



euramm^on

refrigerants delivered by mother nature

EU Standardization Request M/555
Use of flammable Refrigerants: Requirements
given in Regulations and Standards

Carsten Hoch, TÜV SÜD Industrie Service

Schaffhausen, 28th of June 2018

Standardization Request M/555

- **Issued by the European Commission on 2017-11-14**
- **Consist of two parts:**
 - Assessment of existing standards and regulations with focus on development of the State of the Art and latest results arising from research and development activities
 - Drafting of Technical Specifications for the installation (and also operation) of Refrigeration, Air Conditioning and Heat Pump Equipment (Ref/AC/HP)
- **Intention: to enable a wider use of flammable refrigerants**

Standardization Request M/555

- **Addressed to: CEN and Cenelec (CLC)**
- Decision by CEN/Cenelec Management Centre:
 - The work is allocated to **CEN TC 182**.
 - CLC TC 61 is invited
 - “to maintain close liaison with CEN TC 182”.
 - This means: Experts of CLC TC 61 (i.e. SC61C and SC61D) will participate in the newly established CEN working group
- Decision by CEN TC 182: for the purpose of the work arising from M/555, the new Working Group WG12 was established.

Standardization Request M/555

- **Working Group CEN TC 182 WG 12**
- Call for Experts and Call for Convenor
- 1st Meeting (onsite) was held in Dublin on 2018-05-17/18 with approx. 30 participants.
- Decision to establish 7 Ad-Hoc Groups (AHG) for splitting work into smaller work packages, each “Ad-Hoc Group” to consider a dedicated segment of the industry (& general topics in AHG 1)
Commercial Ref -- Transport Ref -- Industrial Ref --
AirCon / Heat Pumps -- Chillers -- Mobile AirCon

Standardization Request M/555 – Time Outline

- **Issued by the European Commission** 2017-11-14
- 1st joint annual report 2018-12-17
- Assessment study (task #1), to be finalized until Plenary Meeting CEN TC 182 2019-03-07/08
- Draft of European Standardization deliverable 2019-07 (tbc)
- 2nd joint annual report 2019-12-30
- **Deadline for adoption of European Standardization deliverable:** 2020-11-15
- Joint final report 2021-02-15

Standardization Request M/555 – Technical Content

- **Task #1: Assessment study**
- Existing standards at European Level:
- General “horizontal” standard: EN 378 (-1, -2, -3, -4)
→ covers (nearly) all types of refrigerating systems & heat pumps
- Product (specific) standards, mainly EN 60335 series, e.g.
EN 60335-2-40: AirCon & Heat Pumps
EN 60335-2-89: Commercial refrigerated appliances
→ cover specific products and “prevail over” the general standard
→ usually set clear limits for the application of the standard

Standardization Request M/555 – Technical Content

- **Task #1: Assessment study**
- Existing rules for European Single Market (“Manufacturing”):
- Low Voltage Directive (LVD) 2014/35/EU
→ covers only equipment for domestic use
- Machinery Directive (MD) 2006/42/EC
→ covers equipment for commercial & industrial use
- Pressure Equipment Directive (PED) 2014/68/EU
→ covers all equipment classified in Categories (with the exception of equipment in Cat. I which is covered by LVD / MD)

Standardization Request M/555 – Technical Content

- **Task #1: Assessment study**
- Existing regulations for “Operation” in Europe
- Operation is ruled by national law
 - different rules in the different member states
- Some member states have stringent rules for the application of flammable refrigerants in force.
- This topic cannot be handled in the work of CEN TC 182 WG 12.
 - It is only possible to report this situation to the Commission.
 - techn. specification could be basis for changes in national law

Standardization Request M/555 – Technical Content

- **Task #1: Assessment study**
- Existing regulations for “Operation” at national level
- The Commission has already published a report on this topic.
- Report dated 2016-11-30 includes some of these aspects, e.g.
 - restrictions set by building codes in several countries
 - restrictions set by legislation on “public access rooms/places”
 - additional requirements set by workplace safety rules
 - these (national) rules are often inconsistently applied
 - in federal states, rules are often set at regional / local level

