The link between safety standards and legislation:
How do they impact the implementation of legislation and the choice of technologies by manufacturers?
Standardization in Europe
Key Standards in the EU

EN 378 (ISO 5149)

- EN 60335-2-89 (IEC 60335-2-89)
- EN 60335-2-24 (IEC 60335-2-24)
- EN 60335-2-40 (IEC 60335-2-40)

- Refrigerating systems and heat pumps
- Refrigerating appliances, ice-cream appliances and ice makers
- Electrical heat pumps, air-conditioners and dehumidifiers

Commercial refrigerating appliances with an incorporated or remote refrigerant unit or compressor

Other
Generic vs. Product standards

- Requirements in product standards prevail over requirements in generic standards.

- Product standards specify charge requirements particular to the scope of the standards. It is normal practice to have different charges for different products.
### Interplay between standards

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<th>Low Voltage</th>
<th>Machinery</th>
<th>Pressure equipment</th>
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<td><strong>EUROPE</strong></td>
<td>EN 60335-2-40</td>
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<td>EN 378</td>
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- **Low Voltage**: o
- **Machinery**: EN 60335-2-89, o
- **Pressure equipment**: EN 378, o

**Product standards**
- Needed for compliance in product design

**Generic standards**
- Mainly influence national regulation

**EN 378**
- Needed for compliance with Pressure equipment directive/is kind of product standard.

**Covers general safety**: electrical, mechanical; includes charge limits, and safe use.

**Covers pressure safety**: flammability affects safety requirements e.g. number of devices needed.
Interaction of standards & legislation

Limitations for the use of flammable refrigerants may arise from various fields of national legislation / regulations. Among them may be national regulations on:

- Workplace safety
- Fire safety
- Building construction
- Environmental protection
- Regulations on public areas / spaces.

The standards are under revision

Codes may refer to EN 378. But not all building codes do.
(MS do not necessarily follow standardisation work)

No particular standards in place: application is limited as in general these instances look at the refrigerant type as specified in CLP (flammable, extremely flammable), and ATEX requirements.
Why & how standards impact the implementation of the F-Gas Regulation
The EU phase-down

Entry into force of GWP limits

- 2015: 93%
- 2016: 63%
- 2018: 45%
- 2021: 31%
- 2024: 24%
- 2027: 21%
- 2030: 0%
The refrigerant dilemma

GWP

Fire
R-404A to be quickly phased out in new commercial refrigeration equipment

It is replaced with a range of different lower GWP alternatives

Source: The EPEE Gapometer
Example: small split a/c

R-410A to be phased out in new split air-conditioning.

It is replaced with lower flammability refrigerants:

- R-410A
- R-32
- R-32 / HFO blends

Source: The EPEE Gapometer
Standards, legislation, innovation and manufacturers’ choice
Ecodesign: Minimum Efficiency Performance Standards (MEPS) in Europe

ECOLABEL: Identifies products and services that have a reduced environmental impact throughout their life cycle.

ENERGY LABEL: “Pull” Help consumers to choose the most energy-efficient products.

ECODESIGN: “Push” Minimum energy efficiency requirements.

Legislation and Standards go hand in hand.
MEPS can trigger innovation

- Move towards Inverter technology
- Electronic expansion valves
- Improved efficiency control
- Reduction of standby consumption

Example of a/c <12 kW:
Boosting the overall energy efficiency of the product
Conclusions
Don‘t put the cart before the horse!

• A coordinated approach between standards and legislation is indispensable to ensure successful implementation of legislation

• F-Gas Regulation and Ecodesign Rules show that innovation and change happen if rules are ambitious, yet realistic, and if industry and political decision makers work together in a transparent way
Questions?

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