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THE EUROPEAN UNION

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NOTE

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to : Delegations

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No. Cion prop. : 12179/03 ENV 433 CODEC 1115 - COM (2003) 492 final

Subject : - Proposal for a Regulation of the European Parliament and of the Council on certain **fluorinated greenhouse gases** (Annex A)
- Proposal for a Directive of the European Parliament and of the Council relating to **emissions from air conditioning systems in motor vehicles** and amending Council Directive 70/156/EEC (Annex B)
= Consideration of Presidency proposal for political agreement

Following the discussion in Coreper yesterday, delegations will find attached a Presidency proposal, for the Regulation, to be used as the basis for discussion in the Working Party on the Environment on Tuesday 14 September. The aim of this discussion is to arrive at a draft text which can be prepared for the political agreement expected to take place at the Environment Council on 14 October.

Delegations will note that some of the existing footnotes, not discussed in Coreper, have also been dropped from this text. This is due to the fact that the Presidency has suggested some new compromise texts, in particular for:

Article 2(f) - former definition of "operators";
Article 3 - Containment;
Article 6(4) - Reporting requirements;
Article 7 new (3) and (4) - Use bans;
Article 8 - Placing on the market; and
Article 9(1) - Review, on mobile equipment.

Other footnotes have been dropped where the Commission has already given explanations or reassurances in relation to delegations' concerns or where the footnote was long-standing and had not gained any support or was a specific scrutiny reservation.

The Presidency will, of course, take time to review all of these issues in the meeting on Tuesday but hopes that delegations will be prepared to consider the suggested compromise texts as a way to move towards finding a draft text which can accommodate as many of the delegations' concerns as possible.

Annex B of this document (the text of the Directive for consideration by the Working Party on Monday 20 September) will be issued on Monday 13 September.

**Proposal for a
REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
on certain fluorinated greenhouse gases ¹**

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular, Article 175(1) thereof in relation to Articles 3, 4, 5 and 6 and Article 95 thereof in relation to Articles 6a, 7 and 8.²,

Having regard to the proposal from the Commission ^{*},

Having regard to the opinion of the European Economic and Social Committee ^{**},

Acting in accordance with the procedure laid down in Article 251 of the Treaty ^{***},

¹ **DELETED**: general scrutiny reservation; DK/FR/UK: parliamentary scrutiny reservation.

² **DELETED** support Article 175(1), as a single legal base.

DELETED would limit the application of Article 95 to Article 8 and its Annex only, and would want to see the environmental ambition of this Article increased.

DELETED: scrutiny reservation on legal base, to take account of Cion's position.

Suggested additional recitals:

"(4) Article 175(1) of the EC Treaty should be invoked in relation to the containment, recovery, training and certification and reporting provisions, laid down in Articles 3 to 6."

"(6) Article 95 of the EC Treaty should be invoked in relation to the labelling and the marketing and use restrictions for certain applications containing fluorinated greenhouse gases, laid down in Article 6a, 7 and 8."

"(x) In order to contribute to the fulfilment of the Community and its Member States' commitments under the UN Framework Convention on Climate Change, the Kyoto Protocol and Council Decision 2002/358/EC, Directive xxxx/2005 and this Regulation, which both contribute to prevention and minimisation of emissions of fluorinated greenhouse gases, should be adopted and enter into force simultaneously;"

^{*} OJ C [...], [...], p. [...].

^{**} OJ C [...], [...], p. [...].

^{***} OJ C [...], [...], p. [...].

Article 1

Scope

The objective of this Regulation is to reduce emissions of the fluorinated greenhouse gases covered by the Kyoto Protocol, it shall apply to the fluorinated greenhouse gases listed in Annex A to that Protocol. Annex I contains a list of the fluorinated greenhouse gases ³ currently covered by this Regulation, together with their Global Warming Potentials. Annex I may be reviewed and updated for assessments on additional substances, in accordance with the procedure laid down in Article 10, in the light of revisions provided for by Article 5(3) of the Kyoto Protocol and future assessments by the IPCC ⁴.

