

Machines & components in the Italian HP supply chain: the companies' point of view

DAIKIN

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HPT - 2026

Intro Daikin

Founded in **1924**
100 Years of History

2

€28 billion
Overall Sales

84%
of Daikin Sales are from outside Japan

Cooling & Heating + cold chain



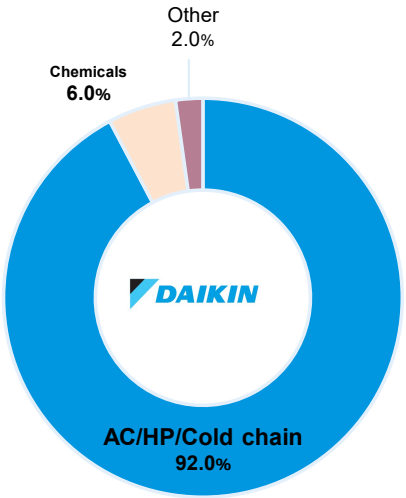
Residential



Commercial & industrial



After Sales Service



Other Businesses



Oil Hydraulic Equipment



Oxygen Concentrators

Chemicals



Refrigerant



Semiconductor Applications



Automotive Applications

130+
Production Bases
In the World

Business Development in
170+
Countries and Regions

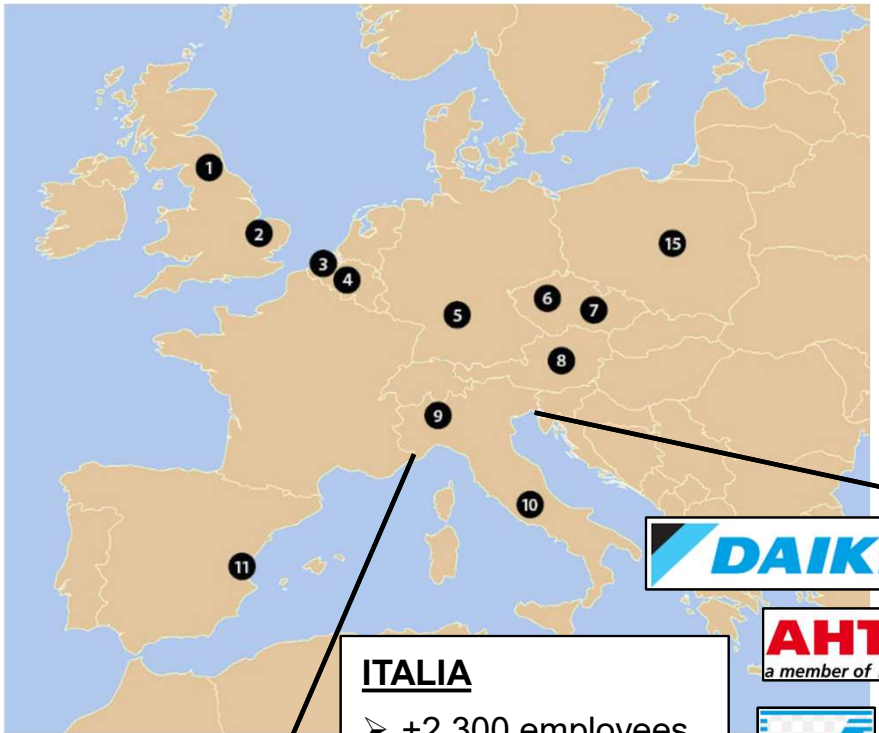
100,000+
Employees

DAIKIN

Daikin
Sold products in Europe – Made in Europe



95% OF DAIKIN PRODUCTS SOLD IN EUROPE ARE MADE IN EUROPE



1. Cramlington, United Kingdom
2. Ipswich, United Kingdom
3. Ostend, Belgium
4. Ghent, Belgium
5. Güglingen, Germany
6. Pilsen, Czech Republic
7. Brno, Czech Republic
8. Rottenmann, Austria
9. Milan, Italy
10. Cecchina, Italy
11. Valencia, Spain
12. Hendek, Turkey
15. Lodz, Poland (since end of 2024)

