



The European voice of refrigeration, air conditioning and heat pumps contractors

AREA F-Gas GUIDE

**A practical guide
on the application of the new F-Gas Regulation
to refrigeration, air conditioning & heat pump contractors**

Edition 03 – October 2016

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AREA

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LIST OF ACRONYMS

A/C	Air conditioning
AREA	European association of refrigeration, air conditioning and heat pump contractors ¹
CO₂-eq / CO₂e	CO ₂ -equivalent
ENER	DG Energy of the European Commission
ENTR	DG Enterprise & Industry of the European Commission
EPEE	European Partnership for Energy and the Environment ²
EU	European Union
FAQ	Frequently Asked Questions
GWP	Global warming potential
HFC	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change ³
Kg	Kilogramme
kW	Kilo-watt
PFC	Perfluorocarbon
RACHP	Refrigeration, air conditioning and heat pump
SF6	Sulfur hexafluoride
t	Tonne
TFUE	Treaty on the functioning of the European Union

¹ <http://www.area-eur.be/>

² <http://www.epeeglobal.org/>

³ <http://www.ipcc.ch/>

FOREWORD

Regulation (EU) No 517/2014⁴ on fluorinated greenhouse gases aims at reducing emissions of these gases through a variety of measures: rules on containment, use, recovery and destruction of fluorinated greenhouse gases, conditions on the placing on the market of certain types of products or equipment containing or relying upon fluorinated greenhouse gases (bans), specific uses of these gases (service ban), quantitative limits for the placing on the market of HFCs (phase-down).

In November 2012, the European Commission proposed to revise Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases. This revision resulted in Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006. It was published in the Official Journal of the EU on 20th May 2014 and entered into force on 9th June 2014. The new Regulation will be applicable from 1st January 2015.

The purpose of this AREA Guide is to explain the main changes and obligations arising from the revision, and to identify their consequences for European refrigeration, air conditioning & heat pump contractors. It also sets out the views of AREA on the practical implementation and interpretation of certain provisions in order to ensure that their objectives are fulfilled. This guide has to be put into perspective with and complements the European Commission's guidelines on Regulation (EU) No 517/2014 on fluorinated greenhouse gases that will be provided successively after consultation of the Member States.

The guidance contained in the present document reflects the best knowledge of industry experts across Europe and the state of the art at the moment of its publication. This Guide will be regularly updated to accommodate latest developments. To ensure that your copy is up to date, please check AREA's website <http://www.area-eur.be>.

The principles contained in this Guide are however not legally binding, and following it gives no guarantees. Contractors must ultimately exercise their own judgement. A binding interpretation of Community legislation is the exclusive competence of the European Court of Justice. AREA also recommends to contractors, when using this Guide, to always refer to the national legislation, and guidance if any, of the Member State they are dealing with.

AREA is the European association of refrigeration, air conditioning and heat pump contractors. Established in 1989, AREA voices the interests of 23 national associations from 20 European countries, representing more than 13,000 companies (mainly small to medium sized enterprises), employing some 110,000 people and with an annual turnover approaching € 23 billion. Contractors are the essential link between end users and manufacturers. They design, install and maintain RACHP equipment using every available solution with complete neutrality towards equipment and refrigerants, in the sole aim of ensuring the highest level of reliability, energy efficiency and cost-effectiveness.

⁴ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L .2014.150.01.0195.01.ENG>

I- Legal basis

The legal basis is the EU Treaty provision(s) on which the Regulation is based. It is relevant insofar as it influences the leeway Member States have when applying the Regulation.

Regulation (EC) 842/2006 had a dual legal basis:

- *Internal market* (article 95 - now article 114 TFUE) for its article 7 on Labelling, article 8 on Control of Use and article 9 on Placing on the Market,
- *Environment* (article 175 – now article 192 TFUE) for all its other provisions.

The new Regulation now has a unique environment basis. This means that provisions on labelling, control of use and, more importantly, placing on the market (bans) are now under an environmental basis. The effect of this change is related to the margin Member States have if they wish to maintain or introduce national measures that are in the scope of the Regulation but create differences.

Under an Internal Market basis, a Member State may maintain or introduce new national provisions based on limited reasons (e.g. health protection, protection of the environment). However, they must notify the Commission of their intention and must obtain the Commission's prior approval.

Under an environment basis (which includes climate change), Member States may maintain or to introduce “more stringent protective measures” as long as these are compatible with the Treaties (i.e. respect free circulation of goods, guarantee undistorted competition, be proportional to the objective). They must notify the Commission of their intention but they do not need approval.

What effect is to be expected in practice?

It is difficult to anticipate Member States' reactions. One could imagine that one or the other Member State may apply more stringent labelling measures or even request earlier or wider bans on equipment. However, only experience will tell the margin Member States will actually have so that these potential national measures respect the condition of compatibility with the Treaties.

II- Definitions

Article 2

The definitions referred to in these guidelines only refer to terms that:

- Are relevant to RACHP contactors, and
- Are new or have been substantially modified compared to Regulation (EC) 842/2006.

Fluorinated greenhouse gases

The new Regulation continues to apply to HFCs, PFCs and SF6. HFCs, PFCs and SF6 are not defined in detail (as in the Regulation (EC) No 842/2006); instead reference is made to the annex I, which lists them.

It is also specified that “*mixtures containing any of these substances*” are also included (Regulation (EC) 842/2006 used to refer to “*preparations*”). A mixture is defined as a “*fluid composed of two or more substances, at least one of which is a fluorinated greenhouse gas*”.

GWPs are listed in Annexes I, II and non-fluorinated components of mixtures in Annex IV. Annex IV also defines the calculation formula for mixtures. Compared to Regulation (EC) No 842/2006 some changes of GWPs occurred since they are based on the Fourth Assessment Panel report of the IPCC, and no longer on the Third. The listed values apply irrespectively of any changes in later IPCC reports or other scientific or commercial publications.

Contractors' services

The new Regulation aligns the definitions of “*recovery*”, “*recycling*” and “*reclamation*” with those used in Regulation (EC) No 1005/2009 on substances that deplete the ozone layer⁵.

In addition, the new Regulation aligns the definitions of “*installation*” and “*maintenance or servicing*” with those used in Commission Regulation (EC) No 303/2008 on minimum requirements and the conditions for mutual recognition for the certification of companies and personnel as regards stationary refrigeration, air conditioning and heat pump equipment containing certain fluorinated greenhouse gases⁶. These activities are based on the common criteria of either completing or breaking into refrigerant circuits.

III- Prevention of emissions

Article 3

Obligations of the operator

The definition of the “operator” (article 2, §8) remains mostly unchanged: “*the natural or legal person exercising actual power over the technical functioning of products and equipment covered by this Regulation; a Member State may, in defined, specific situations, designate the owner as being responsible for the operator's obligations*”

The new Regulation carries the operator’s duty to take precautions to prevent leakages. The operator shall also take all technically and economically feasible measures to minimise leakages.

New! When a leakage is detected, it is now an obligation to have it repaired without *undue delay*. Whereas Regulation (EC) 842/2006 limited this obligation to “technical feasibility” and “(lack of) disproportionate costs”, the new Regulation does not make the repair obligation subject to any economic or technical condition.

'Undue delay' is a legal concept that ensures the consideration of proportionality. It does not quantify a precise delay, but obliges the operator to act as the situation requires. In case of a severe leakage, affecting a large amount of refrigerant, immediate action might be required, within hours irrespectively of holidays or other circumstances. In other cases, with a marginal emission risk, a repair in the course of the routine servicing might be sufficient. Benchmark for deciding in individual cases is the expected behaviour of a diligent operator.

⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009R1005:EN:NOT>

⁶ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008R0303:EN:NOT>

In its information note for technicians and users⁷, the European Commission specifies that prior to a repair, a pump-down or recovery shall be carried out where necessary. It also indicates how to perform the leakage test after repair.

As in the past, for equipment subject to mandatory regular leak checking, a repaired leak must be checked by a certified operative within a month after the repair. In its information note for technicians and users, the European Commission specifies that the check must focus on the repaired areas, as well as adjacent areas. The time interval for the next regular leak checking then starts from the date of that follow-up check.

Obligations of the contractor

It is specified that contractors – both operatives and companies – must be certified to carry out certain tasks or services (installation, maintenance, servicing, repair, decommissioning, leak checking, recovery) on certain types of refrigeration, air conditioning and heat pump equipment.

New! It is also specified that **both operatives and companies must take precautionary measures to prevent leakages.**

It is a very general requirement that is expected to be enforced only in cases of gross negligence or intentional venting. Regulation (EC) No 842/2006 did not provide a clear provision that the authorities use to sanction such behaviour that may occur in practice.

IV- Leakage prevention and treatment

Articles 4 and 5

Equipment in scope

The obligations continue to apply to the categories of equipment included in Regulation (EC) 842/2006 and notably:

- Stationary refrigeration equipment
- Stationary air-conditioning equipment
- Stationary heat pumps

It must be noted that Article 2 point 23 defines “**stationary**” as “*not normally in transit during operation and it includes moveable room air-conditioning appliances*”. The inclusion of “**moveable room air-conditioning appliances**” in the definition is new⁸.

