

The logo for Europe, featuring a dark teal square at the top left, a light teal curved shape below it, and the word "EUROPE" in white capital letters on a teal background.

EUROPE



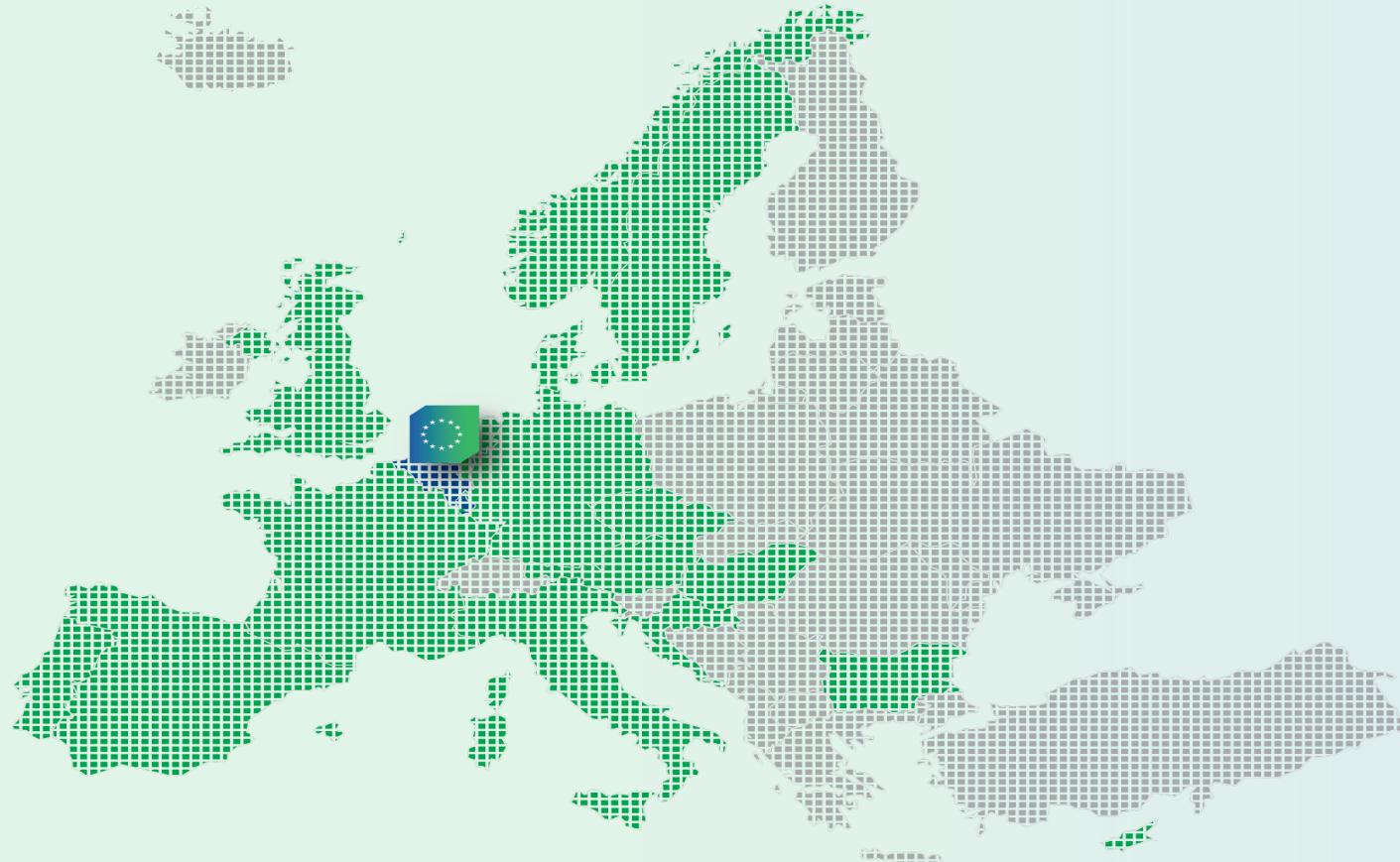
## Development of standards and their impact on natural refrigerants

Thomas Willson  
Policy Officer  
27/09/2017

**34** National organisations



**9** Pan-European organisations



# Introduction to standardisation

## What are standards?

- 'rules or guidelines for products or services for common and repeated use'
- Integral part of the European Single Market
- Facilitate international trade

## Uses and applications?

- Product design and development
- Product testing
- Installation and decommissioning of systems

## Who makes them?



# Overview of relevant standards to F-Gas Regulation and Kigali amendment\*

ISO 5149/EN 378 'Refrigerating systems and heat pumps – Safety and environmental requirements'

- Industrial systems, commercial refrigerators, air conditioners and heat pumps, transport refrigeration and chillers

IEC 60335-2-40/EN 60335-2-40 '