ITALIA

- +2.300 employees
- 5 prod. plants
- 5 R&D
- 1,3€ bln turnover

DAIKIN

AHT a member of DAIKIN group

DUPLOMATIC MOTION SOLUTIONS a member of DAIKIN group

ZANOTTI a member of DAIKIN group

HYDRECO a member of DAIKIN group

Daikin Italy: 2,5% turnover globally 13% at EMEA perimeter

The main challenges for heat pumps sector

- Upfront costs
- Energy bills
- EU policies
- Fake news
- …
- Refrigerants transition

Refrigerant transition
Daikin approach

Selecting the right refrigerant for each application is **not a one-size-fits-all solution**



Environmental impact

- Lower refrigerant global warming potential (GWP)
- Potential to be recycled and reused
- Lower lifecycle climate performance (LCCP) of equipment



Energy efficiency

- Reducing energy consumption to lower the indirect CO_2 impact
- Reduced running costs for end-users



Safety

- Considering the whole life cycle, including transport, storage, installation, use, servicing, recovery and recycling
- Evaluating for each type of use, taking into account toxicity, **flammability**, pressure etc



Affordability

- Affordable solutions
- Regarding equipment, installation, operation, maintenance and end-of-life treatment

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Examples of products using flammable refrigerants



R32 split type comfort cooling & heating



R290 plug in display case



R290 monobloc heat pump (air to water)



R290 cold room



R290 chiller



R1234ze chiller

Safety with flammable refrigerants

How to ensure safety in case of flammable refrigerants ?

I. Risk analysis
II. Risk Mitigation options (examples)
III. Standards & Legislations
IV. Guideline examples

I. Evaluating the risk of products using flammable refrigerants a case-by-case approach

- Refrigerant characteristics
- Locations
- Handling processes
- Market circumstances

