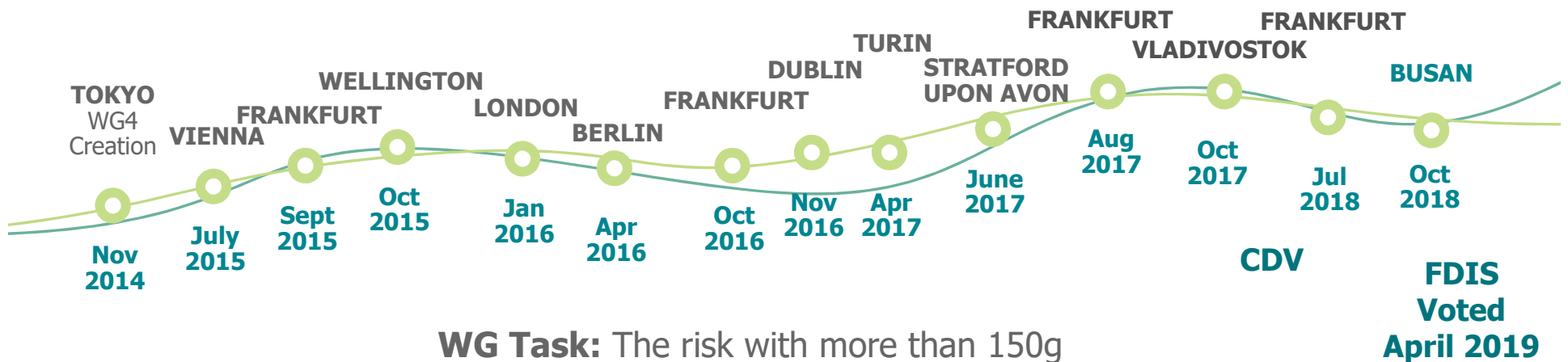


# Commercial Refrigeration Safety Standards Evolution






## Time scale for including the Working Group WG4 proposal into the IEC 60335-2-89:



**WG Task:** The risk with more than 150g flammable refrigerant must be the same as we have with the current limit of 150 g

# Voting Result:




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 **Voting Result** **APPROVED**

## Document 61C/792/FDIS

**Project : IEC 60335-2-89 ED3**

IEC 60335-2-89 ED3: Household and similar electrical appliances - Safety - Part 2-89: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor

Reference	Circulation date	Closing date	Downloads
61C/792/FDIS	2019-03-01	2019-04-12	 962 kB  991 kB

**Compilation of Comments**

Compilation of Comments

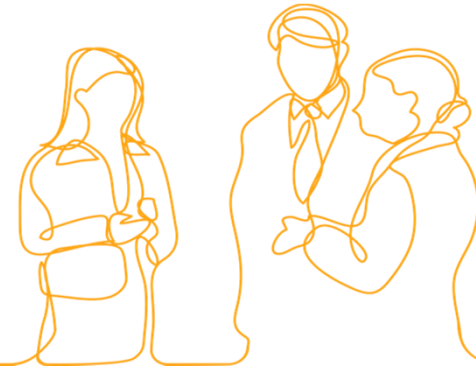
**Vote for P-Members**

P-Members Voting	P-Members In favour
23	17

**All Votes**

Total Votes Cast	Total Against
34	8

# New IEC Charge Limit For Flammables



- **Max** refrigerant **charge** for each circuit **13\*LFL**, but not more than **1.2kg**

eg.

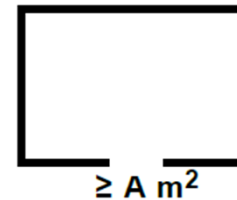
	LFL [kg/m <sup>3</sup> ]	13*LFL	IEC Approved
R290	0.038	0.494 kg	0.494 kg
R32	0.307	3.991 kg	1.2 kg

- **Requirements** for systems **below 150 g** are **not changing**
- **Commercial Ice Makers** are now part of the standard **scope**
- **Remote Systems** with more than 150 g of flammables **are excluded** from the scope of this new edition