This Regulation addresses the containment, use, recovery and destruction of the fluorinated greenhouse gases listed in Annex I; the labelling [...] and disposal of products and equipment containing those gases; the reporting of information on those gases; the placing on the market and use of those gases in certain products and equipment ⁵; and the training and certification of personnel involved in activities provided for by this Regulation. ⁶

³ **DELETED**: insert "whether alone or in a mixture and whether they are virgin, recovered, recycled or reclaimed".

⁴ **DELETED** have serious concerns about allowing for the updating of the table in Annex I via a comitology procedure, they would suggest that revisions should only be undertaken following international agreement within the Kyoto process and that the last, underlined phrase should be deleted. **DELETED** suggests that it may be worth considering limiting the fluorinated greenhouse gases listed in Annex I to those with a GWP higher than 150.

⁵ **DELETED** suggest that the scope should cover placing on the market of the gases themselves, which are to be used in the products and equipment; **DELETED**: against; **DELETED**: scrutiny reservation; **DELETED** also suggests exemption for military equipment: "The competent national authorities may grant exemptions from the requirements laid down in Articles 3 and 4 for military equipment and products when these are serving military operations including their preparation."

⁶ **DELETED** suggests last phrase is unnecessary.

This Regulation shall apply without prejudice to Council Directive 75/442/EEC, Council Directive 96/61/EC, to Directive 2000/53/EC of the European Parliament and of the Council and to Directive 2002/96/EC of the European Parliament and of the Council. ⁷

Article 2

Definitions

For the purposes of this Regulation the following definitions shall apply:

- (a) “Fluorinated greenhouse gases”, for the purposes of this Regulation, means hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) as listed in Annex I and preparations containing those substances, but excludes substances controlled under Regulation (EC) No 2037/2000;
- (b) “Hydrofluorocarbon” means an organic compound ⁸ consisting of carbon, hydrogen and fluorine, and where no more than six carbon atoms are contained in the molecule;
- (c) “Perfluorocarbon” means an organic compound consisting of carbon and fluorine only, and where no more than six carbon atoms are contained in the molecule;

⁷ **DELETED**, supported by **DELETED**, suggests an additional paragraph:
“Member States may, in order to comply with their respective emission reduction targets as decided in Decision 2002/358/EC, maintain or introduce stricter national provisions reducing the use of substances that comply with the requirements of this Regulation.”; **DELETED**:
against.

⁸ **DELETED**: insert “whether virgin, recovered, recycled or reclaimed”.

- (d) “Global Warming Potential” expresses the climatic warming potential of a greenhouse gas relative to that of carbon dioxide. The standard Global Warming Potential (GWP) is calculated in terms of the 100 year warming potential of one kilogram of a gas relative to one kilogram of CO₂. The GWP figures listed in Annex I are taken from the third assessment report (TAR) adopted by the Intergovernmental Panel on Climate Change (“2001 IPCC GWP values” *);⁹
- (e) “preparation” means for the purposes of the obligations in this Regulation, excluding destruction, a mixture composed of two or more substances at least one of which is a fluorinated greenhouse gas, except where the total global warming potential of the preparation is less than 150¹⁰. The total global warming potential ** of the preparation shall be determined in accordance with Part 2 of Annex I to this Regulation;
- (f) “manager” means a natural or legal person exercising actual power over the technical functioning of the equipment and systems covered by this Regulation, who may be the owner and/or the operator of the equipment or system;
- (g) “placing on the market” means the supplying of or making available to third persons, against payment or free of charge, [...] fluorinated greenhouse gases contained in certain products and equipment^{11 12} by a producer or an importer for the first time in the European Union;

* IPCC Third Assessment Climate Change 2001. A Report of the Intergovernmental Panel on Climate Change (<http://www.ipcc.ch/pub/reports.htm>).

⁹ **DELETED** suggests that the values should be those available when the Kyoto Protocol was agreed (i.e. the Second Assessment Report); **DELETED**: scrutiny reservation.

¹⁰ **DELETED**, supported by **DELETED**, suggests GWP of 50.