Refrigerant Characteristics

LIKELIHOOD

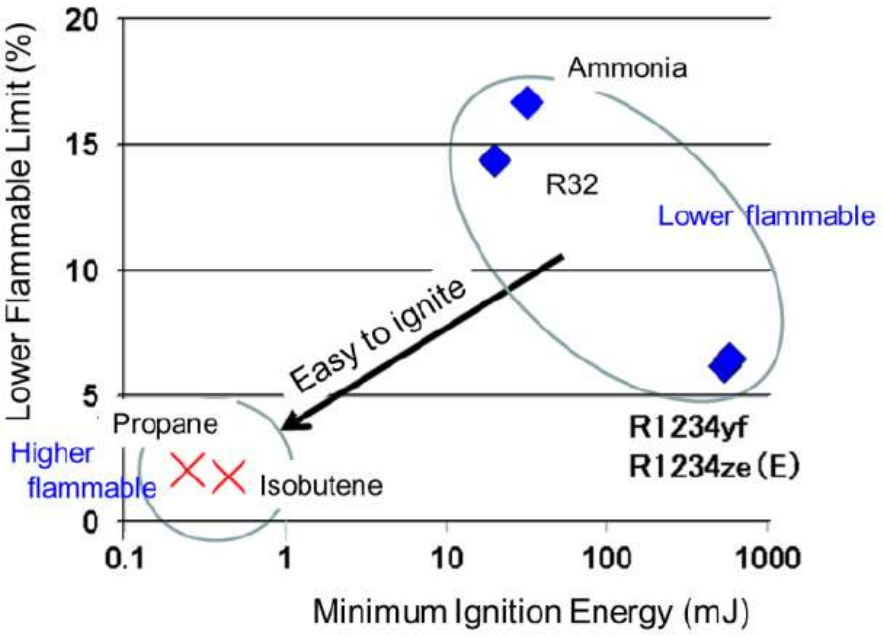


Figure 1-6 Comparison for easy ignition

SEVERITY

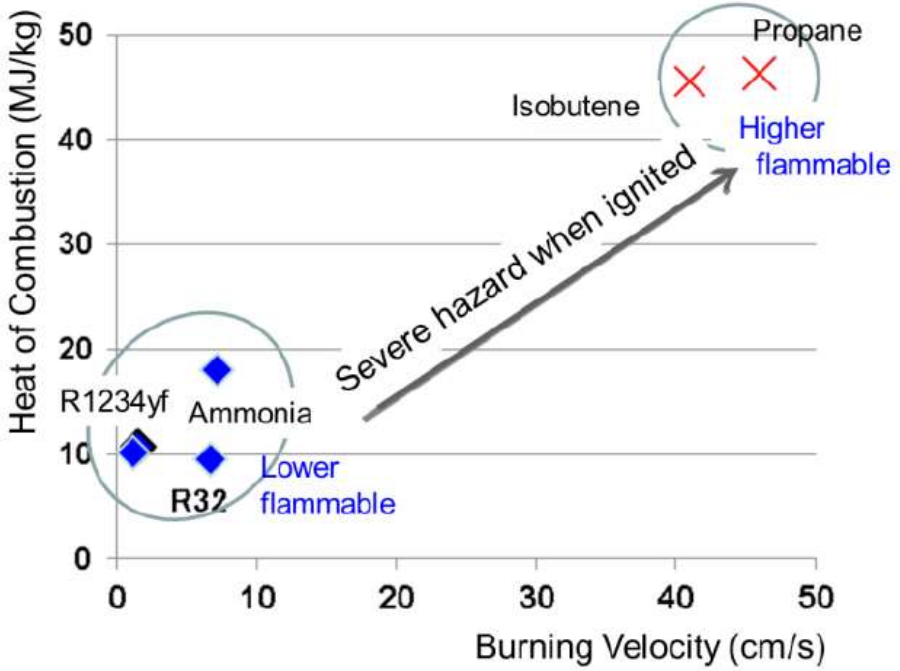
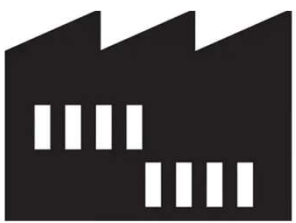


Figure 1-7 Comparison for hazard severity

Locations

→ **not only the site of use needs to be safe**



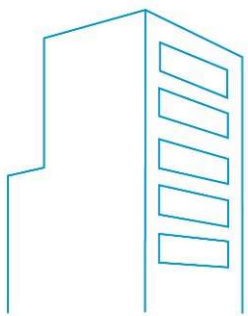
Factory
& test rooms



warehouse



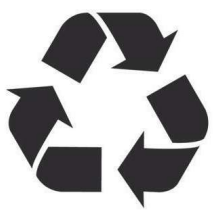
transport
spaces



site of use



waste
collection
site



waste
treatment
site

Handling processes

→ Directly interfering with refrigerant circuit
→ may include handling of refrigerant cylinders