Standardization Request M/555 – Technical Content

- **Task #2: European Standardization Deliverable**
- Expectations posed by the Commission:
- Technical Specifications for the safe installation of equipment using flammable refrigerants (in particular of safety class A3)
 - in view of ensuring safety during installation and operation (operation is including servicing and decommissioning)
 - extending charge size limits and describing associated risk mitigation measures (considering the “whole lifetime”)
 - specifications for rooms/places in which equipment is installed

Standardization Request M/555 – Consequences

- **Development in standardization is needed and partly already in progress.**
- EN 378 – latest published version 2016
- Further development with regard to flammable refrigerants:
 - Amendment A1 of EN 378-4: Annex D - in-service inspections (under Formal Vote)
 - Changes in EN 378-1 concerning refrigerant data (Annex E), refrigerant charge limit requirements (Annex C, several topics) are under discussion.

Standardization Request M/555 – Consequences

- **Development in standardization is needed and partly already in progress.**
- EN 60335-2-40 – latest published version 2013 (at EN level !)
- Further development is done at IEC level:
 - IEC 60335-2-40: 2018 has been published this year
 - Adoption at EN level is expected, but the processing from IEC to CLC seems to be “complicated” (due to several aspects, e.g. for being “harmonized” some changes could be needed, which are not necessarily related to flammability of refrigerant)

Standardization Request M/555 – Consequences

- **Development in standardization is needed and partly already in progress.**
- EN 60335-2-89 – latest published version 2016 (at EN level !)
- Further development is done at IEC level:
 - IEC 60335-2-89: a new version is under vote.
 - The draft version is targeting to “allow” the use of 500 gr of a flammable refrigerant. Some risk mitigation measures are integrated in the draft version.
 - New IEC version to come, maybe still in 2018.

Standardization Request M/555 – Consequences

- **Further Development in standardization is needed.**
- Current situation on EN 378: a lot of work (to be handled by CEN TC 182 WG 6) is under discussion.
- Current situation on CLC product standards: although some progress has been made or is about to come at IEC level, progress in CLC work would be highly appreciated.
- But the question arises:
Will this be sufficient regarding the changes needed?
- And: changes need to be communicated to national authorities!

Standardization Request M/555 – Consequences

- **Remarks from a technical point of view**
- Current changes “under discussion” do not fully reflect the needs originating from the fundamental change of availability of refrigerants commonly used in the past & today.
- The future will be “somehow flammable” or “high-pressurized”



Standardization Request M/555 – Consequences

- **Remarks from a technical point of view**
- Changes in standards have to reflect the situation for all types of Refrigeration / Air-Conditioning / Heat Pump equipment, not only the view of high-scale “mass production” types (e.g. equipment for domestic use).
- The interest of all participants shall consider that the high level of safety reached remains “as is”.
 - This is also the intention of the Commission and this target is explicitly described in the Standardization Request.

Standardization Request M/555 – Consequences

- **Remarks from a technical point of view**
- A key role is the question of “durability”.
- The aim should be: the refrigerant circuit remains tight throughout the whole lifetime of the system.
- **Result: a leakage is not expected to happen.**
- **Question: which requirements shall be fulfilled that this “quality” will become reality?**
- The discussion of implementation of this concept has just started and would offer a new perspective.

Standardization Request M/555 – Consequences

- **Remarks from a technical point of view**
- A future content of standards (mainly EN 378) should include:
 - existing concepts for mitigation measures set out due to the risk of leakages (e.g. “20% LFL concept”)
 - concepts with additional requirements for the installation site (e.g. the alternative concept described in EN 378-1, C.3)
 - new concepts (e.g. “durability concept”) setting an appropriate framework for higher charges of flammable refrigerants.
- It should be clear: we need to consider all practicable concepts.

Contact:
Carsten Hoch
TÜV SÜD Industrie Service GmbH
80686 Munich
Germany
Phone +49 89 5190 3515
E-Mail carsten.hoch@tuev-sued.de



Industrie Service

**Choose certainty.
Add value.**