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# Information and Notices



EN

[1] Text with EEA relevance

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*(Information)*

# COUNCIL

## COMMON POSITION (EC) No 34/2002

## adopted by the Council on 18 March 2002

## with a view to adopting Directive 2002/. . ./EC of the European Parliament and of the Council of . . . on insurance mediation

(2002/C 145 E/01)

THE EUROPEAN PARLIAMENT AND
THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Articles 47(2) and 55 thereof,

Having regard to the proposal from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

Acting in accordance with the procedure laid down in Article 251 of the Treaty [3],

Whereas:

(1) Insurance and reinsurance intermediaries play a central role in the distribution of insurance and reinsurance products in the Community.

(2) A first step to facilitate the exercise of freedom of establishment and freedom to provide services for insurance agents and brokers was made by Council Directive 77/92/EEC of 13 December 1976 on measures to facilitate the effective exercise of freedom of establishment and freedom to provide services in respect of the activities of insurance agents and brokers (ex ISIC Group 630) and, in particular, transitional measures in respect of those activities [4].

(3) Directive 77/92/EEC was to remain applicable until the entry into force of provisions coordinating national rules concerning the taking-up and pursuit of the activities of insurance agents and brokers.

(4) Commission recommendation 92/48/EEC of 18 December 1991 on insurance intermediaries [5] was largely followed by Member States and helped to bring closer together national provisions on the professional requirements and registration of insurance intermediaries.

(5) However, there are still substantial differences between national provisions which create barriers to the taking-up and pursuit of the activities of insurance and reinsurance intermediaries in the internal market. It is therefore appropriate to replace Directive 77/92/EEC with a new Directive.

(6) Insurance and reinsurance intermediaries should be able to avail themselves of the freedom of establishment and the freedom to provide services which are enshrined in the Treaty.

(7) The inability of insurance intermediaries to operate freely throughout the Community hinders the proper functioning of the single market in insurance.

(8) The coordination of national provisions on professional requirements and registration of persons taking up and pursuing the activity of insurance mediation can therefore contribute both to the completion of the single market for financial services and to the enhancement of customer protection in this field.

(9) Various types of persons or institutions, such as agents, brokers and 'bancassurance' operators, can distribute insurance products. Equality of treatment between operators and customer protection requires that all these persons or institutions be covered by this Directive.

(10) This Directive contains a definition of 'tied insurance intermediary' which takes into account the characteristics of certain Member States' markets and whose purpose is to establish the conditions for registration applicable to such intermediaries. This definition is not intended to preclude Member States from having similar concepts in respect of insurance intermediaries who, while acting for and on behalf of an insurance undertaking and under the full responsibility of that undertaking, are entitled to collect premiums or amounts intended for the customer in accordance with the financial guarantees laid down by this Directive.

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[1] OJ C 29 E, 30.1.2001, p. 245.

[2] OJ C 221, 7.8.2001, p. 121.

[3] Opinion of the European Parliament of 14 November 2001 (not yet published in the Official Journal), Council Common Position of 18 March 2002 and Decision of the European Parliament of . . . (not yet published in the Official Journal).

[4] OJ L 26, 31.1.1977, p. 14. Directive as last amended by the Act of Accession of 1994.

[5] OJ L 19, 28.1.1992, p. 32.

(11) This Directive should apply to persons whose activity consists in providing insurance mediation services to third parties for remuneration, which may be pecuniary or take some other form of agreed economic benefit tied to performance.

(12) This Directive should not apply to persons with another professional activity, such as tax experts or accountants, who provide advice on insurance cover on an incidental basis in the course of that other professional activity, provided that the purpose of that activity is not to help the customer conclude or fulfil an insurance or reinsurance contract, nor the professional management of claims for an insurance or reinsurance undertaking, nor the loss adjusting and expert appraisal of claims.

(13) This Directive should not apply to persons practising insurance mediation as an ancillary activity under certain strict conditions.

(14) Insurance and reinsurance intermediaries should be registered with the competent authority of the Member State where they have their residence or their head office, provided that they meet strict professional requirements in relation to their competence, good repute, professional indemnity cover and financial capacity.

(15) Such registration should allow insurance and reinsurance intermediaries to operate in other Member States in accordance with the principles of freedom of establishment and freedom to provide services, provided that an appropriate notification procedure has been followed between the competent authorities.

(16) Appropriate sanctions are needed against persons exercising the activity of insurance or reinsurance mediation without being registered, against insurance or reinsurance undertakings using the services of unregistered intermediaries and against intermediaries not complying with national provisions adopted pursuant to this Directive.

(17) Cooperation and exchange of information between competent authorities are essential in order to protect customers and ensure the soundness of insurance and reinsurance business in the single market.

(18) It is essential for the customer to know whether he is dealing with an intermediary who is advising him on products from a broad range of insurance undertakings or on products provided by a specific number of insurance undertakings.

(19) This Directive should specify the obligations which insurance intermediaries should have in providing information to customers. A Member State may in this area maintain or adopt more stringent provisions which may be imposed on insurance intermediaries independently of their place of residence where they are pursuing mediation activities on its territory provided that any such more stringent provisions comply with Community law, including Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the internal market (Directive on electronic commerce) [1].

(20) If the intermediary declares that he is giving advice on products from a broad range of insurance undertakings, he should carry out a fair and sufficiently wide-ranging analysis of the products available on the market. In addition, all intermediaries should explain the reasons underpinning their advice.

(21) There is less of a need to require that such information be disclosed when the customer is a company seeking reinsurance or insurance cover for commercial and industrial risks.

(22) There is a need for suitable and effective complaint and redress procedures in the Member States in order to settle disputes between insurance intermediaries and customers, using, where appropriate, existing procedures.

(23) Without prejudice to the right of customers to bring their action before the courts, Member States should encourage public or private bodies established with a view to settling disputes out-of-court, to cooperate in resolving cross-border disputes. Such cooperation could for example be aimed at enabling customers to contact extra-judicial bodies established in their Member State of residence about complaints concerning insurance intermediaries established in other Member States. The setting up of the FIN-NET network provides increased assistance to consumers when using cross-border services.

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[1] OJ L 178, 17.7.2000, p. 1.

(24) Directive 77/92/EEC should accordingly be repealed,

HAVE ADOPTED THIS DIRECTIVE:

CHAPTER I

**SCOPE AND DEFINITIONS**

*Article 1*

**Scope**

1. This Directive lays down rules for the taking-up and pursuit of the activities of insurance and reinsurance mediation by natural and legal persons which are established in a Member State or which wish to become established there.

2. This Directive shall not apply to persons providing mediation services for insurance contracts if all the following conditions are met:

(a) the insurance contract only requires knowledge of the insurance cover that is provided;

(b) the insurance contract is not a life assurance contract;

(c) the insurance contract does not cover any liability risks;

(d) the principal professional activity of the person is other than insurance mediation;

(e) the insurance is complementary to the product or service supplied by any provider, where such insurance covers:

(i) the risk of breakdown, loss of or damage to goods supplied by that provider; or

(ii) damage to or loss of baggage and other risks linked to the travel booked with that provider, even if the insurance covers life assurance or liability risks, provided that the cover is ancillary to the main cover for the risks linked to that travel;

(f) the amount of the annual premium does not exceed EUR 500 and the total duration of the insurance contract, including any renewals, does not exceed five years.

3. This Directive does not apply to insurance and reinsurance mediation services provided in relation to risks and commitments located outside the Community.

This Directive does not affect a Member State's law in respect of insurance mediation business pursued by insurance and reinsurance intermediaries established in a non-member country and operating on its territory under the principle of freedom to provide services.

This Directive does not regulate insurance mediation activities carried out in non-member countries or activities of Community insurance or reinsurance undertakings, as defined in the first Council Directive 73/239/EEC of 24 July 1973 on the coordination of laws, regulations and administrative provisions relating to the taking-up and pursuit of the business of direct insurance other than life assurance [1] and the first Council Directive 79/267/EEC of 5 March 1979 on the coordination of laws, regulations and administrative provisions relating to the taking-up and pursuit of the business of direct life assurance [2], carried out through insurance intermediaries in non-member countries.

*Article 2*

**Definitions**

For the purpose of this Directive:

1. 'insurance undertaking' means an undertaking which has received official authorisation in accordance with Article 6 of Directive 73/239/EEC or Article 6 of Directive 79/267/EEC;

2. 'reinsurance undertaking' means an undertaking, other than an insurance undertaking or a non-member-country insurance undertaking, the main business of which consists in accepting risks ceded by an insurance undertaking, a non-member-country insurance undertaking or other reinsurance undertakings;

3. 'insurance mediation' means the activities of introducing, proposing or carrying out other work preparatory to the conclusion of contracts of insurance, or of concluding such contracts, or of assisting in the administration and performance of such contracts, in particular in the event of a claim.

These activities when undertaken by an insurance undertaking or an employee of an insurance undertaking who is acting under the responsibility of the insurance undertaking are not considered as insurance mediation.

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[1] OJ L 228, 16.8.1973, p. 3. Directive as last amended by Directive 2000/26/EC of the European Parliament and of the Council (OJ L 181, 20.7.2000, p. 65).

[2] OJ L 63, 13.3.1979, p. 1. Directive as last amended by Directive 95/26/EC of the European Parliament and of the Council (OJ L 168, 18.7.1995, p. 7).

The provision of information on an incidental basis in the context of another professional activity without the purpose of assisting the customer in concluding or performing an insurance contract, the management of claims of an insurance undertaking on a professional basis, and loss adjusting and expert appraisal of claims are also not considered as insurance mediation;

4. 'reinsurance mediation' means the activities of introducing, proposing or carrying out other work preparatory to the conclusion of contracts of reinsurance, or of concluding such contracts, or of assisting in the administration and performance of such contracts, in particular in the event of a claim.

These activities when undertaken by a reinsurance undertaking or an employee of a reinsurance undertaking who is acting under the responsibility of the reinsurance undertaking are not considered as reinsurance mediation.

The provision of information on an incidental basis in the context of another professional activity without the purpose of assisting the customer in concluding or performing a reinsurance contract, the management of claims of a reinsurance undertaking on a professional basis, and loss adjusting and expert appraisal of claims are also not considered as reinsurance mediation;

5. 'insurance intermediary' means any natural or legal person who, for remuneration, takes up or pursues insurance mediation;

6. 'reinsurance intermediary' means any natural or legal person who, for remuneration, takes up or pursues reinsurance mediation;

7. 'tied insurance intermediary' means any person who carries on the activity of insurance mediation for and on behalf of one or more insurance undertakings in the case of insurance products which are not in competition but does not collect premiums or amounts intended for the customer and who acts under the full responsibility of those insurance undertakings for the products which concern them respectively.

Any person who carries on the activity of insurance mediation in addition to his principal professional activity is also considered as a tied insurance intermediary acting under the responsibility of one or several insurance undertakings for the products which concern them respectively if the insurance is complementary to the goods or services supplied in the framework of this principal professional activity and the person does not collect premiums or amounts intended for the customer;

8. 'large risks' shall be as defined by Article 5(d) of Directive 73/239/EEC;

9. 'home Member State' means:

(a) where the intermediary is a natural person, the Member State in which his residence is situated and in which he carries on business;

(b) where the intermediary is a legal person, the Member State in which its registered office is situated or, if under its national law it has no registered office, the Member State in which its head office is situated;

10. 'host Member State' means the Member State in which an insurance or reinsurance intermediary has a branch or provides services;

11. 'competent authorities' means the authorities which each Member State designates under Article 6;

12. 'durable medium' means any instrument which enables the customer to store information addressed personally to him in a way accessible for future reference for a period of time adequate to the purposes of the information and which allows the unchanged reproduction of the information stored.

In particular, durable medium covers floppy disks, CD-ROMs, DVDs and hard drives of personal computers on which electronic mail is stored, but it excludes Internet sites, unless such sites meet the criteria specified in the first paragraph.

## CHAPTER II

## REGISTRATION REQUIREMENTS

*Article 3*

### Registration

1. Insurance and reinsurance intermediaries shall be registered with a competent authority as defined in Article 6(2), in their home Member State.

Without prejudice to the first subparagraph, Member States may stipulate that insurance and reinsurance undertakings and other bodies may collaborate with the competent authorities in registering insurance and reinsurance intermediaries and in the application of the requirements of Article 4 to such intermediaries. In particular, in the case of tied insurance intermediaries, they may be registered by an insurance undertaking or by an association of insurance undertakings under the supervision of a competent authority.

Member States need not apply the requirement referred to in the first and second subparagraphs to all the natural persons who work in an undertaking and pursue the activity of insurance or reinsurance mediation.

As regards legal persons, Member States shall register such persons and shall also specify in the register the names of the natural persons within the management who are responsible for the mediation business.

2. Member States may establish more than one register for insurance and reinsurance intermediaries provided that they lay down the criteria according to which intermediaries are to be registered.

Member States shall see to it that a single information point is established allowing quick and easy access to information from these different registers, which shall be compiled electronically and kept constantly updated. This information point shall also provide the identification details of the competent authorities of each Member State referred to in paragraph 1, first subparagraph.

3. Member States shall ensure that registration of insurance intermediaries, including tied ones, and reinsurance intermediaries is made subject to the fulfilment of the professional requirements laid down in Article 4.

Member States shall also ensure that insurance intermediaries, including tied ones, and reinsurance intermediaries who cease to fulfil these requirements are removed from the register. If necessary, the home Member State shall inform the host Member State of such removal, by any appropriate means.

4. The competent authorities may provide the insurance and reinsurance intermediaries with a document enabling any interested party by consultation of the register(s) referred to in paragraph 2 to verify that they are duly registered.

That document shall at least provide the information specified in Article 11(1)(a) and (b), and, in the case of a legal person, the name(s) of the natural person(s) referred to in the fourth subparagraph of paragraph 1 of this Article.

The Member State shall require the return of the document to the competent authority which issued it when the insurance or reinsurance intermediary concerned ceases to be registered.

5. Registered insurance and reinsurance intermediaries shall be allowed to take up and pursue the activity of insurance and reinsurance mediation in the Community by means of both freedom of establishment and freedom to provide services.

6. Member States shall ensure that insurance undertakings use the insurance and reinsurance mediation services only of registered insurance and reinsurance intermediaries and of the persons referred to in Article 1(2).

*Article 4*

**Professional requirements**

1. Insurance and reinsurance intermediaries shall possess appropriate knowledge and ability, as determined by the home Member State of the intermediary.

Home Member States may adjust the required conditions with regard to knowledge and ability in line with the activity of insurance or reinsurance mediation and the products distributed, particularly if the principal professional activity of the intermediary is other than insurance mediation. In such cases, that intermediary may pursue an activity of insurance mediation only if an insurance intermediary fulfilling the conditions of this Article or an insurance undertaking assumes full responsibility for his actions.

Member States may provide that for the cases referred to in the second subparagraph of Article 3(1), the insurance undertaking shall verify that the knowledge and ability of the intermediaries are in conformity with the obligations set out in the first subparagraph of this paragraph and, if need be, shall provide such intermediaries with training which corresponds to the requirements concerning the products sold by the intermediaries.

Member States need not apply the requirement referred to in the first subparagraph of this paragraph to all the natural persons working in an undertaking who pursue the activity of insurance or reinsurance mediation. Member States shall ensure that a reasonable proportion of the persons within the management structure of such undertakings who are responsible for mediation in respect of insurance products and all other persons directly involved in insurance or reinsurance mediation demonstrate the knowledge and ability necessary for the performance of their duties.

2. Insurance and reinsurance intermediaries shall be of good repute. As a minimum, they shall have a clean police record or any other national equivalent in relation to serious criminal offences linked to crimes against property or other crimes related to financial activities and they should not have previously been declared bankrupt, unless they have been rehabilitated in accordance with national law.

Member States may, for the cases referred to in the second subparagraph of Article 3(1), allow the insurance undertaking to check the good repute of tied insurance intermediaries.

Member States need not apply the requirement referred to in the first subparagraph of this paragraph to all the natural persons who work in an undertaking and who pursue the activity of insurance and reinsurance mediation. Member States shall ensure that the management structure of such undertakings and any staff directly involved in insurance or reinsurance mediation fulfil that requirement.

3. Insurance and reinsurance intermediaries shall hold professional indemnity insurance covering the whole territory of the Community or some other comparable guarantee against liability arising from professional negligence, for at least EUR 1 000 000 applying to each claim and in aggregate EUR 1 500 000 per year for all claims, unless such insurance or comparable guarantee is already provided by an insurance undertaking, reinsurance undertaking or other undertaking on whose behalf the insurance or reinsurance intermediary is acting or for which the insurance or reinsurance intermediary is empowered to act or such undertaking has taken on full responsibility for the intermediary's actions.

4. Member States shall take all necessary measures to protect customers against the inability of the insurance intermediary to transfer the premium to the insurance undertaking or to transfer the amount of claim or return premium to the insured.

Such measures shall take any one or more of the following forms:

(a) provisions laid down by law or contract whereby monies paid by the customer to the intermediary are treated as having been paid to the undertaking, whereas monies paid by the undertaking to the intermediary are not treated as having been paid to the customer until the customer actually receives them;

(b) a requirement for insurance intermediaries to have financial capacity amounting, on a permanent basis, to 4 % of the sum of annual premiums received, subject to a minimum of EUR 15 000;

(c) a requirement that customers' monies shall be transferred via strictly segregated client accounts and that these accounts shall not be used to reimburse other creditors in the event of bankruptcy;

(d) a requirement that a guarantee fund be set up.

5. Pursuit of the activities of insurance and reinsurance mediation shall require that the professional requirements set out in this Article be fulfilled on permanent basis.

6. Member States may reinforce the requirements set out in this Article or add other requirements for insurance and reinsurance intermediaries registered within their jurisdiction.

7. The amounts referred to in paragraphs 3 and 4 shall be reviewed regularly in order to take account of changes in the European index of consumer prices as published by Eurostat. The first review shall take place five years after the entry into force of this Directive and the successive reviews every five years after the previous review date.

The amounts shall be adapted automatically by increasing the base amount in euro by the percentage change in that index over the period between the entry into force of this Directive and the first review date or between the last review date and the new review date and rounded up to the nearest euro.

*Article 5*

**Notification of establishment and services in other Member States**

1. Any insurance or reinsurance intermediary intending to carry on business for the first time in one or more Member States under the freedom to provide services or the freedom of establishment shall inform the competent authorities of the home Member State.

Within a period of one month of such notification, those competent authorities shall inform the competent authorities of any host Member States wishing to know, of the intention of the insurance or reinsurance intermediary and shall at the same time inform the intermediary concerned.

The insurance or reinsurance intermediary may start business one month after the date on which he was informed by the competent authorities of the home Member State of the notification referred to in the second subparagraph. However, that intermediary may start business immediately if the host Member State does not wish to be informed of the fact.

2. Member States shall notify the Commission of their wish to be informed in accordance with paragraph 1. The Commission shall in turn notify all the Member States of this.

3. The competent authorities of the host Member State may take the necessary steps to ensure appropriate publication of the conditions under which, in the interest of the general good, the business concerned must be carried on in their territories.

*Article 6*

**Competent authorities**

1. Member States shall designate the competent authorities empowered to ensure implementation of this Directive. They shall inform the Commission thereof, indicating any division of those duties.

2. The authorities referred to in paragraph 1 shall be either public authorities or bodies recognised by national law or by public authorities expressly empowered for that purpose by national law. They shall not be insurance or reinsurance undertakings.

3. The competent authorities shall possess all the powers necessary for the performance of their duties. Where there is more than one competent authority on its territory, a Member State shall ensure that those authorities collaborate closely so that they can discharge their respective duties effectively.

*Article 7*

**Sanctions**

1. Member States shall provide for appropriate sanctions in the event that a person exercising the activity of insurance or reinsurance mediation is not registered in a Member State and is not referred to in Article 1(2).

2. Member States shall provide for appropriate sanctions against insurance or reinsurance undertakings which use the insurance or reinsurance mediation services of persons who are not registered in a Member State and who are not referred to in Article 1(2).

3. Member States shall provide for appropriate sanctions in the event of an insurance or reinsurance intermediary's failure to comply with national provisions adopted pursuant to this Directive.

4. This Directive shall not affect the power of the host Member States to take appropriate measures to prevent or to penalise irregularities committed within their territories which are contrary to legal or regulatory provisions adopted in the interest of the general good. This shall include the possibility of preventing offending insurance or reinsurance intermediaries from initiating any further activities within their territories.

5. Any measure adopted involving sanctions or restrictions on the activities of an insurance or reinsurance intermediary must be properly justified and communicated to the intermediary concerned. Every such measure shall be subject to the right to apply to the courts in the Member State which adopted it.

*Article 8*

**Exchange of information between Member States**

1. The competent authorities of the various Member States shall cooperate in order to ensure the proper application of the provisions of this Directive.

2. The competent authorities shall exchange information on insurance and reinsurance intermediaries if they have been subject to a sanction referred to in Article 7(3) or a measure referred to in Article 7(4) and such information is likely to lead to removal from the register of such intermediaries. The competent authorities may also exchange any relevant information at the request of an authority.

3. All persons required to receive or divulge information in connection with this Directive shall be bound by professional secrecy, in the same manner as is laid down in Article 16 of Council Directive 92/49/EEC of 18 June 1992 on the coordination of laws, regulations and administrative provisions relating to direct insurance other than life assurance and amending Directives 73/239/EEC and 88/357/EEC (third non-life insurance Directive) ([1]) and Article 15 of Council Directive 92/96/EEC of 10 November 1992 on the coordination of laws, regulations and administrative provisions relating to direct life assurance and amending Directives 79/267/EEC and 90/619/EEC (third life assurance Directive) ([2]).

*Article 9*

**Complaints**

Member States shall ensure the setting-up of procedures allowing customers and other interested parties to register complaints about insurance and reinsurance intermediaries.

*Article 10*

**Out-of-court redress**

1. Member States shall encourage the setting-up of appropriate and effective complaints and redress procedures for the out-of-court settlement of disputes between insurance intermediaries and customers, using existing bodies where appropriate.

2. Member States shall encourage these bodies to cooperate in the resolution of cross-border disputes.

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([1]) OJ L 228, 11.8.1992, p. 1. Directive as last amended by Directive 2000/64/EC of the European Parliament and of the Council (OJ L 290, 17.11.2000, p. 27).

([2]) OJ L 360, 9.12.1992, p. 1. Directive as last amended by Directive 2000/64/EC of the European Parliament and of the Council.

CHAPTER III

## INFORMATION REQUIREMENTS FOR INTERMEDIARIES

*Article 11*

### Information provided by the insurance intermediary

1. Prior to the conclusion of any initial insurance contract, and, if necessary, on amendment or renewal thereof, an insurance intermediary shall provide the customer with at least the following information:

(a) his identity and address;

(b) the register in which he has been included and the means for verifying that he has been registered;

(c) whether he has a holding, direct or indirect, representing more than 10 % of the voting rights or of the capital in a given insurance undertaking;

(d) whether a given insurance undertaking or parent undertaking of a given insurance undertaking has a holding, direct or indirect, representing more than 10 % of the voting rights or of the capital in the insurance intermediary;

(e) the procedures referred to in Article 9 allowing customers and other interested parties to register complaints about insurance and reinsurance intermediaries and, if appropriate, about the out-of-court complaint and redress procedures referred to in Article 10.

In addition, an insurance intermediary shall inform the customer, concerning the contract that is provided, whether:

(i) he gives advice based on the obligation in paragraph 2 to provide a fair analysis, or

(ii) he is under a contractual obligation to conduct insurance mediation business exclusively with one or more insurance undertakings. In that case, he shall also inform the customer of the names of those insurance undertakings, or

(iii) he is not under a contractual obligation to conduct insurance mediation business exclusively with one or more insurance undertakings and does not give advice based on the obligation in paragraph 2 to provide a fair analysis. In that case, he shall also inform the customer of the names of the insurance undertakings with which he may and does conduct business.

2. If the insurance intermediary informs the customer that he gives advice on the basis of a fair analysis, he is obliged to give that advice based on an analysis of a sufficient number of insurance contracts available on the market to enable him to recommend the insurance contract appropriate to meet the customer's needs.

3. Prior to the conclusion of any specific contract, the insurance intermediary shall at least specify, in particular on the basis of information provided by the customer, the demands and the needs of that customer as well as the underlying reasons for any advice given to the customer on a given insurance product. These details shall be modulated according to the complexity of the insurance contract being proposed.

4. The information referred to in paragraphs 1, 2 and 3 need not be given when the insurance intermediary mediates in the insurance of large risks, nor in the case of mediation by reinsurance intermediaries.

5. Member States may maintain or adopt stricter provisions regarding the information requirements referred to in paragraph 1, provided that such provisions comply with Community law.

Member States shall communicate to the Commission the national provisions set out in the first subparagraph.

In order to establish a high level of transparency by all appropriate means, the Commission shall ensure that the information it receives relating to national provisions is also communicated to consumers and insurance intermediaries.

*Article 12*

### Information conditions

1. All information to be provided to customers in accordance with Article 11 shall be communicated:

(a) on paper or on any other durable medium available and accessible to the customer;

(b) in a clear and accurate manner, comprehensible to the customer;

(c) in an official language of the Member State of the commitment or in any other language agreed by the parties.

2. By way of derogation from paragraph 1(a), the information referred to in Article 11 may be provided orally where the customer requests it, or where immediate cover is necessary. In those cases, the information shall be provided to the customer in accordance with paragraph 1 immediately after the conclusion of the insurance contract.

3. In the case of telephone selling, the prior information given to the customer shall be in accordance with Community rules applicable to the distance marketing of consumer financial services. Moreover, information shall be provided to the customer in accordance with paragraph 1 immediately after the conclusion of the insurance contract.

CHAPTER IV

**FINAL PROVISIONS**

*Article 13*

**Right to apply to the courts**

Member States shall ensure that decisions taken in respect of an insurance intermediary, reinsurance intermediary or an insurance undertaking under the laws, regulations and administrative provisions adopted in accordance with this Directive may be subject to the right to apply to the courts.

*Article 14*

**Repeal**

Directive 77/92/EEC is repealed with effect from the date referred to in Article 15(1).

*Article 15*

**Transposition**

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive before . . . (*). They shall forthwith inform the Commission thereof.

These measures shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such reference shall be laid down by the Member States.

2. Member States shall communicate to the Commission the text of the laws, regulations and administrative provisions which they adopt in the field governed by this Directive. In that communication they shall provide a table indicating the national provisions corresponding to this Directive.

*Article 16*

**Entry into force**

This Directive shall enter into force on the day of its publication in the *Official Journal of the European Communities*.

*Article 17*

**Addressees**

This Directive is addressed to the Member States.

Done at . . .

*For the European Parliament*
*The President*

*For the Council*
*The President*

(*) Two years after the date of entry into force of this Directive.

## STATEMENT OF THE COUNCIL'S REASONS

### I. INTRODUCTION

1. On 22 September 2000, the Commission presented its proposal for a Directive of the European Parliament and of the Council on insurance mediation [1]. The proposal was based on Articles 47(2) and 55 of the Treaty.

2. The European Parliament delivered its opinion on 14 November 2001 [2].

The Economic and Social Committee delivered its opinion on 30 May 2001 [3].