installation, requiring refrigerant piping connections on site



repair



recovery

Handling processes

→ NOT directly interfering with refrigerant circuit, risks still to be assessed





transporting



installing without need for on site refrigerant connection



using the equipment

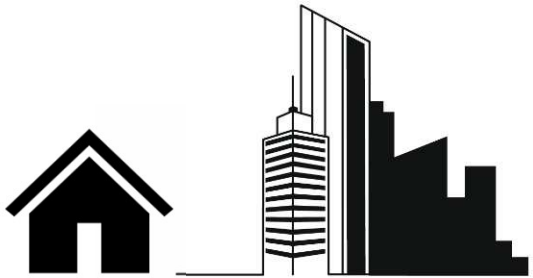
Market circumstances



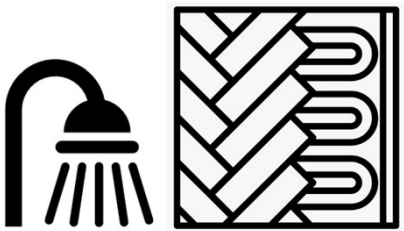
Logistic conditions

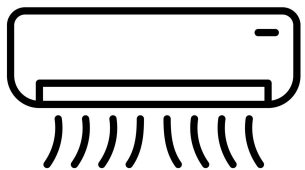


Availability of Skilled workforce



Building types





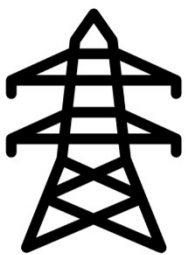




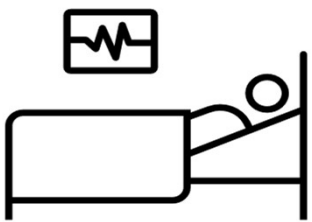
Natural disasters



Enforceability



Grid stability



User vulnerability



User preferences

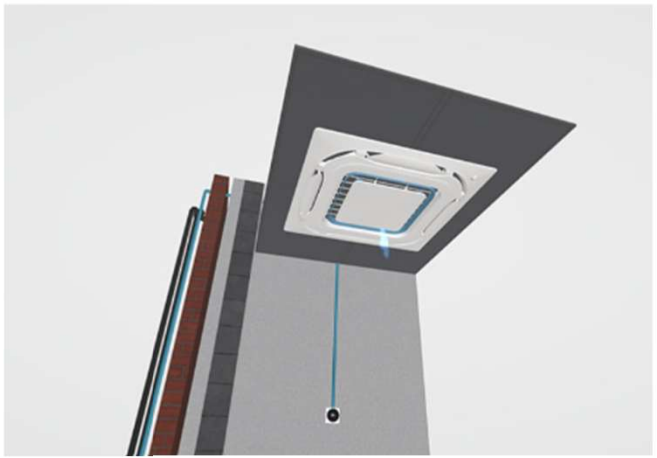
II. Risk mitigation measures - examples

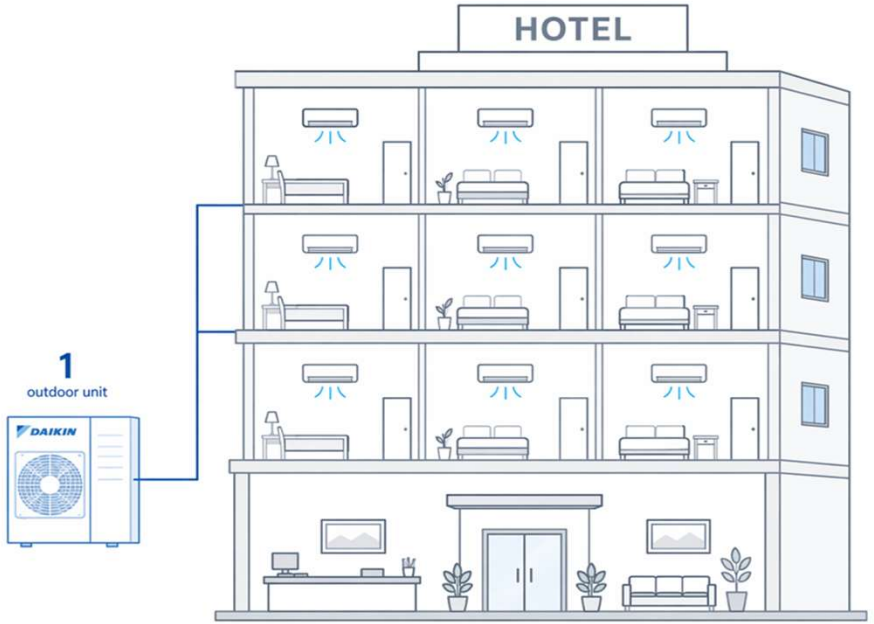
(forewords)

- Next charts give some few examples; it is not a comprehensive list
- Different measures apply case-by-case / product by product / site by site

Risk mitigation – equipment design

Example R32 VRV design measures





What is included in Shîrudo Technology?

- Factory-integrated refrigerant control measures, designed to comply with IEC 60335-2-40 and third-party certified by a Notified Body, providing complete peace of mind

Leak detection sensor in every indoor unit

Audible & visual alarm in Madoka controller or via iTM

Shut-off valves in the outdoor unit or SV box

Specially developed algorithms

Risk mitigation – equipment design



Example for Chillers R290

- **Independent 230V power supply for all safety devices**

If the power supply of the safety devices is inactive, interrupted, or not properly connected, the unit will not start and remains in a safe standby state.