In addition, **refrigeration units of refrigerated trucks and trailers** now fall under leak check obligations:

- *Refrigerated truck* is defined as a motor vehicle with a mass of more than 3.5 tonnes that is designed and constructed primarily to carry goods and that is equipped with a refrigeration unit,
- *Refrigerated trailer* is defined as a vehicle that is designed and constructed to be towed by a truck or a tractor, primarily to carry goods and that is equipped with a refrigeration unit.

⁷ [Information note for technicians and users of refrigeration, air conditioning and heat pump equipment containing fluorinated greenhouse gases](#) (January 2015)

⁸ Article 2 point 18 of Regulation (EC) No 842/2006 defined “*stationary application or equipment*” as “*an application or equipment which is normally not in transit during operation*”

In its information note for technicians and users, the European Commission specifies that there is no weight limit on refrigerated trailers but they must be designed to be towed by a truck or a tractor.

For stationary equipment and refrigeration units of refrigerated trucks and trailers, the checks must be performed by certified contractors.

Exemption

Hermetically sealed equipment containing less than 10 tonnes of CO₂-eq of fluorinated greenhouse gases are exempted from regular leak check provided the equipment is labelled as such. This exemption already existed under Regulation (EC) No 842/2006 for equipment containing less than 6kg of fluorinated greenhouse gases.

Leak checks based on CO₂-equivalent quantities of fluorinated greenhouse gases

The new Regulation replaces thresholds expressed weight of fluorinated greenhouse gases by thresholds expressed in tonnes of CO₂-equivalent quantities. Article 2(7) defines 'tonnes of CO₂-eq as *"a quantity of greenhouse gases expressed as the product of the weight of the greenhouse gases in metric tonnes and their global warming potential"*.

Conversion of thresholds:

- 3kg → 5 tonnes CO₂-eq
- 30kg → 50 tonnes CO₂-eq
- 300kg → 500 tonnes CO₂-eq

Concretely this means that the charge limit from which leak checks apply will depend on the GWP of the refrigerant contained in the equipment⁹. The table below summarises the conversion from CO₂-equivalent to weights by threshold of the most commonly used fluorinated greenhouse gases¹⁰. The European Commission has taken a similar initiative¹¹ (limited to 15 refrigerants).

⁹ It should be noted that this does not affect leak checking requirements or thresholds for R22, which is not in the scope of this Regulation

¹⁰ GWP is based on the latest IPCC report

¹¹ [GWP-metric conversion calculation tool](#)

Table: Equivalent weight for CO₂ limits

Refrigerant	Other name	GWP	5 tonnes CO ₂ -eq (kg)	10 tonnes CO ₂ -eq (kg) ¹²	50 tonnes CO ₂ -eq (kg)	500 tonnes CO ₂ -eq (kg)
23		14800	0.34*	0.68*	3.37	33.78
32		675	7.41	14.82	74.07	740.74
134a		1430	3.50	7.00	34.97	349.65
125		3500	1.42*	2.84*	14.28	142.86
245fa		1030	4.85	9.71	48.54	485.44
404A		3922	1.27*	2.54*	12.75	127.49
407A		2107	2.37*	4.74*	23.73	237.30
407C		1774	2.82*	5.64*	28.18	281.85
407D		1627	3.07	6.14	30.73	307.31
407F	Performax LT™	1825	2.74*	5.48*	27.40	273.97
410A		2088	2.39*	4.78*	23.95	239.46
417A	ISCEON® MO59	2346	2.13*	4.26*	21.31	213.13
422A	ISCEON® MO79	3143	1.59*	3.18*	15.91	159.08
422D	ISCEON® MO29	2729	1.83*	3.66*	18.32	183.22
423A	ISCEON® 39TC™	2280	2.19*	4.38*	21.93	219.30
424A	RS44	2440	2.02*	4.04*	20.49	204.92
426A	RS24	1508	3.32	6.64	33.16	331.56
427A	FX100	2138	2.34*	4.68*	23.39	233.86
428A	RS52	3607	1.39*	2.78*	13.86	138.62
434A	RS45	3245	1.54*	3.08*	15.41	154.08
437A	ISCEON® MO49plus	1805	2.77*	5.54*	27.70	277.01
438A	ISCEON® MO99	2265	2.21*	4.42*	22.07	220.75
442A	RS50	1888	2.65*	5.30*	26.48	264.83
449A		1397	3.58	7.16	35.79	357.91
507		3985	1.25*	2.51*	12.55	125.47
508A		13214	0.38*	0.76*	3.78	37.83
508B	Suva 95	13396	0.37*	0.74*	3.73	37.32
-	ISCEON® MO89	3805	1.31*	2.62*	13.14	131.41

* Regular leak checks applicable only from 1 January 2017 onwards (see explanation three paragraphs below)

The new thresholds will have very important effects on equipment that works with high GWP refrigerants. Indeed, it will make the equipment liable to regular leak check although it contains less than 3kg (or 6kg for hermetically sealed equipment) of refrigerant (minimum threshold in Regulation (EC) 842/2006). This is the case for refrigerants indicated in red in the table above.

On the other hand, equipment currently liable to regular leak checks may suddenly avoid this obligation for the same reason. This is notably the case of equipment working with R134a (minimum charge increases from 3 to 3.5 kg) and with R32 (minimum charge increases from 3 to 7.41 kg). The impact of the new threshold on R32 is expected to be particularly sizeable for contractors since very few small systems contain more than 7kg charge.

¹² Threshold under which fluorinated greenhouse gases in hermetically sealed equipment are exempted from regular leak check

However, **until 31 December 2016**, equipment that contains less than 3kg of fluorinated greenhouse gases, and hermetically sealed equipment¹³ containing less than 6kg of fluorinated greenhouse gases and labelled as such, is not subject to leakage checking requirements.

➡ **Concretely, this means that:**

- Equipment with more than 3kg but less than 5 tonnes CO₂-eq of refrigerant no longer has to be leak checked since 1st January 2015
- Equipment with less than 3kg but more than 5 tonnes CO₂-eq of refrigerant, does not have to be leak checked until 1st January 2017 (when the grace period comes to an end)
- For any type of equipment with at least 3kg of refrigerant, the new thresholds applies since 1st January 2015.

➡ **What should contractors do?**

- *After the publication of the Regulation*, contractors should have informed operators about potential new leak check obligations due to new weight limits applying from 1st January 2015 onwards to systems with at least 50 and 500 tonnes CO₂-eq.
- *Until 31st December 2016*, contractors should inform operators about potential new leak check obligations due to new weight limits applying from 1st January 2017 onwards to systems with at least 5 tonnes CO₂-eq.

Frequency of the leak checks

Leak checks remain based on the same frequency as provided by Regulation (EC) 842/2006. The table below summarises the situation.

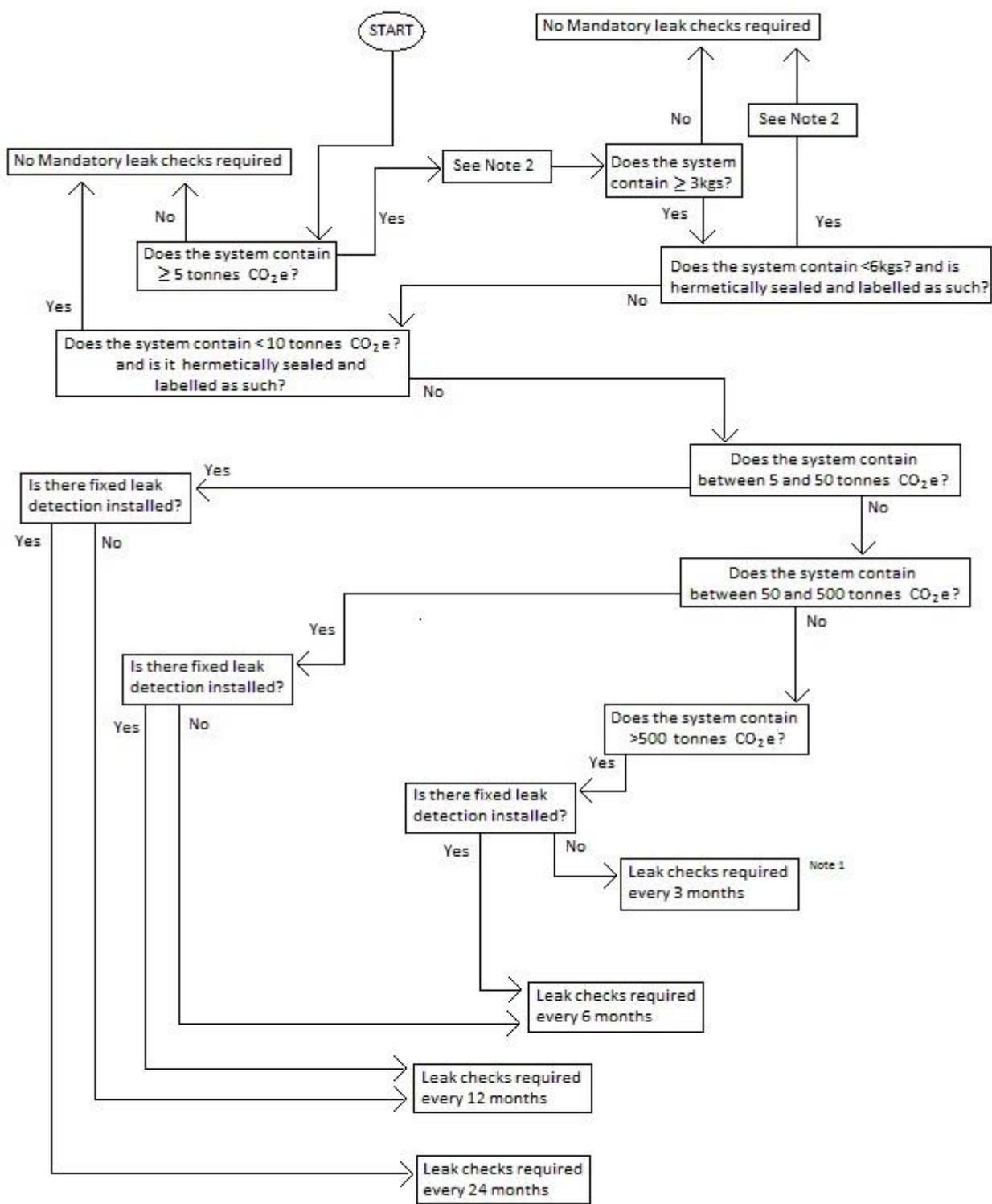
Fluorinated greenhouse gases	Frequency of leak checks	
	No Leakage detection system	Leakage detection systems
5 tonnes CO ₂ -eq	12 months	24 months
50 tonnes CO ₂ -eq	6 months	12 months
500 tonnes CO ₂ -eq	N/A ¹⁴	6 months