^{**} For the calculation of the GWP of non-fluorinated greenhouse gases in preparations, the values published in the First IPCC Assessment shall apply, see: Climate Change, The IPCC Scientific Assessment, J.T. Houghton, G.J. Jenkins, J.J. Ephraums (ed.), Cambridge University Press, Cambridge (UK) 1990.

¹¹ **DELETED**, supported by **DELETED**: include fluorinated greenhouse gases themselves as well as products and equipment which contain them; **DELETED**: scrutiny reservation
DELETED: against this proposal.

¹² **DELETED**: delete the rest of this definition.

- (ga) “use” means the utilisation of fluorinated greenhouse gases in the production, refilling, servicing or maintenance of products and equipment covered by this Regulation;
- (h) “heat pump” means a device or installation that extracts heat at low temperature from air, water or earth and supplies heat;
- (ha) “leakage detection system” means a mechanical, electrical, electronic or UV fluorescent device, for detecting leakage of fluorinated greenhouse gases which, on detection, shall alert the manager;
- (hb) "hermetically sealed system" means a system in which all refrigerant containing parts are made tight by welding, brazing or a similar permanent connection.
- (i) “container” means a product which is designed exclusively for transporting or storing fluorinated greenhouse gases;
- (ia) “a non-refillable container” means a container that is designed not to be refilled and is used in: the service, maintenance or filling of refrigeration, air-conditioning or heat pump equipment, fire protection systems or high-voltage switchgear; in the production of foams; or to store or transport fluorinated greenhouse gas based solvents;
- (j) “recovery” means the collection and storage of fluorinated greenhouse gases from, for example, machinery, equipment and containers;
- (k) “recycling” means the reuse of a recovered fluorinated greenhouse gas following a basic cleaning process;
- (l) “reclamation” means the reprocessing of a recovered fluorinated greenhouse gas in order to meet a specified standard of performance;

- (m) “destruction” means the process by which all or most of a fluorinated greenhouse gas is permanently transformed or decomposed into one or more stable substances which are not fluorinated greenhouse gases;
- (n) “novelty aerosol” means those aerosol generators marketed and intended for sale to the general public for entertainment and decorative purposes as listed in the Annex to Directive 94/48/EC.

Article 3

Containment

1. Managers of the following stationary¹³ applications: refrigeration, air conditioning and heat pump equipment and fire protection systems, which contain gases listed in Annex I, shall, using all measures which are technically feasible and do not entail disproportionate cost:
 - prevent leakage of these fluorinated greenhouse gases; and
 - as soon as possible¹⁴ repair any detected leakage.

2. Managers of the applications referred to in paragraph 1, shall ensure that they are inspected for leakage by certified personnel who have followed the training and certification programmes provided for in Article 5, according to the following schedule:
 - (a) equipment or fire protection systems¹⁵ containing 3 kg or more of fluorinated greenhouse gases shall be fully inspected at least once every twelve months, this shall not apply to equipment with hermetically sealed systems¹⁶ containing less than 6 kg of fluorinated greenhouse gases;

¹³ See Review (Art 9(1)).

¹⁴ **DELETED**: change this to "immediately".

¹⁵ **DELETED** suggests that each indent should read “equipment including at least one circuit containing...”; **DELETED**: against.

¹⁶ **DELETED**: against exemption for sealed systems; **DELETED**: keep it and add labelling.

- (b) equipment or fire protection systems containing 30 kg or more of fluorinated greenhouse gases shall be fully inspected at least once every twelve months; and every three months a further leakage detection check shall be carried out, this check will focus on those parts of the equipment or system most likely to leak, in particular, the compressors and valves and shall be carried out using a mobile leak detection instrument; in the case of equipment or fire protection systems containing 300 kg or more of fluorinated greenhouse gases these additional leakage detection checks shall take place once every month.

The equipment or system must be inspected for leakage within one month after a leak has been repaired to ensure that the repair has been effective. [...]