3. On 26 November 2001, the Council reached a political agreement [4] with a view to the adoption of a Common Position in accordance with Article 251(2) of the Treaty at a later stage.

4. On 18 March 2002 the Council adopted its Common Position in accordance with Article 251 of the Treaty.

### II. OBJECTIVE

The proposal aims at completing the internal market for services and at the same time contributing to a high degree of consumer protection. The intermediaries registered will be allowed to take up and pursue their activities throughout the Community by taking advantage of the freedom of establishment and the freedom to provide services under the supervision of the authorities of their home Member State. Furthermore, the proposal lays down rules on information to be given to the customers.

The proposal provides that natural or legal persons who carry out the business of insurance or reinsurance mediation should be registered on the basis of minimum requirements, especially regarding their professional knowledge and good repute.

### III. ANALYSIS OF THE COMMON POSITION

#### 1. General

The Common Position follows the approach suggested by the Commission, but also takes on board some of the amendments suggested by the European Parliament. This has been done in order to take account of the status of certain intermediaries. Therefore the concept of 'tied insurance intermediary' (Article 2(7)) was defined, along with a more substantial role for insurance undertakings in the registration process of these persons as well as in the verification of their professional knowledge and competence. Furthermore, the Common Position specifies that only the names of some persons in the management structure of intermediaries (legal persons) have to be specified in the registers (Article 3(1)). The treatment of intermediaries from non-member countries was clarified as well (Article 1(3)). The provision on indemnity insurance and guarantees (Article 4(3)) was modified accordingly, in addition to which an aggregate ceiling of EUR 1 500 000 per year and per all claims was added.

The Council added a special provision on information exchange between competent authorities (Article 7a, now Article 8) with the objective of facilitating the act of deletion of names of persons from the national registers who have been subject to certain penalties. A special clause regarding telephone selling (Article 11(3)), now Article 12(3)) was inserted as well. Finally, the information requirements (Article 10(1), (2) and (3), now Article 11(1), (2) and (3)) have been further clarified and thus the transparency for the clients has been improved.

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[1] OJ C 29 E, 30.1.2001, p. 245.

[2] OJ C ...

[3] OJ C 221 7.8.2001, p. 121.

[4] OJ C ...

2. **European Parliament amendments**

The Council has accepted several of Parliament's amendments. Most of them were accepted in substance, although the exact wording has not been followed. However, some amendments could not be accepted by the Council.

2.1. The following amendments have been accepted and integrated into the Council text:

*Amendment 4, recital 12 (now recital 14)*

The reference to the 'residence' in this recital is well-founded.

*Amendment 56, Article 4(4)(a)*

The inclusion of provisions laid down by contract (with the aim of consumer protection) follows legal traditions in some Member States.

2.2. The following amendments were introduced with modifications to the suggested wording:

*Amendment 1, recital 10*

An additional statement regarding the exclusion of activities of mere provision of general information on insurance has to be seen in the context of the much more precise modifications now made in recital 12, Article 2(3), last subparagraph and Article 2(4) last subparagraph.

*Amendment 5, recital 13a (new)*

The issue of several registers in the Member States, supplemented by a central information point for access has been clearly dealt with in the modified Article 3(2). According to the principles applied to the drafting of Community legislation, a provision of this type is to be made in the Articles and not in the recitals.

*Amendment 7, Article 1(2)(a)*

The spirit of the amendment was to improve the wording of this point and exclude simple contracts not requiring specific knowledge of the insurance business as such. The Council text provides a positive wording for the same issue and is thought to be clearer than in the Commission proposal.

*Amendments 8 and 49, Article 1(2)(b)*

The substance of this amendment has been dealt with in point (e) of the same paragraph, to which it systematically belongs. The last part of the amendment 'basic cover offered as a matter of routine' could not be accepted as it would not add any substance to the list of criteria for exceptions in paragraph 2, especially points (b), (c), (e).

*Amendment 9, Article 1(2)(c)*

This amendment apparently aims to take care of travel insurance having some liability risks included in an ancillary cover. The whole issue has now been much more clearly dealt with by the new wording of paragraph 2(e).

*Amendment 11, Article 1(2)(e)*

The objective of the amendment is to embrace all kinds of risks typically linked to a journey. However, in this regard the Council considers that its wording is more straightforward.

*Amendment 15, Article 2(3)*

The Council has not accepted the inclusion of all cases where a person gives information, but has wanted to exclude incidental information more explicitly than Parliament appears to be doing. The all-encompassing phrase 'giving information . . .' has been deleted and a new subparagraph on 'information on an incidental basis' has been introduced in order to clarify the definition of insurance mediation. The reference to electronic means is unnecessary at this point, as it is the activity that should be described here and not the selling method. Insurance mediation via electronic means clearly falls within the scope of the Directive, therefore the last part of this amendment is unnecessary.

*Amendment 16, Article 2(4)*

See reasons referred to under Amendment 15.

*Amendment 17, Article 2(6a) (new) (now point (7))*

The Council has taken on board the definition of 'tied insurance intermediary' in order to specify the scope of provisions applied to this type of intermediary, especially with regard to their registration and the role of insurance undertakings in the verification of their professional competence. The Commission proposal does not provide such a definition.

*Amendment 21, Article 2(10) (now 12)*

The open list of 'durable mediums' is included with slight modifications in the wording ('in particular . . .') in order to clarify the issue.

*Amendment 23, Article 3(1a) (new)*

The amendment by the European Parliament has been integrated in substance in Article 3(1), second subparagraph. However, the Council prefers its wording 'under the supervision of a competent authority' to the alternative 'under the responsibility of a competent authority' since the duty to supervise already implies responsibility

*Amendment 24, Article 3(2) (now Article 3(3))*

The substance of the first part of the amendment is taken care of in the new wording of Article 3(3) and Article 4. The last sentence of the amendment which aims to insert a time limit of three years for the registration would create a very heavy system which has been considered as costly and difficult to manage in practice.

*Amendment 26, Article 3(4)*

Although a detailed list is useful, the publication of the detailed list is not mandatory in the Commission proposal. Moreover, the provisions have to be regarded in the context of an easy access to the central information point.

*Amendment 27, Article 3(5)*

The questions concerning the territorial scope of the Directive, namely insurance mediation activities provided outside the EU, have now been dealt with through an amendment to Article 1(3).

*Amendment 29, Article 4(1), third subparagraph*

The substance of this amendment has been taken care of by a complete redrafting of Article 4(1). Moreover, the Council wording sets out in more precise terms than the suggested amendment the role of the insurance companies as regards the verification of professional requirements.

*Amendment 30, Article 4(2), first subparagraph*

The 'opening of any insolvency proceedings' seems to be too strict a criterion for the exclusion of natural persons. The wording 'declaration of bankruptcy' is much clearer and better justified. Furthermore, the Common Position follows the amendment by requiring the police record to be clean in respect of crimes against property, but adds that criminal offences have to be serious.

*Amendment 37, Article 10(1), introductory phrase (now Article 11)*

The criterion of 'conclusion' of the contract was introduced in Article 10(1) in line with Parliament's suggestions. However, the wording 'any initial insurance contract' was preferable in the view of the Council as an all-encompassing term.

*Amendment 44, Article 11(2) (now Article 12, supplemented by a new paragraph 3)*

The issues of oral information and telephone communication have now been clarified by two separate paragraphs, which also deal with the protection of the customer and of the regime laid down with respect to telephone sales in the Common Position of the Directive of distance marketing on financial services.

2.3. The following amendments were not accepted and were not incorporated into the Council text:

*Amendment 52, recital 10a*

The issue has been clearer dealt with through a modification of Article 1(2)(e).

*Amendment 6, Article 1(2), introductory phrase*

The Council noticed practical problems in excluding certain persons from professional requirements of the Directive (registration, supervision by a competent authority) and at the same time imposing information requirements on them, because this could raise enforcement problems and in addition would not reflect the approach in the original Commission proposal.

*Amendment 10, Article 1(2)(d)*

The main income criterion was estimated as being impractical, for example with regard to pensioners and students, who should not be subject to the requirements of the Directive.

*Amendment 12, Article 1(2)(f)*

Following an extended discussion, the Council preferred an exclusion of insurance contracts that are renewable, but whose total duration would not exceed five years. This requirement now is more in line with the other exceptions, particularly in point (e). On the other hand, the threshold fixed in this point with respect to the amount of the annual premium of the insurance contract has been reduced from EUR 1 000 to EUR 500.

*Amendments 57 and 48, Article 1(2a) (new)*

This amendment would introduce a new list of kinds of insurance contracts and types of intermediaries with the objective of exclusion from the scope of the Directive. However some of these issues are already covered by the current wording of Article 1(2), provided that the conditions laid down are met (tourist package insurance and some animal insurance contracts). Some other activities or persons mentioned should not be excluded, since this would affect the selling of insurance products involving important risks.

*Amendment 19, Article 2(6b) (new)*

The introduction of the definition of an 'agent of an insurance intermediary' would add to complexity. The issue of employees working for an insurance intermediary has furthermore already been dealt with by the new wording in Articles 3 and 4.

*Amendment 18, Article 2(6c) (new)*

The Council preferred not to introduce specific provisions for 'bancassurance'. This was estimated as being unnecessary as most activities concerned would clearly fall under the scope of the Directive. Furthermore, the definition proposed is relatively rigid and does not takes account of different kinds of bancassurance distribution techniques. In the context of bancassurance, however, the provisions of Articles 3 and 4 (e.g. Article 3(1) second subparagraph) may be of relevance too.

*Amendment 20, Article 2(8)(a)*

The amendment deals with the case where the place of residence and the place of the professional activity are different. In the Council's view, there is little need to make this distinction in practice. Furthermore, the wording in the amendment itself does not enhance clarity, as it could even introduce the possibility of two home Member States. In contrast, the definition used by the Council is in line with similar definitions employed in the financial services directives.

*Amendment 22, Article 2a (new)*

See reason referred to under Amendment 18.

*Amendment 25, Article 3(2a) (new)*

See reason referred to under Amendment 19.

*Amendment 31, Article 4(3)*

The wording 'some other comparable guarantee' seems to be clear enough. The wording of Parliament's amendment could be interpreted as reducing the appropriate level of professional liability of insurance intermediaries. More flexible and less strict rules to cover professional negligence of intermediaries should not be the objective.

*Amendment 32, Article 4a (new)*

The Council did not consider it necessary to provide a general 'grandfathering clause'. Registration requirements have to be implemented at any regard by the national competent authorities.

*Amendment 34, Article 5(3a) (new)*

Automatic publication of the list for the public should not be compulsory, but only optional for the national authorities.

*Amendment 54, Article 8*

The Council preferred to leave detailed implementation requirements to the Member States in line with the Commission proposal.

*Amendment 36, Article 9(1) (now Article 10)*

The proposed amendment rather seemed to be more apt for a recital. An insertion into the Articles as suggested by Parliament would change the character of a recommendation to an obligation.

*Amendment 38, Article 10(1)(b) (now Article 11)*

The information requirements have been thoroughly reformulated and adapted in a separate subparagraph after paragraph 1(e). Furthermore, the Council has taken the view that the type of information concerned should be given anyway and not only on request from the client. Otherwise the objective of information to customers pursued by the proposal in order to ensure transparency would be jeopardised.

*Amendment 55, Article 10(1)(d) (now Article 11)*

See reason referred to under Amendment 38.

*Amendment 40, Article 10(1)(e) (now Article 11)*

The Council preferred to abstain from a definite obligation to mention the liable persons, since this is a matter to be finally decided by the courts.

*Amendments 41 and 60, Article 10(2) (now Article 11)*

The Council preferred to follow the Commission proposal and to avoid setting a 'best possible advice standard' to the intermediary, which would be too complicated to implement.

*Amendment 42, Article 10(3) (deleted) (now Article 11)*

The requirement of specification according to the consumers' needs has been clarified in the Common Position by inserting a phrase referring to the complexity of the product and the information provided by the customer himself. With this modification this paragraph lays down general requirements of product-specific information that have to be considered together with other legal requirements.

*Amendment 43, Article 10(4) (now Article 11)*

The substance of this amendment has been sufficiently dealt with in the definitions in Article 1 that exclude certain types of activities.

*Amendment 45, Article 11a (new)*

The amendment provides that non-registered persons, excluded from the scope of the Directive, should comply with information requirements. The addressees would thus fall outside the normal scope of this Directive. In addition, it would be extremely difficult to be implemented in practice by the Member States since the persons to whom it is addressed are not subject to supervision. The Council preferred to follow the original approach of the Commission proposal in this regard.

3. **Major new elements contained in the Common Position as compared with the Commission proposal**

*Article 1(3) — Intermediaries from non-member countries*

The clarification of the application of the Directive vis-à-vis non-member countries contributes to a facilitated implementation. Furthermore, it takes account in substance of European Parliament amendment 27.

*Article 1(2)(e) — Exclusion of certain types of ancillary insurance*

The clearer exclusion of certain insurance covers from the scope of the Directive meets the preoccupations of some parties concerned, for example travel insurance providers. Furthermore, it takes into account the principles of European Parliament amendments 8, 9 and 11.

*Article 2(7) — Definition of 'tied intermediary'*

The definition of 'tied intermediary' is necessary to clarify the scope of the Directive and to explain the requirements contained in Articles 3 and 4, concerning the role of insurance undertakings in the process of registration and verification. The responsibility of the insurance undertakings for the protection of the consumer is thus acknowledged.

*Article 3(2) — Different registers and central information point*

Member States may establish more than one register, but a central information point should safeguard an easy access by other authorities and/or the clients. This requirement would reconcile the objective of easy information flows with different national traditions and the competencies already established.

*Article 4(3) — Amounts for aggregate minimum levels for indemnity insurance*

The Council has introduced an aggregate minimum level for indemnity insurance of EUR 1 500 000 per year for all claims.

*Article 10(5) (now Article 11(5)) — National requirements regarding information*

This provision clarifies that stricter requirements on a national level are possible, but requires at the same time that national provisions have to be communicated to the Commission. The provisions can match with national preferences without impairing the objective of free marketing of insurance products. This provision, as well as the relevant recital, is coherent with other provisions contained in other acts concerning financial services.

*Article 11(3) (now Article 12(3)) — Provision on telephone selling*

The Council inserted a wording clarifying the application of the Directive with regard to telephone sales in connection with the Directive on distance marketing of financial services.

## 4. Conclusion

The Common Position, which has been unanimously adopted by the Council, reinforces the need for a mandatory legislative framework for insurance mediation services and for a well-defined consumer protection regime in this respect. It tries at the same time to avoid that the system becomes unnecessarily cumbersome for those involved.

# COMMON POSITION (EC) No 35/2002

## adopted by the Council on 25 March 2002

## with a view to adopting Directive 2002/. . ./EC of the European Parliament and of the Council of . . . amending Directive 97/68/EC on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery

(2002/C 145 E/02)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 95 thereof,

Having regard to the proposal from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

Following consultation of the Committee of the Regions,

Acting in accordance with the procedure laid down in Article 251 of the Treaty [3],

Whereas:

(1) The Auto Oil II programme was aimed at identifying costeffective strategies to meet the air quality objectives of the Community. The Commission communication review on the Auto Oil II programme concluded that there is a need for further measures, especially to address the issues of ozone and particulate emissions. Recent work on the development of national emissions ceilings has shown that further measures are needed to meet the air quality objectives decided on in the Community legislation.

(2) Stringent standards on emissions from vehicles on highways have been gradually introduced. It has already been decided that those standards should be strengthened. The relative contribution of pollutants from non-road mobile machinery will thus be more predominant in the future.

(3) Directive 97/68/EC [4] introduced emission limit values for gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.

(4) Although Directive 97/68/EC initially applied only to certain compression ignition engines, recital 5 of that Directive envisages the subsequent extension of its scope to include in particular gasoline engines.

(5) The emissions from small spark ignition engines (gasoline engines) in different types of machinery contribute significantly to identified air quality problems, both current and future, especially ozone formation.

(6) Emissions from small spark ignition engines are subject to strict environmental standards in the USA, showing that it is possible significantly to reduce the emissions.

(7) The absence of Community legislation means it is possible to place on the market engines with old fashioned technology from an environmental point of view, thereby jeopardising the air quality objectives in the Community, or to implement national legislation in this field, with the potential to create barriers to trade.

(8) Directive 97/68/EC is closely aligned with the corresponding US legislation, and continuing alignment will have benefits for industry, as well as for the environment.

(9) A certain lead time is necessary for the European industry, especially for those manufacturers that are not yet operating on a global basis, to be able to meet the emission standards.

(10) A two-step approach is used in Directive 97/68/EC for compression ignition engines as well as in the US regulations on spark ignition engines. Although it might have been possible to adopt a one-step approach in the Community legislation, this would have left the field unregulated for another four to five years.

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[1] OJ C 180 E, 26.6.2001, p. 31.

[2] OJ C 260, 17.9.2001, p. 1.

[3] Opinion of the European Parliament of 2 October 2001 (OJ C 87 E, 11.4.2002), Council Common Position of 25 March 2002 and Decision of the European Parliament of . . . (not yet published in the Official Journal).

[4] OJ L 59, 27.2.1998, p. 1. Directive as amended by Commission Directive 2001/63/EC (OJ L 227, 23.8.2001, p. 41).

(11) To achieve the necessary flexibility for worldwide alignment, a possible derogation, to be made under the comitology procedure, is included.

(12) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission [1].

(13) Directive 97/68/EC should be amended accordingly,

HAVE ADOPTED THIS DIRECTIVE:

*Article 1*

Directive 97/68/EC is amended as follows:

1. In Article 2:

(a) the eighth indent shall be replaced by the following:

'— *placing on the market* shall mean the action of making an engine available for the first time on the market, for payment or free of charge, with a view to distribution and/or use in the Community,';

(b) the following indents shall be added:

'— *replacement engines* shall mean a newly built engine to replace an engine in a machine, and which has been supplied for this purpose only,

— *handheld engine* shall mean an engine that meets at least one of the following requirements:

(a) the engine must be used in a piece of equipment that is carried by the operator throughout the performance of its intended function(s);

(b) the engine must be used in a piece of equipment that must operate multipositionally, such as upside down or sideways, to complete its intended function(s);

(c) the engine must be used in a piece of equipment for which the combined engine and equipment dry weight is under 20 kilograms and at least one of the following attributes is also present:

(i) the operator must alternatively provide support or carry the equipment throughout the performance of its intended function(s);

(ii) the operator must provide support or attitudinal control for the equipment throughout the performance of its intended function(s);

(iii) the engine must be used in a generator or a pump;

— *non-handheld* engine shall mean an engine which does not fall under the definition of a handheld engine,

— *professional use multipositional handheld engine* shall mean a handheld engine which meets the requirements of both points (a) and (b) of the handheld engine definition and in relation to which the engine manufacturer has satisfied an approval authority that a category 3 emissions durability period (according to Section 2.1 of Appendix 4 of Annex IV) would be applicable to the engine,

— *emission durability period* shall mean the number of hours indicated in Annex IV, Appendix 4 used to determine the deterioration factors,

— *small volume engine family* shall mean a spark-ignition (SI) engine family with a total yearly production of less than 5 000 units,

— *small volume engine manufacturer of SI engines* shall mean a manufacturer with a total yearly production of less than 25 000 units.'

2. Article 4 is amended as follows:

(a) paragraph 2 shall be amended as follows:

(i) in the first sentence 'Annex VI' shall be replaced by 'Annex VII';

(ii) in the second sentence 'Annex VII' shall be replaced by 'Annex VIII';

(b) paragraph 4 shall be amended as follows:

(i) in point (a) 'Annex VIII' shall be replaced by 'Annex IX';

(ii) in point (b) 'Annex IX' shall be replaced by 'Annex X';

(c) in paragraph 5, 'Annex X' shall be replaced by 'Annex XI'.

3. Article 7(2) shall be replaced by the following:

'2. Member States shall accept type-approvals and, where applicable, the pertaining approval marks listed in Annex XII as being in conformity with this Directive.'

[1] OJ L 184, 17.7.1999, p. 23.

4. Article 9 is amended as follows:

(a) the heading 'Timetable' shall be replaced by the heading 'Timetable-compression ignition engines';

(b) in paragraph 1, 'Annex VI' shall be replaced by 'Annex VII';

(c) paragraph 2 shall be amended as follows:

(i) 'Annex VI' shall be replaced by 'Annex VII';

(ii) 'Section 4.2.1 of Annex I' shall be replaced by 'Section 4.1.2.3 of Annex I';

(d) paragraph 3 shall be amended as follows:

(i) 'Annex VI' shall be replaced by 'Annex VII';

(ii) 'Section 4.2.3 of Annex I' shall be replaced by 'Section 4.1.2.1 of Annex I';

(e) in the first subparagraph of paragraph 4, the phrase 'placing on the market of new engines' shall be replaced by 'placing on the market of engines'.

5. The following Article shall be inserted:

'*Article 9a*

**Timetable — spark ignition engines**

1. DIVIDING INTO CLASSES

For the purpose of this Directive, spark ignition engines shall be divided into the following classes.

main class S: Small engines with a net power ≤ 19 kW

the main class S shall be divided into two categories

H: engines for handheld machinery

N: engines for non-handheld machinery

| Class/category | Displacement (cubic cm) |
|---|---|
| Handheld engines<br>Class SH:1 | < 20 |
| Class SH:2 | ≥ 20<br>< 50 |
| Class SH:3 | ≥ 50 |
| Non-handheld engines<br>Class SN:1 | < 66 |
| Class SN:2 | ≥ 66<br>< 100 |
| Class SN:3 | ≥ 100<br>< 225 |
| Class SN:4 | ≥ 225 |

2. GRANT OF TYPE-APPROVALS

After . . . (*), Member States may not refuse to grant type-approval for an SI engine type or engine family or to issue the document as described in Annex VII, and may not impose any other type-approval requirements with regard to air-polluting emissions for non-road mobile machinery in which an engine is installed, if the engine meets the requirements specified in this Directive as regards the emissions of gaseous pollutants.

3. TYPE-APPROVALS STAGE 1

Member States shall refuse to grant type-approval for an engine type or engine family and to issue the documents as described in Annex VII, and shall refuse to grant any other type-approval for non-road mobile machinery in which an engine is installed after . . . (*) if the engine fails to meet the requirements specified in this Directive and where the emissions of gaseous pollutants from the engine do not comply with the limit values as set out in the table in Section 4.2.2.1 of Annex I.

4. TYPE-APPROVALS STAGE II

Member States shall refuse to grant type-approval for an engine type or engine family and to issue the documents as described in Annex VII, and shall refuse to grant any other type-approval for non-road mobile machinery in which an engine is installed:

after 1 August 2004 for engine classes SN:1 and SN:2

after 1 August 2006 for engine class SN:4

after 1 August 2007 for engine classes SH1, SH2 and SN:3

after 1 August 2008 for engine class SH:3,

if the engine fails to meet the requirements specified in this Directive and where the emissions of gaseous pollutants from the engine do not comply with the limit values as set out in the table in Section 4.2.2.2 of Annex I.

5. PLACING ON THE MARKET: ENGINE PRODUCTION DATES

Six months after the dates for the relevant category of engine in paragraphs 3 and 4, with the exception of machinery and engines intended for export to non-member countries, Member States shall permit placing on the market of engines, whether or not already installed in machinery, only if they meet the requirements of this Directive.

(*) Eighteen months after the date of entry into force of this Directive.

6. OPTIONAL IMPLEMENTATION DELAY

Nevertheless, for each category, Member States may postpone the dates in paragraphs 3, 4 and 5 for two years in respect of engines with a production date prior to those dates.'

6. Article 10 is amended as follows:

(a) paragraph 1 shall be replaced by the following:

'1. The requirements of Article 8(1) and (2), Article 9(4) and Article 9a(5) shall not apply to:

— engines for use by the armed services,

— engines exempted in accordance with paragraphs 1a and 2;'

(b) the following paragraph shall be inserted:

'1a. A replacement engine shall comply with the limit values that the engine to be replaced had to meet when originally placed on the market.

The text "REPLACEMENT ENGINE" shall be attached to a label on the engine or inserted into the owner's manual.';

(c) the following paragraphs shall be added:

'3. The requirements of Article 9a(4) and (5) shall be postponed by three years for small volume engine manufacturers.

4. The requirements of Article 9a(4) and (5) shall be replaced by the corresponding stage I requirements for a small volume engine family to a maximum of 25 000 units providing that the various engine families involved all have different cylinder displacements.'

7. Articles 14 and 15 shall be replaced by the following Articles:

'*Article 14*

**Adaptation to technical progress**

Any amendments which are necessary in order to adapt the Annexes to this Directive, with the exception of the requirements specified in Section 1, Sections 2.1 to 2.8 and Section 4 of Annex I, to take account of technical progress shall be adopted by the Commission in accordance with the procedure referred to in Article 15(2).

*Article 14a*

**Procedure for derogations**

The Commission shall study possible technical difficulties in complying with the Stage II requirements for certain uses of the engines, in particular mobile machinery in which engines of classes SH:2 and SH:3 are installed. If the Commission studies conclude that for technical reasons certain mobile machinery, in particular, professional use, multipositional, handheld engines, cannot meet these deadlines, it shall submit, by 31 December 2003, a report accompanied by appropriate proposals for derogations, not exceeding five years, for such machinery, under the procedure laid down in Article 15(2).

*Article 15*

**Committee**

1. The Commission shall be assisted by the Committee on Adaptation to Technical Progress of the Directives on the Removal of Technical Barriers to Trade in the Motor Vehicle Sector (hereinafter referred to as "the Committee").

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC (*) shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its rules of procedure.

(*) OJ L 184, 17.7.1999, p. 23.'

8. The following list of Annexes shall be added at the beginning of the Annexes:

'**LIST OF ANNEXES**

ANNEX I: Scope, definitions, symbols and abbreviations, engine markings, specifications and tests, specification of conformity of production assessments, parameters defining the engine family, choice of the parent engine

ANNEX II: Information documents

*Appendix 1:* Essential characteristics of the (parent) engine

*Appendix 2:* Essential characteristics of the engine family

*Appendix 3:* Essential characteristics of engine type within family

ANNEX III: Technical characteristics of reference fuel

*Appendix 1:* Measurement and sampling procedures

*Appendix 2:* Calibration of the analytical instruments

*Appendix 3:* Data evaluation and calculations

ANNEX IV: Test procedure — spark ignition engines

*Appendix 1:* Measurement and sampling procedures

*Appendix 2:* Calibration of the analytical instruments

*Appendix 3:* Data evaluation and calculations

*Appendix 4:* Deterioration factors

ANNEX V: Technical characteristics of reference fuel prescribed for approval tests and to verify conformity of production test procedure — compression ignition engines

ANNEX VI: Analytical and sampling system

ANNEX VII: Type-approval certificate

*Appendix 1:* Test result for CI engines

*Appendix 2:* Test result for SI engines

*Appendix 3:* Equipment and auxiliaries to be installed for the test to determine engine power

ANNEX VIII: Approval certificate numbering system

ANNEX IX: List of engine/engine family type-approvals issued

ANNEX X: List of engines produced

ANNEX XI: Data sheet of type approved engines

ANNEX XII: Recognition of alternative type-approvals'.