- **Power pack is designed as a controlled environment**

Continuously pressurized, equipped with refrigerant leak detection systems, supported by ATEX-certified ventilation, visual and audible alarms

- **R-290 refrigerant factory charged in dedicated tanks**

More safety during transport and handling before installation.

- **Additional security measures**

They allow any potential refrigerant leakage to be detected and managed in a controlled manner, allowing the unit to be safely shut down

Risk mitigation - installation instructions



Examples of installation instructions (indoors) → minimum floor area

Example of Split indoor unit using R32

English

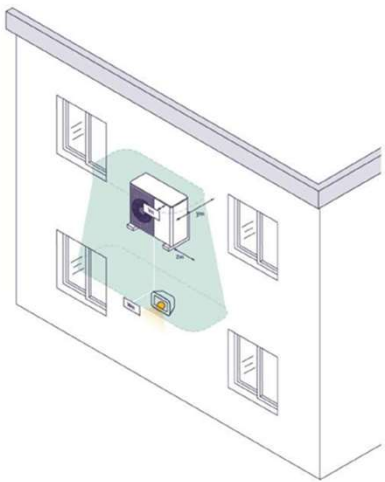
SPECIAL PRECAUTIONS WHEN DEALING WITH R32 UNIT

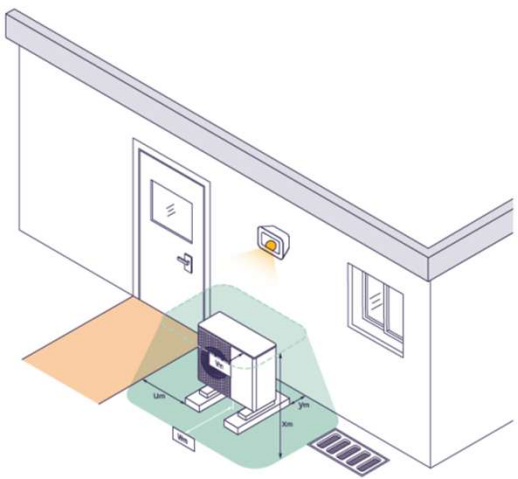
Model	R32 charge, kg for 7.5m piping	Minimum floor area, Xm² (based on 7.5m piping)	R32 charge, kg for max allowable pipe length*	Minimum floor area, Xm² (based on max allowable pipe length*)
FTXC20B - RXC20B	0.55	0.29	0.76	0.55
FTXC25B - RXC25B	0.55	0.29	0.76	0.55
FTXC35B - RXC35B	0.75	0.54	0.96	0.88
FTXC50B - RXC50B	1.00	0.95	1.38	1.82
FTXC60B - RXC60B	1.10	1.15	1.48	2.10
FTXC71B - RXC71B	1.15	1.26	1.53	2.24

* Calculation based on Installation Height of 1.8m
* Max. Allowable Length (L),m for:-
  FTXC20/25/35B-RXC20/25/35B:20
  FTXC50/60/71B-RXC50/60/71B:30

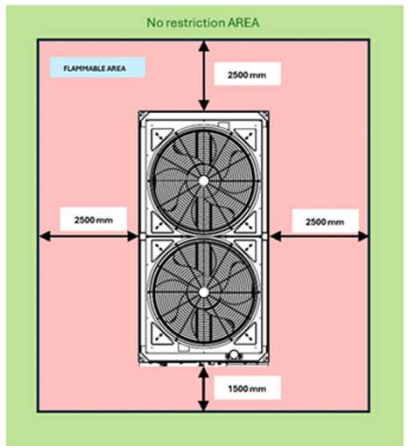
Risk mitigation – installation instructions

Examples of installation instructions (outdoors)





Example R290 monobloc heat pump
(self contained air to water)



