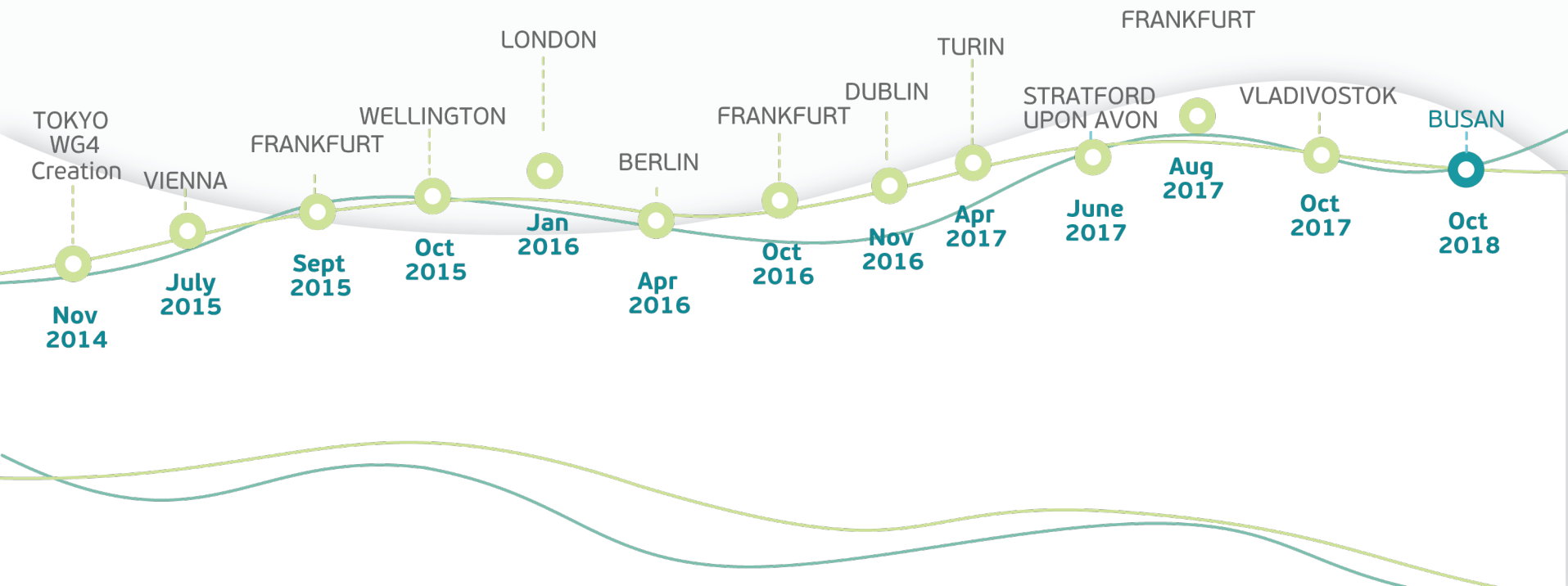
AT KR BE BR CZ DE FI GB
TR IT JO JP NZ SK MY US

16
countries
29
experts

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**



TIME SCALE FOR INCLUDING THE WG4 PROPOSAL INTO THE IEC 60335-2-89:





THE RISK WITH MORE THAN 150G FLAMMABLE REFRIGERANT MUST BE THE SAME AS WE HAVE WITH THE CURRENT LIMIT OF 150 G

1

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 up to 1,2 kg

2

Proposed Standard Amendment (CDV) added new specific requirements, for example:

- refrigerant circuit has to be hermetically sealed and mechanically protected,
- construction has not cause excessive vibrations or resonances of circuit piping,
- airflow has to be assured to avoid flammable concentration beyond the boundary of the appliance
- appliance shall be installed in a room with a floor area not less than the marked minimum room area.

3

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





THE RISK WITH MORE THAN 150G FLAMMABLE REFRIGERANT MUST BE THE SAME AS WE HAVE WITH THE CURRENT LIMIT OF 150 G

- 4 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
- 5 In both stages (CDV & FDIS) it is approved, if:
 - a [two-thirds majority of the votes](#) cast by the [P-members](#) countries are in favor,
 - not more than one-quarter of the total number of votes (P- and O- member states) cast are negative
- 6 Support to the proposal should go thru each country National Committee, in case of United States, to responsible [ANSI Accredited U.S. Technical Advisory Groups \(TAG\)](#)



Thank you

embraco



ATMO
sphere

Business Case for
Natural Refrigerants

06/12-14/2018 – Long Beach, CA