9. The Annexes shall be amended in accordance with the Annex to this Directive.

*Article 2*

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by ... (*). They shall forthwith inform the Commission thereof.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.

2. Member States shall communicate to the Commission the text of the main provisions of the national law which they adopt in the field governed by this Directive.

*Article 3*

Not later than ... (*), the Commission shall submit to the European Parliament and the Council a report and, if appropriate, a proposal regarding the potential costs, benefits and feasibility of:

(a) reducing particulate emissions from small spark ignition engines with special attention to two-stroke engines. The report shall take into account:

(i) estimates of the contribution of such engines to the emission of particles, and the way proposed emission reduction measures could contribute towards improving air quality and reduced health effects,

(ii) tests, measurement procedures and equipment which could be used to assess particulate emissions from small spark ignition engines at type-approval,

(iii) work and conclusion within the particulate measurement programme,

(iv) developments in test procedures, engine technology, exhaust purification as well as enhanced standards for fuel and engine oil and

(v) costs of reducing particulate emissions from small spark ignition engines and the cost effectiveness of any proposed measures;

(b) reducing emissions from those recreational vehicles, including snowmobiles and go-carts, currently not covered;

(c) reducing exhaust gas and particulate emissions from small compression ignition engines under 18 kW;

(d) reducing exhaust gas and particulate emissions from locomotive compression ignition engines. A test cycle should be formulated in order to measure such emissions.

*Article 4*

This Directive shall enter into force on the day of its publication in the *Official Journal of the European Communities*.

*Article 5*

This Directive is addressed to the Member States.

Done at ...

| *For the European Parliament* | *For the Council* |
|---|---|
| *The President* | *The President* |

(*) Eighteen months after the date of entry into force of this Directive.

*ANNEX*

1. Annex I is amended as follows:

(a) the first sentence of Section 1 'SCOPE' shall be replaced by the following:

'This Directive applies to all engines to be installed in non-road mobile machinery and to secondary engines fitted into vehicles intended for passenger or goods transport on the road.';

(b) paragraphs 1A, B, C, D and E shall be amended as follows:

'A. intended and suited, to move, or to be moved on the ground, with or without road, and with either

(i) a CI engine having a net power in accordance with Section 2.4 that is higher than 18 kW but not more than 560 kW ([4]) and that is operated under intermittent speed rather than a single constant speed.

Machinery, the engines ... (remainder unchanged, down to

"— mobile cranes;") or

(ii) a CI engine having a net power in accordance with Section 2.4 that is higher than 18 kW but not more than 560 kW and that is operated under constant speed.

Machinery, the engines of which are covered under this definition, includes but is not limited to:

— gas compressors,

— generating sets with intermittent load including refrigerating units and welding sets, applies only from 31 December 2006,

— irrigation pumps,

— turf care, chippers, snow removal equipment, sweepers; or

(iii) a petrol fuelled SI engine having a net power in accordance with Section 2.4 of not more than 19 kW.

Machinery, the engines of which are covered under this definition, includes but is not limited to:

— lawn mowers,

— chain saws,

— generators,

— water pumps,

— bush cutters.

The Directive is not applicable for the following applications:

B. ships;

C. railway locomotives;

D. aircraft;

E. recreational vehicles, for example:

— snowmobiles,

— off road motorcycles,

— all-terrain vehicles;'

(c) Section 2 shall be amended as follows:

— the following words shall be added to footnote 2 in Section 2.4:

'. . . except for cooling fans of air cooled engines directly fitted on the crankshaft (see Appendix 3 of Annex VII).';

— the following indent shall be added to Section 2.8:

'— for engines to be tested on cycle G1, the intermediate speed shall be 85 % of the maximum rated speed (see Section 3.5.1.2 of Annex IV).';

— the following sections shall be added:

'2.9. *adjustable parameter* shall mean any physically adjustable device, system or element of design which may affect emission or engine performance during emission testing or normal operation;

2.10. *after-treatment* shall mean the passage of exhaust gases through a device or system whose purpose is chemically or physically to alter the gases prior to release to the atmosphere;

2.11. *spark ignition (SI) engine* shall mean an engine which works on the spark-ignition principle;

2.12. *auxiliary emission control device* shall mean any device that senses engine operation parameters for the purpose of adjusting the operation of any part of the emission control system;

2.13. *emission control system* shall mean any device, system or element of design which controls or reduces emissions;

2.14. *fuel system* shall mean all components involved in the metering and mixture of the fuel;

2.15. *secondary engine* shall mean an engine installed in or on a motor vehicle, but not providing motive power to the vehicle;

2.16. *mode length* means the time between leaving the speed and/or torque of the previous mode or the preconditioning phase and the beginning of the following mode. It includes the time during which speed and/or torque are changed and the stabilisation at the beginning of each mode.',

— Section 2.9 shall become Section 2.17 and current Sections 2.9.1 to 2.9.3 shall become Sections 2.17.1 to 2.17.3;

(d) Section 3 shall be amended as follows:

— Section 3.1 shall be replaced by the following:

'3.1. Compression ignition engines approved in accordance with this Directive must bear:';

— Section 3.1.3 shall be amended as follows: Annex VII shall be replaced by Annex VIII,

— the following section shall be inserted:

'3.2. Spark ignition engines approved in accordance with this Directive must bear:

3.2.1. the trade mark or trade name of the manufacturer of the engine;

3.2.2. the EC type-approval number as defined in Annex VIII;',

— Sections 3.2 to 3.6 shall become Sections 3.3 to 3.7,

— Section 3.7 shall be amended as follows: Annex VI shall be replaced by Annex VII;

(e) Section 4 shall be amended as follows:

— the following heading shall be inserted: '4.1 CI engines.',

— current Section 4.1 shall become Section 4.1.1 and the reference to Sections 4.2.1 and 4.2.3. shall be replaced by a reference to Sections 4.1.2.1 and 4.1.2.3,

— current Section 4.2 shall become Section 4.1.2 and shall be amended as follows: Annex V shall be replaced throughout by Annex VI,

— current Section 4.2.1 shall become Section 4.1.2.1; current Section 4.2.2 shall become Section 4.1.2.2 and the reference to Section 4.2.1 shall be replaced by a reference to Section 4.1.2.1; current Sections 4.2.3 and 4.2.4 shall become Sections 4.1.2.3 and 4.1.2.4;

(f) The following paragraph shall be added:

'4.2. **SI engines**

4.2.1. *General*

The components liable to affect the emission of gaseous pollutants shall be so designed, constructed and assembled as to enable the engine, in normal use, despite the vibrations to which it may be subjected, to comply with the provisions of this Directive.

The technical measures taken by the manufacturer must be such as to ensure that the mentioned emissions are effectively limited, pursuant to this Directive, throughout the normal life of the engine and under normal conditions of use in accordance with Annex IV, Appendix 4.

4.2.2. *Specifications concerning the emissions of pollutants*

The gaseous components emitted by the engine submitted for testing shall be measured by the methods described in Annex VI (and shall include any after-treatment device).

Other systems or analysers may be accepted if they yield equivalent results to the following reference systems:

— for gaseous emissions measured in the raw exhaust, the system shown in Figure 2 of Annex VI,

— for gaseous emissions measured in the dilute exhaust of a full flow dilution system, the system shown in Figure 3 of Annex VI.

4.2.2.1. The emissions of carbon monoxide, the emissions of hydrocarbons, the emissions of oxides of nitrogen and the sum of hydrocarbons and oxides of nitrogen obtained shall for stage I not exceed the amount shown in the table below:

Stage I

| Class | Carbon monoxide (CO) (g/kWh) | Hydrocarbons (HC) (g/kWh) | Oxides of nitrogen ($NO_x$) (g/kWh) | Sum of hydrocarbons and oxides of nitrogen HC + $NO_x$ (g/kWh) |
|---|---|---|---|---|
| SH:1 | 805 | 295 | 5,36 | |
| SH:2 | 805 | 241 | 5,36 | |
| SH:3 | 603 | 161 | 5,36 | |
| SN:1 | 519 | | | 50 |
| SN:2 | 519 | | | 40 |
| SN:3 | 519 | | | 16,1 |
| SN:4 | 519 | | | 13,4 |

4.2.2.2. The emissions of carbon monoxide and the emissions of the sum of hydrocarbons and oxides of nitrogen obtained shall for stage II not exceed the amount shown in the table below:

Stage II [1]

| Class | Carbon monoxide (CO) (g/kWh) | Sum of hydrocarbons and oxides of nitrogen ($HC + NO_x$) (g/kWh) |
|---|---|---|
| SH:1 | 805 | 50 |
| SH:2 | 805 | 50 |
| SH:3 | 603 | 72 |
| SN:1 | 610 | 50,0 |
| SN:2 | 610 | 40,0 |
| SN:3 | 610 | 16,1 |
| SN:4 | 610 | 12,1 |

The $NO_x$ emissions for all engine classes must not exceed 10 g/kWh.

4.2.2.3. Notwithstanding the definition of "handheld engine" in Article 2 of this Directive two-stroke engines used to power snowthrowers only have to meet SH:1, SH:2 or SH:3 standards.

[1] See Annex 4, Appendix 4: deterioration factors included.'

(g) Sections 6.3 to 6.9 shall be replaced by the following sections:

'6.3. Individual cylinder displacement, within 85 % and 100 % of the largest displacement within the engine family.

6.4. Method of air aspiration:

6.5. Fuel type:

— diesel

— petrol

6.6. Combustion chamber type/design:

6.7. Valve and porting — configurations, size and number:

6.8. Fuel system:

for diesel:

— pump-line injector

— in-line pump

— distributor pump

— single element

— unit injector

for petrol:

— carburettor

— port fuel injection

— direct injection

6.9. Miscellaneous features

— exhaust gas recirculation

— water injection/emulsion

— air injection

— charge cooling system

— ignition type (compression, spark)

6.10. Exhaust after-treatment:

— oxidation catalyst

— reduction catalyst

— three way catalyst

— thermal reactor

— particulate trap'.

2. Annex II is amended as follows:

(a) in Appendix 2 the text in the table shall be amended as follows:

'Fuel delivery per stroke ($mm^3$)' in lines 3 and 6 shall be replaced by 'Fuel delivery per stroke ($mm^3$) or diesel engines, fuel flow (g/h) for petrol engines';

(b) Appendix 3 shall be amended as follows:

— The heading of Section 3 shall be replaced by 'FUEL FEED FOR DIESEL ENGINES',

— The following sections shall be inserted:

'4. FUEL FEED FOR PETROL ENGINES

4.1. Carburettor: .....

4.1.1. Make(s): .....

4.1.2. Type(s): .....

4.2. Port fuel injection: single-point or multi-point: .....

4.2.1. Make(s): .....

4.2.2. Type(s): .....

4.3. Direct injection: .....

4.3.1. Make(s): .....

4.3.2. Type(s): .....

4.4. Fuel flow (g/h) and air/fuel ratio at rated speed and wide open throttle',

— current Section 4 shall become Section 5 and the following points shall be added:

'5.3. Variable valve timing system (if applicable and where intake and/or exhaust)

5.3.1. Type: continuous or on/off

5.3.2. Cam phase shift angle';

— The following sections shall be added:

'6. PORTING CONFIGURATION

6.1. Position, size and number

7. IGNITION SYSTEM

7.1. Ignition coil

7.1.1. Make(s): .....

7.1.2. Type(s): .....

7.1.3. Number: .....

7.2. Spark plug(s):

7.2.1. Make(s): .....

7.2.2. Type(s): .....

7.3. Magneto:

7.3.1. Make(s): .....

7.3.2. Type(s): .....

7.4. Ignition timing:

7.4.1. Static advance with respect to top dead centre [crank angle degrees]: .....

7.4.2. Advance curve, if applicable: .....'

3. Annex III shall be amended as follows:

(a) The heading shall be replaced by the following: 'TEST PROCEDURE FOR CI ENGINES';

(b) Section 2.7 shall be amended as follows: Annex VI shall be replaced by Annex VII and Annex IV shall be replaced by Annex V;

(c) Section 3.6 shall be amended as follows:

— Sections 3.6.1 and 3.6.1.1 shall be amended as follows:

'3.6.1. Equipment specifications according to Section 1A of Annex I:

3.6.1.1. Specification A: For engines covered by Section 1 A(i) of Annex I, the following 8-mode cycle [1] shall be followed in dynamometer operation on the test engine: (table unchanged);

[1] Identical with C1 cycle of the draft ISO 8178-4 standard.'

— the following section shall be added:

'3.6.1.2. Specification B. For engines covered by Sections 1A(ii), the following 5-mode cycle [1] shall be followed in dynamometer operation on the test engine:

| Mode number | Engine speed | Load % | Weighting factor |
|---|---|---|---|
| 1 | Rated | 100 | 0,05 |
| 2 | Rated | 75 | 0,25 |
| 3 | Rated | 50 | 0,3 |
| 4 | Rated | 25 | 0,3 |
| 5 | Rated | 10 | 0,1 |

The load figures are percentage values of the torque corresponding to the prime power rating defined as the maximum power available during a variable power sequence, which may be run for an unlimited number of hours per year, between stated maintenance intervals and under the stated ambient conditions, the maintenance being carried out as prescribed by the manufacturer [2],

[1] Identical with D2 cycle of the ISO 8178-4: 1996(E) standard.
[2] For a better illustration of the prime power definition, see Figure 2 of ISO 8528-1: 1993(E) standard.'

— Section 3.6.3 shall be amended as follows:

'3.6.3. *Test sequence*

The test sequence shall be started. The test shall be performed in ascending order of mode numbers as set out above for the test cycles.

During each mode of the given test cycle' (remainder unchanged);

(d) Appendix 1, Section 1 shall be amended as follows:

In Sections 1 and 1.4.3. Annex V shall be replaced by Annex VI throughout.

4. The following Annex shall be added:

'*ANNEX IV*

**TEST PROCEDURE FOR SPARK IGNITION ENGINES**

1. INTRODUCTION

1.1. This Annex describes the method of determining emissions of gaseous pollutants from the engines to be tested.

1.2. The test shall be carried out with the engine mounted on a test bench and connected to a dynamometer.

2. TEST CONDITIONS

2.1. Engine test conditions

The absolute temperature ($T_a$) of the engine air at the inlet to the engine, expressed in Kelvin, and the dry atmospheric pressure ($p_s$), expressed in kPa, shall be measured and the parameter $f_a$ shall be determined according to the following provisions:

$$f_a = \left(\frac{99}{p_s}\right)^{1,2} \times \left(\frac{T_a}{298}\right)^{0,6}$$

2.1.1. Test validity

For a test to be recognised as valid, the parameter $f_a$ shall be such that:

$$0,93 \leq f_a \leq 1,07$$

2.1.2. Engines with charge air-cooling

The temperature of the cooling medium and the temperature of the charge air have to be recorded.

2.2. Engine air inlet system

The test engine shall be equipped with an air inlet system presenting an air inlet restriction within 10 % of the upper limit specified by the manufacturer for a new air cleaner at the engine operating conditions, as specified by the manufacturer, which result in maximum air flow in the respective engine application.

For small spark ignition engines < 1 000 $cm^3$ displacement) a system representative of the installed engine shall be used.

2.3. Engine exhaust system

The test engine shall be equipped with an exhaust system presenting an exhaust back pressure within 10 % of the upper limit specified by the manufacturer for the engine operating conditions which result in the maximum declared power in the respective engine application.

For small spark ignition engines < 1 000 $cm^3$ displacement) a system representative of the installed engine shall be used.

2.4. Cooling system

An engine cooling system with sufficient capacity to maintain the engine at normal operating temperatures prescribed by the manufacturer shall be used. This provision shall apply to units which have to be detached in order to measure the power, such as with a blower where the blower (cooling) fan has to be disassembled to get access to the crankshaft.

2.5. Lubricating oil

Lubricating oil that meets the engine manufacturer's specifications for a particular engine and intended usage shall be used. Manufacturers must use engine lubricants representative of commercially available engine lubricants.

The specifications of the lubricating oil used for the test shall be recorded at Section 1.2 of Annex VII, Appendix 2 for SI engines and presented with the results of the test.

2.6. Adjustable carburettors

Engines with limited adjustable carburettors shall be tested at both extremes of the adjustment.

2.7. Test fuel

The fuel shall be the reference fuel specified in Annex V.

The octane number and the density of the reference fuel used for test shall be recorded at Section 1.1.1 of Annex VII, Appendix 2 for SI engines.

For two-stroke engines, the fuel/oil mixture ratio must be the ratio which shall be recommended by the manufacturer. The percentage of oil in the fuel/lubricant mixture feeding the two-stroke engines and the resulting density of the fuel shall be recorded at Section 1.1.4 of Annex VII, Appendix 2 for SI engines.

2.8. Determination of dynamometer settings

Emissions measurements shall be based on uncorrected brake power. Auxiliaries necessary only for the operation of the machine and which may be mounted on the engine shall be removed for the test. Where auxiliaries have not been removed, the power absorbed by them shall be determined in order to calculate the dynamometer settings except for engines where such auxiliaries form an integral part of the engine (e.g. cooling fans for air cooled engines).

The settings of inlet restriction and exhaust pipe back pressure shall be adjusted, for engines where it shall be possible to perform such an adjustment, to the manufacturer's upper limits, in accordance with Sections 2.2 and 2.3. The maximum torque values at the specified test speeds shall be determined by experimentation in order to calculate the torque values for the specified test modes. For engines which are not designed to operate over a speed range on a full load torque curve, the maximum torque at the test speeds shall be declared by the manufacturer. The engine setting for each test mode shall be calculated using the formula:

$$S = \left( (P_M + P_{AE}) \times \frac{L}{100} \right) - P_{AE}$$

where:

S is the dynamometer setting (kW)

$P_M$ is the maximum observed or declared power at the test speed under the test conditions (see Appendix 2 of Annex VII) (kW)

$P_{AE}$ is the declared total power absorbed by any auxiliary fitted for the test (kW) and not required by Appendix 3 of Annex VII

L is the percent torque specified for the test mode.

If the ratio

$$\frac{P_{AE}}{P_M} \geq 0{,}03$$

the value of $P_{AE}$ may be verified by the technical authority granting type-approval.

3. TEST RUN

3.1. Installation of the measuring equipment

The instrumentation and sampling probes shall be installed as required. When using a full flow dilution system for exhaust gas dilution, the tailpipe shall be connected to the system.

3.2. Starting the dilution system and engine

The dilution system and the engine shall be started and warmed up until all temperatures and pressures have stabilised at full load and rated speed (Section 3.5.2).

3.3. Adjustment of the dilution ratio

The total dilution ratio shall not be less than four.

For $CO_2$ or $NO_x$ concentration controlled systems, the $CO_2$ or $NO_x$ content of the dilution air must be measured at the beginning and at the end of each test. The pre- and post-test background $CO_2$ or $NO_x$ concentration measurements of the dilution air must be within 100 ppm or 5 ppm of each other, respectively.

When using a dilute exhaust gas analysis system, the relevant background concentrations shall be determined by sampling dilution air into a sampling bag over the complete test sequence.

Continuous (non-bag) background concentration may be taken at the minimum of three points, at the beginning, at the end, and a point near the middle of the cycle and averaged. At the manufacturer's request background measurements may be omitted.

3.4. Checking the analysers

The emission analysers shall be set at zero and spanned.

3.5. Test cycle

3.5.1. Specification (c) of machinery according to Section 1A(iii) of Annex I.

The following test cycles shall be followed in dynamometer operation on the test engine according to the given type of machinery:

cycle D ([1]): engines with constant speed and intermittent load such as generating sets;

cycle G1: non-handheld intermediate speed applications;

cycle G2: non-handheld rated speed applications;

cycle G3: handheld applications.

([1]) Identical with D2 cycle of the ISO 8168-4: 1996(E) standard.

3.5.1.1. Test modes and weighting factors

Cycle D

| Mode number | 1 | 2 | 3 | 4 | 5 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Engine speed | Rated speed | | | | | Intermediate | | | | | Low-idle speed |
| Load ([1]) % | 100 | 75 | 50 | 25 | 10 | | | | | | |
| Weighting factor | 0,05 | 0,25 | 0,3 | 0,3 | 0,1 | | | | | | |

Cycle G1

| Mode number | | | | | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Engine speed | Rated speed | | | | | Intermediate speed | | | | | Low-idle speed |
| Load % | | | | | | 100 | 75 | 50 | 25 | 10 | 0 |
| Weighting factor | | | | | | 0,09 | 0,2 | 0,29 | 0,3 | 0,07 | 0,05 |

Cycle G2

| Mode number | 1 | 2 | 3 | 4 | 5 | | | | | | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Engine speed | Rated speed | | | | | Intermediate speed | | | | | Low-idle speed |
| Load % | 100 | 75 | 50 | 25 | 10 | | | | | | 0 |
| Weighting factor | 0,09 | 0,2 | 0,29 | 0,3 | 0,07 | | | | | | 0,05 |

Cycle G3

| Mode number | 1 | | | | | | | | | | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Engine speed | Rated speed | | | | | Intermediate speed | | | | | Low-idle speed |
| Load % | 100 | | | | | | | | | | 0 |
| Weighting factor | 0,85 ([2]) | | | | | | | | | | 0,15 ([2]) |

([1]) The load figures are percentage values of the torque corresponding to the prime power rating defined as the maximum power available during a variable power sequence, which may be run for an unlimited number of hours per year, between stated maintenance intervals and under the stated ambient conditions, the maintenance being carried out as prescribed by the manufacturer. For a better illustration of the prime power definition, see Figure 2 of ISO 8528-1: 1993(E) standard.

([2]) For Stage I, 0,90 and 0,10 may be used instead of 0,85 and 0,15 respectively.

3.5.1.2. Choosing an appropriate test cycle

If the primary end use of an engine model is known then the test cycle may be chosen based on the examples given in Section 3.5.1.3. If the primary end use of an engine is uncertain then the appropriate test cycle should be chosen based on the engine specification.

3.5.1.3. Examples (the list is not exhaustive):

Typical examples are for:

Cycle D:

Generating sets with intermittent load including generating sets on board ships and trains (not for propulsion), refrigerating units, welding sets;

Gas compressors.

Cycle G1:

Front or rear engines riding lawn mowers;

Golf carts;

Lawn sweepers;

Pedestrian-controlled rotary or cylinder lawn mowers;

Snow removal equipment;

Waste disposers.

Cycle G2:

Portable generators, pumps, welders and air compressors;

May also include lawn and garden equipment, which operate at engine rated speed.

Cycle G3:

Blowers;

Chain saws;

Hedge trimmers;

Portable saw mills;

Rotary tillers;

Sprayers;

String trimmers;

Vacuum equipment.

3.5.2. Conditioning of the engine

Warming up of the engine and the system shall be at maximum speed and torque in order to stabilise the engine parameters according to the recommendations of the manufacturer.

Note: The conditioning period should also prevent the influence of deposits from a former test in the exhaust system. There is also a required period of stabilisation between test points which has been included to minimise point to point influences.

3.5.3. Test sequence

Test cycles G1, G2 or G3 shall be performed in ascending order of mode number of the cycle in question. Each mode sampling time shall be at least 180 s. The exhaust emission concentration values shall be measured and recorded for the last 120 s of the respective sampling time. For each measuring point, the mode length shall be of sufficient duration to achieve thermal stability of the engine prior to the start of sampling. The mode length shall be recorded and reported.

(a) For engines tested with the dynamometer speed control test configuration: During each mode of the test cycle after the initial transition period, the specified speed shall be held to within ± 1 % of rated speed or ± 3 $min^{-1}$ whichever is greater except for low idle which shall be within the tolerances declared by the manufacturer. The specified torque shall be held so that the average over the period during which the measurements are being taken is within ± 2 % of the maximum torque at the test speed.

(b) For engines tested with the dynamometer load control test configuration: During each mode of the test cycle after the initial transition period, the specified speed shall be within ± 2 % of rated speed or ± 3 $min^{-1}$ whichever is greater, but shall in any case be held within ± 5 %, except for low idle which shall be within the tolerances declared by the manufacturer.

During each mode of the test cycle where the prescribed torque is 50 % or greater of the maximum torque at the test speed the specified average torque over the data acquisition period shall be held within ± 5 % of the prescribed torque. During modes of the test cycle where the prescribed torque is less than 50 % of the maximum torque at the test speed the specified average torque over the data acquisition period shall be held within ± 10 % of the prescribed torque or ± 0,5 Nm whichever is greater.

3.5.4. Analyser response

The output of the analysers shall be recorded on a strip chart recorder or measured with an equivalent data acquisition system with the exhaust gas flowing through the analysers at least during the last 180 s of each mode. If bag sampling is applied for the diluted CO and $CO_2$ measurement (see Appendix 1, Section 1.4.4), a sample shall be bagged during the last 180 s of each mode, and the bag sample analysed and recorded.

3.5.5. Engine conditions

The engine speed and load, intake air temperature and fuel flow shall be measured for each mode once the engine has been stabilised. Any additional data required for calculation shall be recorded (see Appendix 3, Sections 1.1 and 1.2).

3.6. Rechecking the analysers

After the emission test a zero gas and the same span gas shall be used for re-checking. The test shall be considered acceptable if the difference between the two measuring results is less than 2 %.

*Appendix 1*

1. MEASUREMENT AND SAMPLING PROCEDURES

Gaseous components emitted by the engine submitted for testing shall be measured by the methods described in Annex VI. The methods of Annex VI describe the recommended analytical systems for the gaseous emissions (Section 1.1).

1.1. Dynamometer specification

An engine dynamometer with adequate characteristics to perform the test cycles described in Annex IV, Section 3.5.1 shall be used. The instrumentation for torque and speed measurement shall allow the measurement of the shaft power within the given limits. Additional calculations may be necessary.

The accuracy of the measuring equipment must be such that the maximum tolerances of the figures given in Section 1.3 are not exceeded.

1.2. Fuel flow and total diluted flow

Fuel flow meters with the accuracy defined in Section 1.3 shall be used to measure the fuel flow that will be used to calculate emissions (Appendix 3). When using a full flow dilution system, the total flow of the dilute exhaust ($G_{TOTW}$) shall be measured with a PDP or CFV — Annex VI, Section 1.2.1.2. The accuracy shall conform to the provisions of Annex III, Appendix 2, Section 2.2.

1.3. Accuracy

The calibration of all measuring instruments shall be traceable to national (international) standards and comply with the requirements given in tables 2 and 3.

Table 2

Permissible deviations of instruments for engine related parameters

| No | Item | Permissible deviation |
|---|---|---|
| 1 | Engine speed | ± 2 % of the reading or ± 1 % of engine's maximum value whichever is larger |
| 2 | Torque | ± 2 % of the reading or ± 1 % of engine's maximum value whichever is larger |
| 3 | Fuel consumption [a] | ± 2 % of engine's maximum value |
| 4 | Air consumption [a] | ± 2 % of the reading or ± 1 % of engine's maximum value whichever is larger |

[a] The calculations of the exhaust emissions as described in this Directive are, in some cases, based on different measurement and/or calculation methods. Because of limited total tolerances for the exhaust emission calculation, the allowable values for some items, used in the appropriate equations, must be smaller than the allowed tolerances given in ISO 3046-3.