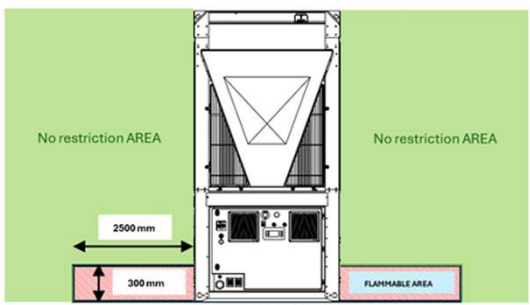


Figure 13 – Flammable area

Example R290 chiller

Risk mitigation –installation skills



Example R290 chiller



Installation of the units is limited to **qualified and authorised personnel**. Commissioning **activities must be registered** via Daikin's proprietary e-Care application. This will ensure traceability of start-up operations and guarantee that the system is installed and operated in line with the original design intent from trained technicians

III. Standards & legislations

→ Lifecycle safety is a shared responsibility
→ Safety (products) standards do not cover the entire lifecycle
→ Various local & international rules also apply







Building safety codes

IV. Guideline examples

SKILLSAFE EU

[SKILLSAFE EU]



Co-funded by the European Union

DAIKIN

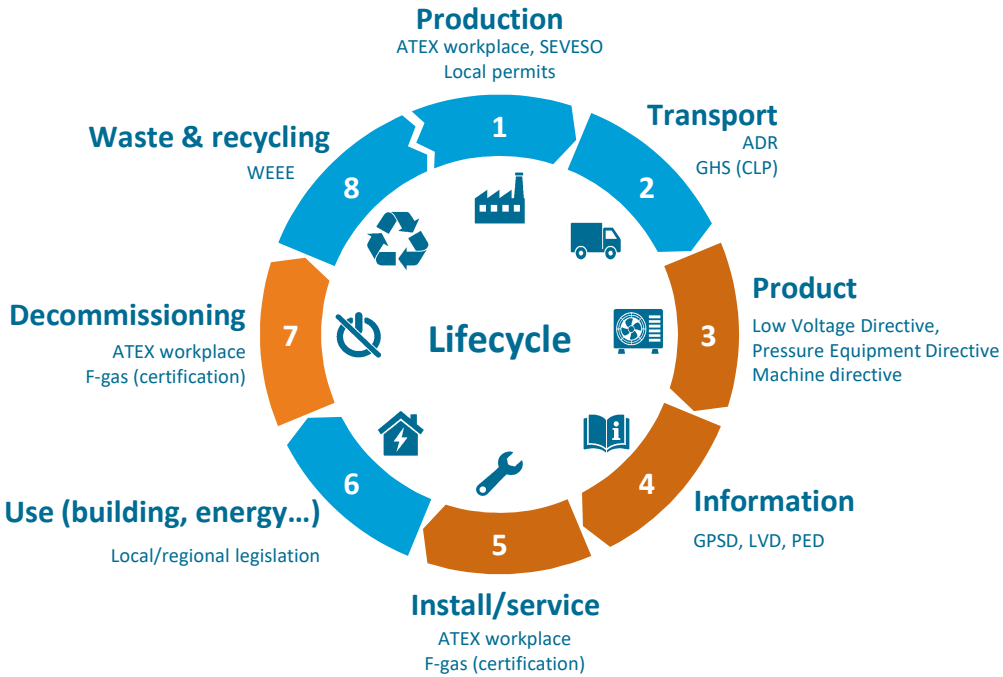
ehpa european heat pump association