3. Managers of the applications referred to in paragraph 1, containing 300 kg or more of fluorinated greenhouse gases, shall install leakage detection systems. Leakage detection systems shall be inspected at least once every twelve months to ensure their proper functioning. *(former para 4 and second sentence of para 3)*
4. Where a leakage detection system is in place, the competent authority may reduce the frequency of the regular leak detection checks required under paragraph 2(b).¹⁷ *(adaptation of former para 3)*
5. In the case of fire protection systems where there is an existing inspection regime in place to meet ISO 14520 standard, these inspections may also fulfil the obligations of this Regulation as long as those inspections are at least as frequent.¹⁸ *(former para 2a)*

¹⁷ **DELETED** suggest alternative “Paragraph 2 shall not apply to equipment or fire protection systems where a functioning leakage detection system is in place.”. **DELETED** suggests should also apply to paragraph 2(a)

¹⁸ **DELETED**: delete this paragraph; **DELETED** against.

6. Managers of the applications referred to in paragraph 1, containing 3 kg or more of fluorinated greenhouse gases, shall maintain records on the quantity and type of fluorinated greenhouse gases installed, any quantities added and the quantity recovered during maintenance, servicing and final disposal. They shall also maintain records of other relevant information including the identification of the company or servicing technician who performed the maintenance or servicing; as well as the dates and results of the inspections and leakage detection checks carried out under paragraph 2. The records shall be made available on request to the competent authority and to the Commission.

Article 4

Recovery

1. Managers of the following types of equipment shall be responsible for putting in place arrangements for the proper recovery by certified personnel, who have followed the training and certification programmes provided for in Article 5, of fluorinated greenhouse gases for ¹⁹ recycling, reclamation or destruction:
- (a) the cooling circuits of refrigeration, air-conditioning and heat pump equipment;
 - (b) equipment containing fluorinated greenhouse gas based solvents;
 - (c) fire protection systems and fire extinguishers; and
 - (d) high voltage switch gear.
2. When a refillable or non-refillable fluorinated greenhouse gas container reaches the end of its life the person utilising the container for transport or storage purposes shall be responsible for ensuring the proper recovery of any residual gases it contains and for putting in place arrangements for their recycling, reclamation or destruction.

¹⁹ **DELETED**: insert "ensuring their".

3. Fluorinated greenhouse gases contained in other products and equipment shall be recovered, to the extent that it is technically feasible and does not entail disproportionate cost for recycling, reclamation or destruction.²⁰
4. Recovery, for the purpose of recycling, reclamation or destruction of the fluorinated greenhouse gases contained in the equipment listed in paragraph 1, pursuant to paragraphs 1 to 3, shall take place before the final disposal of that equipment and, when appropriate, during its servicing and maintenance.

Article 5

Training and certification programmes

1. By the date of entry into force of this Regulation, on the basis of information received from Member States and in consultation with the relevant sectors, the Commission shall establish, in accordance with the procedure laid down in Article 10, minimum requirements and mutual recognition for training and certification programmes for the relevant personnel involved in the activities provided for in Articles 3 and 4.
2. Within one year of the date of entry into force of this regulation Member States shall establish or adapt their own training and certification programmes, on the basis of the minimum requirements referred to in paragraph 1. Member States shall notify the Commission of information on their training and certification programmes. Member States shall give recognition to the certificates issued in another Member State and shall not restrict the freedom to provide services or the freedom of establishment for reasons relating to the certification issued in another Member State.

²⁰ **DELETED**: need to specify who is responsible in para 3.

3. The manager²¹ of the relevant equipment or fire protection system shall ensure that the relevant personnel have obtained the necessary certification and consequently a level of knowledge of the applicable regulations and standards as well as the necessary competence in emission prevention and recovery of fluorinated greenhouse gases and handling safely the relevant type and size of equipment.
4. Within two years²² of the date of entry into force of this Regulation, Member States shall ensure that the companies involved in carrying out the activities provided for in Articles 3 and 4²³, shall only take delivery of fluorinated greenhouse gases where their relevant personnel hold the certificates mentioned in paragraph 2.
5. By the date of entry into force of this Regulation, the Commission, in accordance with the procedure laid down in Article 10, shall determine the format of the notification referred to in paragraph 2.

Article 6

Reporting

1. By 31 March each year from the first calendar year following entry into force of this Regulation, each producer, importer and exporter shall communicate to the Commission, sending the same information to the competent authority of the Member State concerned, the following data in respect of the preceding calendar year:
 - a) Each producer of fluorinated greenhouse gases who produces more than one tonne²⁴ per annum shall communicate:

²¹ **DELETED**: concerned that burden of responsibility should not be placed solely on the manager.