Table 3

Permissible deviations of instruments for other essential parameters

| No | Item | Permissible deviation |
|---|---|---|
| 1 | Temperatures ≤ 600 K | ± 2 K absolute |
| 2 | Temperatures ≥ 600 K | ± 1 % of reading |
| 3 | Exhaust gas pressure | ± 0,2 kPa absolute |
| 4 | Inlet manifold depressions | ± 0,05 kPa absolute |
| 5 | Atmospheric pressure | ± 0,1 kPa absolute |
| 6 | Other pressures | ± 0,1 kPa absolute |
| 7 | Relative humidity | ± 3 % absolute |
| 8 | Absolute humidity | ± 5 % of reading |
| 9 | Dilution air flow | ± 2 % of reading |
| 10 | Diluted exhaust gas flow | ± 2 % of reading |

1.4. Determination of the gaseous components

1.4.1. General analyser specifications

The analysers shall have a measuring range appropriate for the accuracy required for measuring the concentrations of the exhaust gas components (Section 1.4.1.1). It is recommended that the analysers be operated such that the measured concentration falls between 15 % and 100 % of full scale.

If the full scale value is 155 ppm (or ppm C) or less or if read-out systems (computers, data loggers) that provide sufficient accuracy and resolution below 15 % of full scale are used concentrations below 15 % of full scale are also acceptable. In this case, additional calibrations are to be made to ensure the accuracy of the calibration curves — Appendix 2, Section 1.5.5.2 of this Annex.

The electromagnetic compatibility (EMC) of the equipment shall be on a level as to minimise additional errors.

1.4.1.1. Accuracy

The analyser shall not deviate from the nominal calibration point by more than ± 2 % of the reading over the whole measurement range except zero, and ± 0,3 % of full scale at zero. The accuracy shall be determined according to the calibration requirements laid down in Section 1.3.

1.4.1.2. Repeatability

The repeatability, shall be such that 2,5 times the standard deviation of 10 repetitive responses to a given calibration or span gas is not greater than ± 1 % of full scale concentration for each range used above 100 ppm (or ppm C) or ± 2 % of each range used below 100 ppm (or ppm C).

1.4.1.3. Noise

The analyser peak-to-peak response to zero and calibration or span gases over any 10 s period shall not exceed 2 % of full scale on all ranges used.

1.4.1.4. Zero drift

Zero response is defined as the mean response, including noise, to a zero gas during a 30-s time interval. The drift of the zero response during a one-hour period shall be less than 2 % of full scale on the lowest range used.

1.4.1.5. Span drift

Span response is defined as the mean response, including noise, to a span gas during a 30-s time interval. The drift of the span response during a one-hour period shall be less than 2 % of full scale on the lowest range used.

1.4.2. Gas drying

Exhaust gases may be measured wet or dry. Any gas-drying device, if used, must have a minimal effect on the concentration of the measured gases. Chemical dryers are not an acceptable method of removing water from the sample.

1.4.3. Analysers

Sections 1.4.3.1 to 1.4.3.5 describe the measurement principles to be used. A detailed description of the measurement systems is given in Annex VI.

The gases to be measured shall be analysed with the following instruments. For non-linear analysers, the use of linearising circuits is permitted.

1.4.3.1. Carbon monoxide (CO) analysis

The carbon monoxide analyser shall be of the non-dispersive infrared (NDIR) absorption type.

1.4.3.2. Carbon dioxide ($CO_2$) analysis

The carbon dioxide analyser shall be of the non-dispersive infrared (NDIR) absorption type.

1.4.3.3. Oxygen ($O_2$) analysis

Oxygen analysers shall be of the paramagnetic detector (PMD), zirconium dioxide (ZRDO) or electro-chemical sensor (ECS) types.

Note: Zirconium dioxide sensors are not recommended when HC and CO concentrations are high such as for lean burn spark ignited engines. Electrochemical sensors shall be compensated for $CO_2$ and $NO_X$ interference.

1.4.3.4. Hydrocarbon (HC) analysis

For direct gas sampling the hydrocarbon analyser shall be of the heated flame ionisation detector (HFID) type with detector, valves, pipework, etc., heated so as to maintain a gas temperature of 463 K ± 10 K (190 °C ± 10 °C).

For diluted gas sampling the hydrocarbon analyser shall be either the heated flame ionisation detector (HFID) type or the flame ionisation detector (FID) type.

1.4.3.5. Oxides of nitrogen ($NO_x$) analysis

The oxides of nitrogen analyser shall be of the chemiluminescent detector (CLD) or heated chemiluminescent detector (HCLD) type with a $NO_2$/NO converter, if measured on a dry basis. If measured on a wet basis, a HCLD with converter maintained above 328 K (55 °C) shall be used, provided the water quench check (Annex III, Appendix 2, Section 1.9.2.2) is satisfied. For both CLD and HCLD, the sampling path shall be maintained at a wall temperature of 328 K to 473 K (55 °C to 200 °C) up to the converter for dry measurement, and up to the analyser for wet measurement.

1.4.4. Sampling for gaseous emissions

If the composition of the exhaust gas is influenced by any exhaust after-treatment system, the exhaust sample shall be taken downstream of this device. The exhaust sampling probe should be in a high pressure side of the muffler, but as far from the exhaust port as possible. To ensure complete mixing of the engine exhaust before sample extraction, a mixing chamber may be optionally inserted between the muffler outlet and the sample probe. The internal volume of the mixing chamber must be not less than 10 times the cylinder displacement of the engine under test and should be roughly equal dimensions in height, width and depth, being similar to a cube. The mixing chamber size should be kept as small as practicable and should be coupled as close as possible to the engine. The exhaust line leaving the mixing chamber of muffler should extend at least 610 mm beyond the sample probe location and be of sufficient size to minimise back pressure. The temperature of the inner surface of the mixing chamber must be maintained above the dew point of the exhaust gases and a minimum temperature of 338 °K (65 °C) is recommended.

All components may optionally be measured directly in the dilution tunnel, or by sampling into a bag and subsequent measurement of the concentration in the sampling bag.

*Appendix 2*

1. CALIBRATION OF THE ANALYTICAL INSTRUMENTS

1.1. Introduction

Each analyser shall be calibrated as often as necessary to fulfil the accuracy requirements of this standard. The calibration method that shall be used is described in this paragraph for the analysers indicated in Appendix 1, Section 1.4.3.

1.2. Calibration gases

The shelf life of all calibration gases must be respected.

The expiry date of the calibration gases stated by the manufacturer shall be recorded.

1.2.1. Pure gases

The required purity of the gases is defined by the contamination limits given below. The following gases must be available for operation:

— purified nitrogen (contamination ≤ 1 ppm C, ≤ 1 ppm CO, ≤ 400 ppm $CO_2$, ≤ 0,1 ppm NO)

— purified oxygen (purity > 99,5 % vol $O_2$)

— hydrogen-helium mixture (40 ± 2 % hydrogen, balance helium); contamination ≤ 1 ppm C, ≤ 400 ppm $CO_2$

— purified synthetic air (contamination ≤ 1 ppm C, ≤ 1 ppm CO, ≤ 400 ppm $CO_2$, ≤ 0,1 ppm NO (oxygen content between 18 and 21 % vol).

1.2.2. Calibration and span gases

Mixture of gases having the following chemical compositions shall be available:

— $C_3H_8$ and purified synthetic air (see Section 1.2.1)

— CO and purified nitrogen

— $NO_x$ and purified nitrogen (the amount of $NO_2$ contained in this calibration gas must not exceed 5 % of the NO content)

— $CO_2$ and purified nitrogen

— $CH_4$ and purified synthetic air

— $C_2H_6$ and purified synthetic air.

Note: Other gas combinations are allowed provided the gases do not react with one another.

The true concentration of a calibration and span gas shall be within ± 2 % of the nominal value. All concentrations of calibration gas shall be given on a volume basis (volume percentage or volume ppm).

The gases used for calibration and span may also be obtained by means of precision blending devices (gas dividers), diluting with purified $N_2$ or with purified synthetic air. The accuracy of the mixing device must be such that the concentration of the diluted calibration gases is accurate to within ± 1,5 %. This accuracy implies that primary gases used for blending must be known to an accuracy of at least ± 1 %, traceable to national or international gas standards. The verification shall be performed at between 15 and 50 % of full scale for each calibration incorporating a blending device.

Optionally, the blending device may be checked with an instrument, which by nature is linear, for example using NO gas with a CLD. The span value of the instrument shall be adjusted with the span gas directly connected to the instrument. The blending device shall be checked at the used settings and the nominal value shall be compared to the measured concentration of the instrument. This difference shall in each point be within ± 0,5 % of the nominal value.

1.2.3. Oxygen interference check

Oxygen interference check gases shall contain propane with 350 ppm C ± 75 ppm C hydrocarbon. The concentration value shall be determined to calibration gas tolerances by chromatographic analysis of total hydrocarbons plus impurities or by dynamic blending. Nitrogen shall be the predominant diluent with the balance oxygen. Blend required for gasoline-fuelled engine testing is as follows:

— $O_2$ interference concentration: Balance

— 10 (9 to 11): Nitrogen

— 5 (4 to 6): Nitrogen

— 0 (0 to 1): Nitrogen

1.3. Operating procedure for analysers and sampling system

The operating procedure for analysers shall follow the start-up and operating instructions of the instrument manufacturer. The minimum requirements given in Sections 1.4 to 1.9 shall be included. For laboratory instruments such as GC and high performance liquid chromatography (HPLC) only Section 1.5.4 shall apply.

1.4. Leakage test

A system leakage test shall be performed. The probe shall be disconnected from the exhaust system and the end plugged. The analyser pump shall be switched on. After an initial stabilisation period all flow meters should read zero. If not, the sampling lines shall be checked and the fault corrected.

The maximum allowable leakage rate on the vacuum side shall be 0,5 % of the in-use flow rate for the portion of the system being checked. The analyser flows and bypass flows may be used to estimate the in-use flow rates.

Alternatively, the system may be evacuated to a pressure of at least 20 kPa vacuum (80 kPa absolute). After an initial stabilisation period the pressure increase δp (kPa/min) in the system shall not exceed:

$$\delta p = p/V_{syst} \times 0{,}005 \times fr$$

Where:

$V_{syst}$ = system volume (l)

fr = system flow rate (l/min)

Another method is the introduction of a concentration step change at the beginning of the sampling line by switching from zero to span gas. If after an adequate period of time the reading shows a lower concentration compared to the introduced concentration, this points to calibration or leakage problems.

1.5. Calibration procedure

1.5.1. Instrument assembly

The instrument assembly shall be calibrated and calibration curves checked against standard gases. The same gas flow rates shall be used as when sampling exhaust gas.

1.5.2. Warming-up time

The warming-up time should be according to the recommendations of the manufacturer. If not specified, a minimum of two hours is recommended for warming-up the analysers.

1.5.3. NDIR and HFID analyser

The NDIR analyser shall be tuned, as necessary, and the combustion flame of the HFID analyser shall be optimised (Section 1.9.1).

1.5.4. GC and HPCL

Both instruments shall be calibrated according to good laboratory practice and the recommendations of the manufacturer.

1.5.5. Establishment of the calibration curves

1.5.5.1. General guidelines

(a) Each normally used operating range shall be calibrated.

(b) Using purified synthetic air (or nitrogen), the CO, $CO_2$, $NO_x$ and HC analysers shall be set at zero.

(c) The appropriate calibration gases shall be introduced to the analysers, the values recorded, and the calibration curves established.

(d) For all instrument ranges except for the lowest range, the calibration curve shall be established by at least 10 calibration points (excluding zero) equally spaced. For the lowest range of the instrument, the calibration curve shall be established by at least 10 calibration points (excluding zero) spaced so that half of the calibration points are placed below 15 % of the analyser's full scale and the rest are placed above 15 % of full scale. For all ranges the highest nominal concentration must be equal to or higher than 90 % of full scale.

(e) The calibration curve shall be calculated by the method of least squares. A best-fit linear or non-linear equation may be used.

(f) The calibration points must not differ from the least-squares best-fit line by more than ± 2 % of reading or ± 0,3 % of full scale whichever is larger.

(g) The zero setting shall be rechecked and the calibration procedure repeated, if necessary.

1.5.5.2. Alternative methods

If it can be shown that alternative technology (e.g. computer, electronically controlled range switch, etc.) can give equivalent accuracy, then these alternatives may be used.

1.6. Verification of the calibration

Each normally used operating range shall be checked prior to each analysis in accordance with the following procedure.

The calibration is checked by using a zero gas and a span gas whose nominal value is more than 80 % of full scale of the measuring range.

If, for the two points considered, the value found does not differ by more than ± 4 % of full scale from the declared reference value, the adjustment parameters may be modified. Should this not be the case, the span gas shall be verified or a new calibration curve shall be established in accordance with Section 1.5.5.1.

1.7. Calibration of tracer gas analyser for exhaust flow measurement

The analyser for measurement of the tracer gas concentration shall be calibrated using the standard gas.

The calibration curve shall be established by at least 10 calibration points (excluding zero) spaced so that half of the calibration points are placed between 4 % and 20 % of the analyser's full scale and the rest are in between 20 % and 100 % of the full scale. The calibration curve shall be calculated by the method of least squares.

The calibration curve must not differ by more than ± 1 % of the full scale from the nominal value of each calibration point, in the range from 20 % to 100 % of the full scale. It also must not differ by more than ± 2 % of reading from the nominal value in the range from 4 % to 20 % of the full scale. The analyser shall be set at zero and spanned prior to the test run using a zero gas and a span gas whose nominal value is more than 80 % of the analyser full scale.

1.8. Efficiency test of the $NO_x$ converter

The efficiency of the converter used for the conversion of $NO_2$ into NO is tested as given in Sections 1.8.1 to 1.8.8 (Figure 1 of Annex III, Appendix 2).

1.8.1. Test set-up

Using the test set-up as shown in Figure 1 of Annex III and the procedure below, the efficiency of converters can be tested by means of an ozonator.

1.8.2. Calibration

The CLD and the HCLD shall be calibrated in the most common operating range following the manufacturer's specifications using zero and span gas (the NO content of which must amount to about 80 % of the operating range and the $NO_2$ concentration of the gas mixture to less than 5 % of the NO concentration). The $NO_x$ analyser must be in the NO mode so that the span gas does not pass through the converter. The indicated concentration has to be recorded.

1.8.3. Calculation

The efficiency of the $NO_x$, converter is calculated as follows:

$$\text{Efficiency (\%)} = \left(1 + \frac{a - b}{c - d}\right) \times 100$$

Where:

a = $NO_x$ concentration according to Section 1.8.6

b = $NO_x$ concentration according to Section 1.8.7

c = NO concentration according to Section 1.8.4

d = NO concentration according to Section 1.8.5.

1.8.4. Adding of oxygen

Via a T-fitting, oxygen or zero air is added continuously to the gas flow until the concentration indicated is about 20 % less than the indicated calibration concentration given in Section 1.8.2. (The analyser is in the NO mode.)

The indicated concentration (c) shall be recorded. The ozonator is kept deactivated throughout the process.

1.8.5. Activation of the ozonator

The ozonator is now activated to generate enough ozone to bring the NO concentration down to about 20 % (minimum 10 %) of the calibration concentration given in Section 1.8.2. The indicated concentration (d) shall be recorded. (The analyser is in the NO mode).

1.8.6. $NO_x$ mode

The NO analyser is then switched to the $NO_x$ mode so that the gas mixture (consisting of NO, $NO_2$, $O_2$ and $N_2$) now passes through the converter. The indicated concentration (a) shall be recorded. (The analyser is in the $NO_x$ mode).

1.8.7. Deactivation of the ozonator

The ozonator is now deactivated. The mixture of gases described in Section 1.8.6 passes through the converter into the detector. The indicated concentration (b) shall be recorded. (The analyser is in the $NO_x$ mode).

1.8.8. NO mode

Switched to NO mode with the ozonator deactivated, the flow of oxygen or synthetic air is also shut off. The $NO_x$ reading of the analyser shall not deviate by more than ± 5 % from the value measured according to Section 1.8.2. (The analyser is in the NO mode).

1.8.9. Test interval

The efficiency of the converter must be checked monthly.

1.8.10. Efficiency requirement

The efficiency of the converter shall not be less than 90 %, but a higher efficiency of 95 % is strongly recommended.

Note: If, with the analyser in the most common range, the ozonator cannot give a reduction from 80 % to 20 % according to Section 1.8.5, then the highest range which will give the reduction shall be used.

1.9. Adjustment of the FID

1.9.1. Optimisation of the detector response

The HFID must be adjusted as specified by the instrument manufacturer. A propane in air span gas should be used to optimise the response on the most common operating range.

With the fuel and airflow rates set at the manufacturer's recommendations, a 350 ± 75 ppm C span gas shall be introduced to the analyser. The response at a given fuel flow shall be determined from the difference between the span gas response and the zero gas response. The fuel flow shall be incrementally adjusted above and below the manufacturer's specification. The span and zero response at these fuel flows shall be recorded. The difference between the span and zero response shall be plotted and the fuel flow adjusted to the rich side of the curve. This is the initial flow rate setting, which may need further optimisation depending on the results of the hydrocarbon response factor and the oxygen interference check according to Sections 1.9.2 and 1.9.3.

If the oxygen interference or the hydrocarbon response factors do not meet the following specifications, the airflow shall be incrementally adjusted above and below the manufacturer's specifications, Sections 1.9.2 and 1.9.3 should be repeated for each flow.

1.9.2. Hydrocarbon response factors

The analyser shall be calibrated using propane in air and purified synthetic air, according to Section 1.5.

Response factors shall be determined when introducing an analyser into service and after major service intervals. The response factor ($R_f$) for a particular hydrocarbon species is the ratio of the FID C1 reading to the gas concentration in the cylinder expressed by ppm C1.

The concentration of the test gas must be at a level to give a response of approximately 80 % of full scale. The concentration must be known to an accuracy of ± 2 % in reference to a gravimetric standard expressed in volume. In addition, the gas cylinder must be preconditioned for 24 hours at a temperature of 298 K (25 °C) ± 5 K.

The test gases to be used and the recommended relative response factor ranges are as follows:

— methane and purified synthetic air: $1{,}00 \leq R_f \leq 1{,}15$

— propylene and purified synthetic air: $0{,}90 \leq R_f \leq 1{,}1$

— toluene and purified synthetic air: $0{,}90 \leq R_f \leq 1{,}10$

These values are relative to the response factor ($R_f$) of 1,00 for propane and purified synthetic air.

1.9.3. Oxygen interference check

The oxygen interference check shall be determined when introducing an analyser into service and after major service intervals. A range shall be chosen where the oxygen interference check gases will fall in the upper 50 %. The test shall be conducted with the oven temperature set as required. The oxygen interference gases are specified in Section 1.2.3.

(a) The analyser shall be zeroed.

(b) The analyser shall be spanned with the 0 % oxygen blend for gasoline fuelled engines.

(c) The zero response shall be rechecked. If it has changed more than 0,5 % of full scale subsections (a) and (b) of this section shall be repeated.

(d) The 5 % and 10 % oxygen interference check gases shall be introduced.

(e) The zero response shall be rechecked. If it has changed more than ± 1 % of full scale, the test shall be repeated.

(f) The oxygen interference (% $O_2$I) shall be calculated for each mixture in step (d) as follows:

$$O_2I = \frac{(B - C)}{B} \times 100 \qquad \text{ppm C} = \frac{A}{D}$$

Where:

A = hydrocarbon concentration (ppm C) of the span gas used in subsection (b)

B = hydrocarbon concentration (ppm C) of the oxygen interference check gases used in subsection (d)

C = analyser response

D = percentage of full scale analyser response due to A

(g) The % of oxygen interference (% $O_2$I) shall be less than ± 3 % for all required oxygen interference check gases prior to testing

(h) If the oxygen interference is greater than ± 3 %, the air flow above and below the manufacturer's specifications shall be incrementally adjusted, repeating Section 1.9.1 for each flow.

(i) If the oxygen interference is greater than ± 3 %, after adjusting the air flow, the fuel flow and thereafter the sample flow shall be varied, repeating Section 1.9.1 for each new setting.

(j) If the oxygen interference is still greater than ± 3 %, the analyser, FID fuel, or burner air shall be repaired or replaced prior to testing. This section shall then be repeated with the repaired or replaced equipment or gases.

1.10. Interference effects with CO, $CO_2$, $NO_x$ and $O_2$ analysers

Gases other than the one being analysed can interfere with the reading in several ways. Positive interference occurs in NDIR and PMD instruments where the interfering gas gives the same effect as the gas being measured, but to a lesser degree. Negative interference occurs in NDIR instruments by the interfering gas broadening the absorption band of the measured gas, and in CLD instruments by the interfering gas quenching the radiation. The interference checks in Sections 1.10.1 and 1.10.2 shall be performed prior to an analyser's initial use and after major service intervals, but at least once per year.

1.10.1. CO analyser interference check

Water and $CO_2$ can interfere with the CO analyser performance. Therefore a $CO_2$ span gas having a concentration of 80 % to 100 % of full scale of the maximum operating range used during testing shall be bubbled through water at room temperature and the analyser response recorded. The analyser response must not be more than 1 % of full scale for ranges equal to or above 300 ppm or more than 3 ppm for ranges below 300 ppm.

1.10.2. $NO_x$ analyser quench checks

The two gases of concern for CLD (and HCLD) analysers are $CO_2$ and water vapour. Quench responses of these gases are proportional to their concentrations, and therefore require test techniques to determine the quench at the highest expected concentrations experienced during testing.

1.10.2.1. $CO_2$ quench check

A $CO_2$ span gas having a concentration of 80 % to 100 % of full scale of the maximum operating range shall be passed through the NDIR analyser and the $CO_2$ value recorded as A. It shall then be diluted approximately 50 % with NO span gas and passed through the NDIR and (H)CLD with the $CO_2$ and NO values recorded as B and C, respectively. The $CO_2$ shall be shut off and only the NO span gas is passed through the (H)CLD and the NO value recorded as D.

The quench, which shall not be greater than 3 % full scale, shall be calculated as follows:

$$\%\ CO_2\ \text{quench} = \left[1 - \left(\frac{(C \times A)}{(D \times A) - (D \times B)}\right)\right] \times 100$$

Where:

A = undiluted $CO_2$ concentration measured with NDIR %

B = diluted $CO_2$ concentration measured with NDIR %

C = diluted NO concentration measured with CLD ppm

D = undiluted NO concentration measured with CLD ppm

Alternative methods of diluting and quantifying $CO_2$ and NO span gas values, such as dynamic/mixing/blending, can be used.

1.10.2.2. Water quench check

This check applies to wet gas concentration measurements only. Calculation of water quench must consider dilution of the NO span gas with water vapour and scaling of water vapour concentration of the mixture to that expected during testing.

A NO span gas having a concentration of 80 % to 100 % of full scale to the normal operating range shall be passed through the (H)CLD and the NO value recorded as D. The NO span gas shall then be bubbled through water at room temperature and passed through the (H)CLD and the NO value recorded as C. The water temperature shall be determined and recorded as F. The mixture's saturation vapour pressure that corresponds to the bubbler water temperature (F) shall be determined and recorded as G. The water vapour concentration (in percentage) of the mixture shall be calculated as follows:

$$H = 100 \times \left( \frac{G}{P_B} \right)$$

and recorded as H. The expected diluted NO span gas (in water vapour) concentration shall be calculated as follows:

$$D_e = D \times \left( 1 - \frac{H}{100} \right)$$

and recorded as $D_e$.

The water quench shall not be greater than 3 % and shall be calculated as follows:

$$\% \, H_2O \text{ quench } = 100 \times \left( \frac{D_e - C}{D_e} \right) \times \left( \frac{H_m}{H} \right)$$

Where:

$D_e$ = expected diluted NO concentration (ppm)

C = diluted NO concentration (ppm)

$H_m$ = maximum water vapour concentration

H = actual water vapour concentration (%)

Note: It is important that the NO span gas contains minimal $NO_2$ concentration for this check, since absorption of $NO_2$ in water has not been accounted for in the quench calculations.

1.10.3. $O_2$ analyser interference

Instrument response of a PMD analyser caused by gases other than oxygen is comparatively slight. The oxygen equivalents of the common exhaust gas constituents are shown in the table.

Oxygen equivalents

| Gas | $O^2$ equivalent % |
|---|---|
| Carbon dioxide ($CO_2$) | – 0,623 |
| Carbon monoxide (CO) | – 0,354 |
| Nitrogen oxide (NO) | + 44,4 |
| Nitrogen dioxide ($NO_2$) | + 28,7 |
| Water ($H_2O$) | – 0,381 |

The observed oxygen concentration shall be corrected by the following formula if high precision measurements are to be done:

$$\text{Interference} = \frac{(\text{Equivalent \% } O_2 \times \text{Obs. conc.})}{100}$$

1.11. Calibration intervals

The analysers shall be calibrated according to Section 1.5 at least every three months or whenever a system repair or change is made that could influence calibration.

*Appendix 3*

1. DATA EVALUATION AND CALCULATIONS

1.1. Gaseous emissions evaluation

For the evaluation of the gaseous emissions, the chart reading for a minimum of the last 120 s of each mode shall be averaged, and the average concentrations (conc) of HC, CO, $NO_x$ and $CO_2$ during each mode shall be determined from the average chart readings and the corresponding calibration data. A different type of recording can be used if it ensures an equivalent data acquisition.

The average background concentration ($conc_d$) may be determined from the bag readings of the dilution air or from the continuous (non-bag) background reading and the corresponding calibration data.

1.2. Calculation of the gaseous emissions

The finally reported test results shall be derived through the following steps.

1.2.1. Dry/wet correction

The measured concentration, if not already measured on a wet basis, shall be converted to a wet basis:

$$\text{conc (wet)} = k_w \times \text{conc (dry)}$$

For the raw exhaust gas:

$$k_w = k_{w,r} = \frac{1}{1 + \alpha \times 0{,}005 \times (\%\ CO\ [dry] + \%\ CO_2\ [dry]) - 0{,}01 \times \%\ H_2\ [dry] + k_{w2}}$$

Where α is the hydrogen to carbon ratio in the fuel.

The $H_2$ concentration in the exhaust shall be calculated:

$$H_2\ [dry] = \frac{0{,}5 \times \alpha \times \%\ CO\ [dry] \times (\%\ CO\ [dry] + \%\ CO_2\ [dry])}{\%\ CO\ [dry] + (3 \times \%\ CO_2\ [dry])}$$

The factor $k_{w2}$ shall be calculated:

$$k_{w2} = \frac{1{,}608 \times H_a}{1\ 000 + (1{,}608 \times H_a)}$$

with $H_a$ absolute humidity of the intake air gas g of water per kg of dry air.

For the diluted exhaust gas:

For wet $CO_2$ measurement:

$$k_w = k_{w,e,1} = \left(1 - \frac{\alpha \times \%\ CO_2\ [wet]}{200}\right) - k_{w1}$$

Or, for dry $CO_2$ measurement:

$$k_w = k_{w,e,2} = \left(\frac{(1 - k_{w1})}{1 + \frac{\alpha \times \%\ CO_2\ [dry]}{200}}\right)$$

Where α is the hydrogen to carbon ratio in the fuel.