The following flowchart summarises the questioning process users should go through.

¹³ Hermetically sealed equipment is defined by Article 2 point 11 as equipment in which all fluorinated greenhouse gas containing parts are made tight by welding, brazing or a similar permanent connection which may include capped valves and capped service ports that allow proper repair or disposal and which have a tested leakage rate of less than 3 grams per year under a pressure of at least a quarter of the maximum allowable pressure;

¹⁴ Leakage detection systems are mandatory when the equipment contains more than 500t CO₂-eq of refrigerant

F Gas Regulation Review: Article 3 - Checking for Leakage



Note 1 Article 4 states that all systems containing 500 tonnes CO_2e or more shall have leak detection equipment fitted which alerts the operator or a service company of any leakage

Note 2 Where system contains $> 5\text{ tonnes CO}_2\text{e}$ but $< 3\text{kgs}$ or is a hermetically sealed unit with $> 10\text{ tonnes CO}_2\text{e}$ but $< 6\text{ kgs}$ a 2 year transition period applies until 1st January 2017



Next leak check

The table below clarifies the new leak checking frequencies, as well as the deadlines by which next leak checks will have to be performed under the new Regulation. R404A is taken as an example.

Amount of R404A (type, kg & CO ₂ -eq)	Leak check frequency (Reg. 842/2006)	Last leak check (example)	Leak check frequency (Reg. 517/2014)	Next leak check (deadline)
1.3kg / 5.1t CO ₂ -eq	No leak check	None	12 months (from 01/01/2017)	31/12/2017
9kg / 35.3t CO ₂ -eq	12 months	02/01/2014	12 months	01/01/2015
15kg / 58.8t CO ₂ -eq	12 months	15/12/2014	6 months	14/06/2015
31kg / 121.6t CO ₂ -eq	6 months	31/07/2014	6 months	30/01/2015
330kg / 1,294.3t CO ₂ -eq	3 months / 6 months with leakage detection system	30/10/2014	6 months with leakage detection system*	29/04/2015

* Leakage detection systems mandatory

Implementing acts

The Commission is empowered to adopt an implementing act to specify requirements for leak checks and notably identify those parts of the equipment most likely to leak.

The Commission may therefore amend Commission Regulation (EC) No 1516/2007 establishing standard leakage checking requirements for stationary refrigeration, air conditioning and heat pump equipment containing certain fluorinated greenhouse gases.

The Commission will notably have to work on standard leakage checking requirements for new equipment in scope, including refrigeration units of refrigerated trucks and trailers. Until adoption of the updated implementation rules the provisions of the current regulation could be used, where appropriate, as guidance for carrying out leak checks on equipment not yet covered by the scope.

Leakage detection systems

Article 2 point 29 defines a leakage detection system as *“a calibrated mechanical, electrical or electronic device for detecting leakage of fluorinated greenhouse gases which, on detection, alerts the operator”*.

In its information note for technicians and users, the European Commission gives some indications on the types, location and features of equipment of leakage detection systems. It notably specifies that the system should be installed in the machine room or as close as possible to the compressor or to the relief valves. It also explains that systems that detect leakage through electronic analysis of liquid level or other data may also be used.

In order to optimise leakage detection, good practice recommends that detection methods by direct measurement can be used under the condition that the entire system is monitored (for instance, a room controller can normally not monitor the entire direct expansion installation in a machine room).

As far as detection methods by indirect measurement method are concerned, they can be used to comply with the Regulation but to be fully effective they should enable to control the refrigerant charge almost in real time. Great care must be taken with low-level alarm systems on liquid bottles. Indeed, since the liquid may be at a low level without

leakage, the system's set-up often triggers the alarm too late in case of leakage and after a large share of the refrigerant has escaped.

Requirements on leakage detection systems depend on the type of equipment and the environmental impact of the refrigerant charged expressed in CO₂-equivalent.

As far as stationary equipment is concerned¹⁵, a leakage detection system is mandatory for equipment containing at least 500 tonnes CO₂-equivalent of fluorinated greenhouse gases.

In case of leakage, the system must be able to alert the operator or the service company.

Leakage detection systems must be inspected at least every 12 months. Although not explicitly mentioned in Article 6 on record keeping, these inspections should be duly documented to enable the operator to provide proof of compliance with this requirement when requested by the competent authorities of the Member State.

The table below summarises the weight thresholds from which a leakage detection system becomes mandatory (i.e. equivalent to 500 tonnes CO₂-equivalent) for the most commonly used fluorinated greenhouse gases

Table: Mandatory leakage detection systems thresholds

Refrigerant	Other name	GWP	Minimum charge (kg)
23		14800	33.78
32		675	740.74
134a		1430	349.65
125		3500	142.86
245fa		1030	485.437
404A		3922	127.49
407A		2107	237.30
407C		1774	281.85
407D		1627	307.31
407F	Performax LT™	1825	273.97
410A		2088	239.46
417A	ISCEON® MO59	2346	213.13
422A	ISCEON® MO79	3143	159.08
422D	ISCEON® MO29	2729	183.22
423A	ISCEON® 39TC™	2280	219.30
424A	RS44	2440	204.92
426A	RS24	1508	331.56
427A	FX100	2138	233.86
428A	RS52	3607	138.62
434A	RS45	3245	154.08
437A	ISCEON® MO49plus	1805	277.01
438A	ISCEON® MO99	2265	220.75
442A	RS50	1888	264.83
449A		1397	357.91
507		3985	125.47

¹⁵ This also applies to refrigeration units of refrigerated trucks and trailers though such a quantity of refrigerants is practically unknown

508A		13214	37.83
508B	Suva 95	13396	37.32
-	ISCEON® MO89	3805	131.41

Again the new thresholds will have very important effects on equipment that works with high GWP refrigerants. Indeed, it will make installation of a leakage detection system mandatory on equipment that contains less than 300kg of refrigerant (minimum threshold in Regulation (EC) 842/2006). This is the case for refrigerants indicated **in red** in the table above.



Article 5 applies to all equipment, not only to equipment installed after 1 January 2015. Only for switchgear and organic Rankine cycles a transitional period is foreseen. Equipment with a charge size between the maximum charge listed in the table in red and 300kg must have been retrofitted before the 1 January 2015.

V- Record keeping

Article 6

Operators of equipment that must be leak checked regularly are obliged to establish and maintain records. This obligation already existed under Regulation (EC) 842/2006 but some specifications and additional requirements are introduced. It must be pointed out that the records must be kept for each piece of the installed equipment.

In its information note for technicians and users, the European Commission specifies that no records have to be kept for mobile air conditioning equipment or refrigerated vehicles other than trucks and trailers.

Information to record

- **Quantity and type of fluorinated greenhouse gases installed**
- **Quantities of fluorinated greenhouse gases added:** it is specified that these additions can be due to installation, maintenance and servicing but also to leakage
- **New! Whether the quantities of installed fluorinated greenhouse gases have been recycled or reclaimed:** If so, must also be recorded:
 - The name and address of the recycling or reclamation facility
 - If applicable, the certificate number
- **Quantity of fluorinated greenhouse gas recovered**
- **Identity of the undertaking which installed, serviced, maintained, but also, where applicable, repaired or decommissioned the equipment:** where applicable, its certification number must be recorded
- **Dates and results of the checks**

- **New!** If the equipment is decommissioned, the measures taken to recover and dispose of the refrigerant

Who keeps the records and for how long?

