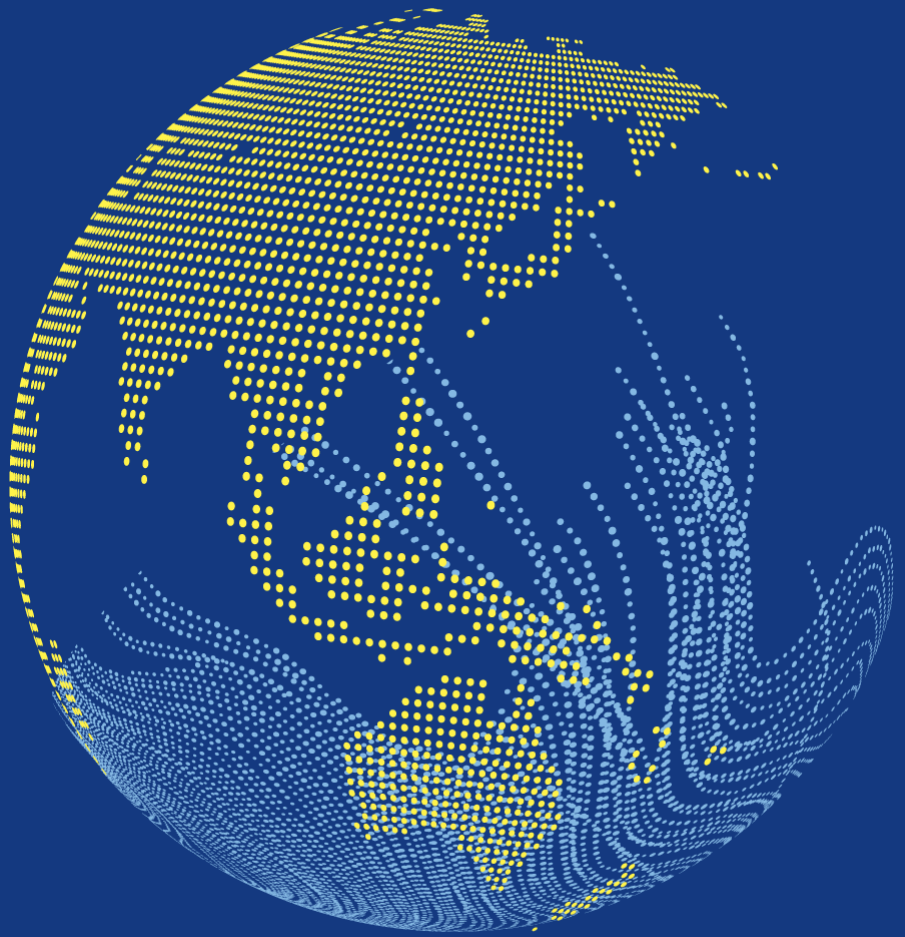
ATMO JAPAN sphere

Business Case for Natural Refrigerants



12/02/2019

TOKYO

New IEC Charge Limit For Flammables

Marek Zgliczynski

IEC SC61C Chair

#GoNatRefs

COMMITTEES & STANDARDS

International and Regional

	INTERNATIONAL LEVEL	EUROPEAN LEVEL	UNITED STATES LEVEL	JAPAN LEVEL
GENERAL STANDARD	ISO TC 86 SC1 ISO 5149	CEN TC182WG6 EN378	ASHRAE SSPC 15 ASHRAE 15	METI Ministry of Economy, High Pressure Act Electrical Safety Act
PRODUCT STANDARD	IEC TC61 SC61C IEC 60335-2-24 IEC 60335-2-89 TC61 SC61D IEC 60335-2-40	CENELEC CLC61 EN 60335-2-24 EN 60335-2-89 EN 60335-2-40	UL STP's UL250 UL60335-2-24 UL471 UL60335-2-89 UL474, UL484 UL60335-2-40	JIS C 9335-2-24 C 9335-2-89 C 9335-2-40

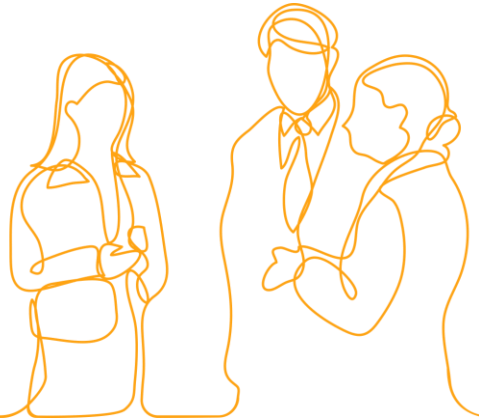
#GoNatRefs

12/02/2019 — TOKYO, JAPAN

ATMO sphere JAPAN

New IEC Charge Limit For Flammables

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



- 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**

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

- **Max** refrigerant **charge** for each circuit **13*LFL**, but not more than **1,2kg**, (remote systems are excluded)