²² **DELETED** suggests one year.

²³ **DELETED** suggest addition of “and maintenance managers”.

²⁴ See paragraph 4

- the total production of each fluorinated greenhouse gas in the Community, identifying the main categories of applications (e.g. mobile air-conditioning, refrigeration, air-conditioning, foams, aerosols, electrical equipment, semi-conductor manufacture) in which the substance is expected to be used ²⁵;
 - the quantities of each fluorinated greenhouse gas placed on the market in the Community;
 - any quantities of each fluorinated greenhouse gas recycled, reclaimed or destroyed.
- b) Each importer of fluorinated greenhouse gases who imports more than one tonne per annum, including any producers who also import, shall communicate:
- the quantity of each fluorinated greenhouse gas imported or placed on the market in the Community, separately identifying the main categories of applications (e.g. mobile air-conditioning, refrigeration, air-conditioning, foams, aerosols, electrical equipment, semi-conductor manufacture) in which the substance is expected to be used;
 - any quantities of each used fluorinated greenhouse gas imported for recycling, for reclamation or for destruction.
- c) Each exporter of fluorinated greenhouse gases who exports more than one tonne per annum, including any producers who also export, shall communicate:
- the quantities of each fluorinated greenhouse gas exported from the Community;
 - any quantities of each used fluorinated greenhouse gas exported for recycling, for reclamation or for destruction.

²⁵ **DELETED**: reservation on this deletion here and in sub-paragraph (b); **DELETED**: list of examples is not necessary; **DELETED** sees a difficulty for producers to identify the relevant applications.

- 1A. The competent authorities shall review every 2 years a random sample of the records referred to in Article 3(5), for each of the categories listed in Article 3(2), and report to the Commission emissions estimated in accordance with the methodologies laid out in the IPCC 1996 Revised Guidelines for National Inventories and the IPCC 2000 Guidance Notes for Good Practice in Emissions Inventories.²⁶
2. The format of the report referred to in paragraph 1 shall be established in accordance with the procedure laid down in Article 10 by the date of entry into force of this Regulation.
3. The Commission shall take appropriate steps to protect the confidentiality of the information submitted to it.
4. The Commission may modify the reporting requirements in paragraph 1, in particular the one tonne quantitative limit, in accordance with the procedure laid down in Article 10, to improve the practical application of those reporting requirements.

27

²⁶ **DELETED**: delete this paragraph.

²⁷ **DELETED**, supported by **DELETED**, suggests additional paragraph as follows: "Member States shall establish reporting systems for the sectors referred to in this Regulation, with the objective of acquiring, to the extent possible, emission data for the relevant applications."; **DELETED**: against; **DELETED**: scrutiny reservation.

Labelling

1. Without prejudice to the provisions of Council Directive 67/548/EEC and of Directive 1999/45/EC of the European Parliament and of the Council on the labelling of dangerous substances and preparations, the products and equipment, listed in paragraph 2, containing fluorinated greenhouse gases shall not be placed on the market unless the chemical name of the fluorinated greenhouse gases are identified using the accepted industry nomenclature²⁹ and this is clearly and indelibly stated on the product or equipment, adjacent to the service points for charging or recovering the fluorinated greenhouse gas, or on that part of the product or equipment which contains the fluorinated greenhouse gas.

2. Paragraph 1 shall apply to the following types of equipment and products:
 - a) refrigeration equipment and products which contain perfluorocarbons or preparations containing perfluorocarbons;
 - b) refrigeration equipment and products, fire protection systems and fire extinguishers and pressure gas packages except for medicinal products if the respective type of equipment or product contains hydrofluorocarbons or preparations containing hydrofluorocarbons;
 - c) pressure gas packages and electrical and electronic products which contain sulphur hexafluoride or preparations containing sulphur hexafluoride;
all fluorinated greenhouse gas containers.