The factor $k_{w1}$ shall be calculated from the following equations:

$$k_{w1} = \left( \frac{1{,}608 \times [H_d \times (1 - 1/DF) + H_a \times (1/DF)]}{1\,000 + 1{,}608 \times [H_d \times (1 - 1/DF) + H_a \times (1/DF)]} \right)$$

Where:

$H_d$ = absolute humidity of the dilution air, g of water per kg of dry air

$H_a$ = absolute humidity of the intake air, g of water per kg of dry air

$$DF = \frac{13{,}4}{\%\ conc_{CO_2} + (ppm\ conc_{CO} + ppm\ conc_{HC}) \times 10^{-4}}$$

For the dilution air:

$$k_{w,d} = 1 - k_{w1}$$

The factor $k_{w1}$ shall be calculated from the following equations:

$$DF = \frac{13{,}4}{\%\ conc_{CO_2} + (ppm\ conc_{CO} + ppm\ conc_{HC}) \times 10^{-4}}$$

$$k_{w1} = \left( \frac{1{,}608 \times [H_d \times (1 - 1/DF) + H_a \times (1/DF)]}{1\,000 + 1{,}608 \times [H_d \times (1 - 1/DF) + H_a \times (1/DF)]} \right)$$

Where:

$H_d$ = absolute humidity of the dilution air, g of water per kg of dry air

$H_a$ = absolute humidity of the intake air, g of water per kg of dry air

$$DF = \frac{13{,}4}{\%\ conc_{CO_2} + (ppm\ conc_{CO} + ppm\ conc_{HC}) \times 10^{-4}}$$

For the intake air (if different from the dilution air):

$$k_{w,a} = 1 - k_{w2}$$

The factor $k_{w2}$ shall be calculated from the following equations:

$$k_{w2} = \frac{1{,}608 \times H_a}{1\,000 + (1{,}608 \times H_a)}$$

with $H_a$ absolute humidity of the intake air, g of water per kg of dry air.

1.2.2. Humidity correction for $NO_x$

As the $NO_x$ emission depends on ambient air conditions, the $NO_x$ concentration shall be multiplied by the factor $K_H$ taking into account humidity:

$K_H = 0{,}6272 + 44{,}030 \times 10^{-3} \times H_a - 0{,}862 \times 10^{-3} \times H_a^2$ (for 4-stroke engines)

$K_H = 1$ (for 2-stroke engines)

with $H_a$ absolute humidity of the intake air as g of water per kg of dry air

1.2.3. Calculation of emission mass flow rate

The emission mass flow rates $Gas_{mass}$ (g/h) for each mode shall be calculated as follows.

(a) For the raw exhaust gas ([1]):

$$Gas_{mass} = \frac{MW_{Gas}}{MW_{FUEL}} \times \frac{1}{\left\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\right\}} \times \%\ conc \times G_{FUEL} \times 1\ 000$$

Where:

$G_{FUEL}$ [kg/h] is the fuel mass flow rate;

$MW_{Gas}$ [kg/kmole] is the molecular weight of the individual gas shown in Table 1;

Table 1

Molecular weights

| Gas | $MW_{Gas}$ (kg/kmol) |
|---|---|
| $NO_x$ | 46,01 |
| CO | 28,01 |
| HC | $MW_{HC} = MW_{FUEL}$ |
| $CO_2$ | 44,01 |

— $MW_{FUEL}$ = 12,011 + α × 1,00794 + β × 15,9994 [kg/kmole] is the fuel molecular weight with α hydrogen to carbon ratio and β oxygen to carbon ratio of the fuel ([2]);

— $CO_{2AIR}$ is the $CO_2$ concentration in the intake air (that is assumed equal to 0,04 % if not measured);

(b) For the diluted exhaust gas ([3]):

$$Gas_{mass} = u \times conc_c \times G_{TOTW}$$

Where

— $G_{TOTW}$ [kg/h] is the diluted exhaust gas mass flow rate on wet basis that, when using a full flow dilution system, shall be determined according to Annex III, Appendix 1, Section 1.2.4,

— $conc_c$ is the background corrected concentration:

$$conc_c = conc - conc_d \times (1 - 1/DF)$$

with

$$DF = \frac{13,4}{\%\ conc_{CO_2} + (ppm\ conc_{CO} + ppm\ conc_{HC}) \times 10^{-4}}$$

The u coefficient is shown in Table 2.

Table 2

Values of u coefficient

| Gas | u | conc |
|---|---|---|
| $NO_x$ | 0,001587 | ppm |
| CO | 0,000966 | ppm |
| HC | 0,000479 | ppm |
| $CO_2$ | 15,19 | % |

([1]) For $NO_x$ the concentration has to be multiplied by the humidity correction factor $K_H$ (humidity correction factor for $NO_x$).

([2]) In the ISO 8178-1 a more complete formula of the fuel molecular weight is quoted (formula 50 of Chapter 13.5.1(b). The formula takes into account not only the hydrogen to carbon ratio and the oxygen to carbon ratio but also other possible fuel components such as sulphur and nitrogen. However, as the SI engines of the Directive are tested with a petrol (quoted as a reference fuel in Annex V) containing usually only carbon and hydrogen, the simplified formula is considered.

([3]) For $NO_x$ the concentration has to be multiplied by the humidity correction factor $K_H$ (humidity correction factor for $NO_x$).

Values of the u coefficient are based on a molecular weight of the dilute exhaust gases equal to 29 (kg/kmole); the value of u for HC is based on an average carbon to hydrogen ratio of 1:1,85.

1.2.4. Calculation of specific emissions

The specific emission (g/kWh) shall be calculated for all individual components:

$$\text{Individual gas} = \frac{\sum_{i=1}^{n}(\text{Gas}_{\text{mass}_i} \times \text{WF}_i)}{\sum_{i=1}^{n}(P_i \times \text{WF}_i)}$$

Where $P_i = P_{M,i} + P_{AE,i}$

When auxiliaries, such as cooling fan or blower, are fitted for the test, the power absorbed shall be added to the results except for engines where such auxiliaries are an integral part of the engine. The fan or blower power shall be determined at the speeds used for the tests either by calculation from standard characteristics or by practical tests (Appendix 3 of Annex VII).

The weighting factors and the number of the n modes used in the above calculation are shown in Annex IV, Section 3.5.1.1.

2. EXAMPLES

2.1. Raw exhaust gas data from a 4-stroke SI engine

With reference to the experimental data (Table 3), calculations are carried out first for mode No 1 and then are extended to other test modes using the same procedure.

Table 3

Experimental data of a 4-stroke SI engine

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Engine speed | $min^{-1}$ | 2 550 | 2 550 | 2 550 | 2 550 | 2 550 | 1 480 |
| Power | kW | 9,96 | 7,5 | 4,88 | 2,36 | 0,94 | 0 |
| Load percent | % | 100 | 75 | 50 | 25 | 10 | 0 |
| Weighting factors | — | 0,090 | 0,200 | 0,290 | 0,300 | 0,070 | 0,050 |
| Barometric pressure | kPa | 101,0 | 101,0 | 101,0 | 101,0 | 101,0 | 101,0 |
| Air temperature | °C | 20,5 | 21,3 | 22,4 | 22,4 | 20,7 | 21,7 |
| Air relative humidity | % | 38,0 | 38,0 | 38,0 | 37,0 | 37,0 | 38,0 |
| Air absolute humidity | $g_{H20}/kg_{air}$ | 5,696 | 5,986 | 6,406 | 6,236 | 5,614 | 6,136 |
| CO dry | ppm | 60 995 | 40 725 | 34 646 | 41 976 | 68 207 | 37 439 |
| $NO_x$ wet | ppm | 726 | 1 541 | 1 328 | 377 | 127 | 85 |
| HC wet | ppm C1 | 1 461 | 1 308 | 1 401 | 2 073 | 3 024 | 9 390 |
| $CO_2$ dry | % Vol. | 11,4098 | 12,691 | 13,058 | 12,566 | 10,822 | 9,516 |
| Fuel mass flow | kg/h | 2,985 | 2,047 | 1,654 | 1,183 | 1,056 | 0,429 |
| Fuel H/C ratio α | — | 1,85 | 1,85 | 1,85 | 1,85 | 1,85 | 1,85 |
| Fuel O/C ratio β | | 0 | 0 | 0 | 0 | 0 | 0 |

2.1.1. Dry/wet correction factor $k_w$

The dry/wet correction factor $k_w$ shall be calculated for converting dry CO and $CO_2$ measurements on a wet basis:

$$k_w = k_{w,r} = \frac{1}{1 + \alpha \times 0{,}005 \times (\%\ CO\ [dry] + \%\ CO_2\ [dry]) - 0{,}01 \times \%\ H_2\ [dry] + k_{w2}}$$

Where:

$$H_2\ [dry] = \frac{0{,}5 \times \alpha \times \%\ CO\ [dry] \times (\%\ CO\ [dry] + \%\ CO_2\ [dry])}{\%\ CO\ [dry] + (3 \times \%\ CO_2\ [dry])}$$

and:

$$k_{w2} = \frac{1{,}608 \times H_a}{1\ 000 + (1{,}608 \times H_a)}$$

$$H_2\ [dry] = \frac{0{,}5 \times 1{,}85 \times 6{,}0995 \times (6{,}0995 + 11{,}4098)}{6{,}0995 + (3 \times 11{,}4098)} = 2{,}450\ \%$$

$$k_{w2} = \frac{1{,}608 \times 5{,}696}{1\ 000 + (1{,}608 \times 5{,}696)} = 0{,}009$$

$$k_w = k_{w,r} = \frac{1}{1 + 1{,}85 \times 0{,}005 \times (6{,}0995 + 11{,}4098) - 0{,}01 \times 2{,}450 + 0{,}009} = 0{,}872$$

$$CO\ [wet] = CO\ [dry] \times k_w = 60\ 995 \times 0{,}872 = 53\ 198\ ppm$$

$$CO_2\ [wet] = CO_2\ [dry] \times k_w = 11{,}410 \times 0{,}872 = 9{,}951\ \%\ Vol.$$

Table 4

CO and $CO_2$ wet values according to different test modes

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| $H_2$ dry | % | 2,450 | 1,499 | 1,242 | 1,554 | 2,834 | 1,422 |
| $k_{w2}$ | — | 0,009 | 0,010 | 0,010 | 0,010 | 0,009 | 0,010 |
| $k_w$ | — | 0,872 | 0,870 | 0,869 | 0,870 | 0,874 | 0,894 |
| CO wet | ppm | 53 198 | 35 424 | 30 111 | 36 518 | 59 631 | 33 481 |
| $CO_2$ wet | % | 9,951 | 11,039 | 11,348 | 10,932 | 9,461 | 8,510 |

2.1.2. C emissions

$$HC_{mass} = \frac{MW_{HC}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times G_{FUEL} \times 1\ 000$$

Where:

$MW_{HC} = MW_{FUEL}$

$MW_{FUEL} = 12{,}011 + \alpha \times 1{,}00794 = 13{,}876$

$$HC_{mass} = \frac{13{,}876}{13{,}876} \times \frac{1}{(9{,}951 - 0{,}04 + 5{,}3198 + 0{,}1461)} \times 0{,}1461 \times 2{,}985 \times 1\ 000 = 28{,}361\ g/h$$

Table 5

HC emissions (g/h) according to different test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $HC_{mass}$ | 28,361 | 18,248 | 16,026 | 16,625 | 20,357 | 31,578 |

2.1.3. $NO_x$ emissions

At first the humidity correction factor $K_H$ of $NO_x$ emissions shall be calculated:

$K_H = 0{,}6272 + 44{,}030 \times 10^{-3} \times H_a - 0{,}862 \times 10^{-3} \times H_a^2$

$K_H = 0{,}6272 + 44{,}030 \times 10^{-3} \times 5{,}696 - 0{,}862 \times 10^{-3} \times (5{,}696)^2 = 0{,}850$

Table 6

Humidity correction factor $K_H$ of $NO_x$ emissions according to different modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $K_H$ | 0,850 | 0,860 | 0,874 | 0,868 | 0,847 | 0,865 |

Then $NO_{xmass}$ (g/h) shall be calculated:

$$NO_{xmass} = \frac{MW_{NOx}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times K_H \times G_{FUEL} \times 1\,000$$

$$NO_{xmass} = \frac{46{,}01}{13{,}876} \times \frac{1}{(9{,}951 - 0{,}04 + 5{,}3198 + 0{,}1461)} \times 0{,}073 \times 0{,}85 \times 2{,}985 \times 1\,000 = 39{,}717\ \ g/h$$

Table 7

$NO_x$ emissions (g/h) according to the different test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $NO_{xmass}$ | 39,717 | 61,291 | 44,013 | 8,703 | 2,401 | 0,820 |

2.1.4. CO emissions

$$CO_{mass} = \frac{MW_{NO_x}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times G_{FUEL} \times 1\,000$$

$$CO_{2mass} = \frac{44{,}01}{13{,}876} \times \frac{1}{(9{,}951 - 0{,}04 + 5{,}3198 + 0{,}1461)} \times 9{,}951 \times 2{,}985 \times 1\,000 = 6\,126{,}806\ \ g/h$$

Table 8

CO emissions (g/h) according to different test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $CO_{mass}$ | 2 084,588 | 997,638 | 695,278 | 591,183 | 810,334 | 227,285 |

2.1.5. $CO_2$ emissions

$$CO_{2mass} = \frac{MW_{CO_2}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times G_{FUEL} \times 1\,000$$

$$CO_{2mass} = \frac{44{,}01}{13{,}876} \times \frac{1}{(9{,}951 - 0{,}04 + 5{,}3198 + 0{,}1461)} \times 9{,}951 \times 2{,}985 \times 1\,000 = 6\,126{,}806\ \ g/h$$

Table 9

$CO_2$ emissions (g/h) according to different test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $CO_{2mass}$ | 6 126,806 | 4 884,739 | 4 117,202 | 2 780,662 | 2 020,061 | 907,648 |

2.1.6. Specific emissions

The specific emission (g/kWh) shall be calculated for all individual components:

$$\text{Individual gas} = \frac{\sum_{i=1}^{n}(Gas_{mass_i} \times WF_i)}{\sum_{i=1}^{n}(P_i \times WF_i)}$$

Table 10

Emissions (g/h) and weighting factors according to the test modes

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| $HC_{mass}$ | g/h | 28,361 | 18,248 | 16,026 | 16,625 | 20,357 | 31,578 |
| $NO_{xmass}$ | g/h | 39,717 | 61,291 | 44,013 | 8,703 | 2,401 | 0,820 |
| $CO_{mass}$ | g/h | 2 084,588 | 997,638 | 695,278 | 591,183 | 810,334 | 227,285 |
| $CO_{2mass}$ | g/h | 6 126,806 | 4 884,739 | 4 117,202 | 2 780,662 | 2 020,061 | 907,648 |
| Power $P_I$ | kW | 9,96 | 7,50 | 4,88 | 2,36 | 0,94 | 0 |
| Weighting factors $WF_I$ | — | 0,090 | 0,200 | 0,290 | 0,300 | 0,070 | 0,050 |

$$HC = \frac{28,361\times0,090+18,248\times0,200+16,026\times0,290+16,625\times0,300+20,357\times0,070+31,578\times0,050}{9,96\times0,090+7,50\times0,200+4,88\times0,290+2,36\times0,300+0,940\times0,070+0\times0,050} = 4,11 \text{ g/kWh}$$

$$NO_x = \frac{39,717\times0,090+61,291\times0,200+44,013\times0,290+8,703\times0,300+2,401\times0,070+0,820\times0,050}{9,96\times0,090+7,50\times0,200+4,88\times0,290+2,36\times0,300+0,940\times0,070+0\times0,050} = 6,85 \text{ g/kWh}$$

$$CO = \frac{2\,084,59\times0,090+997,64\times0,200+695,28\times0,290+591,18\times0,300+810,33\times0,070+227,29\times0,050}{9,96\times0,090+7,50\times0,200+4,88\times0,290+2,36\times0,300+0,940\times0,070+0\times0,050} = 181,93 \text{ g/kWh}$$

$$CO_2 = \frac{6\,126,81\times0,090+4\,884,74\times0,200+4\,117,20\times0,290+2\,780,66\times0,300+2\,020,06\times0,070+907,65\times0,050}{9,96\times0,090+7,50\times0,200+4,88\times0,290+2,36\times0,300+0,940\times0,070+0\times0,050} = 816,36 \text{ g/kWh}$$

2.2. Raw exhaust gas data from a 2-stroke SI engine

With reference to the experimental data (Table 11), calculations shall be carried out first for mode No 1 and then extended to the other test mode using the same procedure.

Table 11

Experimental data of a 2-stroke SI engine

| Mode | | 1 | 2 |
|---|---|---|---|
| Engine speed | $min^{-1}$ | 9 500 | 2 800 |
| Power | kW | 2,31 | 0 |
| Load percent | % | 100 | 0 |
| Weighting factors | — | 0,9 | 0,1 |
| Barometric pressure | kPa | 100,3 | 100,3 |
| Air temperature | °C | 25,4 | 25 |
| Air relative humidity | % | 38,0 | 38,0 |
| Air absolute humidity | $g_{H20}/kg_{air}$ | 7,742 | 7,558 |
| CO dry | ppm | 37 086 | 16 150 |

| Mode | | 1 | 2 |
|---|---|---|---|
| $NO_x$ wet | ppm | 183 | 15 |
| HC wet | ppmC1 | 14 220 | 13 179 |
| $CO_2$ dry | % Vol. | 11,986 | 11,446 |
| Fuel mass flow | kg/h | 1,195 | 0,089 |
| Fuel H/C ratio α | — | 1,85 | 1,85 |
| Fuel O/C ratio β | | 0 | 0 |

2.2.1. Dry/wet correction factor $k_w$

The dry/wet correction factor $k_w$ shall be calculated for converting dry CO and $CO_2$ measurements on a wet basis:

$$k_w = k_{w,r} = \frac{1}{1 + \alpha \times 0{,}005 \times (\%\ CO\ [dry] + \%\ CO_2\ [dry]) - 0{,}01 \times \%\ H_2\ [dry] + k_{w2}}$$

Where:

$$H_2\ [dry] = \frac{0{,}5 \times \alpha \times \%\ CO\ [dry] \times (\%\ CO\ [dry] + \%\ CO_2\ [dry])}{\%\ CO\ [dry] + (3 \times \%\ CO_2\ [dry])}$$

$$H_2\ [dry] = \frac{0{,}5 \times 1{,}85 \times 3{,}7086 \times (3{,}7086 + 11{,}986)}{3{,}7086 + (3 \times 11{,}986)} = 1{,}357\ \%$$

$$k_{w2} = \frac{1{,}608 \times H_a}{1\ 000 + (1{,}608 \times H_a)}$$

$$k_{w2} = \frac{1{,}608 \times 7{,}742}{1\ 000 + (1{,}608 \times 7{,}742)} = 0{,}012$$

$$k_w = k_{w,r} = \frac{1}{1 + 1{,}85 \times 0{,}005 \times (3{,}7086 + 11{,}986) - 0{,}01 \times 1{,}357 + 0{,}012} = 0{,}874$$

$CO\ [wet] = CO\ [dry] \times k_w = 37\ 086 \times 0{,}874 = 32\ 420$ ppm

$CO_2\ [wet] = CO_2\ [dry] \times k_w = 11{,}986 \times 0{,}874 = 10{,}478$ % Vol

Table 12

CO and $CO_2$ wet values according to different test modes

| Mode | | 1 | 2 |
|---|---|---|---|
| $H_2$ dry | % | 1,357 | 0,543 |
| $k_{w2}$ | — | 0,012 | 0,012 |
| $k_w$ | — | 0,874 | 0,887 |
| CO wet | ppm | 32 420 | 14 325 |
| $CO_2$ wet | % | 10,478 | 10,153 |

2.2.2. HC emissions

$$HC_{mass} = \frac{MW_{HC}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times G_{FUEL} \times 1\ 000$$

Where:

$MW_{HC} = MW_{FUEL}$

$MW_{FUEL} = 12{,}011 + \alpha \times 1{,}00794 = 13{,}876$

$$HC_{mass} = \frac{13{,}876}{13{,}876} \times \frac{1}{(10{,}478 - 0{,}04 + 3{,}2420 + 1{,}422)} \times 1{,}422 \times 1{,}195 \times 1\ 000 = 112{,}520\ \ g/h$$

Table 13

HC emissions (g/h) according to test modes

| Mode | 1 | 2 |
|---|---|---|
| $HC_{mass}$ | 112,520 | 9,119 |

2.2.3. $NO_x$ emissions

The factor $K_H$ for the correction of the $NO_x$ emissions is equal to 1 for two-stroke engines:

$$NO_{xmass} = \frac{MW_{NO_x}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times K_H \times G_{FUEL} \times 1\ 000$$

$$NO_{xmass} = \frac{46,01}{13,876} \times \frac{1}{(10,478 - 0,04 + 3,2420 + 1,422)} \times 0,0183 \times 1 \times 1,195 \times 1\ 000 = 4,800\ \ g/h$$

Table 14

$NO_x$ emissions (g/h) according to test modes

| Mode | 1 | 2 |
|---|---|---|
| $NO_{xmass}$ | 4,800 | 0,034 |

2.2.4. CO emissions

$$CO_{mass} = \frac{MW_{CO}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times G_{FUEL} \times 1\ 000$$

$$CO_{mass} = \frac{28,01}{13,876} \times \frac{1}{(10,478 - 0,04 + 3,2420 + 1,422)} \times 3,2420 \times 1,195 \times 1\ 000 = 517,851\ \ g/h$$

Table 15

CO emissions (g/h) according to test modes

| Mode | 1 | 2 |
|---|---|---|
| $CO_{mass}$ | 517,851 | 20,007 |

2.2.5. $CO_2$ emissions

$$CO_{2mass} = \frac{MW_{CO}}{MW_{FUEL}} \times \frac{1}{\{(\%\ CO_2\ [wet] - \%\ CO_{2AIR}) + \%\ CO\ [wet] + \%\ HC\ [wet]\}} \times \%\ conc \times G_{FUEL} \times 1\ 000$$

$$CO_{2mass} = \frac{44,01}{13,876} \times \frac{1}{(10,478 - 0,04 + 3,2420 + 1,422)} \times 10,478 \times 1,195 \times 1\ 000 = 2\ 629,658\ \ g/h$$

Table 16

$CO_2$ emissions (g/h) according to test modes

| Mode | 1 | 2 |
|---|---|---|
| $CO_{2mass}$ | 2 629,658 | 222,799 |

2.2.6. Specific emissions

The specific emission (g/kWh) shall be calculated for all individual components in the following way:

$$\text{Individual gas} = \frac{\sum_{i=1}^{n}(Gas_{mass_i} \times WF_i)}{\sum_{i=1}^{n}(P_i \times WF_i)}$$

Table 17

Emissions (g/h) and weighting factors in two test modes

| Mode | | 1 | 2 |
|---|---|---|---|
| $HC_{mass}$ | g/h | 112,520 | 9,119 |
| $NO_{xmass}$ | g/h | 4,800 | 0,034 |
| $CO_{mass}$ | g/h | 517,851 | 20,007 |
| $CO_{2mass}$ | g/h | 2 629,658 | 222,799 |
| Power $P_{II}$ | kW | 2,31 | 0 |
| Weighting factors $WF_i$ | — | 0,85 | 0,15 |

$$HC = \frac{112{,}52 \times 0{,}85 + 9{,}119 \times 0{,}15}{2{,}31 \times 0{,}85 + 0 \times 0{,}15} = 49{,}4 \text{ g/kWh}$$

$$NO_x = \frac{4{,}800 \times 0{,}85 + 0{,}034 \times 0{,}15}{2{,}31 \times 0{,}85 + 0 \times 0{,}15} = 2{,}08 \text{ g/kWh}$$

$$CO = \frac{517{,}851 \times 0{,}85 + 20{,}007 \times 0{,}15}{2{,}31 \times 0{,}85 + 0 \times 0{,}15} = 225{,}71 \text{ g/kWh}$$

$$CO_2 = \frac{2\,629{,}658 \times 0{,}85 + 222{,}799 \times 0{,}15}{2{,}31 \times 0{,}85 + 0 \times 0{,}15} = 1\,155{,}4 \text{ g/kWh}$$

2.3. Diluted exhaust gas data from a 4-stroke SI engine

With reference to the experimental data (Table 18), calculations shall be carried out first for mode No 1 and then extended to other test modes using the same procedure.

Table 18

Experimental data of a 4-stroke SI engine

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Engine speed | $min^{-1}$ | 3 060 | 3 060 | 3 060 | 3 060 | 3 060 | 2 100 |
| Power | kW | 13,15 | 9,81 | 6,52 | 3,25 | 1,28 | 0 |
| Load percent | % | 100 | 75 | 50 | 25 | 10 | 0 |
| Weighting factors | — | 0,090 | 0,200 | 0,290 | 0,300 | 0,070 | 0,050 |
| Barometric pressure | kPa | 980 | 980 | 980 | 980 | 980 | 980 |
| Intake air temperature (1) | °C | 25,3 | 25,1 | 24,5 | 23,7 | 23,5 | 22,6 |
| Intake air relative humidity (1) | % | 19,8 | 19,8 | 20,6 | 21,5 | 21,9 | 23,2 |
| Intake air absolute humidity (1) | $G_{H20}/kg_{air}$ | 4,08 | 4,03 | 4,05 | 4,03 | 4,05 | 4,06 |
| CO dry | ppm | 3 681 | 3 465 | 2 541 | 2 365 | 3 086 | 1 817 |
| $NO_x$ wet | ppm | 85,4 | 49,2 | 24,3 | 5,8 | 2,9 | 1,2 |
| HC wet | ppm C1 | 91 | 92 | 77 | 78 | 119 | 186 |
| $CO_2$ dry | % Vol. | 1,038 | 0,814 | 0,649 | 0,457 | 0,330 | 0,208 |
| CO dry (background) | ppm | 3 | 3 | 3 | 2 | 2 | 3 |
| $NO_x$ wet (background) | ppm | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| HC wet (background) | ppm C1 | 6 | 6 | 5 | 6 | 6 | 4 |
| $CO_2$ dry (background) | % Vol. | 0,042 | 0,041 | 0,041 | 0,040 | 0,040 | 0,040 |

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Dil. exh. gas mass flow $G_{TOTW}$ | kg/h | 625,722 | 627,171 | 623,549 | 630,792 | 627,895 | 561,267 |
| Fuel H/C ratio α | — | 1,85 | 1,85 | 1,85 | 1,85 | 1,85 | 1,85 |
| Fuel O/C ratio β | | 0 | 0 | 0 | 0 | 0 | 0 |

([1]) Dilution air conditions equal to intake air conditions.

2.3.1. Dry/wet correction factor $k_w$

The dry/wet correction factor $k_w$ shall be calculated for converting dry CO and $CO_2$ measurements on a wet basis.