IEC

ATMO JAPAN sphere

New IEC Charge Limit For Flammables

Main new requirements above 150g of charge:

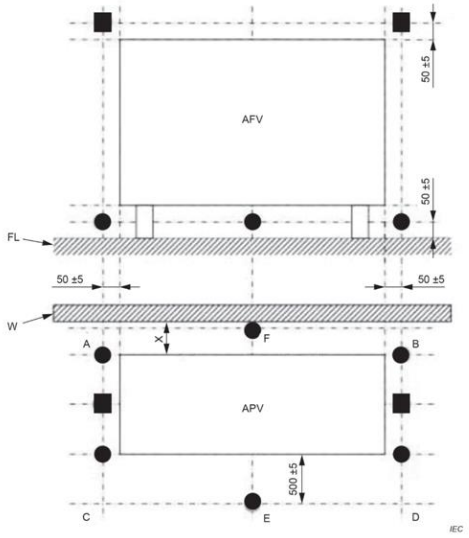
- Refrigeration circuit has to be **hermetically sealed**
- Refrigerant-containing parts shall be **protected** and **not** be an **accessible** part**,**
- Appliance shall be constructed to **not cause excessive vibration or resonance,**
- Appliance shall be **marked** with the **minimum room floor 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:

- Appliance shall be constructed such that a leak of refrigerant shall not result in a flammable refrigerant concentration **surrounding the appliance** , by passing the test of **Annex CC**

- Testing includes **doors**/drawers **opening** test after full charge release inside closed cabinet.



Key

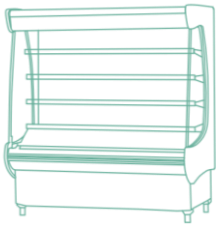
AFV	appliance front view
APV	appliance plan view
X	minimum separation distance from the wall specified in the instructions or allowed by the construction or 50 mm whichever is greater
FL	test room floor
W	test room wall

Figure CC.1 – Schematic illustration of the refrigerant concentration sampling points

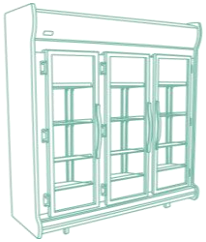
#GoNatRefs
14/04/2023 — TOKYO, JAPAN

Applications To Benefit
Higher Charge Limit

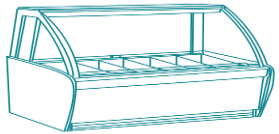
MULTI-DECK CABINETS



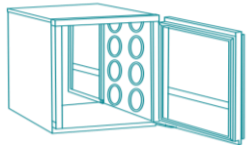
GLASS DOOR MERCHANDISER



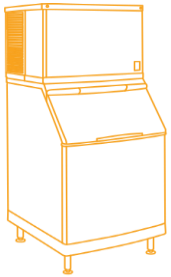
SERVE-OVER CABINETS



BLAST FREEZERS

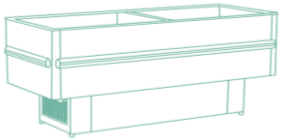


ICE MAKERS

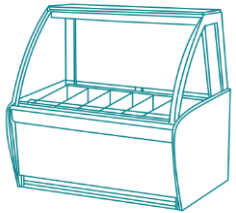


RECH-IN CABINETS

GONDOLA CABINETS



GELATO COUNTERS



#GoNatRefs

12/02/2019 — TOKYO, JAPAN

ATMO JAPAN sphere

Conclusions:

• Based on positive vote in CDV stage, during plenary of IEC SC61C in Busan, **SC61C** decided to go for the final vote of **FDIS** (Final Draft of International Standard), 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**

• International vote on **FDIS** will start arround **April 2019**. **If positive**, proposed standard will be published in **Q3 2019**. It will allow use of flammable refrigerants to much larger plug-in appliances

• In **Japan**, in case of a positive IEC, Ed.3 of IEC standard 60335-2-89 is going to be translated into Japanese and **JIS C 9335 2-89** with some national differences coming from JRAIA risk assessment can be released

• Publication of the New Edition of **IEC 60335-2-89** will be an huge achievement on the path to meet **Kigali Amendment** and all regional and national legislation to **mitigate global warming**

ATMO JAPAN sphere

Business Case for Natural Refrigerants

Thank you for listening.