Unless a national database exists,

- The operator must keep the records for 5 years
- **New!** The contractor must keep a copy for 5 years

Competent national authorities or the European Commission may request the records.

Implementing act

The European Commission may, by implementing act:

- Determine the format of the records
- Specify how records should be established and maintained

N.B.: this section will be updated once an implementing act is adopted

AREA has developed a simple spreadsheet that serves as a tool for contractors and their clients to fulfil their record keeping obligations under Article 6 of the F-Gas Regulation. The AREA logbook can be downloaded in the publications section of AREA website (www.area-eur.be).



VI- Recovery

Articles 8 & 9

Fluorinated greenhouse gases are recovered to be recycled, reclaimed or destroyed. The obligations related to recovery of fluorinated greenhouse gases depend on the type of equipment under consideration.

Stationary equipment and refrigerated units of refrigerated trucks and trailers

The relevant equipment included in this category is:

- The cooling circuits of stationary refrigeration, stationary air-conditioning and stationary heat pump equipment;
- The cooling circuits of refrigeration units of refrigerated trucks and trailers.

Operators of such equipment must ensure that the recovery of the fluorinated greenhouse contained is carried out by a certified operative.

Fluorinated greenhouse gas container

The undertaking that uses such a container immediately prior to its disposal must arrange for the recovery of any residual gas.

Regulation (EC) 842/2006 referred to “a person using a container reaching the end of its life for transport or storage purposes”. The new Regulation’s wording is simpler, notably by clarifying that:

- The “person” responsible is the undertaking, however, according to the very wide definition of 'undertaking' in Article 2 point 30, this can also be a natural person carrying out activities involving F-gases as listed in this definition, including the operator and manufacturer of equipment.
- Recovery must be performed “immediately prior to disposal” without adding “end of life” and “use for transport or storage purposes” elements

Equipment, including mobile equipment, other than stationary equipment and refrigerated units of refrigerated trucks and trailers and air-conditioning in road vehicles

There, two situations have to be distinguished:

- **Recovery is technically feasible without disproportionate costs:** the operator must arrange for the gas to be recovered by an appropriately qualified operative,
- **Recovery is not technically feasible or entails disproportionate costs:** the operator must arrange for the destruction of the gases without prior recovery

The European Commission clarified that to its understanding the destruction of gases without prior recovery mainly targets F-gases contained in isolation foams; typically the recovery of F-gases used as refrigerant is feasible and would only in exceptional cases entail disproportionate costs.

Road vehicles

New! Recovery of fluorinated greenhouse gases in any road vehicle must be carried out by appropriately qualified natural persons.

For road vehicles in the scope of Directive 2006/40/EC¹⁶, only a natural person that holds at least a training attestation in accordance with the New Regulation (Article 10 in conjunction with Commission Regulation (EC) No 307/2008 is considered appropriately qualified. This applies to the following categories of vehicles¹⁷:

- *Category M1:* Vehicles designed and constructed for the carriage of passengers and comprising no more than eight seats in addition to the driver's seat
- *Category N1, class I:* Vehicles designed and constructed for the carriage of goods and having a maximum mass not exceeding 1305kg

Producer responsibility schemes

Member States must “encourage” the development of producer responsibility schemes for the recovery of fluorinated greenhouse gases and their recycling, reclamation or destruction.

¹⁶ [Directive 2006/40/EC](#) of the European Parliament and of the Council of 17 May 2006 relating to emissions from air conditioning systems in motor vehicles and amending Council Directive 70/156/EEC (OJ L 161, 14.6.2006, p. 12).

¹⁷ As defined in Annex II of Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers

Member States must inform the European Commission on the actions undertaken for that purpose. However, it is not expected that a harmonised approach will be followed at EU level.

VII- Training & certification

Article 10

Training and certification will most remain as they have been since the adoption of Regulation (EC) 842/2006 and the Commission Regulations (EC) No 303/2008 and 307/2008. However, some new requirements are introduced.

Who needs to be certified?

- A- **Natural persons** (i.e. personnel) carrying out certain tasks on certain types of equipment must be certified or qualified.

Relevant equipment

- Stationary refrigeration, air conditioning and heat pump
- **New!** Refrigerated trucks (above 3.5 t) and trailers
- Air conditioning equipment in road vehicles within the scope of Directive 2006/40/EC on mobile air conditioning (recovery operations only)
- **New!** Air conditioning equipment in road vehicles outside the scope of Directive 2006/40/EC on mobile air conditioning (recovery operations only)

Member States can adopt further certification and training programmes on other types of equipment.

Tasks

- a) Installation, servicing, maintenance
- b) Repair
- c) **New!** Decommissioning
- d) Leakage checking
- e) Recovery

For tasks a) to e) on stationary equipment and on refrigerated trucks and trailers, personnel must be certified.

For tasks e)

- *On air conditioning equipment in road vehicles within the scope of Directive 2006/40/EC on mobile air conditioning, personnel must be appropriately qualified, i.e. hold at least a training attestation. Member States must ensure that training programmes are available.*
- *On air conditioning equipment in road vehicles outside the scope of Directive 2006/40/EC on mobile air conditioning, personnel must be appropriately qualified, but a training attestation is not required.*

- B- **Undertakings** (i.e. companies, but also self-employed contractors) carrying out certain tasks on certain types of equipment for other parties must be certified.

Relevant equipment

- Stationary refrigeration, air conditioning and heat pump

Member States can adopt further certification and training programmes on other types of equipment.

Tasks

- Installation, servicing, maintenance
- Repair
- **New!** Decommissioning

Equipment's users must take reasonable steps to ascertain that the undertaking performing the abovementioned tasks holds the necessary certificate.

Summary of certification requirements

	Installation, servicing, maintenance	Repair	Decommissioning	Leakage checking	Recovery
Stationary RACHP equipment					
Refrigerated trucks & trailers					
A/C in road vehicles Directive 2006/40					 (1)
A/C in road vehicles Directive 2006/40					 (2)



Company



Natural person

- (1) Personnel must be appropriately qualified, i.e. hold at least a training attestation
 (2) Personnel must be appropriately qualified, no formal training attestation required

What happens to existing certificates and training attestations?

Certificates and training attestations issued before the new Regulation's application will remain valid in accordance with the conditions under which they were originally issued.

Concretely, as regards stationary equipment, this means that:

- Certificates issued on the basis of Regulation 842/2006 are still valid and mutual recognition (in the EU) continues to apply
- In countries (or regions) that do not apply time limitation, these certificates will remain valid without any further requirement to be fulfilled
- In countries (or regions) that apply a time limitation with renewal, when the certificate issued on the basis of Regulation 842/2006 reaches the end of its validity, the renewal will be then governed by the new Fgas Regulation. In practice, this means that the renewal of the certification will include information on alternative refrigerants.

Member States have until 1st January 2017 to notify their (new) training and certification programme.

- Regardless of the certificate's validity, individuals who would like to update their knowledge (notably on information on alternatives) can always do so and Member States must actually make sure training is available for that purpose.

As regards refrigeration units of refrigerated trucks and trailers, according to implementing Regulation 2015/2067:

- From 1st July 2017, people working on refrigeration units of refrigerated trucks and trailers must be certified
- This obligation does not affect the validity of certificates for stationary equipment:
 - Certified operatives who wish or used to work on refrigerated units of refrigerated trucks and trailers can (continue to) do so without any additional requirement
 - Operatives who wish used to work on refrigerated units of refrigerated trucks and trailers without certification must be certified by 1st July 2017

Certification & training programmes

Content

Certification programmes and training must cover the themes already included in current schemes under Regulation (EC) 842/2006, with one addition:

- Applicable regulations and standards
- Emission prevention
- Recovery of fluorinated greenhouse gases
- Safe handling of equipment of the type and size covered by the certificate
- **New!** Information on relevant technologies to replace or reduce the use of fluorinated greenhouse gases and their safe handling (this provision may be clarified in the update of the implementing Commission Regulation (EC) No 303/2008)

The new Regulation also specifies that certification can only be granted when the candidate has successfully completed an evaluation process.

As regards the minimum requirements for certification and for training attestations, the new Regulation refers to existing relevant texts: Commission Regulations (EC) No 303/2008, 306/2008 and 307/2008. Commission Regulation 303/2008 was however repealed and replaced by Implementing Regulation 2015/2067¹⁸. The European Commission also specified that to ensure a smooth transition from the old regime to the new regime, "old" Commission Regulations remain in force and continue to apply until repealed by delegated or implementing acts adopted by the Commission pursuant to the 2014 F-gas Regulation.

Availability

Member States must notify the European Commission of their certification and training programmes, which will include the changes required by the new Regulation, by **1st January 2017**. However, Member States with a small population, for which setting up these programmes would represent too heavy a burden in view of the low demand level, can achieve compliance by recognising certificates issued in other Member States.

Member States must recognise certificates and training attestations issued in another Member State. The Commission may specify the conditions for mutual recognition in an implementing act.