For the diluted exhaust gas:

$$k_w = k_{w,e,2} = \left( \frac{(1 - k_{w1})}{1 + \frac{\alpha \times \%\ CO_2\ [dry]}{200}} \right)$$

Where:

$$k_{w1} = \left( \frac{1{,}608 \times [H_d \times (1 - 1/DF) + H_a \times (1/DF)]}{1\,000 + 1{,}608 \times [H_d \times (1 - 1/DF) + H_a \times (1/DF)]} \right)$$

$$DF = \frac{13{,}4}{\%\ conc_{CO_2} + (ppm\ conc_{CO} + ppm\ conc_{HC}) \times 10^{-4}}$$

$$DF = \frac{13{,}4}{1{,}038 + (3\,681 + 91) \times 10^{-4}} = 9{,}465$$

$$k_{w1} = \left( \frac{1{,}608 \times [4{,}08 \times (1 - 1/9{,}465) + 4{,}08 \times (1/9{,}465)]}{1\,000 + 1{,}608 \times [4{,}08 \times (1 - 1/9{,}465) + 4{,}08 \times (1/9{,}465)]} \right) = 0{,}007$$

$$k_w = k_{w,e,2} = \left( \frac{(1 - 0{,}007)}{1 + \frac{1{,}85 \times 1{,}038}{200}} \right) = 0{,}984$$

$CO\ [wet] = CO\ [dry] \times k_w = 3\,681 \times 0{,}984 = 3\,623$ ppm

$CO_2[wet] = CO_2\ [dry] \times k_w = 1{,}038 \times 0{,}984 = 1{,}0219$ %

Table 19

CO and $CO_2$ wet values for the diluted exhaust gas according to test modes

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| DF | — | 9,465 | 11,454 | 14,707 | 19,100 | 20,612 | 32,788 |
| $k_{w1}$ | — | 0,007 | 0,006 | 0,006 | 0,006 | 0,006 | 0,006 |
| $k_w$ | — | 0,984 | 0,986 | 0,988 | 0,989 | 0,991 | 0,992 |
| CO wet | ppm | 3 623 | 3 417 | 2 510 | 2 340 | 3 057 | 1 802 |
| $CO_2$ wet | % | 1,0219 | 0,8028 | 0,6412 | 0,4524 | 0,3264 | 0,2066 |

For the dilution air:

$$k_{w,d} = 1 - k_{w1}$$

Where the factor $k_{w1}$ is the same as that already calculated for the diluted exhaust gas.

$k_{w,d} = 1 - 0{,}007 = 0{,}993$

$CO\ [wet] = CO\ [dry] \times k_w = 3 \times 0{,}993 = 3$ ppm

$CO_2\ [wet] = CO_2\ [dry] \times k_w = 0{,}042 \times 0{,}993 = 0{,}0421$ % Vol

Table 20

CO and $CO_2$ wet values for the dilution air according to test modes

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| $K_{w1}$ | — | 0,007 | 0,006 | 0,006 | 0,006 | 0,006 | 0,006 |
| $K_w$ | — | 0,993 | 0,994 | 0,994 | 0,994 | 0,994 | 0,994 |
| CO wet | ppm | 3 | 3 | 3 | 2 | 2 | 3 |
| $CO_2$ wet | % | 0,0421 | 0,0405 | 0,0403 | 0,0398 | 0,0394 | 0,0401 |

2.3.2. HC emissions

$$HC_{mass} = u \times conc_c \times G_{TOTW}$$

Where:

u = 0,000478 from Table 2

$conc_c = conc - conc_d \times (1 - 1/DF)$

$conc_c = 91 - 6 \times (1 - 1/9{,}465) = 86$ ppm

$HC_{mass} = 0{,}000478 \times 86 \times 625{,}722 = 25{,}666$ g/h

Table 21

HC emissions (g/h) according to test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $HC_{mass}$ | 25,666 | 25,993 | 21,607 | 21,850 | 34,074 | 48,963 |

2.3.3. $NO_x$ emissions

The factor $K_H$ for the correction of the $NO_x$ emissions shall be calculated from:

$K_H = 0{,}6272 + 44{,}030 \times 10^{-3} \times H_a - 0{,}862 \times 10^{-3} \times H_a^2$

$K_H = 0{,}6272 + 44{,}030 \times 10^{-3} \times 4{,}08 - 0{,}862 \times 10^{-3} \times (4{,}08)^2 = 0{,}79$

Table 22

Humidity correction factor $K_H$ of $NO_x$ emissions according to test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $K_H$ | 0,793 | 0,791 | 0,791 | 0,790 | 0,791 | 0,792 |

$$NO_{xmass} = u \times conc_c \times K_H \times G_{TOTW}$$

Where:

u = 0,001587 from Table 2

$conc_c = conc - conc_d \times (1 - 1/DF)$

$conc_c = 85 - 0 \times (1 - 1/9{,}465) = 85$ ppm

$NO_{xmass} = 0{,}001587 \times 85 \times 0{,}79 \times 625{,}722 = 67{,}168$ g/h

Table 23

$NO_x$ emissions (g/h) according to test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $NO_{xmass}$ | 67,168 | 38,721 | 19,012 | 4,621 | 2,319 | 0,811 |

2.3.4. $CO_2$ emissions

$$CO_{mass} = u \times conc_c \times G_{TOTW}$$

Where:

u = 0,000966 from Table 2

$conc_c = conc - conc_d \times (1 - 1/DF)$

$conc_c = 3\,622 - 3 \times (1 - 1/9{,}465) = 3\,620$ ppm

$CO_{mass} = 0{,}000966 \times 3\,620 \times 625{,}722 = 2\,188{,}001$ g/h

Table 24

CO emissions (g/h) according to test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $CO_{mass}$ | 2 188,001 | 2 068,760 | 1 510,187 | 1 424,792 | 1 853,109 | 975,435 |

2.3.5. $CO_2$ emissions

$$CO_{2mass} = u \times conc_c \times G_{TOTW}$$

Where:

u = 15,19 from Table 2

$conc_c = conc - conc_d \times (1 - 1/DF)$

$conc_c = 1{,}0219 - 0{,}0421 \times (1 - 1/9{,}465) = 0{,}9842$ % Vol

$CO_{2mass} = 15{,}19 \times 0{,}9842 \times 625{,}722 = 9\,354{,}488$ g/h

Table 25

$CO_2$ emissions (g/h) according to different test modes

| Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $CO_{2mass}$ | 9 354,488 | 7 295,794 | 5 717,531 | 3 973,503 | 2 756,113 | 1 430,229 |

2.3.6. Specific emissions

The specific emission (g/kWh) shall be calculated for all individual components:

$$\text{Individual gas} = \frac{\sum_{i=1}^{n}(Gas_{mass_i} \times WF_i)}{\sum_{i=1}^{n}(P_i \times WF_i)}$$

Table 26

Emissions (g/h) and weighting factors according to different test modes

| Mode | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| $HC_{mass}$ | g/h | 25,666 | 25,993 | 21,607 | 21,850 | 34,074 | 48,963 |
| $NO_{xmass}$ | g/h | 67,168 | 38,721 | 19,012 | 4,621 | 2,319 | 0,811 |
| $CO_{mass}$ | g/h | 2 188,001 | 2 068,760 | 1 510,187 | 1 424,792 | 1 853,109 | 975,435 |
| $CO_{2mass}$ | g/h | 9 354,488 | 7 295,794 | 5 717,531 | 3 973,503 | 2 756,113 | 1 430,229 |
| Power $P_i$ | kW | 13,15 | 9,81 | 6,52 | 3,25 | 1,28 | 0 |
| Weighting factors $WF_I$ | — | 0,090 | 0,200 | 0,290 | 0,300 | 0,070 | 0,050 |

$$HC = \frac{25{,}666\times0{,}090+25{,}993\times0{,}200+21{,}607\times0{,}290+21{,}850\times0{,}300+34{,}074\times0{,}070+48{,}963\times0{,}050}{13{,}15\times0{,}090+9{,}81\times0{,}200+6{,}52\times0{,}290+3{,}25\times0{,}300+1{,}28\times0{,}070+0\times0{,}050} = 4{,}12 \text{ g/kWh}$$

$$NO_x = \frac{67{,}168\times0{,}090+38{,}721\times0{,}200+19{,}012\times0{,}290+4{,}621\times0{,}300+2{,}319\times0{,}070+0{,}811\times0{,}050}{13{,}15\times0{,}090+9{,}81\times0{,}200+6{,}52\times0{,}290+3{,}25\times0{,}300+1{,}28\times0{,}070+0\times0{,}050} = 3{,}42 \text{ g/kWh}$$

$$CO = \frac{2\,188{,}001\times0{,}09+2\,068{,}760\times0{,}2+1\,510{,}187\times0{,}29+1\,424{,}792\times0{,}3+1\,853{,}109\times0{,}07+975{,}435\times0{,}05}{13{,}15\times0{,}090+9{,}81\times0{,}200+6{,}52\times0{,}290+3{,}25\times0{,}300+1{,}28\times0{,}070+0\times0{,}050} = 271{,}15 \text{ g/kWh}$$

$$CO_2 = \frac{9\,354{,}488\times0{,}09+7\,295{,}794\times0{,}2+5\,717{,}531\times0{,}29+3\,973{,}503\times0{,}3+2\,756{,}113\times0{,}07+1\,430{,}229\times0{,}05}{13{,}15\times0{,}090+9{,}81\times0{,}200+6{,}52\times0{,}290+3{,}25\times0{,}300+1{,}28\times0{,}070+0\times0{,}050} = 887{,}53 \text{ g/kWh}$$

*Appendix 4*

1. COMPLIANCE WITH EMISSION STANDARDS

This appendix shall apply to SI engines Stage II only.

1.1. The exhaust emission standards for Stage 2 engines in Annex I 4.2 apply to the emissions of the engines for their emission durability period EDP as determined in accordance with this Appendix.

1.2. For all Stage II engines, if, when properly tested according to the procedures in this Directive, all test engines representing an engine family have emissions which, when adjusted by multiplication by the deterioration factor (DF) laid down in this Appendix, are less than or equal to each Stage II emission standard (family emission limit (FEL), where applicable) for a given engine class, that family shall be considered to comply with the emission standards for that engine class. If any test engine representing an engine family has emissions which, when adjusted by multiplication by the deterioration factor laid down in this Appendix, are greater than any single emission standard (FEL, where applicable) for a given engine class, that family shall be considered not to comply with the emission standards for that engine class.

1.3. Small volume engine manufacturers may, optionally, take deterioration factors for HC + $NO_x$ and CO from Tables 1 or 2 in this section, or they may calculate deterioration factors for HC + $NO_x$ and CO according to the process described in Section 1.3.1. For technologies not covered by Tables 1 and 2 in this section, the manufacturer must use the process described in Section 1.4 in this Appendix.

Table 1

Handheld engine HC + $NO_x$ and CO assigned deterioration factors for small volume manufacturer

| Engine class | 2-stroke engines | | 4-stroke engines | | Engines with aftertreatment |
|---|---|---|---|---|---|
| | HC + $NO_x$ | CO | HC + $NO_x$ | CO | |
| SH:1 | 1,1 | 1,1 | 1,5 | 1,1 | DFs must be calculated using the formula in Section 1.3.1 |
| SH:2 | 1,1 | 1,1 | 1,5 | 1,1 | |
| SH:3 | 1,1 | 1,1 | 1,5 | 1,1 | |

Table 2

Non-handheld engine HC + $NO_x$ and CO assigned deterioration factors for small volume manufacturers

| Engine Class | Side valve engines | | Overhead valve engines | | Engines with aftertreatment |
|---|---|---|---|---|---|
| | HC + $NO_x$ | CO | HC + $NO_x$ | CO | |
| SN:1 | 2,1 | 1,1 | 1,5 | 1,1 | DFs must be calculated using the formula in Section 1.3.1 |
| SN:2 | 2,1 | 1,1 | 1,5 | 1,1 | |
| SN:3 | 2,1 | 1,1 | 1,5 | 1,1 | |
| SN:4 | 1,6 | 1,1 | 1,4 | 1,1 | |

1.3.1. Formula for calculating deterioration factors for engines with aftertreatment:

$$DF = [(NE * EDF) - (CC * F)]/(NE - CC)$$

Where:

DF = deterioration factor

NE = new engine emission levels prior to the catalyst (g/kWh)

EDF = deterioration factor for engines without catalyst as shown in Table 1

CC = amount converted at 0 hours in g/kWh

F = 0,8 for HC and 0,0 for $NO_x$ for all classes of engines

F = 0,8 for CO for all classes of engines

1.4. Manufacturers shall obtain an assigned DF or calculate a DF, as appropriate, for each regulated pollutant for all Stage 2 engine families. Such DFs shall be used for type-approval and production line testing.

1.4.1. For engines not using assigned DFs from Tables 1 or 2 of this section, DFs shall be determined as follow.

1.4.1.1. On at least one test engine representing the configuration chosen to be the most likely to exceed HC + $NO_x$ emission standards, (FELs where applicable), and constructed to be representative of production engines, conduct (full) test procedure emission testing as described in this Directive after the number of hours representing stabilised emissions.

1.4.1.2. If more than one engine is tested, average the results and round to the same number of decimal places contained in the applicable standard, expressed to one additional significant figure.

1.4.1.3. Conduct such emission testing again following ageing of the engine. The ageing procedure should be designed to allow the manufacturer to appropriately predict the in-use emission deterioration expected over the durability period of the engine, taking into account the type of wear and other deterioration mechanisms expected under typical consumer use which could affect emissions performance. If more than one engine is tested, average the results and round to the same number of decimal places contained in the applicable standard, expressed to one additional significant figure.

1.4.1.4. Divide the emissions at the end of the durability period (average emissions, if applicable) for each regulated pollutant by the stabilised emissions (average emissions, if applicable) and round to two significant figures. The resulting number shall be the DF, unless it is less than 1,00, in which case the DF shall be 1,0.

1.4.1.5. At the manufacturer's option additional emission test points can be scheduled between the stabilised emission test point and the emission durability period. If intermediate tests are scheduled, the test points must be evenly spaced over the EDP (plus or minus two hours) and one such test point shall be at one-half of full EDP (plus or minus two hours).

For each pollutant HC + $NO_x$ and CO, a straight line must be fitted to the data points treating the initial test as occurring at hour zero, and using the method of least-squares. The deterioration factor is the calculated emissions at the end of the durability period divided by the calculated emissions at zero hours.

1.4.1.6. Calculated deterioration factors may cover families in addition to the one on which they were generated if the manufacturer submits a justification acceptable to the national type-approval authority in advance of type-approval that the affected engine families can be reasonably expected to have similar emission deterioration characteristic based on the design and technology used.

A non-exclusive list of design and technology groupings is given below:

— conventional 2-stroke engines without aftertreatment system

— conventional 2-stroke engines with a ceramic catalyst of the same active material and loading, and the same number of cells per $cm^2$

— conventional 2-stroke engines with a metallic catalyst of the same active material and loading, same substrate and the same number of cells per $cm^2$

— 2-stroke engines provided with a stratified scavenging system

— 4-stroke engines with catalyst (defined as above) with same valve technology and identical lubrication system

— 4-stroke engines without catalyst with the same valve technology and identical lubrication system.

2. EMISSION DURABILITY PERIODS FOR STAGE 2 ENGINES

2.1. Manufacturers shall declare the applicable EDP category for each engine family at the time of type-approval. Such category shall be the category which most closely approximates the expected useful lives of the equipment into which the engines are expected to be installed as determined by the engine manufacturer. Manufacturers shall retain data appropriate to support their choice of EDP category for each engine family. Such data shall be supplied to the approval authority on request.

2.1.1. For handheld engines: manufacturers shall select a EDP category from Table 1.

Table 1

EDP categories for handheld engines (hours)

| Category | 1 | 2 | 3 |
|---|---|---|---|
| Class SH:1 | 50 | 125 | 300 |
| Class SH:2 | 50 | 125 | 300 |
| Class SH:3 | 50 | 125 | 300 |

2.1.2. For non-handheld engines: manufacturers shall select an EDP category from Table 2.

Table 2

EDP categories for non-handheld engines (hours)

| Category | 1 | 2 | 3 |
|---|---|---|---|
| Class SN:1 | 50 | 125 | 300 |
| Class SN:2 | 125 | 250 | 500 |
| Class SN:3 | 125 | 250 | 500 |
| Class SN:4 | 250 | 500 | 1 000 |

2.1.3. The manufacturer must satisfy the approval authority that the declared useful life is appropriate. Data to support a manufacturer's choice of EDP category, for a given engine family, may include but are not limited to:

— surveys of the life spans of the equipment in which the subject engines are installed,

— engineering evaluations of field aged engines to ascertain when engine performance deteriorates to the point where usefulness and/or reliability is impacted to a degree sufficient to necessitate overhaul or replacement,

— warranty statements and warranty periods,

— marketing materials regarding engine life,

— failure reports from engine customers, and

— engineering evaluations of the durability, in hours, of specific engine technologies, engine materials or engine designs.'

5. Annex IV shall become Annex V and shall be amended as follows:

The current headings shall be replaced by the following:

**'TECHNICAL CHARACTERISTICS OF REFERENCE FUEL PRESCRIBED FOR APPROVAL TESTS AND TO VERIFY CONFORMITY OF PRODUCTION**

NON-ROAD MOBILE MACHINERY REFERENCE FUEL FOR CI ENGINES [1]'.

In the table in the line on 'Neutralisation' the word 'Minimum' in column 2 shall be replaced by the word 'Maximum'. The following new table and new footnotes shall be added:

'NON-ROAD MOBILE MACHINERY REFERENCE FUEL FOR SI ENGINES

Note: The fuel for 2-stroke engines is a blend of lubricant oil and the petrol specified below. The fuel/oil mixture ratio must be the ratio which is recommended by the manufacturer as specified in Annex IV, Section 2.7.

| Parameter | Unit | Limits [1] | | Test Method | Publication |
|---|---|---|---|---|---|
| | | Minimum | Maximum | | |
| Research octane number, RON | | 95,0 | — | EN 25164 | 1993 |
| Motor octane number, MON | | 85,0 | — | EN 25163 | 1993 |
| Density at 15 °C | kg/m$^3$ | 748 | 762 | ISO 3675 | 1995 |
| Reid vapour pressure | kPa | 56,0 | 60,0 | EN 12 | 1993 |
| Distillation | | | | | |
| Initial boiling point | °C | 24 | 40 | EN-ISO 3405 | 1988 |
| — evaporated at 100 °C | % v/v | 49,0 | 57,0 | EN-ISO 3405 | 1988 |
| — evaporated at 150 °C | % v/v | 81,0 | 87,0 | EN-ISO 3405 | 1988 |
| — final boiling point | °C | 190 | 215 | EN-ISO 3405 | 1988 |
| Residue | % | — | 2 | EN-ISO 3405 | 1988 |
| Hydrocarbon analysis | | | | | |
| — olefins | % v/v | — | 10 | ASTM D 1319 | 1995 |
| — aromatics | % v/v | 28,0 | 40,0 | ASTM D 1319 | 1995 |
| — benzene | % v/v | — | 1,0 | EN 12177 | 1998 |
| — saturates | % v/v | — | balance | ASTM D 1319 | 1995 |
| Carbon/hydrogen ratio | | report | report | | |
| Oxidation stability [2] | min | 480 | — | EN-ISO 7536 | 1996 |
| Oxygen content | % m/m | — | 2,3 | EN 1601 | 1997 |
| Existent gum | mg/ml | — | 0,04 | EN-ISO 6246 | 1997 |
| Sulphur content | mg/kg | — | 100 | EN-ISO 14596 | 1998 |
| Copper corrosion at 50 °C | | — | 1 | EN-ISO 2160 | 1995 |
| Lead content | g/l | — | 0,005 | EN 237 | 1996 |
| Phosphorus content | g/l | — | 0,0013 | ASTM D 3231 | 1994 |

[1] The values quoted in the specification are "true values". In establishment of their limit values the terms of ISO 4259 "Petroleum products — Determination and application of precision data in relation to methods of test" have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility). Notwithstanding this measure, which is necessary for statistical reasons, the manufacturer of fuels should nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify the question as to whether a fuel meets the requirements of the specifications, the terms of ISO 4259 should be applied.

[2] The fuel may contain oxidation inhibitors and metal deactivators normally used to stabilise refinery gasoline streams, but detergent/dispersive additives and solvent oils must not be added.'

6. Annex V shall become Annex VI.

7. Annex VI shall become Annex VII and shall be amended as follows:

(a) Appendix 1 shall be amended as follows:

— The heading shall be replaced by the following:

*'Appendix 1*

**TEST RESULTS FOR COMPRESSION IGNITION ENGINES,'**

— Section 1.3.2 shall be replaced by the following:

'1.3.2. Power absorbed at indicated engine speed (as specified by the manufacturer):

| Equipment | Power $P_{AE}$ (kW) absorbed at various engine speeds (1), taking into account Appendix 3 of this Annex | |
|---|---|---|
| | Intermediate (if applicable) | Rated |
| | | |
| | | |
| | | |
| | | |
| Total: | | |

(1) Must not be greater than 10 % of the power measured during the test.'

— Section 1.4.2. shall be replaced by the following:

'1.4.2. Engine power (1)

| Condition | Power setting (kW) at various engine speeds | |
|---|---|---|
| | Intermediate (if applicable) | Rated |
| Maximum power measured on test ($P_M$) (kW) (a) | | |
| Total power absorbed by engine driven equipment as per Section 1.3.2 of this Appendix, or Section 2.8 of Annex III ($P_{AE}$) (kW) (b) | | |
| Net engine power as specified in Section 2.4 of Annex I (kW) (c) | | |
| c = a + b | | |

(1) Uncorrected power measured in accordance with the provisions of Section 2.4 of Annex I.'

— Section 1.5 shall be amended as follows:

'1.5. Emission levels

1.5.1. Dynamometer setting (kW)

| Percent load | Dynamometer setting (kW) at various engine speeds | |
|---|---|---|
| | Intermediate (if applicable) | Rated |
| 10 (if applicable) | | |
| 25 (if applicable) | | |
| 50 | | |
| 75 | | |
| 100 | | |

1.5.2. Emission results on the test cycle:'

(b) The following Appendix shall be added:

*'Appendix 2*

**TEST RESULTS FOR SPARK IGNITION ENGINES**

1. INFORMATION CONCERNING THE CONDUCT OF THE TEST(S) (1):

1.1. Reference fuel used for test

1.1.1. Octane number

1.1.2. State percentage of oil in mixture when lubricant and petrol are mixed as in the case of 2-stroke engines

1.1.3. Density of petrol for 4-stroke engines and petrol/oil mixture for 2-stroke engines

1.2. Lubricant

1.2.1. Make(s)

1.2.2. Type(s)

1.3. Engine driven equipment (if applicable)

1.3.1. Enumeration and identifying details

1.3.2. Power absorbed at indicated engine speed (as specified by the manufacturer)

| Equipment | Power $P_{AE}$ (kW) absorbed at various engine speeds (1), taking into account Appendix 3 of this Annex | |
|---|---|---|
| | Intermediate (if applicable) | Rated |
| | | |
| | | |
| | | |
| | | |
| Total: | | |

(1) Must not be greater than 10 % of the power measured during the test.

1.4. Engine performance

1.4.1. Engine speeds:

Idle: $min^{-1}$

Intermediate: $min^{-1}$

Rated: $min^{-1}$

1.4.2. Engine power (2)

| Condition | Power setting (kW) at various engine speeds | |
|---|---|---|
| | Intermediate (if applicable) | Rated |
| Maximum power measured on test ($P_M$) (kW) (a) | | |
| Total power absorbed by engine driven equipment as per Section 1.3.2 of this Appendix, or Section 2.8 of Annex III ($P_{AE}$) (kW) (b) | | |
| Net engine power as specified in Section 2.4 of Annex I (kW) (c) | | |
| c = a + b | | |

1.5. Emission levels

1.5.1. Dynamometer setting (kW)

| Percent load | Dynamometer setting (kW) at various engine speeds | |
|---|---|---|
| | Intermediate (if applicable) | Rated (if applicable) |
| 10 (if applicable) | | |
| 25 (if applicable) | | |
| 50 | | |
| 75 | | |
| 100 | | |

1.5.2. Emission results on the test cycle:

CO: g/kWh

HC: g/kWh

$NO_x$: g/kWh

(1) In case of several parent engines, to be indicated for each of them.
(2) Uncorrected power measured in accordance with the provisions of Section 2.4 of Annex I.'

(c) The following Appendix 3 shall be added:

'*Appendix 3*

**EQUIPMENT AND AUXILIARIES TO BE INSTALLED FOR THE TEST TO DETERMINE ENGINE POWER**

| Number | Equipment and auxiliaries | Fitted for emission test |
|---|---|---|
| 1 | Inlet system | |
| | Inlet manifold | Yes, standard production equipment |
| | Crankcase emission control system | Yes, standard production equipment |
| | Control devices for dual induction inlet manifold system | Yes, standard production equipment |
| | Air flow meter | Yes, standard production equipment |
| | Air inlet duct work | Yes (a) |
| | Air filter | Yes (a) |
| | Inlet silencer | Yes (a) |
| | Speed-limiting device | Yes (a) |

| Number | Equipment and auxiliaries | Fitted for emission test |
|---|---|---|
| 2 | Induction-heating device of inlet manifold | Yes, standard production equipment. If possible to be set in the most favourable condition |
| 3 | Exhaust system | |
| | Exhaust purifier | Yes, standard production equipment |
| | Exhaust manifold | Yes, standard production equipment |
| | Connecting pipes | Yes ([b]) |
| | Silencer | Yes ([b]) |
| | Tail pipe | Yes ([b]) |
| | Exhaust brake | No ([c]) |
| | Pressure charging device | Yes, standard production equipment |
| 4 | Fuel supply pump | Yes, standard production equipment ([d]) |
| 5 | Carburation equipment | |
| | Carburettor | Yes, standard production equipment |
| | Electronic control system, air flow meter, etc. | Yes, standard production equipment |
| | Equipment for gas engines | |
| | Pressure reducer | Yes, standard production equipment |
| | Evaporator | Yes, standard production equipment |
| | Mixer | Yes, standard production equipment |
| 6 | Fuel injection equipment (petrol and diesel) | |
| | Prefilter | Yes, standard production or test bed equipment |
| | Filter | Yes, standard production or test bed equipment |
| | Pump | Yes, standard production equipment |
| | High-pressure pipe | Yes, standard production equipment |
| | Injector | Yes, standard production equipment |
| | Air inlet valve | Yes, standard production equipment ([e]) |
| | Electronic control system, air flow meter, etc. | Yes, standard production equipment |
| | Governor/control system | Yes, standard production equipment |
| | Automatic full-load stop for the control rack depending on atmospheric conditions | Yes, standard production equipment |
| 7 | Liquid-cooling equipment | |
| | Radiator | No |
| | Fan | No |
| | Fan cowl | No |
| | Water pump | Yes, standard production equipment ([f]) |
| | Thermostat | Yes, standard production equipment ([g]) |
| 8 | Air cooling | |
| | Cowl | No ([h]) |
| | Fan or blower | No ([h]) |
| | Temperature-regulating device | No |

| Number | Equipment and auxiliaries | Fitted for emission test |
|---|---|---|
| 9 | Electrical equipment | |
| | Generator | Yes, standard production equipment ([i]) |
| | Spark distribution system | Yes, standard production equipment |
| | Coil or coils | Yes, standard production equipment |
| | Wiring | Yes, standard production equipment |
| | Spark plugs | Yes, standard production equipment |
| | Electronic control system including knock sensor/spark retard system | Yes, standard production equipment |
| 10 | Pressure charging equipment | |
| | Compressor driven either directly by the engine and/or by the exhaust gases | Yes, standard production equipment |
| | Charge air cooler | Yes, standard production or test bed equipment ([j]) ([k]) |
| | Coolant pump or fan (engine-driven) | No ([h]) |
| | Coolant flow control device | Yes, standard production equipment |
| 11 | Auxiliary test-bed fan | Yes, if necessary |
| 12 | Anti-pollution device | Yes, standard production equipment ([l]) |
| 13 | Starting equipment | Test bed equipment |
| 14 | Lubricating oil pump | Yes, standard production equipment |

([a]) The complete inlet system shall be fitted as provided for the intended application:
where there is a risk of an appreciable effect on the engine power;
in the case of naturally aspirated spark ignition engines;
when the manufacturer requests that this should be done.
In other cases, an equivalent system may be used and a check should be made to ascertain that the intake pressure does not differ by more than 100 Pa from the upper limit specified by the manufacturer for a clean air filter.