²⁸ **DELETED**: scrutiny reservation, not sure of added value, particularly for end user as most users of the equipment listed in paragraph 2 are technical experts;

DELETED support, in principle; **DELETED**: this Article could be extended to ensure protection and sufficient information for the consumers (in connection with Article 8).

²⁹ **DELETED**: add “and it is clearly stated that the product contains fluorinated greenhouse gases.”; **DELETED**: positive scrutiny reservation.

Article 7

Control of use

1. The use of sulphur hexafluoride or preparations thereof in magnesium die-casting, except where the quantity of sulphur hexafluoride used is below 850 kilograms per year³⁰, shall be prohibited from 1 January 2008.
2. The use of sulphur hexafluoride or preparations thereof for the filling of vehicle tyres shall be prohibited from the date of entry into force of this Regulation.
3. The use of non-refillable fluorinated greenhouse gas containers to fill or service air-conditioning equipment, stationary refrigeration or heat pump equipment, fire protection systems or high voltage switch gear shall be prohibited from one year after the entry into force of the Regulation
4. The Commission shall review the exemption contained in paragraph 1, in accordance with the procedure laid down in Article 10, in the light of further assessment of the available alternatives by 1 January 2010.

Article 8

Placing on the market

1. The placing on the market of fluorinated greenhouse gases contained in certain products and equipment³¹, as listed in Annex II shall be prohibited as specified in that Annex.

³⁰ See new paragraph (4).

³¹ **DELETED**: include fluorinated greenhouse gases themselves as well as products and equipment which contain them;
DELETED: scrutiny reservation; **DELETED**: against.

2. Paragraph 1 shall not apply to products and equipment shown to be manufactured before the date of entry into force of the relevant placing on the market prohibition.³²

Article 9

Review

1. On the basis of progress in potential containment or replacement of fluorinated greenhouse gases in air conditioning systems, other than those contained in motor vehicles, and refrigeration systems contained in modes of transport the Commission shall review the present legislation and publish a report by 31 December 2007 at the latest. If appropriate it shall present appropriate legislative proposals with respect to applying the provisions of Article 3 to mobile systems.

2. Within four years after the entry into force of this Regulation, the Commission shall publish a report based on the experience of the application of this Regulation. In particular, the report shall:
 - assess the impact of relevant provisions on emissions and projected emissions of fluorinated greenhouse gases and examine the cost-effectiveness of these provisions;
 - evaluate the training and certification programmes established by Member States under Article 5(2);
 - assess the need for European Community standards relating to the control of emissions of fluorinated greenhouse gases from products and equipment, in particular as regards foam, including technical requirements with respect to the design of products and equipment;
 - evaluate the effectiveness of containment measures carried out by Managers under Article 3 and assess whether maximum leakage rates for installations can be established;

³² **DELETED**: against, should at least be time limited to six months.

- assess whether the substitution of sulphur hexafluoride in sand casting, permanent mould casting and high-pressure die-casting is technically feasible and cost-effective and, if appropriate, propose a revision of Article 7(1) ³³;
 - assess the need for the development and dissemination of notes describing best available techniques and best environmental practices concerning the prevention and minimisation of emissions of fluorinated greenhouse gases;
 - include an overall summary of the development, both within the EU and at an international level, of the state of technology, in particular as regards foams, experience gained, environmental requirements and any impacts on the functioning of the internal market.
3. Where necessary, the Commission shall present appropriate proposals for revision of the relevant provisions of this Regulation.

Article 10

Committee

1. The Commission shall be assisted by the committee instituted by Article 18 of Regulation (EC) No 2037/2000.
2. Where reference is made to this paragraph, the procedure laid down in Article 4 of Decision 1999/468/EC shall apply, in compliance with Article 7 and Article 8 thereof.
3. The period provided for in Article 4(3) of Decision 1999/468/EC shall be set at one month.

³³ **DELETED** suggest this should be done within 3 years of the date of entry into force or by 2008 and should take account of all technical development and progress.

Article 11

Sanctions

1. Member States shall lay down rules on sanctions applicable to infringements of the provisions of this Regulation and shall take all measures necessary to ensure that such rules are implemented. The sanctions provided for shall be effective, proportionate and dissuasive.
2. Member States shall notify the rules on sanctions to the Commission by one year after the entry into force of this Regulation and shall also notify it without delay of any subsequent amendment affecting those rules.