Member States are not allowed to restrict freedom of establishment or to provide services because a certificate was issued in another Member State.

¹⁸ [Commission Implementing Regulation \(EU\) 2015/2067](#) of 17 November 2015 establishing, pursuant to Regulation (EU) No 517/2014 of the European Parliament and of the Council, minimum requirements and the conditions for mutual recognition for the certification of natural persons as regards stationary refrigeration, air conditioning and heat pump equipment, and refrigeration units of refrigerated trucks and trailers, containing fluorinated greenhouse gases and for the certification of companies as regards stationary refrigeration, air conditioning and heat pump equipment, containing fluorinated greenhouse gases

Alternative refrigerants & technologies

Although the new Regulation does not name the alternative refrigerants, Ammonia (NH₃), Carbene Dioxide (CO₂), Hydrocarbons (HCs) and Hydrofluoroolefine (HFOs) are the main fluids affected. It is expected that the combination of the phase-down and the planned bans will result in an increase in use of alternative refrigerants and technologies to HFCs. The new Regulation therefore provides for minimum information to be given to certified contractors. Such information is related to the technologies themselves, safety aspects and regulatory requirements. One must differentiate between information provided during a training or certification process and to certified operatives.

Certification and training programmes must now include information on relevant technologies to replace or reduce the use of fluorinated greenhouse gases and their safe handling. Implementing Regulation 2015/2067 (which replaces Regulation 303/2008) has provided details on the type of information required in its Annex 1 on Minimum requirements as to the skills and knowledge to be covered by the evaluation bodies. A new point 11 is added to the existing list, as reproduced below.

SKILLS & KNOWLEDGE		CATEGORIES			
		I	II	III	IV
11	Information on relevant technologies to replace or to reduce the use of fluorinated greenhouse gases and their safe handling				
11.01	Know the relevant alternative technologies to replace or to reduce the use of fluorinated greenhouse gases and about their safe handling	T	T	T	T
11.02	Know relevant system designs to reduce the charge size of fluorinated greenhouse gases and to increase energy efficiency	T	T	-	-
11.03	Know relevant safety regulations and standards for the use, storage and transportation of flammable or toxic refrigerants or refrigerants requiring higher operating pressure	T	T	-	-
11.04	Understand the respective advantages and disadvantages, notably in relation to energy efficiency, of alternative refrigerants according to the intended application and to the climate conditions of the different regions	T	T	-	-

Certified operatives must have access to information on:

- Relevant technologies to replace or reduce the use of fluorinated greenhouse gases and their safe handling, and
- Existing regulatory requirements for working with equipment containing alternative refrigerants

VIII- Bans

Article 11 + Annex III

Article 11 provides that certain types of equipment will be banned from being placed on the EU market from certain dates. Types of equipment and applicable dates are detailed in Annex III.

Full exemption

Military equipment is exempted from the bans under Annex III.

Temporary exemption

Article 11(3) allows temporary exemptions under the following conditions:

- The request must be made to the European Commission by a competent authority or a Member State;
- The request must be substantiated and demonstrate that:
 - for a specific product or a piece of equipment, or for a specific category of products or equipment, alternatives are not available, or cannot be used for technical or safety reasons; or
 - the use of technically feasible and safe alternatives would entail disproportionate costs;
- The exemption can be granted by means of implementing act and for a maximum of 4 years.

The provision does not exclude that a new application is made toward the end of the 4 years period, substantiating that the obstacles for the use of alternatives persist.

Exception

Bans will not apply to Ecodesign equipment that has less lifecycle CO₂-equivalent emissions than equivalent equipment that meets Ecodesign requirements and does not contain HFCs.

The conditions for such an exception would be as follows:

- 1- The equipment falls under Ecodesign requirements, i.e. an Ecodesign measure has been adopted for the equipment in question. In the field of RACHP equipment, this is currently the case of:
 - a. Commission Regulation 643/2009 on Ecodesign requirements for household refrigerating appliances¹⁹
 - b. Commission Regulation 206/2012 on Ecodesign requirements for air conditioners and comfort fans²⁰

It must be noted that other potentially relevant Ecodesign measures are in the process of adoption:

- ENTR Lot 1 on refrigerating and freezing equipment (professional)
 - ENTR Lot 6 on tertiary air conditioning and ventilation systems
 - ENER Lot 12 on commercial refrigeration
 - ENER Lot 21 on air heating products, cooling products and high temperature process chillers
- 2- It is explicitly established in the Ecodesign that the equipment, due to higher energy efficiency, has lifecycle CO₂-equivalent emissions lower than equivalent equipment which meets all relevant Ecodesign requirements and does not contain HFCs.

Currently none of the adopted Ecodesign standards contain such statement.

Refrigerators & freezers for commercial use

Equipment included

Refrigerators & freezers must be:

- **Hermetically sealed equipment**, which article 2 point 11 defines as “*equipment in which all fluorinated greenhouse gas containing parts are made tight by welding, brazing or a similar permanent connection, which may include capped valves or capped service ports that allow proper repair or disposal, and which have a tested leakage rate of less than 3 grams per year under a pressure of at least a quarter of the maximum allowable pressure*”, and
- For **commercial use**, which article 2 point 32 defines as “*used for the storage, display or dispensing of products, for sale to end users, in retail and food services*”.

¹⁹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009R0643:EN:NOT>

²⁰ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32012R0206:EN:NOT>

Application dates

Application dates depend on the GWP of the HFC contained:

- HFC ≥ 2500 GWP: 1 January 2020
- HFC ≥ 150 GWP: 1 January 2022

Stationary refrigeration equipment

This ban complements the service ban (see Section XII of these guidelines).

Conditions

- The equipment contains HFC ≥ 2500 GWP, which includes notably R404A, R422D and R507
- The equipment must not be used to cool products to temperatures below -50°C

Equipment included

Article 2 point 23 defines **stationary** as “*not normally in transit during operation [...]*”. **Refrigeration equipment** is however not specifically defined. The implementing regulation on the reporting contains a section with sub-categories of 'refrigeration equipment'

Ecodesign ENTR Lot 1 study on professional refrigeration products includes:

- Professional storage cabinets
- Blast cabinets
- Walk-in cold rooms
- Refrigeration process chillers
- Condensing units (*N.B.: Condensing unit is always part of larger system and energy efficiency depends on the whole*)

Ecodesign ENER Lot 12 study on commercial refrigeration includes:

- Commercial refrigerated cabinets
- Refrigerated vending machines

Application date

1 January 2020

Multipack centralised refrigeration for commercial use

Equipment in scope

- **Multipack centralised refrigeration systems:** article 2 point 37 defines them as “*systems with two or more compressors operated in parallel, which are connected to one or more common condensers and to a number of cooling devices such as display cases, cabinets, freezers or to chilled store rooms*”
- **For commercial use,** which article 2, point 32 defines as “*used for the storage, display or dispensing of products, for sale to end users, in retail and food services*”
- **With a rated capacity $\geq 40\text{kW}$**
- **Containing or relying upon HFC ≥ 150 GWP**
 - **Exception:** in the **primary refrigerant circuit of cascade systems**, HFCs ≥ 1500 GWP can be used; this includes notably R32, R134a and R245fa. Article 2 point 38 defines primary circuit of cascade systems as “*the primary circuit in indirect medium temperature systems where a combination of two or more*

separate refrigeration circuits are connected in series such that the primary circuit absorbs the condenser heat from a secondary circuit for the medium temperature”

Application date

1 January 2022

Movable room air-conditioning

Equipment in scope

- Hermetically sealed equipment (see definition of Article 2 point 11 reproduced above)
- Movable between rooms by the end user: this means that the “movability” does not depend on the intervention of a professional
- Containing HFC ≥ 150 GWP

Application date

1 January 2020

Single split air conditioning systems

Equipment in scope

- **Single split air conditioning systems**, which Article 2 point 39 defines as “*systems for room air conditioning that consist of one outdoor unit and one indoor unit linked by refrigerant piping, needing installation at the site of usage*”.
- **Containing ≤ 3 kg HFCs**
- **Containing HFCs ≥ 750 GWP**: R32 is therefore exempted

Application date

1 January 2025

IX- Delivery of f-gases

Article 11(4)

Article 6(3) and (4)

Article 11(4) provides that for the purpose of installation, servicing, maintenance or repair of stationary air conditioning, refrigeration and heat pump equipment, as well as refrigeration units of refrigerated trucks and trailers, fluorinated greenhouse gases can only be **sold to and purchased by certified undertakings**. The reference to training attestations and companies employing persons holding such attestations, relevant in particular for the MAC sector, clarifies that this provision also applies to undertakings servicing and repairing air-conditioning units on road vehicles covered by Directive 2006/40/EC.

What are the main changes?