([b]) The complete exhaust system shall be fitted as provided for the intended application:
where there is a risk of an appreciable effect on the engine power;
in the case of naturally aspirated spark ignition engines;
when the manufacturer requests that this should be done.
In other cases, an equivalent system may be installed provided the pressure measured does not differ by more than 1 000 Pa from the upper limit specified by the manufacturer.

([c]) If an exhaust brake is incorporated in the engine, the throttle valve shall be fixed in the fully open position.

([d]) The fuel feed pressure may be adjusted, if necessary, to reproduce the pressure existing in the particular engine application (particularly when a "fuel return" system is used).

([e]) The air intake valve is the control valve for the pneumatic governor of the injection pump. The governor or the fuel injection equipment may contain other devices which may affect the amount of injected fuel.

([f]) The cooling-liquid circulation shall be operated by the engine water pump only. Cooling of the liquid may be produced by an external circuit, such that the pressure loss of this circuit and the pressure at the pump inlet remain substantially the same as those of the engine cooling system.

([g]) The thermostat may be fixed in the fully open position.

([h]) When the cooling fan or blower is fitted for the test, the power absorbed shall be added to the results, except for cooling fans of air cooled engines directly fitted on the crankshaft. The fan or blower power shall be determined at the speeds used for the test either by calculation from standard characteristics or by practical tests.

([i]) Minimum power of the generator: the electrical power of the generator shall be limited to that necessary for operation of accessories which are indispensable for engine operation. If the connection of a battery is necessary, a fully charged battery in good condition shall be used.

([j]) Charge air-cooled engines shall be tested with charge air cooling, whether liquid- or air-cooled, but if the manufacturer prefers, a test bench system may replace the air cooler. In either case, the measurement of power at each speed shall be made with the maximum pressure drop and the minimum temperature drop of the engine air across the charge air cooler on the test bench system as specified by the manufacturer.

([k]) These may include, for example, exhaust-gas recirculation (EGR)-system, catalytic converter, thermal reactor, secondary air-supply system and fuel evaporation protecting system.

([l]) The power for electrical or other starting systems shall be provided from the test bed.'

8. Annexes VII to X shall become Annexes VIII to XI.

9. The following Annex XII shall be added:

'*ANNEX XII*

**RECOGNITION OF ALTERNATIVE TYPE-APPROVALS**

1. The following type-approvals and, where applicable, the pertaining approval marks are recognised as being equivalent to an approval to this Directive for engines of categories A, B and C as defined in Article 9, Section 2;

1.1. Directive 2000/25/EC.

1.2. Type-approvals to Directive 88/77/EEC, complying with the requirements of stage A or B regarding Article 2 and Annex I, Section 6.2.1 of Directive 88/77/EEC as amended by Directive 91/542/EEC, or UN-ECE Regulation 49.02 series of amendments corrigenda I/2.

1.3. Certificates of type-approvals according to UN-ECE Regulation No 96.

2. For engines categories D, E, F and G (Stage II) as defined in Article 9, Section 3, the following type-approvals and, where applicable, the pertaining approval marks are recognised as being equivalent to an approval to this Directive;

2.1. Directive 2000/25/EC, Stage II approvals.

2.2. Type-approvals to Directive 88/77/EEC as amended by Directive 99/96/EC which are in compliance with stages A, B1, B2 or C provided for in Article 2 and Section 6.2.1 of Annex I.

2.3. UN-ECE Regulation 49.03 series of amendments.

2.4 UN-ECE Regulation 96 stage B approvals according to paragraph 5.2.1 of the 01 series of amendments of Regulation 96.'

## STATEMENT OF THE COUNCIL'S REASONS

### I. INTRODUCTION

1. On 19 December 2000, the Commission presented to the Council its proposal for a Directive of the European Parliament and of the Council amending Directive 97/68/EC on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.

2. The European Parliament gave its opinion on 2 October 2001.

The Economic and Social Committee gave its opinion on 11 July 2001.

3. On 25 March 2002, the Council adopted its Common Position in accordance with Article 251(2) of the Treaty.

### II. OBJECTIVE

The objective of the proposal is to extend the scope of the current Directive on emissions from compression ignition engines to be used in non-road mobile machinery (Directive 97/68/EC) to cover small spark ignition engines also. This will contribute to achieving ambient air quality targets especially concerning formation of ozone.

### III. ANALYSIS OF THE COMMON POSITION

#### 1. General

The Council made a number of changes to the Commission proposal; the major change involved the deletion of those parts of the proposal which introduced an 'average and banking [. . .] system' for emissions.

The Commission proposed the introduction of this system to follow the system used in the USA, however, the Council did not feel that this Directive was the appropriate place to introduce such a system. Therefore references to it have been deleted throughout the proposal. Without this system some alternative form of flexibility is required to accommodate those machines which, due to lack of current technical know-how, are unable to meet the relevant emission limits. The solution found (detailed in new Article 14a) requires the Commission to study possible technical difficulties in complying with the Stage II requirements for certain uses of engines and if appropriate suggest relevant derogations for such engines. The report of the study, with appropriate proposals, must be submitted by 31 December 2003.

Other minor changes were also made to the exemptions for small volume engine manufacturers and some of the definitions. A technical working group studied the Annexes to the proposal and a number of minor technical changes proposed by them were incorporated into the Annexes.

The Commission has accepted the Common Position agreed by the Council.

#### 2. European Parliament Amendments

In its plenary vote on 2 October 2001, Parliament adopted 21 amendments to the proposal. Seventeen of these have been incorporated, verbatim, and one (amendment 30) with a small addition, into the Council's Common Position.

(a) The three amendments which have not been incorporated are as follows:

*Amendment 29* which proposed that all chainsaws and a list of other handheld machinery should be completely exempt from Stages I and II of the Directive was unacceptable to both Council and Commission.

*Amendment 22* related to the use of labelling and economic incentives to encourage early compliance and *amendment 18* proposed a new recital on economic incentives. The Council felt that these incentives could already be provided without making explicit reference in the proposal, which could, in fact, narrow the scope for the potential use of such incentives.

(b) The 18 amendments, which Council has incorporated into its Common Position, can be grouped as follows:

*amendments 2, 3, 6, 7, 8, 12, 15 and 17* concern the deletion of the proposed averaging and banking system, which Council also wished to delete;

*amendments 19 and 20* are clarifications to definitions in Article 2;

*amendment 23* clarifies the application of the exemption for small volume engine producers;

*amendments 21, 24 and 27* simplify the system of reference to type-approvals by specifying them in an Annex;

*amendment 25* requires Member States to implement the Directive by 18 months after the date of the entry into force of the Directive;

*amendment 26* introduces a new Article 2a which requires the Commission to submit a report to Council and the European Parliament on the potential costs and benefits and feasibility of reducing particulate emissions and emissions from certain recreational vehicles; small compression ignition engines and locomotive compression ignition engines;

*amendment 28* brings forward the proposed dates for compliance with Stage II for engine classes SH1, SH2 and SN3 to 1 August 2007 and for engine class SH3 to 1 August 2008, and

*amendment 30* provides, in new Article 14a, for the flexibility mentioned above (in Section III.(1), which is required given that the average, banking and trading system proposed by the Commission is deleted. In the Common Position the proposed new Article 14a has been slightly modified by the addition of the words 'in particular, professional use, multipositional, handheld engines'. The aim of this addition is to specify more clearly the type of machinery which should be studied. The Commission also made a declaration listing the types of machinery it is likely to study, this list includes all those machines listed in amendment 29, which was rejected by the Council as too wide a derogation.

## IV. **CONCLUSIONS**

The Council considers that its Common Position takes into account, almost entirely, the opinion of the European Parliament in first reading and represents a balanced solution for the amended directive. While ensuring the environmental benefit to be derived from the new limits, it also provides a practical solution for those machines which cannot, for the moment, meet the requirements. The solution used, which requires recommendations from the Commission by the end of 2003, also provides a degree of certainty for the industry in meeting its environmental obligations.

# COMMON POSITION (EC) No 36/2002

## adopted by the Council on 25 March 2002

## with a view to adopting Regulation (EC) No .../2002 of the European Parliament and of the Council of ... amending Council Regulation (EEC) No 95/93 on common rules for the allocation of slots at Community airports

(2002/C 145 E/03)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 80(2) thereof,

Having regard to the proposal from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

Following consultation of the Committee of the Regions,

Acting in accordance with the procedure laid down in Article 251 of the Treaty [3],

Whereas:

(1) The terrorist attacks of 11 September 2001 in the United States and the political developments that followed those events seriously affected the air transport operations of air carriers and resulted in a significant drop in demand during the remainder of the summer 2001 and winter 2001/2002 scheduling seasons.

(2) In order to make sure that the non-utilisation of slots allocated for those seasons does not cause operators to lose their entitlement to those slots, it appears necessary to provide clearly and unambiguously that those scheduling seasons were adversely affected by the terrorist attacks of 11 September 2001.

(3) Council Regulation (EEC) No 95/93 of 18 January 1993 on common rules for the allocation of slots at Community airports [4] should therefore be accordingly amended,

HAVE ADOPTED THIS REGULATION:

*Article 1*

The following Article shall be inserted in Council Regulation (EEC) No 95/93:

'*Article 10a*

**The events of 11 September 2001**

For the purposes of Article 10(3), coordinators shall accept that air carriers are entitled to the same series of slots during summer scheduling season 2002 and winter scheduling season 2002 to 2003 as had been allocated to them on the date of September 11 2001 for the summer scheduling season 2001 and the winter scheduling season 2001 to 2002 respectively.'

*Article 2*

This Regulation shall enter into force on the day following its publication in the *Official Journal of the European Communities*,

It shall apply from ...

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

Done at ...

*For the European Parliament*
*The President*

*For the Council*
*The President*

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[1] OJ C 270 E, 25.9.2001, p. 131.

[2] Not yet published in the Official Journal.

[3] Opinion of the European Parliament of 6 February 2002 (not yet published in the Official Journal), Council Common Position of 25 March 2002 and Decision of the European Parliament of ... (not yet published in the Official Journal).

[4] OJ L 14, 22.1.1993, p. 1.

## STATEMENT OF THE COUNCIL'S REASONS

1. On 15 January 2002 the Commission submitted to the Council its proposal for a Regulation of the European Parliament and of the Council amending Council Regulation (EEC) No 95/93 of 18 January 1993 on common rules for the allocation of slots at Community airports. This proposal follows on from the events of 11 September 2001 and aims to allow air carriers to maintain, for the summer season 2002 and the winter season 2002 to 2003, the slots allocated to them on 11 September 2001. The proposal is based on Article 80(2) of the EC Treaty and falls under the co-decision procedure provided for in Article 251 of the Treaty.

   The Economic and Social Committee delivered its opinion on 21 March 2002 and the Committee of the Regions dispensed with delivering its opinion on this matter.

   The European Parliament delivered its opinion on 6 February 2002 [1].

   On 25 March 2002 the Council adopted its Common Position pursuant to Article 251(2) of the Treaty.

2. The Council fully agreed with the Commission's approach. However, whilst examining the proposal, it noted that it could not accept the amendment proposed by the European Parliament, which aimed to introduce an Article 10b. It also made the following two amendments which are not of major substantive significance:

   — deletion of the first sentence of Article 10a of the proposal, given that reference is made to the terrorist attacks in the recitals,

   — maintenance of the date of 11 September 2001 as the reference date for the scheduling of slots.

[1] 5961/02 CODEC 149 Aviation 17.

# COMMON POSITION (EC) No 37/2002

## adopted by the Council on 15 April 2002

## with a view to adopting Directive 2002/. . ./EC of the European Parliament and of the Council of . . . amending Directive 98/70/EC relating to the quality of petrol and diesel fuels

(2002/C 145 E/04)

**(Text with EEA relevance)**

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 95 thereof,

Having regard to the proposal from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

After consultation of the Committee of the Regions,

Acting in accordance with the procedure laid down in Article 251 of the Treaty [3],

Whereas:

(1) Directive 98/70/EC [4] lays down the environmental specifications for market fuels.

(2) Article 95 of the Treaty provides that Commission proposals having as their object the establishment and functioning of the internal market and concerning, *inter alia*, health and environmental protection, will take as a base a high level of protection and that the European Parliament and the Council will also seek to achieve this objective.

(3) A revision of Directive 98/70/EC is foreseen in order to meet the requirements of Community air quality standards and related objectives and in order to incorporate additional specifications to complement those mandatory specifications already laid down in Annex III and Annex IV to the Directive.

(4) A reduction of the sulphur content of petrol and diesel fuels has been identified as a means of contributing to the achievement of those objectives.

(5) The adverse effect of sulphur in petrol and diesel fuels on the effectiveness of catalytic exhaust gas after-treatment technologies is well established for on-road vehicles and increasingly in the case of non-road mobile machinery.

(6) Road vehicles are increasingly reliant on catalytic after-treatment devices to attain the emissions limits laid down in Council Directive 70/220/EEC of 20 March 1970 on the approximation of the laws of the Member States on measures to be taken against air pollution by emissions from motor vehicles [5] and Council Directive 88/77/EEC of 3 December 1987 on the approximation of the laws of the Member States relating to the measures to be taken against the emission of gaseous and particulate pollutants from compression ignition engines for use in vehicles, and the emission of gaseous pollutants from positive ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles [6]. Accordingly a reduction in the sulphur content of petrol and diesel fuels is likely to have a larger impact on exhaust emissions than changes to the other fuel parameters.

(7) The introduction of fuels with a maximum sulphur content of 10 mg/kg will improve the fuel efficiency attainable with new, emerging vehicle technologies and should be examined in the case of non-road mobile machinery and should lead to significant reductions in emissions of conventional air pollutants when used in existing vehicles. These benefits will compensate for the increased emissions of $CO_2$ associated with the production of lower sulphur petrol and diesel fuels.

(8) It is therefore appropriate to lay down measures ensuring the introduction and availability of fuels with a maximum sulphur content of 10 mg/kg. In this regard fiscal incentives have been shown to be effective in promoting the early introduction of higher quality fuels according to national needs and priorities and to shorten the transition period where two different qualities are distributed in the market.

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[1] OJ C 213 E, 31.7.2001, p. 255.

[2] OJ C 36, 8.2.2002, p. 115.

[3] Opinion of the European Parliament of 29 November 2001 (not yet published in the Official Journal), Council Common Position of 15 April 2002 and Decision of the European Parliament of . . . (not yet published in the Official Journal).

[4] OJ L 350, 28.12.1998, p. 58. Directive as last amended by Commission Directive 2000/71/EC (OJ L 287, 14.11.2000, p. 46).

[5] OJ L 76, 6.4.1970, p. 1. Directive as last amended by Directive 2001/100/EC of the European Parliament and of the Council (OJ L 16, 18.1.2002, p. 32).

[6] OJ L 36, 9.2.1988, p. 33. Directive as last amended by Commission Directive 2001/27/EC (OJ L 107, 18.4.2001, p. 10).

(9) The widespread availability of fuels with a maximum sulphur content of 10 mg/kg will provide a basis for the automobile manufacturers to make significant additional progress towards improving the fuel efficiency of new vehicles. The potential contribution of fuels with a maximum sulphur content of 10 mg/kg towards the attainment of the Community's target of 120 g/km for the average $CO_2$ emissions of the new car fleet will be assessed when the current environmental commitments with the automobile manufacturers are reviewed in 2003.

(10) It is necessary to ensure that sufficient quantities of petrol and diesel fuels with a maximum sulphur content of 10 mg/kg are available from 1 January 2005 on an appropriate geographic basis in order to permit the free circulation of new vehicles requiring these fuels whilst ensuring that $CO_2$ emissions reductions from new vehicles outweigh those additional emissions associated with the production of these fuels.

(11) The complete penetration of petrol and diesel fuels with a maximum sulphur content of 10 mg/kg should be provided for from 1 January 2009 in order to allow the fuel manufacturing industry enough time to make the necessary investments to adapt its production plans. In addition, the full introduction of petrol and diesel fuels with a maximum sulphur content of 10 mg/kg from 1 January 2009 will reduce emissions of conventional pollutants from the existing fleet of vehicles leading to an improvement in air quality, whilst ensuring that there is no overall increase in greenhouse gas emissions. In this context it will be necessary to confirm this date in the case of diesel fuels no later than 31 December 2005.

(12) In order to protect human health and/or the environment in specific agglomerations or in specific ecologically or environmentally sensitive areas with special pollution problems, Member States should be permitted, subject to a procedure established in this Directive, to require that fuels may be marketed only if they comply with more stringent environmental specifications, related to pollutants of concern, than established under this Directive. This procedure is a derogation from the information procedure laid down in Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on information society services [1].

(13) The emissions from engines installed in non-road mobile machinery and agricultural and forestry tractors must comply with the limits stipulated in Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery [2] and in Directive 2000/25/EC of the European Parliament and of the Council of 22 May 2000 on action to be taken against the emission of gaseous and particulate pollutants by engines intended to power agricultural or forestry tractors and amending Council Directive 74/150/EEC [3]. Attainment of these emissions limits will become increasingly dependent on the quality of the gas oils used by these engines and so it is important to include a definition for such fuels in Directive 98/70/EC.

(14) It is appropriate to provide for a uniform system of fuel quality monitoring or national systems that ensure results of equivalent confidence and for systems of reporting in order to assess compliance with the mandated environmental fuel quality specifications.

(15) A procedure should be laid down for updating the measurement methods used to ensure compliance with the mandated fuel quality specifications.

(16) The measures necessary for the implementation of Directive 98/70/EC should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down procedures for the exercise of implementing powers conferred upon the Commission [4].

(17) Provision should be made for a review of the provisions in Directive 98/70/EC in order to take account of new Community air quality legislation and related environmental objectives, such as the need to encourage alternative fuels, including biofuels, the development of new pollution abatement technologies and the impact of metallic additives and other relevant issues on their performance and to confirm, or otherwise, the date for full introduction of diesel fuels with a maximum sulphur content of 10 mg/kg in order to ensure that there is no overall increase in emissions of greenhouse gases.

(18) A comprehensive review of alternative fuels, including bio-fuels, should be undertaken, including the discussion of the need for specific legislation.

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[1] OJ L 204, 21.7.1998, p. 37. Directive as amended by Directive 98/48/EC (OJ L 217, 5.8.1998, p. 18).

[2] OJ L 59, 27.2.1998, p. 1. Directive as amended by Commission Directive 2001/63/EC (OJ L 227, 23.8.2001, p. 41).

[3] OJ L 173, 12.7.2000, p. 1.

[4] OJ L 184, 17.7.1999, p. 23.

(19) The Member States should lay down rules on penalties applicable to infringements of the provisions of Directive 98/70/EC and ensure that they are implemented.

(20) Directive 98/70/EC should therefore be amended accordingly,

HAVE ADOPTED THIS DIRECTIVE:

*Article 1*

Directive 98/70/EC is hereby amended as follows:

1. Article 2 shall be replaced by the following:

'*Article 2*

**Definitions**

For the purposes of this Directive:

1. "petrol" means any volatile mineral oil intended for the operation of internal combustion positive-ignition engines for the propulsion of vehicles and falling within CN codes 2710 11 41, 2710 11 45, 2710 11 49, 2710 11 51 and 2710 11 59 (*);

2. "diesel fuels" means gas oils falling within CN codes 2710 19 41 (*) and used for self-propelling vehicles as referred to in Directive 70/220/EEC and Directive 88/77/EEC;

3. "gas oils intended for use by non-road mobile machinery and agricultural and forestry tractors" means any petroleum-derived liquid, falling within CN codes 2710 19 41 and 2710 19 45 (*), intended for use in engines referred to in Directives 97/68/EC (**), and 2000/25/EC (***);

4. "Outermost Regions" means France with regard to the French Overseas Departments, Portugal with regard to the Azores and Madeira and Spain with regard to the Canary Islands.

For Member States with arctic or severe winter conditions the maximum distillation point of 65 % at 250 °C for diesel fuels and gas oils may be replaced with a maximum distillation point of 10 % (vol/vol) at 180 °C.

(*) The numbering of these CN codes as specified in the Common Customs Tariff as amended by Commission Regulation (EC) No 2031/2001 (OJ L 279, 23.10.2001, p. 1).

(**) OJ L 59, 27.2.1998, p. 1. Directive as amended by Commission Directive 2001/63/EC (OJ L 227, 23.8.2001, p. 41).

(***) OJ L 173, 12.7.2000, p. 1.'

2. In Article 3(2) the following subparagraphs shall be added:

'(d) Without prejudice to the provisions of subparagraph (c), Member States shall take all measures necessary to ensure that in due time and no later than 1 January 2005, unleaded petrol with a maximum sulphur content of 10 mg/kg is marketed within their territories. Member States shall ensure that such unleaded petrol is available on an appropriate geographic basis and complies in all other respects with the specifications in Annex III.

However, Member States may, for the Outermost Regions, make specific provisions for the introduction of petrol of a maximum sulphur content of 10 mg/kg. Member States making use of this provision will inform the Commission accordingly.

(e) By no later than 1 January 2009, Member States shall ensure that unleaded petrol can be marketed in their territory only if it complies with the environmental specification set out in Annex III except for the sulphur content which shall be a maximum of 10 mg/kg.'

3. In Article 4:

(a) the following subparagraphs shall be added to paragraph 1:

'(d) Without prejudice to the provisions of subparagraph (c), Member States shall take all measures necessary to ensure that in due time and no later than 1 January 2005, diesel fuel with a maximum sulphur content of 10 mg/kg is marketed within their territories. Member States shall ensure that such diesel fuel is available on an appropriate geographic basis and complies in all other respects with the specifications in Annex IV.

However, Member States may, for the Outermost Regions, make specific provisions for the introduction of diesel fuel of a maximum sulphur content of 10 mg/kg. Member States making use of this provision will inform the Commission accordingly.

(e) By no later than 1 January 2009, Member States shall ensure, subject to the provisions of Article 9(1)(a), that diesel fuel can be marketed in their territory only if it complies with the environmental specification set out in Annex IV except for the sulphur content which shall be a maximum of 10 mg/kg.';

(b) The following new paragraph shall be added:

'5. Member States shall ensure that gas oils intended for use by non-road mobile machinery and agricultural and forestry tractors marketed within their territory contain less than 2 000 mg/kg of sulphur. By 1 January 2008 at the latest the maximum permissible sulphur content of gas oils intended for use by non-road mobile machinery and agricultural and forestry tractors shall be 1 000 mg/kg. However, Member States may require a lower limit or the same sulphur content for diesel fuels stipulated in this Directive.'

4. In Article 6:

(a) paragraph 1 shall be replaced by the following:

'1. By way of derogation from Articles 3, 4 and 5 and in accordance with Article 95(10) of the Treaty, a Member State may take measures to require that in specific areas, within its territory, fuels may only be marketed if they comply with more stringent environmental specifications than those provided for in this Directive for all or part of the vehicle fleet with a view to protecting the health of the population in a specific agglomeration or the environment in a specific ecologically or environmentally sensitive area in that Member State, if atmospheric or ground water pollution constitutes or may reasonably be expected to constitute a serious and recurrent problem for human health or the environment.';

(b) paragraph 3 shall be replaced by the following:

'3. The Member States involved shall provide the Commission with relevant environmental data for the agglomeration or area in question as well as the predicted effects on the environment of the measures proposed.';

(c) paragraphs 7 and 8 shall be deleted.

5. Article 8 shall be replaced by the following:

'*Article 8*

**Monitoring compliance and reporting**

1. Member States shall monitor compliance with the requirements of Articles 3 and 4, in respect of petrol and diesel fuels, on the basis of the analytical methods referred to in European Standards EN 228:1999 and EN 590:1999 respectively.

2. Member States shall establish a fuel quality monitoring system in accordance with the requirements of the relevant European Standard. The use of an alternative fuel quality monitoring system may be permitted provided that such a system ensures results of equivalent confidence.

3. Each year by 30 June the Member States shall submit a report of national fuel quality data for the preceding calendar year. The first report shall be submitted by 30 June 2002. From 1 January 2004 the format for this report shall be consistent with that described in the relevant European standard. In addition, Member States shall report the total volumes of petrol and diesel fuels marketed in their territories and the volumes of unleaded petrol and diesel fuels marketed with a maximum sulphur content of 10 mg/kg. Furthermore, the Member States shall report annually on the availability on an appropriate geographic basis of petrol and diesel fuels with a maximum sulphur content of 10 mg/kg that are marketed within their territory.

4. The Commission shall ensure that the information submitted pursuant to paragraph 3 is promptly made available by appropriate means. The Commission shall publish annually, and for the first time by 31 December 2003, a report on actual fuel quality in the different Member States and geographic coverage of fuels with a maximum sulphur content of 10 mg/kg, aiming to provide an overview of the fuels quality data in the different Member States.'

6. Article 9 shall be replaced by the following:

'*Article 9*

**Review process**

1. By 31 December 2005 at the latest the Commission shall review the fuel specifications of Annexes III and IV with the exception of sulphur content and propose amendments, if appropriate, in keeping with current and future requirements of Community vehicle emission and air quality legislation and related objectives. In particular, the Commission shall consider:

(a) the necessity of any change to the end date for the full introduction of diesel fuel, with a maximum sulphur content of 10 mg/kg, in order to ensure that there is no overall increase in greenhouse gas emissions. This analysis shall consider developments in refinery processing technologies, expected fuel economy improvements of vehicles and the rate that new fuel-efficient technologies are introduced into the vehicle fleet;

(b) the implications of new Community legislation setting air quality standards for substances such as polycyclic aromatic hydrocarbons;

(c) the outcome of the review described in Article 10 of Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (*);

(d) the outcome of the review of the various commitments by the Japanese (**), Korean (***) and European (****) automobile manufacturers to reduce the fuel consumption and carbon dioxide emissions of new passenger cars in the light of the fuel quality changes introduced by this Directive and progress towards the Community target of 120 g/km $CO_2$ emissions for the average vehicle;

(e) the outcome of the review required by Article 7 of Directive 1999/96/EC of the European Parliament and of the Council of 13 December 1999 on the approximation of the laws of the Member States relating to measures to be taken against the emission of gaseous and particulate pollutants from compression ignition engines for use in vehicles, and the emission of gaseous pollutants from positive ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles and amending Council Directive 88/77/EEC (*****) and the confirmation of the mandatory $NO_x$ emission standard for heavy duty engines;

(f) the effective functioning of new pollution abatement technologies and the impact of metallic additives and other relevant issues on their performance and developments affecting international fuel markets;

(g) the need to change other parameters in the fuel specifications as well as the need to encourage the introduction of alternative fuels, including biofuels.