NVKL

CSIM VALORE TECNICO

Background

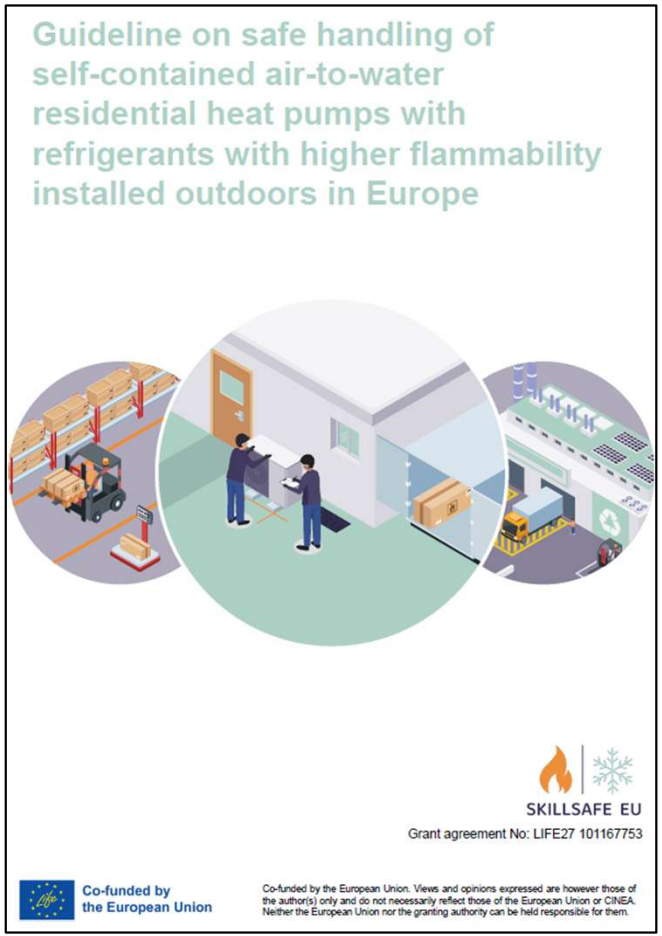
Aim to bridge gaps between fragmented regulations and standards with a common industry guideline, supporting consistent, safe handling of R-290 heat pumps throughout their lifecycle and reducing uncertainty for installers and service technicians.



(products) standards do not cover all aspects!

Guideline: Monobloc & Splits

Monobloc guideline: Published Q2 2025

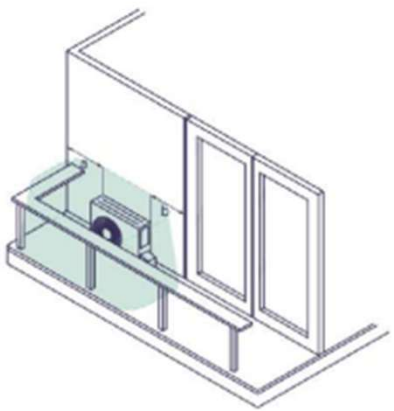


Splits guideline: Published Q3 2026

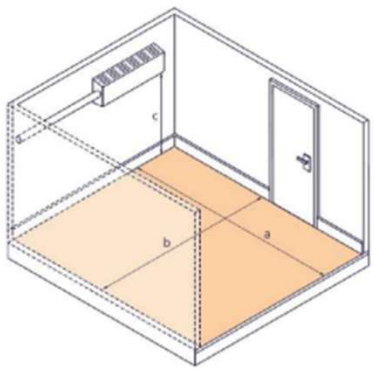


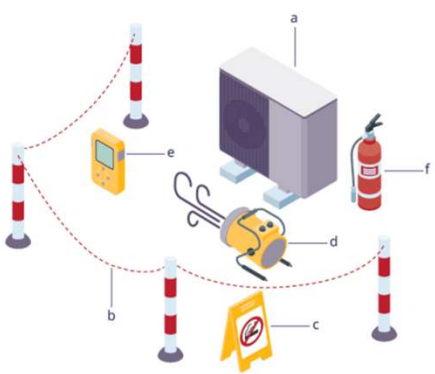
Guideline: Content (split)

Information on R-290 | Qualification and Certification | Installation Site (Outdoor unit / Indoor unit)| On-site handling of the equipment | Labelling and documentation | Transport | Risk and hazard assessment | National annexes