- **Equipment in scope:** Refrigeration units of refrigerated trucks and trailers are now included in addition to stationary RACHP equipment
- **Operations involved:**
 - Whereas Regulation (EC) 842/2006 limited itself to mentioning containment and recovery operations, the new Regulation refers to part of the list of operations requiring certification: installation, servicing, maintenance, repair and decommissioning
 - Recovery and leak checking operations are now excluded unless they involve the operations indicated above
- **Shared responsibility:** Responsibility for delivering the refrigerant to a certified undertaking is now clearly shared by distributors and installers

Shared responsibility distributor/installer

Regulation (EC) 842/2006 provided that only certified installers could take delivery of fluorinated greenhouse gases. Interpreted restrictively, this meant that distributors did not have to actually check that the buyer held the appropriate certificate.

The new Regulation corrects this loophole by specifying that distributors can only sell to certified undertakings. In practical terms, this means that distributors will have to perform a check.

What must distributors do?

According to Article 6(3) distributors must **establish and maintain records** of relevant **information on the purchaser**, including:

- Certification number of the purchaser
- Quantities of refrigerant purchased

These records must be **kept for 5 years** and made available upon request from a national authority or the European Commission.

The European Commission may determine the format of these records by implementing act. Concretely, for each sale distributors will have to check the buyer's certification number and record it together with the quantity of refrigerant purchased.

Example of the application of these obligations in France and recommendations for application are provided in Annex 3.

AREA has created a flyer that summarises the abovementioned obligation but also includes a flowchart reproducing the questions distributors must ask themselves to ensure they conform to both the letter and spirit of the Regulation. The flyer can be downloaded on AREA website.



X- Sale of pre-charged equipment

Article 11(5)

The European Commission's original proposal suggested banning pre-charging of non-hermetically sealed air conditioning equipment. One of the objectives was to ensure that such equipment is indeed installed by certified professionals. This already was an obligation under Regulation (EC) 842/2006 but it was regularly breached in practice.

To achieve the objective the new Regulation provides that non-hermetically sealed pre-charged equipment shall only be sold to the end user where **evidence** is provided that the **installation** shall be carried out by a **certified undertaking**.

Practical application – how to enforce such an obligation?

What kind of evidence?

The evidence required must demonstrate that the installation will be performed by a certified undertaking. The combination of two pieces of information can prove that:

- 1- The name and details of the undertaking, and,
- 2- The certification number of the undertaking

To whom should the evidence be provided?

The evidence must be provided to the seller but also ultimately to the competent authorities in charge of controlling that the requirement is respected.

How could the evidence be provided?

There could be several possibilities to ensure the respect of the requirement, e.g.:

- The equipment's sale price includes the installation service by a certified company;
- Buyers fill in a form indicating their details, the equipment details (serial number), the purchase date, and the name and certification number of the company that will carry out the installation. Distributors then keep records of this information and pass it on to competent authorities for possible controls. Buyers are made aware of possible inspections and penalties in case of breach.

How to ensure regular, simple and effective controls?

In the first example above, controls are almost unnecessary as the installation is included in the price. In the second example, random controls should be made on the basis of the data sheets filled in by the buyer by checking with the indicated certified company that it indeed carried out the installation.

Additional incentives

Equipment manufacturers should clearly indicate that professional installation by a certified company is legally compulsory. Lack of respect of this obligation is punishable and results in a loss of warranty.

XI- Labelling of recycled/reclaimed refrigerant

Article 12(6)

Recycled or reclaimed fluorinated greenhouse gases must now be specifically labelled. The label, the format of which will be determined by implementing act, must include the following information:

- Indication that the substance has been recycled or reclaimed;
- Information on the batch number;
- Name & address of the recycling or reclamation facility.

Contractors must make sure that the information above is indicated on the reclaimed/recycled refrigerant they use.

XII- Service ban

Article 13(3)

Principle

Service and maintenance of refrigeration equipment with a minimum charge size of 40 tonnes CO₂-equivalent with refrigerants ≥ 2500 GWP is prohibited from 1 January 2020.

Scope

→ Refrigeration equipment

The following types of equipment are however **exempted**:

- Military equipment;
- Equipment used for deep freezing (below -50°C);
- Refrigeration equipment benefitting from an exemption from the bans indicated in Annex III, in particular points 12 and 13 (see “temporary exemptions” under section VIII of these guidelines).

Refrigerant & charge size

→ Refrigerant ≥ 2500 GWP for a minimum charge size of 40 tonnes CO₂-equivalent

The table below summarises the minimum charge size corresponding to 40 tonnes CO₂-equivalent for the most common refrigerants ≥ 2500 GWP used in refrigeration

Refrigerant	GWP	Minimum charge size (kg)
404A	3922	10.20
422D	2729	14.66
507	3985	10.04

Exceptions

Reclaimed refrigerant ≥ 2500 GWP may be used until 1 January 2030 under the following conditions:

- They have been properly labelled in accordance with article 12(6) (see section XI of these guidelines);
- They are used for servicing and maintenance of existing refrigeration equipment.

Recycled refrigerants ≥ 2500 GWP may be used until 1 January 2030 under the following conditions:

- They are used for servicing and maintenance of existing refrigeration equipment
- They have been recovered from such equipment, i.e. refrigeration equipment.
- They may only be used by:
 - the undertaking which carried out their recovery as part of maintenance or servicing, or,
 - the undertaking for which the recovery was carried out as part of maintenance or servicing.

These exceptions are aligned with those in Regulation 1005/2009 on substances that deplete the ozone layer, applicable to the re-use of HCFCs until 31 December 2014.²¹

What does this mean for contractors?

Refrigerants ≥ 2500 GWP are mostly seen in mid or low temperature applications such as in supermarkets, cold stores, in the food processing industry, in catering, reefers, fruit & vegetable refrigeration and industrial refrigeration. In most of these installations the refrigeration charges are higher or much higher than 10-15 kg, which means they will fall under the service ban.

This provision will therefore have a great impact on the contractor as well as his customer.

Since producers and importers of refrigerants will most likely be reluctant to stockpile unsellable refrigerants, shortage of high GWP refrigerants is very likely to occur long before the entry into force of the service ban on 1 January 2020.

Handling, sales and distribution of reclaimed or recycled refrigerants also raises many questions:

- Where to buy it? Who will want to deal with it?
- How to be sure of its origin, purity and quality?

What does AREA recommend?

Even if installations of high GWP refrigerants are legal until 1 January 2020, AREA recommends already now being very restrictive in promoting and quoting installations working with these refrigerants.

If doing so we strongly recommend that customers / end users are carefully informed of the consequences they will face regarding availability and price level of these refrigerants in the future.

²¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:286:0001:0030:EN:PDF>

XIII- Pre-charging of equipment

Article 14

In its original proposal, for a revision the European Commission proposed to ban pre-charging of air conditioning and heat pump equipment. This proposal pursued two objectives:

- 1- Ensure installation of pre-charged equipment by certified professionals
- 2- Preserve the integrity of the phase-down scheme (by ensuring that the refrigerant charged was indeed accounted for)

During the decision-making process, this proposal was eventually abandoned and replaced by two sets of measures to address the aforementioned objectives. Installation by certified professionals is addressed by Article 11(5) (see Section X).

Article 14 on pre-charging of equipment addresses the second objective by establishing **a traceability system that ensures that charged refrigerant is accounted for in the phase-down quotas.**

To ensure this obligation is respected, manufacturers or importers must document that the refrigerant is included in the quota and draw up a declaration of conformity in this respect. The Commission may determine the modalities relating to the declaration of conformity by implementing act.

What does this mean for installers?

Responsibility for compliance rests with the manufacturer or the importer. Nevertheless, installers dealing with pre-charged equipment to install at a customer's may want to **check that the equipment is accompanied with the declaration of conformity.**

XIV- Phase-down of HFCs

Articles 15-18 + Annexes V and VI

The new Regulation includes a phase-down scheme according to which the quantity of HFCs placed on the EU market will gradually decrease between 2015 and 2030. The definition of 'HFCs' in Article 2 point 2 makes clear that also blends containing HFCs are considered as HFCs. The Commission will thus ensure that the quantity of HFCs producers and importers place on the market each year does not exceed the maximum quantity they are entitled to.

Scope

The phase-down applies to all **producers or importers of ≥ 100 tonnes CO₂ equivalent of HFCs.** The table below summarises the corresponding weight thresholds (i.e. equivalent to 100 tonnes CO₂-equivalent) for the most commonly used fluorinated greenhouse gases.

Refrigerant	GWP	Minimum volume (kg)
23	14800	6.76
32	675	148.15
134a	1430	69.93
125	3500	28.57
245fa	1030	97.09
404A	3922	25.50
407A	2107	47.46
407C	1774	56.37
407D	1627	61.46
407F	1825	54.79
410A	2088	47.89
417A	2346	42.63
422A	3143	31.82
422D	2729	36.64
423A	2280	43.86
424A	2440	40.98
426A	1508	66.31
427A	2138	46.77
428A	3607	27.72
434A	3245	30.82
437A	1805	55.40
438A	2265	44.15
442A	1888	52.97
449A	1397	71.58
507	3985	25.09
508A	13214	7.57
508B	13396	7.46
ISCEON® MO89	3805	26.28

The following categories of HFCs are **excluded** from the phase-down, but subject to specific labelling and reporting requirements:

- HFCs imported for destruction
- HFCs used for feedstock applications
- HFCs supplied for export out of EU in bulk
- HFCs for use in military equipment
- HFCs used for semiconductors
- (from 1 January 2018) HFCs use for metered dose inhalers for the delivery of pharmaceutical ingredients

It should also be noted that HFOs (R1234yf, R1234ze) are not included in the list of HFCs, therefore not subject to the phase-down.