# New IEC Charge Limit For Flammables

## Main new requirements above 150g of charge:

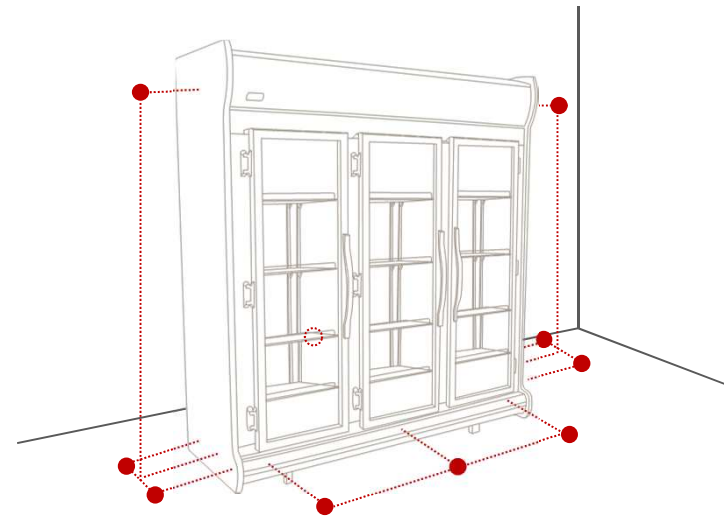
- Refrigeration circuit has to be **hermetically sealed**
- Refrigerant-containing parts shall be **protected** and **not** be an **accessible** part
- Appliance shall be constructed to **not cause excessive vibration or resonance**
- Appliance shall be **marked** with the **minimum room floor area** in which the appliance is permitted to be installed (With some exceptions)



# New IEC Charge Limit For Flammables

## Main new requirements above 150g of charge:

- **Air-flow** is the main factor to minimize the risk of flammable cloud around the appliance
- Appliance shall be constructed to pass the **Annex CC** test to prevent flammable refrigerant concentration
- Testing includes **doors/drawers opening** test after full charge release inside closed cabinet.

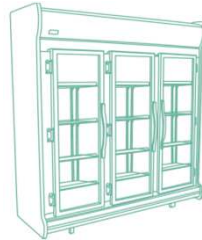


# Applications To Benefit Higher Charge Limit

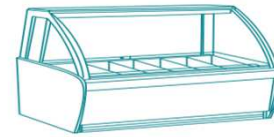
**MULTI-DECK  
CABINETS**



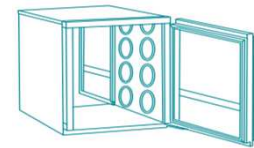
**GLASS DOOR  
MERCHANTISER**



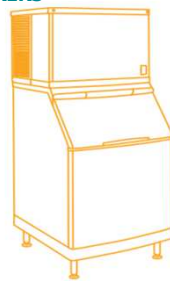
**SERVE-OVER  
CABINETS**



**BLAST  
FREEZERS**



**ICE  
MAKERS**



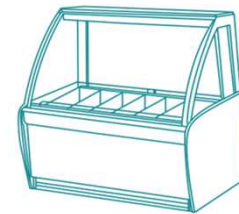
**RECH-IN  
CABINETS**



**GONDOLA  
CABINETS**















**GELATO  
COUNTERS**



# What's Next?

## COMMITTEES & STANDARDS

*International and Regional*

	 INTERNATIONAL LEVEL	 EUROPEAN LEVEL	 UNITED STATES LEVEL	 JAPAN LEVEL
GENERAL STANDARD	 <u>TC 86 SC1</u> ISO 5149	 <u>TC182WG6</u> EN378	 SSPC 15 <u>ASHRAE 15</u>	 <u>High Pressure Act</u> <u>Electrical Safety Act</u>
PRODUCT STANDARD	 <u>TC61 SC61C</u> IEC 60335-2-24 <u>IEC 60335-2-89</u> <u>TC61 SC61D</u> IEC 60335-2-40	 <u>CLC61</u> EN 60335-2-24 EN 60335-2-89 EN 60335-2-40	 STP's UL250 UL60335-2-24 UL471 <u>UL60335-2-89</u> UL474, UL484 UL60335-2-40	 C 9335-2-24 C 9335-2-89 C 9335-2-40



- New Edition of **IEC 60335-2-89 ed.3** was published on **June 20 2019**

## What next?

- European **EN** version of IEC 60335-2-89 was **not voted in parallel** because of IEC60335-1 updates.
  - **CENELEC TC61** is working on the conversion of an IEC standard to an EN IEC standard. As standard is intended to become a harmonized standard it has to be reviewed in relation to the respective directives.
  - Other nations/regions are working for introduction of Ed. 3 amendments. For example: USA and Canada formed recently a working group with **CANENA** for update of equivalent standards with UL and CSA.
-

# Thank You