- Air conditioners and heat pumps, chillers

IEC 60335-2-89/EN 60335-2-89

- Commercial refrigerators

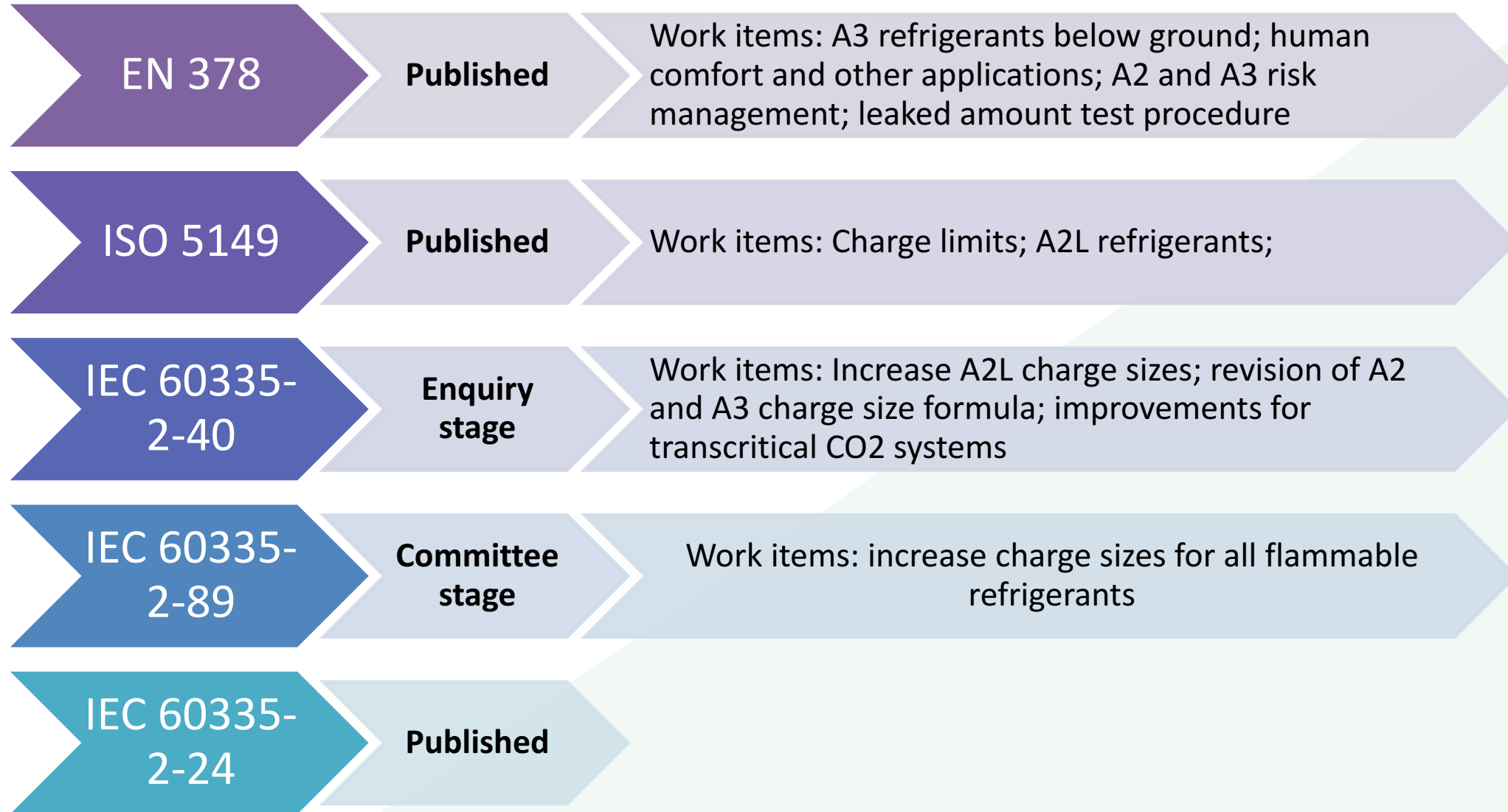
IEC 60335-2-24/EN 60335-2-24

- Domestic refrigerators

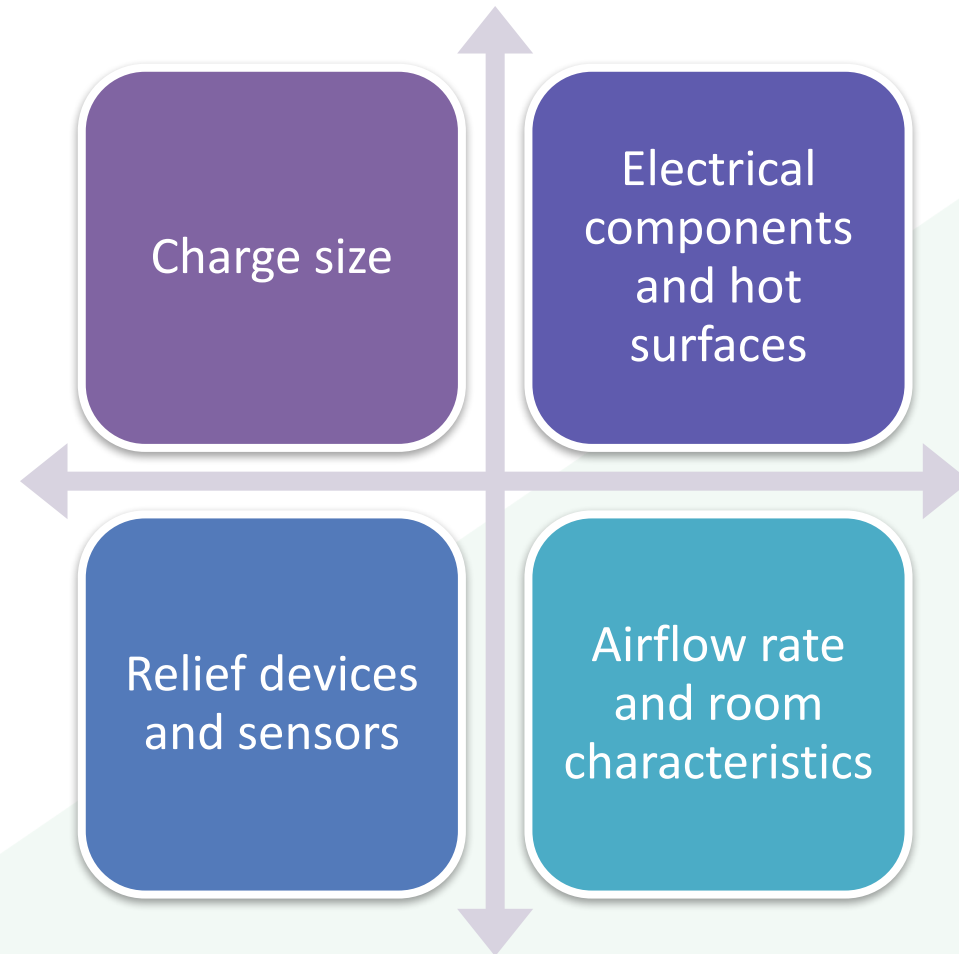


\*non-exhaustive list

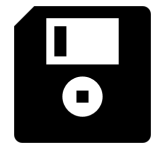
## Status of standards



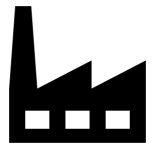
# How do these standards impact systems that use natural refrigerants?



# Standardisation development process distortions



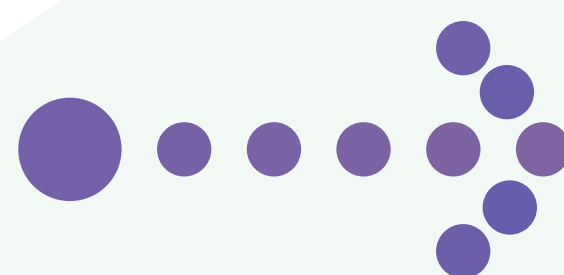
Limited information



Narrow interests



Limited stakeholder participation



Unsuitable standards



# F-Gas Standardisation Request

## Analysis

- Existing standards and work programmes to identify standards that should be further updated
- Risk analysis used in related standards
- Relationship between risk and increased charge
- Options for additional mitigation requirements if the risk increase is not tolerable
- Identification of performance based requirements that result from risk assessments
- Identification of options for risk minimisation