Allocation of quotas

Quotas specifying maximum quantities will be determined for each producer or importer for each year beginning with the year 2015. A reference value will be calculated, based on the annual average volume placed on the market by each undertaking from 2009 to 2012.

Based on the reference value, annual maximum quantities will be calculated by using the following percentages.

Year	Percentage
2015	100%
2016-17	93%
2018-20	63%
2021-23	45%
2024-26	31%
2027-29	24%
2030	21%

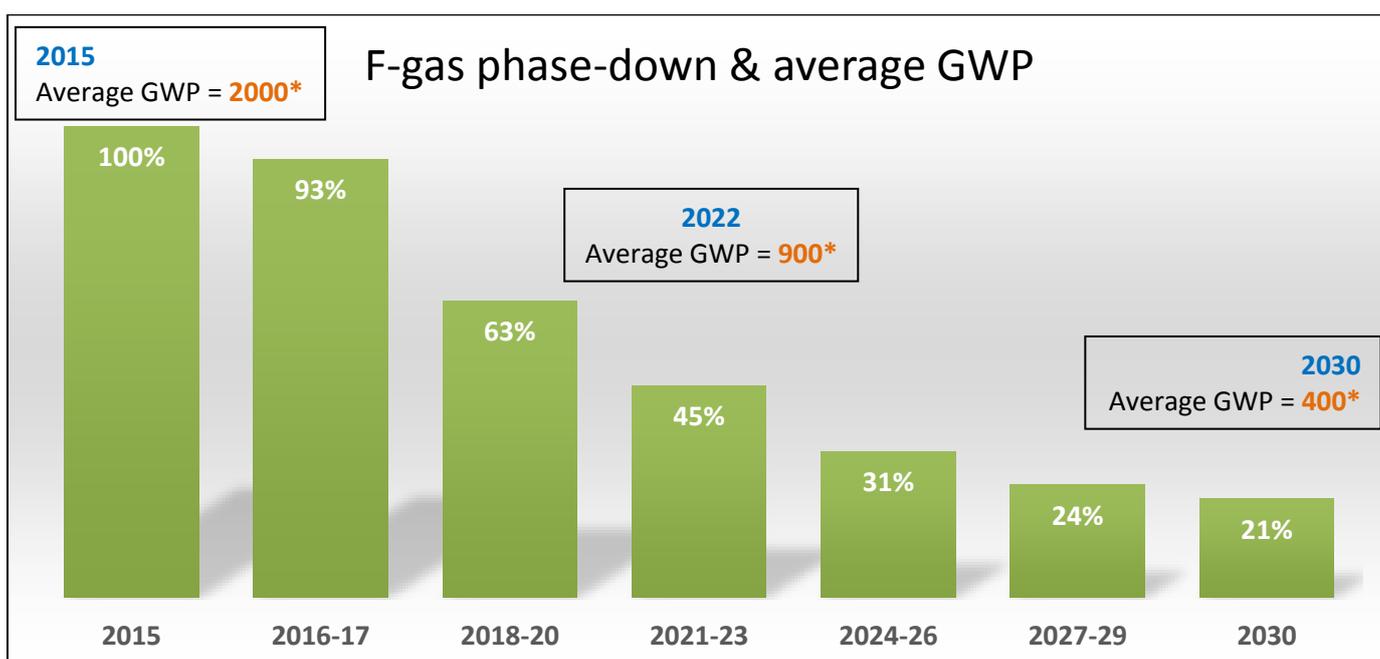
Each undertaking for which a reference value has been established will receive a quota corresponding to 89% of its reference value multiplied with the percentage indicated for the respective year. The remaining 11% of the quantity are allocated to new undertakings for which no reference value has yet been established.

Registry

An electronic registry will be set up by the Commission. The registry shall include producers and importers that have been allocated a quota as well as importers placing pre-charged equipment charged with HFC's on the market.

What does this mean?

Reasoning on the basis of the average GWP levels of refrigerants placed on the EU market provides an interesting insight on the impact of the phase-down. European Commission's estimations on average GWP level in the EU point at approximately 2000 CO₂-equivalent in 2015. With this starting value percentage figures can be transformed into average CO₂-equivalent consumption figures for the intermediate and final stages of the phase-down, in 2022 and 2030, respectively.



* Source: European Commission

According to the starting GWP value of 2000 CO₂-equivalent, it will soon become difficult to use R404A in new installations and it will only take a few years before the same applies to R410A and R134A. This is due to the fact that new plants have to under-compensate for the leakage of high GWP refrigerant charge in already existing plants in order to reach the average value.

For more information about the phase-down, see:

- Commission Regulation (exact number to be indicated once the Regulation is adopted)
- EPEE FAQ²²



²² <http://www.epeeglobal.org/>

ANNEX 1 – Relevant key dates

1 January 2015	Entry into force of the new Regulation
1 January 2015	Phase-down stage 1 100% of annual average quantity placed on EU market in the period 2009-2012
1 January 2016 (→ 31 Dec. 2017)	Phase-down stage 2 93% of annual average quantity placed on EU market in the period 2009-2012
1 January 2017	Leak checks now apply also to: <ul style="list-style-type: none">• Equipment containing less than 3kg but at least 5 tonnes CO₂-eq of fluorinated greenhouse gases• Hermetically sealed equipment containing less than 6kg but at least 10 tonnes CO₂-eq of fluorinated greenhouse gases
1 January 2017	Deadline for Commission's report on EU legislation on training for safe handling of alternative refrigerants
1 July 2017	Deadline for Commission's report on possible alternatives for multipack centralised refrigeration systems
1 July 2017	Deadline for Commission's report assessing the quota allocation method
1 January 2018 (→ 31 Dec. 2020)	Phase-down stage 3 63% of annual average quantity placed on EU market in the period 2009-2012 (minus amounts exempted for use)
1 January 2020	Ban refrigeration equipment with refrigerant ≥ 2500 GWP, except equipment intended for deep freezing (below -50°C)
1 January 2020	Ban on service and maintenance of refrigeration equipment with a minimum charge size of 40 tonnes CO ₂ -equivalent with refrigerant of ≥ 2500 GWP
1 July 2020	Deadline for Commission's report on possible alternatives for new single split air conditioning systems
31 Dec. 2020	Deadline for Commission's report on the availability of hydrofluorocarbons on the Union market
1 January 2021 (→ 31 Dec. 2023)	Phase-down stage 4 45% of annual average quantity placed on EU market in the period 2009-2012 (minus amounts exempted for use)
1 January 2022	Ban on multipack centralised refrigeration systems for commercial use with ≥ 40 kW capacity and with refrigerant ≥ 150 GWP, except in the primary refrigerant circuit of cascade systems where refrigerant ≥ 1500 GWP may be used
31 Dec. 2022	Deadline for Commission's report on the effects of the new F-gas Regulation

- 1 January 2024**
(→ 31 Dec. 2026) Phase-down stage 5
31% of annual average quantity placed on EU market in the period 2009-2012 (minus amounts exempted for use)
- 1 January 2025** Ban on single split air-conditioning systems containing less than 3kg of fluorinated greenhouse gases, that contain, or that rely upon for their functioning, fluorinated greenhouse gases with GWP of 750 or more
- 1 January 2027**
(→ 31 Dec. 2029) Phase-down stage 6
24% of annual average quantity placed on EU market in the period 2009-2012 (minus amounts exempted for use)
- 1 January 2030** Phase-down stage 7
21% of annual average quantity placed on EU market in the period 2009-2012 (minus amounts exempted for use)
- 1 January 2030** Reclaimed or recycled refrigerant ≥ 2500 GWP cannot be used any longer to service or maintain refrigeration equipment with a minimum charge of 40 tonnes CO₂-eq

ANNEX 2 - Correlation table

Regulation (EC) No 842/2006	This Regulation
Article 1	Article 1
Article 2	Article 2
Article 3(1)	Article 3(2) and (3)
Article 3(2), first subparagraph	Article 4(1), (2) and (3)
Article 3(2), second subparagraph	Article 3(3), second subparagraph
Article 3(2), third subparagraph	-
Article 3(3)	Article 5(1)
Article 3(4)	Article 4(3)
Article 3(5)	Article 4(4)
Article 3(6)	Article 6(1) and (2)
Article 3(7)	Article 4(5)
Article 4(1)	Article 8(1)
Article 4(2)	Article 8(2)
Article 4(3)	Article 8(3)
Article 4(4)	-
Article 5(1)	Article 10(5) and (12)
Article 5(2), first sentence	Article 10(1), (1a) and (6)
Article 5(2), second sentence	Article 10(10), first subparagraph
Article 5(2), third sentence	Article 10(10), second subparagraph
Article 5(3)	Article 3(4), first subparagraph and Article 10(3)
Article 5(4)	Article 11(4)
Article 5(5)	Article 10(13)
Article 6(1)	Article 19(1) and Annex VII
Article 6(2)	Article 19(7)
Article 6(3)	Article 19(8)
Article 6(4)	Article 20 and Article 6(2)
Article 7(1), first subparagraph, first sentence	Article 12(1) first sentence
Article 7(1), first subparagraph, second and third sentence	Article 12(2), (3) and (4)
Article 7(1) second subparagraph	Article 12(13)
Article 7(2)	Article 12(1), second sentence
Article 7(3), first sentence	Article 12(14)
Article 7(3), second sentence	Article 12(15)
Article 8(1)	Article 13(1)
Article 8(2)	Article 13(2)
Article 9(1)	Article 11(1)
Article 9(2)	-
Article 9(3)	-
Article 10	21(2)
Article 11	-
Article 12	Article 24
Article 13(1)	Article 25(1), first subparagraph
Article 13(2)	Article 25(1), second subparagraph
Article 14	-
Article 15	Article 27
Annex I — Part 1	Annex I
Annex I — Part 2	Annex IV
Annex II	Annex III

ANNEX 3 – Equivalence – old and new Fgas legislation

The table below lists the old Fgas legislation (relevant to RACHP contractors) and its current equivalent further to the adoption of the new Fgas Regulation.