Article 12

Entry into force

This Regulation shall enter into force twelve months³⁴ following the date of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, [...]

For the European Parliament
The President

For the Council
The President

³⁴ **DELETED** suggests split date of entry into force: 20 days for Arts. 2, 8 and Annex II and 12 months for the rest; **DELETED** support in principle; **DELETED**: scrutiny reservation (date of entry into force depends on dates in the Regulation).

Part 1

Fluorinated greenhouse gases

<u>Fluorinated greenhouse gas</u>	<u>Chemical Formula</u>	<u>Global Warming Potential*</u>
Sulphur hexafluoride	SF ₆	22200
<u>Hydrofluorocarbons (HFCs):</u>		
HFC-23	CHF ₃	12000
HFC-32	CH ₂ F ₂	550
HFC-41	CH ₃ F	97
HFC-43-10mee	C ₅ H ₂ F ₁₀	1500
HFC-125	C ₂ HF ₅	3400
HFC-134	C ₂ H ₂ F ₄	1100
HFC-134a	CH ₂ FCF ₃	1300
HFC-152a	C ₂ H ₄ F ₂	120
HFC-143	C ₂ H ₃ F ₃	330
HFC-143a	C ₂ H ₃ F ₃	4300
HFC-227ea	C ₃ HF ₇	3500
HFC-236cb	CH ₂ FCF ₂ CF ₃	1300
HFC-236ea	CHF ₂ CHF ₂ CF ₃	1200
HFC-236fa	C ₃ H ₂ F ₆	9400
HFC-245ca	C ₃ H ₃ F ₅	640
HFC-245fa	CHF ₂ CH ₂ CF ₃	950
HFC-365mfc	CF ₃ CH ₂ CF ₂ CH ₃	890
<u>Perfluorocarbons (PFCs)</u>		
Perfluoromethane	CF ₄	5700
Perfluoroethane	C ₂ F ₆	11900
Perfluoropropane	C ₃ F ₈	8600
Perfluorobutane	C ₄ F ₁₀	8600
Perfluoropentane	C ₅ F ₁₂	8900
Perfluorohexane	C ₆ F ₁₄	9000
Perfluorocyclobutane	c-C ₄ F ₈	10000

Part 2

Method of calculating the total global warming potential (GWP) for a preparation

The total GWP for a preparation is a weighted average, derived from the sum of the weight fractions of the individual substances multiplied by their GWPs.

$$\Sigma (\text{Substance X \%} \times \text{GWP}) + (\text{Substance Y \%} \times \text{GWP}) + \dots (\text{Substance N \%} \times \text{GWP})$$

Where % is the contribution by weight with a weight tolerance of +/- 1%

For example: applying the formula to a theoretical blend of gases consisting of 23% HFC-32; 25% HFC-125 and 52% HFC-134a

$$\Sigma (23\% * 650) + (25\% * 2800) + (52\% * 1300)$$

$$\Rightarrow \text{Total GWP} = 1525.5$$

Placing on the market prohibitions in accordance with Article 8

Fluorinated greenhouse gases	Application	Date of prohibition
[...]		
Hydrofluorocarbons and perfluorocarbons	Refrigerants in non-confined direct-evaporation systems	Date of entry into force
Perfluorocarbons	Fire protection systems and fire extinguishers	Date of entry into force
Fluorinated greenhouse gases	Windows for domestic use	Date of entry into force
Fluorinated greenhouse gases	Other windows	One year after the date of entry into force
Fluorinated greenhouse gases	Footwear	1 July 2006
Fluorinated greenhouse gases	Tyres	Date of entry into force
Fluorinated greenhouse gases	One component foams, except when required to meet national safety standards	Date of entry into force
Hydrofluorocarbons	Novelty aerosols	Two years after the entry into force

³⁵ The Presidency, while appreciating that a number of additional suggestions for this table appeared in the last document, proposes that this should be the text submitted to ministers, unless it is clear that there is sufficient support in the Working Party to include certain other applications.