## Draft technical specifications

- Extended charge size limits and risk mitigation measures
- Design and structural requirements for rooms
- Marking of installations containing flammable refrigerants



# life front.

- FRONT is a 3 year demonstration project, which aims to address flammable refrigerants in standardisation and increase the availability of suitable alternatives
- Objectives:
  - Support standardisation development processes
  - Reduce safety risks with improve system design
  - Engage in technology capacity building
  - Remove non-technological knowledge barriers



Literature review  
and market study

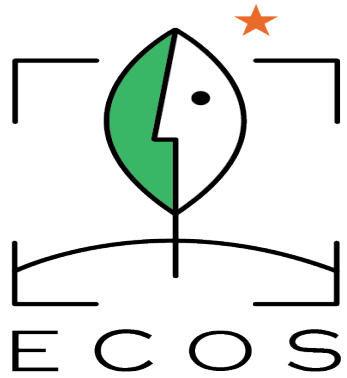


Field and laboratory  
studies




Product safety  
design and risk  
assessment





**Thomas Willson**  
**Policy Officer**

Mundo B, Rue d'Edimbourg 26  
1050 Brussels, Belgium  
T. +32 2 894 46 39  
E. [Thomas.willson@ecostandard.org](mailto:Thomas.willson@ecostandard.org)  
**[www.ecostandard.org](http://www.ecostandard.org)**

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