Old Fgas legislation	New Fgas legislation
Regulation 842/2006 on certain fluorinated greenhouse gases	<u>Regulation 517/2014</u> on fluorinated greenhouse gases
Commission Regulation 1494/2007	<u>Commission Implementing Regulation 2015/2068</u> establishing the format of labels for products and equipment containing fluorinated greenhouse gases
Commission Regulation 1516/2007 establishing standard leakage checking requirements for stationary refrigeration, air conditioning and heat pump equipment containing certain fluorinated greenhouse gases	
Commission Regulation 303/2008 establishing minimum requirements and the conditions for mutual recognition for the certification of companies and personnel as regards stationary refrigeration, air conditioning and heat pump equipment containing certain fluorinated greenhouse gases	<u>Commission Implementing Regulation 2015/2067</u> on minimum requirements and the conditions for mutual recognition for the certification of natural persons as regards stationary refrigeration, air conditioning and heat pump equipment, and refrigeration units of refrigerated trucks and trailers, containing fluorinated greenhouse gases and for the certification of companies as regards stationary refrigeration, air conditioning and heat pump equipment, containing fluorinated greenhouse gases
Commission Regulation 307/2008 establishing minimum requirements for training programmes and the conditions for mutual recognition of training attestations for personnel as regards air-conditioning systems in certain motor vehicles containing certain fluorinated greenhouse gases	
Commission Regulation 308/2008	<u>Commission Implementing Regulation 2015/2065</u> establishing the format for notification of the training and certification programmes of the Member States
	<u>Commission Implementing Decision</u> determining, reference values for the period 1 January 2015 to 31 December 2017 for each producer or importer who has reported placing on the market hydrofluorocarbons under Regulation (EC) No 842/2006 of the European Parliament and the Council
	<u>Commission Implementing Regulation 1191/2014</u> determining the format and means for submitting the report referred to in Article 19 of Regulation (EU) No 517/2014

ANNEX 4 - Delivery of F-Gases

The French example

The provisions of article 11, §4 and article 6, §3 correspond to the interpretation that France is already following with Regulation (EC) 842/2006 since 2008. Below is a summary of the system applying to delivery of fluorinated greenhouse gases in France.

Public list of certified companies

10 authorised bodies (by the Environment Ministry) issue the f-gas certification to undertakings for five years. Each year, authorised bodies must submit the list of certified undertakings to the Ministry. This list includes the category of their certification and the quantities of refrigerants bought, sold, stored and recovered that each undertaking declared earlier. They also provide a list of companies, the certification of which is suspended or revoked (with the justification).

The Ministry publishes on its website the national list of certified companies with the end date of the certification and the categories. Authorised bodies also keep an updated list of certified undertakings available to distributors, end users and the public in general.

Distributors can only sell to certified companies

Distributors are allowed to supply fluorinated greenhouse gases only to other distributors and to companies that hold the French certificate or an equivalent certificate issued in another EU Member States.

Distributors are required to submit annually to the Environment Ministry figures about the quantities of refrigerants placed on the market, stored or recycled/reclaimed. They record the name of the purchaser, the number of the certification and the nature of the refrigerants.

How does it work in practice?

Distributors' database mentions if the refrigerant purchaser has the certification and its end date. If a purchaser wants to buy refrigerants without having the certification or if his certification has expired, the system automatically locks and it becomes impossible to fulfil an order form.

Distributors update their database periodically. Each new client is requested to show the original of the certificate. Distributors then keep a copy and control on the national list of the Ministry and on the list of the agreed body that the company is really certificated. If yes, it is included in the distributor's database.

Note: Overall the system is recognized as positive by the installers. For distributors, there were constraints initially which are now well accepted. It has improved practices, promoted tightness and recovery and has helped to have a good traceability. It also safeguards fair competition among certified companies.

Suggestions of application

In order to ensure that the objectives of the new Regulation are fulfilled, it is essential that some safeguards are put in place so that the system cannot be cheated. AREA therefore recommends 3 key elements in the application of the provisions on delivery of fluorinated greenhouse gases:

- **Authorised bodies must maintain updated lists of certified companies.** These lists must at least indicate:
 - Category of certification
 - Whether the certification is active, suspended or revoked
- **Distributors must** go beyond the automatic record of the certification number and actually **check the existence and validity of the certificate** with the authorised body that issued it

- Companies who attempt to purchase refrigerant without a valid certificate should be reported to the competent authorities

Moreover and although this is not an obligation under the new Regulation, the establishment and maintenance of **national public lists of certified companies** substantially facilitates controls, not only by distributors but also by end users and installers.

ANNEX 5 – Useful links

Implementing acts

- 02/06/2016 - [Commission Implementing Regulation \(EU\) 2016/879 establishing detailed arrangements relating to the declaration of conformity when placing refrigeration, air conditioning and heat pump equipment charged with hydrofluorocarbons on the market and its verification by an independent auditor](#)
- 17/11/2015 - [Commission Implementing Regulation \(EU\) 2015/2068 establishing the format of labels for products and equipment containing fluorinated greenhouse gases](#)
- 17/11/2015 - [Commission Implementing Regulation \(EU\) 2015/2067 establishing minimum requirements and the conditions for mutual recognition for the certification of natural persons as regards stationary refrigeration, air conditioning and heat pump equipment, and refrigeration units of refrigerated trucks and trailers, containing fluorinated greenhouse gases and for the certification of companies as regards stationary refrigeration, air conditioning and heat pump equipment, containing fluorinated greenhouse gases](#)
- 17/11/2015 - [Commission Implementing Regulation \(EU\) 2015/2066 establishing minimum requirements and the conditions for mutual recognition for the certification of natural persons carrying out installation, servicing, maintenance, repair or decommissioning of electrical switchgear containing fluorinated greenhouse gases or recovery of fluorinated greenhouse gases from stationary electrical switchgear](#)
- 17/11/2015 - [Commission Implementing Regulation \(EU\) 2015/2065 establishing the format for notification of the training and certification programmes of the Member States](#)
- 31/10/2014 - [Commission Implementing Decision determining, pursuant to Regulation \(EU\) No 517/2014 of the European Parliament and of the Council on fluorinated greenhouse gases, reference values for the period 1 January 2015 to 31 December 2017 for each producer or importer who has reported placing on the market hydrofluorocarbons under Regulation \(EC\) No 842/2006 of the European Parliament and the Council](#)
- 30/10/2014 - [Commission Implementing Regulation \(EU\) No 1191/2014 determining the format and means for submitting the report referred to in Article 19 of Regulation \(EU\) No 517/2014 of the European Parliament and of the Council on fluorinated greenhouse gases](#)

Guidance documents

These guidance documents are edited by the European Commission. They are all available on its [website](#) and in all official EU languages.

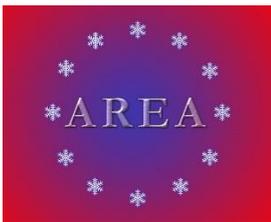
- [Guidance for submitting a Quota Declaration in the F-gas Portal](#)
- [Guidance for providing an Authorization in the F-gas Portal](#)
- [Discussion Paper on verification by auditors](#)
- [Guidance document: Imports of pre-charged equipment](#)
- [GWP-metric conversion calculation tool](#)

- [Guidance document: Information for technicians and users of refrigeration, air conditioning and heat pump equipment containing fluorinated greenhouse gases](#)
- [Brochure: Information for technical personnel and companies working with equipment containing fluorinated greenhouse gases](#)
- [Guidance document for registering in the F-gas Portal](#)
- [Reporting: FAQ document for companies reporting on F-gases](#)
- [Reporting: Manual for Business data repository \(BDR\)](#)
- [Discussion Paper on HFC-23 by-production](#)

Other

- [Contact lists of Member States](#)

Source: http://ec.europa.eu/clima/policies/f-gas/documentation_en.htm



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