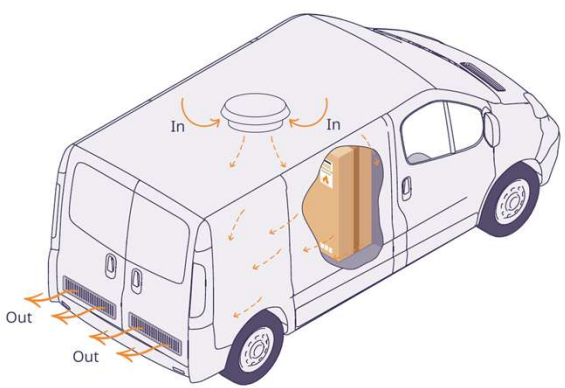






a. Heat Pump b. Bollards c. Safety sign d. ATEX approved fan

e. Gas detector f. Fire Extinguisher

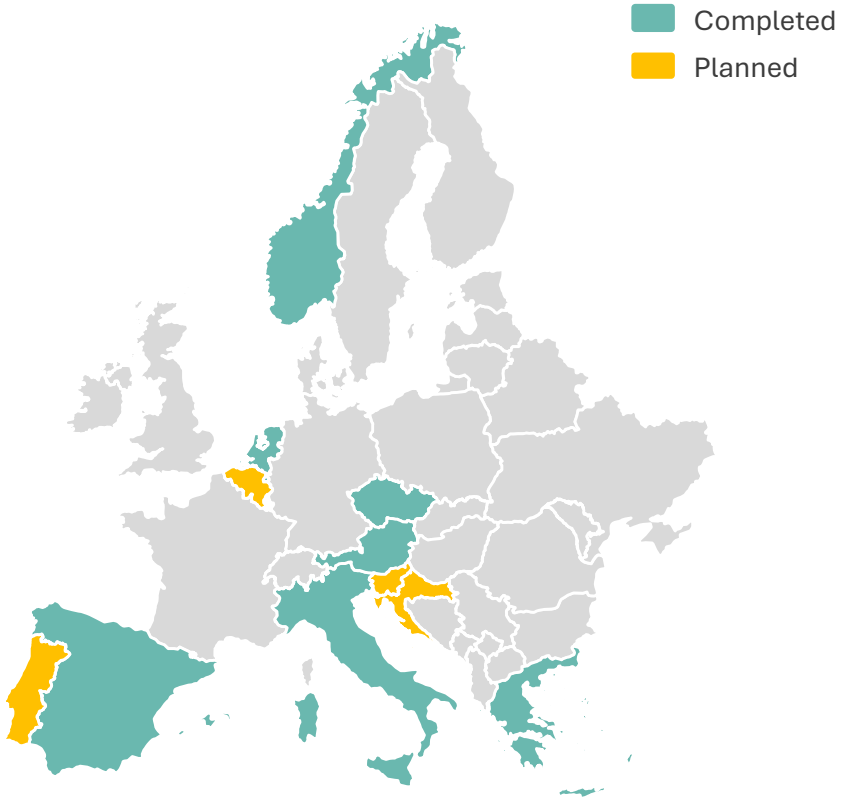


Trainings

Objective: Test the guideline with the users i.e. installers

Focus of the content:

- Basic Safety
- Explanation of highly flammable refrigerants.
- Identification of risk zones rfr. guideline
- Proper use of Personal Protective Equipment (PPE)
- Safety tools and procedures
- Risk assessment



Conclusions

- GWP is not the only criteria for a proper refrigerant choice
- Safety requires life cycle analysis & tailored mitigation measures to manage the risks
- The entire distribution chain is required to ensure safety



Environmental impact



Energy efficiency

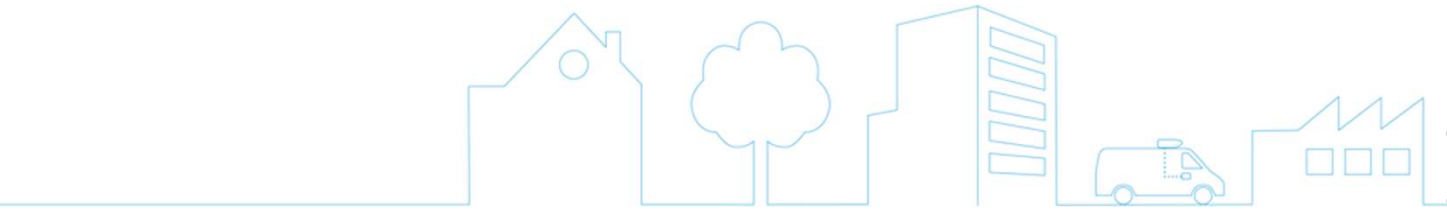


Safety



Cost-effectiveness

Thank you



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