2. When considering the next stage of emission standards for compression ignition engines in non-road applications, the Commission shall in parallel establish the required fuel quality. In so doing, the Commission shall take into account the importance of the emissions from this sector, the overall environmental benefits, the implications in the Member States regarding fuel distribution and the costs and benefits of a more restrictive sulphur level than is currently required for fuel used in compression ignition engines in non-road applications, including the same maximum sulphur level specified in this Directive for road vehicles.

3. In addition to the provisions of paragraph 1 the Commission may, *inter alia*, bring forward:

— proposals taking into consideration the particular situation of captive fleets and the need to propose levels of specifications for the special fuels they use,

— proposals setting levels of specifications applicable to liquid petroleum gas, natural gas and biofuels.

(*) OJ L 163, 29.6.1999, p. 41. Directive as amended by Commission Decision 2001/744/EC (OJ L 278, 23.10.2001, p. 35).
(**) OJ L 100, 20.4.2000, p. 57.
(***) OJ L 100, 20.4.2000, p. 55.
(****) OJ L 40, 13.2.1999, p. 49.
(*****) OJ L 44, 16.2.2000, p. 1.'

7. The following Article shall be inserted:

'*Article 9a*

**Penalties**

Member States shall determine the penalties applicable to breaches of the national provisions adopted pursuant to this Directive. The penalties determined must be effective, proportionate and dissuasive.'

8. The first subparagraph of Article 10 shall be replaced by the following:

'The measurement methods to be applied in relation to the parameters specified in Annexes I and III shall be those analytical methods set out in European Standard EN 228:1999. The measurement methods to be applied in relation to the parameters specified in Annexes II and IV shall be those analytical methods set out in European Standard EN 590:1999. Member States may adopt the analytical methods specified in replacement EN 228:1999 or EN 590:1999 standards, as appropriate if they can be shown to give at least the same accuracy and at least the same level of precision as the analytical methods they replace. In the event that adaptation of the permitted analytical methods to technical progress is necessary, amendments may be adopted by the Commission in accordance with the procedure referred to in Article 11(2).'

9. Article 11 shall be replaced by the following:

'*Article 11*

**Committee procedure**

1. The Commission shall be assisted by the Committee established in accordance with Article 12 of Directive 96/62/EC (*).

2. Where reference is made to this paragraph Articles 5 and 7 of Council Decision 1999/468/EC of 28 June 1999 laying down procedures for the exercise of implementing powers conferred upon the Commission (**) shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its rules of procedure.

(*) OJ L 296, 21.11.1996, p. 55.

(**) OJ L 184, 17.7.1999, p. 23.'

10. Annexes I to IV are replaced by the text in the Annex to this Directive.

*Article 2*

Member States shall adopt and publish the laws, regulations and administrative provisions necessary to comply with this Directive by 30 June 2003 at the latest. They shall forthwith inform the Commission thereof.

Member States shall apply these measures from 1 January 2004.

When Member States adopt these measures, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. The methods of making such a reference shall be laid down by the Member States.

*Article 3*

This Directive shall enter into force on the day of its publication in the *Official Journal of the European Communities*.

*Article 4*

This Directive is addressed to the Member States.

Done at . . .

| *For the European Parliament* | *For the Council* |
| --- | --- |
| *The President* | *The President* |

*ANNEX*

*'ANNEX I*

**ENVIRONMENTAL SPECIFICATIONS FOR MARKET FUELS TO BE USED FOR VEHICLES EQUIPPED WITH POSITIVE-IGNITION ENGINES**

Type: **Petrol**

| Parameter (1) | Unit | Limits (2) | |
|---|---|---|---|
| | | Minimum | Maximum |
| Research octane number | | 95 (3) | — |
| Motor octane number | | 85 | — |
| Vapour pressure, summer period (4) | kPa | — | 60,0 (5) |
| Distillation: | | | — |
| — percentage evaporated at 100 °C | % v/v | 46,0 | |
| — percentage evaporated at 150 °C | % v/v | 75,0 | — |
| Hydrocarbon analysis: | | | |
| — olefins | % v/v | — | 18,0 (6) |
| — aromatics | % v/v | — | 42,0 |
| — benzene | % v/v | — | 1,0 |
| Oxygen content | % m/m | — | 2,7 |
| Oxygenates | | | |
| — methanol (stabilising agents must be added) | % v/v | — | 3 |
| — ethanol (stabilising agents may be necessary) | % v/v | — | 5 |
| — iso-propyl alcohol | % v/v | — | 10 |
| — tert-butyl alcohol | % v/v | — | 7 |
| — iso-butyl alcohol | % v/v | — | 10 |
| — ethers containing five or more carbon atoms per molecule | % v/v | — | 15 |
| — other oxygenates (7) | % v/v | — | 10 |
| Sulphur content | mg/kg | — | 150 |
| Lead content | g/l | — | 0,005 |

(1) Test methods shall be those specified in EN 228:1999. Member States may adopt the analytical method specified in replacement EN 228:1999 standard if it can be shown to give at least the same accuracy and at least the same level of precision as the analytical method it replaces.

(2) The values quoted in the specification are "true values". In the establishment of their limit values the terms of ISO 4259 "Petroleum products — determination and application of precision data in relation to methods of test" have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account (R = reproducibility). The results of individual measurements shall be interpreted on the basis of the criteria described in ISO 4259 (published in 1995).

(3) Unleaded regular grade petrol may be marketed with a minimum motor octane number (MON) of 81 and a minimum research octane number (RON) of 91.

(4) The summer period shall begin no later than 1 May and shall not end before 30 September. For Member States with arctic or severe winter conditions the summer period shall begin no later than 1 June and shall not end before 31 August.

(5) For Member States with arctic or severe winter conditions the vapour pressure shall not exceed 70 kPa during the summer period.

(6) Unleaded regular grade petrol may be marketed with a maximum olefin content of 21 % v/v.

(7) Other mono-alcohols and ethers with a final boiling point no higher than that stated in EN 228:1999.

*ANNEX II*

**ENVIRONMENTAL SPECIFICATIONS FOR MARKET FUELS TO BE USED FOR VEHICLES EQUIPPED WITH COMPRESSION IGNITION ENGINES**

Type: **Diesel fuel**

| Parameter (1) | Unit | Limits (2) | |
|---|---|---|---|
| | | Minimum | Maximum |
| Cetane number | | 51,0 | — |
| Density at 15 °C | $kg/m^3$ | — | 845 |
| Distillation: | | | |
| — 95 % ($^{v}/_{v}$) recovered at | °C | — | 360 |
| Polycyclic aromatic hydrocarbons | % m/m | — | 11 |
| Sulphur content | mg/kg | — | 350 |

(1) Test methods shall be those specified in EN 590:1999. Member States may adopt the analytical method specified in replacement EN 590:1999 standard if it can be shown to give at least the same accuracy and at least the same level of precision as the analytical method it replaces.

(2) The values quoted in the specification are "true values". In the establishment of their limit values the terms of ISO 4259 "Petroleum products — determination and application of precision data in relation to methods of test" have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account (R = reproducibility). The results of individual measurements shall be interpreted on the basis of the criteria described in ISO 4259 (published in 1995).

*ANNEX III*

**ENVIRONMENTAL SPECIFICATIONS FOR MARKET FUELS TO BE USED FOR VEHICLES EQUIPPED WITH POSITIVE-IGNITION ENGINES**

Type: **Petrol**

| Parameter (1) | Unit | Limits (2) | |
|---|---|---|---|
| | | Minimum | Maximum |
| Research octane number | | 95 (3) | — |
| Motor octane number | | 85 | — |
| Vapour pressure, summer period (4) | kPa | — | 60,0 (5) |
| Distillation: | | | — |
| — percentage evaporated at 100 °C | % v/v | 46,0 | |
| — percentage evaporated at 150 °C | % v/v | 75,0 | — |
| Hydrocarbon analysis: | | | |
| — olefins | % v/v | — | 18,0 |
| — aromatics | % v/v | — | 35,0 |
| — benzene | % v/v | — | 1,0 |
| Oxygen content | % m/m | — | 2,7 |
| Oxygenates | | | |
| — Methanol (stabilising agents must be added) | % v/v | — | 3 |
| — Ethanol (stabilising agents may be necessary) | % v/v | — | 5 |
| — Iso-propyl alcohol | % v/v | — | 10 |
| — Tert-butyl alcohol | % v/v | — | 7 |
| — Iso-butyl alcohol | % v/v | — | 10 |
| — Ethers containing 5 or more carbon atoms per molecule | % v/v | — | 15 |
| — Other oxygenates (6) | % v/v | — | 10 |
| Sulphur content | mg/kg | — | 50 |
| | mg/kg | — | 10 (7) |
| Lead content | g/l | — | 0,005 |

(1) Test methods shall be those specified in EN 228:1999. Member States may adopt the analytical method specified in replacement EN 228:1999 standard if it can be shown to give at least the same accuracy and at least the same level of precision as the analytical method it replaces.

(2) The values quoted in the specification are "true values". In the establishment of their limit values the terms of ISO 4259 "Petroleum products — determination and application of precision data in relation to methods of test" have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account (R = reproducibility). The results of individual measurements shall be interpreted on the basis of the criteria described in ISO 4259 (published in 1995).

(3) Member States may decide to continue to permit the marketing of unleaded regular grade petrol with a minimum motor octane number (MON) of 81 and a minimum research octane number (RON) of 91.

(4) The summer period shall begin no later than 1 May and shall not end before 30 September. For Member States with arctic or severe winter conditions the summer period shall begin no later than 1 June and shall not end before 31 August.

(5) For Member States with arctic or severe winter conditions the vapour pressure shall not exceed 70 kPa during the summer period.

(6) Other mono-alcohols and ethers with a final boiling point no higher than that stated in EN 228:1999.

(7) In accordance with Article 3(2), by no later than 1 January 2005 unleaded petrol with a maximum sulphur content of 10 mg/kg must be marketed and be available on an appropriate geographic basis within the territory of a Member State. By 1 January 2009 all unleaded petrol marketed in the territory of a Member State must have a maximum sulphur content of 10 mg/kg.

*ANNEX IV*

**ENVIRONMENTAL SPECIFICATIONS FOR MARKET FUELS TO BE USED FOR VEHICLES EQUIPPED WITH COMPRESSION IGNITION ENGINES**

Type: **Diesel fuel**

| Parameter (1) | Unit | Limits (2) | |
|---|---|---|---|
| | | Minimum | Maximum |
| Cetane number | | 51,0 | — |
| Density at 15 °C | $kg/m^3$ | — | 845 |
| Distillation: | | | |
| — 95 % ($^{v}/_{v}$) recovered at | °C | — | 360 |
| Polycyclic aromatic hydrocarbons | % m/m | — | 11 |
| Sulphur content | mg/kg | — | 50 |
| | mg/kg | — | 10 (3) |

(1) Test methods shall be those specified in EN 590:1999. Member States may adopt the analytical method specified in replacement EN 590:1999 standard, if it can be shown to give at least the same accuracy and at least the same level of precision as the analytical method it replaces.

(2) The values quoted in the specification are "true values". In the establishment of their limit values the terms of ISO 4259 "Petroleum products — determination and application of precision data in relation to methods of test" have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account (R = reproducibility). The results of individual measurements shall be interpreted on the basis of the criteria described in ISO 4259 (published in 1995).

(3) In accordance with Article 4(1), by no later than 1 January 2005 diesel fuel with a maximum sulphur content of 10 mg/kg must be marketed and be available on an appropriate geographic basis within the territory of a Member State. In addition, and subject to the review in Article 9(1), by 1 January 2009 all diesel fuel marketed in the territory of a Member State must have a maximum sulphur content of 10 mg/kg.'

## STATEMENT OF THE COUNCIL'S REASONS

### I. INTRODUCTION

1. On 11 May 2001, the Commission presented to the Council its proposal for a Directive of the European Parliament and of the Council amending Directive 98/70/EC relating to the quality of petrol and diesel fuels.

2. The European Parliament gave its opinion on 29 November 2001.

The Economic and Social Committee adopted its opinion on 18 October 2001.

3. On 15 April 2002, the Council adopted its Common Position in accordance with Article 251(2) of the Treaty.

### II. OBJECTIVE

The proposal introduces the requirement to introduce petrol and diesel fuels with a maximum sulphur content of 10 mg/kg into the market place, on a balanced geographic basis by 1 January 2005, and it makes this limit compulsory by a specified end date (1 January 2011 in the proposal). This final date for diesel fuels is subject to review.

The proposal also clarifies the situation regarding the currently permissible sulphur content for diesel used in non-road mobile machinery but introduces no new provisions. It also proposes minor changes to the provisions on technical adaptation and alignment with a pending European standard on fuel quality monitoring. No changes to the non-sulphur parameters have been proposed.

### III. ANALYSIS OF THE COMMON POSITION

#### 1. General

The main issues are:

— the final date after which the maximum sulphur content of all petrol and diesel sold must be limited to 10 mg/kg: the Commission proposed 1 January 2011, Parliament proposed 1 January 2008 and the Council agreed on 1 January 2009. In relation to the availability of this fuel by 1 January 2005 the Council agreed that this should be on an 'appropriate' geographic basis, rather than 'balanced' as in the Commission proposal,

— non-road mobile machinery: the Commission did not propose changing this, Parliament suggested the same requirements should apply from 1 January 2005 and the Council have requested that the Commission come forward with proposals in relation to fuel quality for non-road mobile machinery; however, Member States may now apply more stringent standards for sulphur content if they so wish,

— more stringent environmental specifications for petrol and diesel than those set down in the directive when they are justified by local environmental conditions. The Council extended the current provision in Directive 98/70/EC, whereby a Member State may seek permission to have more stringent environmental specifications for petrol and/or diesel in specific areas within its territory for air quality reasons, to include risks to groundwater pollution.

The Commission has accepted the Common Position agreed by the Council.

2. **European Parliament amendments**

In its plenary vote on 29 November 2001, Parliament adopted 36 amendments to the proposal. Seventeen of these have already been incorporated (seven to the Articles and 10 to the recitals), either verbatim, in part or in spirit, into the Council's Common Position.

(a) The 19 amendments which have not been incorporated can be grouped as follows:

Fiscal incentives (*amendments 10, 19 and 27*): Parliament proposed that Member States should have an automatic right to promote the early introduction of petrol and diesel with a maximum sulphur content of 10 mg/kg through the use of fiscal incentives. This was not accepted by the Council due to incompatibility with the legal basis for this proposal and existing provisions in Community legislation.

Derogations (*amendments 20, 21, 24, 25*): Parliament proposed to delete the possibility for a Member State to seek derogation from the obligation to market petrol and diesel with a sulphur content less than 50 parts per million from 1 January 2005 for up to two years. This was not accepted.

Definition of balanced geographic basis (*amendments 42/45 and 43/46*): Parliament proposed that the Commission should identify, via a comitology procedure, criteria to determine what would constitute availability of 10 mg/kg petrol and diesel on a balanced geographic basis during the introductory phase. The Council felt that the divergence of local circumstances would mitigate against the development of such common criteria.

Non-road mobile machinery (*amendments 3, 12, 26 and 37*): Parliament proposed that diesel used in non-road mobile machinery should meet the same environmental specifications as on-road diesel from 1 January 2005. The Council did not however accept these amendments, it did invite the Commission in Article 1(5)(b) to establish the necessary specifications required for diesel when considering the next stage of emission standards for compression ignition engines used in non-road mobile machinery.

Final date (*amendments 5, 11, 15, 18, 23 and 32*): Parliament suggested advancing the final date after which all petrol and diesel sold must comply with a 10 mg/kg maximum sulphur content to 1 January 2008, eliminating the possibility for the Commission to confirm the final date in the case of diesel and providing for the possibility of derogation due to socioeconomic considerations, these amendments are not reflected in the Common Position. The Council did however agree to advance the final date to 1 January 2009 but maintained the possibility for the Commission to confirm the date for diesel no later than 31 December 2005.

(b) The 17 amendments, which Council has incorporated into its Common Position, can be grouped as follows:

Reporting (*amendments 29 and, in principle 28*): The Commission agreed to make available the information requested in the new paragraph introduced by amendment 29 (Article 8(4)); and amendment 28 makes small changes to the wording of the reporting requirement (Article 8(3)) made on Member States. Most of these changes were incorporated into the Common Position.

Dates (*amendment 30*): The earlier review date, suggested in this amendment for the full implementation of the proposal in relation to diesel fuel, of 31 December 2005 has been accepted verbatim, this fits with the Council's decision to make the end date two years earlier than proposed by the Commission.

91 RON petrol (*amendment 35*): This amendment permits the continued sale of 91 RON petrol and was included as part of the Common Position.

Review clause (*amendments 48 and, in part, 47*): The review clause (Article 9) agreed in the Common Position includes a requirement to consider the need to change other fuel parameters, and to encourage the introduction of alternative fuels, including biofuels (this covers amendment 48, in principle). The review also requires the Commission to consider the 'impact of metallic additives and other relevant issues on the performance' of abatement technologies (this covers part of amendment 47, in principle).

Strengthening voluntary agreements (*amendment 34, in principle*): The spirit of this amendment has been incorporated to Article 9(1)(d) with two minor changes to the wording.

Recitals (*amendments 1, 2, 4 (in part), 6, 7, 8, 9, 13, 16 and 44*): These amendments have been incorporated into the recitals of the Common Position, they deal with:

amendment 1: highlighting the importance of the sulphur content of fuels in both on-road vehicles and non-road mobile machinery (recital 5);

amendment 2: more accurate reference to Directive title (recital 6);

amendment 4: emphasises the effect that lower sulphur content will have on $CO_2$ emissions in on-road vehicles (recital 7), the part on non-road mobile machinery does not appear in the Common Position;

amendment 6: highlights role that fiscal incentives can play (recital 8);

amendment 7: stresses the need to take account of move towards petrol and diesel with a maximum sulphur content of 10 mg/kg in the review in 2003 of the voluntary agreements with the major auto manufacturers to reduce $CO_2$ emissions from vehicles (recital 9);

amendment 8: is in part reflected in recital 10 to the extent that it improves the text referring to the maximum sulphur content. However, that part of the amendment referring to the mandatory availability of all grades of petrol with a maximum sulphur content of 10 mg/kg is not reflected in the Common Position;

amendment 9: introduces a new recital pointing to the need to allow the continued marketing of regular unleaded petrol, this is reflected by the provision in footnote 3 of Annexes I and III;

amendment 13: is in principle reflected in recital 14 in that the fuel quality monitoring systems foreseen will achieve the same objective sought by the amendment;

amendments 16 and 44: point to the need for further evaluation of alternative fuels, bio-fuels and of the impact of a number of issues, including the use of metallic additives in relation to abatement equipment which are both reflected in recital 17.

3. **Most important innovations introduced by the Council**

The most important innovation, which is also a move towards Parliament's position (in *amendments 5, 11, 15, 18, 23 and 32*), is the change to the end date for full market availability of the petrol and diesel fuels with a maximum sulphur content of 10 mg/kg. The date proposed by the Commission was 1 January 2011, this has been brought forward in the Common Position to 1 January 2009 (Parliament suggested 1 January 2008). Given the earlier end date, Parliament's amendment to bring forward the review date in relation to diesel fuels, from 31 December 2006 to 31 December 2005 was incorporated into the Common Position.

The Commission's proposal made no change to the fuel requirements for non-road mobile machinery. The Council considered this issue very carefully and amended the proposal to require that the Commission come forward with a proposal in relation to fuel quality for non-road mobile machinery when considering the next stage of emission standards for compression ignition engines.

The Council also decided to extend a previous provision in Article 6 of Directive 98/70/EC, which currently allows Member States, subject to a Community control procedure, to require the marketing of fuel with more stringent environmental specifications in certain parts of a Member State for reasons of atmospheric pollution, to include reasons related to groundwater pollution.

IV. **CONCLUSION**

The Council considers that its Common Position takes account of the opinion of the European Parliament in first reading to a large extent. The Council's Common Position has moved the Commission's proposal towards Parliament's opinion in relation to most of the amendments which were not accepted. It represents a balanced solution for the amended Directive, which ensures the environmental benefit to be derived from the new limits while also making requirements on the industry which are practically feasible.

# COMMON POSITION (EC) No 38/2002

## adopted by the Council on 15 April 2002

## with a view to adopting Regulation (EC) No .../2002 of the European Parliament and of the Council of ... on waste statistics

(2002/C 145 E/05)

**(Text with EEA relevance)**

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 285 thereof,

Having regard to the proposals from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

Acting in accordance with the procedure laid down in Article 251 of the Treaty [3],

Whereas:

(1) Regular Community statistics on the production and management of waste from businesses and private households are required by the Community for monitoring the implementation of waste policy. This creates the basis for monitoring compliance with the principles of maximisation of recovery and safe disposal. Statistical instruments are still required, however, for assessing compliance with the principle of waste prevention and to establish a link between waste generation data and global, national and regional inventories of resource use.

(2) The terms for the description of waste and waste management need to be defined in order to ensure the comparability of results in waste statistics.

(3) Community waste policy has led to the establishment of a set of principles to be followed by waste-producing units and waste management. This requires the monitoring of waste at different points of the waste-stream generation, collection, recovery and disposal.

(4) Council Regulation (EC) No 322/97 of 17 February 1997 on Community statistics [4] constitutes the reference framework for the provisions of this Regulation.

(5) To guarantee comparable results, waste statistics should be produced in accordance with the specified breakdown, in an appropriate form and within a fixed period of time from the end of the reference year.

(6) Since the objective of the proposed measure, namely to establish a framework for the production of Community statistics on the generation, recovery and disposal of waste, cannot be sufficiently achieved by the Member States, by reason of the need to define terms of description of waste and waste management so as to ensure the comparability of the statistics supplied by the Member States, and can therefore be better achieved at Community level, the Community may adopt measures in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Regulation does not go beyond what is necessary in order to achieve the objective of the proposed measure.

(7) Individual Member States may need a transitional period for the establishment of their statistics on waste for the economic activities of NACE REV. 1 as established by Council Regulation (EEC) No 3037/90 of 9 October 1990 on the statistical classification of economic activities in the European Community [5] for which their national statistical system requires major adaptations.

(8) The measures necessary for the implementation of this Regulation should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission [6].

(9) The Statistical Programme Committee has been consulted by the Commission,

HAVE ADOPTED THIS REGULATION:

*Article 1*

### Objective

1. The objective of this Regulation is to establish a framework for the production of Community statistics on the generation, recovery and disposal of waste.

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[1] OJ C 87, 29.3.1999, p. 22 and OJ C 180 E, 26.6.2001, p. 202.

[2] OJ C 329, 17.11.1999, p. 17.

[3] Opinion of the European Parliament of 4 September 2001 (not yet published in the Official Journal), Council Common Position of 15 April 2002 and Decision of the European Parliament of ... (not yet published in the Official Journal).

[4] OJ L 52, 22.2.1997, p. 1.

[5] OJ L 293, 24.10.1990, p. 1. Regulation as last amended by Commission Regulation (EC) No 29/2002 (OJ L 6, 10.1.2002, p. 3).

[6] OJ L 184 17.7.1999, p. 23.

2. Member States and the Commission, within their respective fields of competence, shall produce Community statistics on the generation, recovery and disposal of waste, excluding radioactive waste, which is already covered by other legislation.

3. The statistics shall cover the following areas:

(a) generation of waste according to Annex I;

(b) recovery and disposal of waste according to Annex II.

4. In compiling the statistics, Member States and the Commission shall observe the mainly substance-oriented statistical nomenclature, as set out in Annex III.

5. The Commission shall, in accordance with the procedure referred to in Article 7(2), establish a table of equivalence between the statistical nomenclature of Annex III and the list of waste established by Commission Decision 2000/532/EC ([1]).

*Article 2*

**Definitions**

For the purposes and within the framework of this Regulation:

(a) 'waste' shall mean any substance or object as defined in Article 1(a) of Council Directive 75/442/EEC of 15 July 1975 on waste ([2]);

(b) 'separately collected fractions of waste' shall mean household and similar waste, selectively collected in homogeneous fractions by public services, non-profit organisations and private enterprises acting in the field of organised waste collection;

(c) 'recycling' shall have the same meaning as in the definition given in Article 3(7) of European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste ([3]);

(d) 'recovery' shall mean any of the operations provided for in Annex II.B to Directive 75/442/EEC;

(e) 'disposal' shall mean any of the operations provided for in Annex II.A to Directive 75/442/EEC;

(f) 'recovery or disposal facility' shall mean a facility that requires a permit or registration pursuant to Articles 9, 10 or 11 of Directive 75/442/EC;

(g) 'hazardous waste' shall mean any waste as defined in Article 1(4) of Council Directive 91/689/EEC of 12 December 1991 on hazardous waste ([4]);

(h) 'non-hazardous waste' shall mean waste which is not covered by point (g);

(i) 'incineration' shall mean thermal treatment of waste in an incineration plant as defined in Article 3(4) or a coincineration plant as defined in Article 3(5) of Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste ([5]);

(j) 'landfill' shall mean a waste disposal site as defined in Article 2(g) of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste ([6]);

(k) 'capacity of waste incineration facilities' shall mean the maximum capacity to incinerate waste, in tonnes per annum or in gigajoules;

(l) 'capacity of waste recycling facilities' shall mean the maximum capacity to recycle waste, in tonnes per annum;

(m) 'capacity of landfills' shall mean the remaining capacity (at the end of the data reference year) of the landfill facility to dispose of waste in the future, measured in cubic metres;

(n) 'capacity of other disposal facilities' shall mean the capacity of the facility to dispose of waste, measured in tonnes per annum.

*Article 3*

**Collection of data**

1. Member States shall, whilst complying with conditions as to quality and accuracy to be defined in accordance with the procedure referred to in Article 7(2), acquire the data necessary for the specification of the characteristics listed in Annexes I and II by means either of:

— surveys,

— administrative or other sources, such as the reporting obligations under Community legislation on waste management,

([1]) OJ L 226, 6.9.2000, p. 3. Decision as last amended by Council Decision 2001/573/EC (OJ L 203, 28.7.2001, p. 18).

([2]) OJ L 194, 25.7.1975, p. 39. Directive as last amended by Commission Decision 96/350/EC (OJ L 135, 6.6.1996, p. 32).

([3]) OJ L 365, 31.12.1994, p. 10.

([4]) OJ L 377, 31.12.1991, p. 20. Directive as amended by Directive 94/31/EC (OJ L 168, 2.7.1994, p. 28).

([5]) OJ L 332, 28.12.2000, p. 91.

([6]) OJ L 182, 16.7.1999, p. 1.

— statistical estimation procedures on the basis of samples or waste-related estimators, or

— a combination of these means.

In order to reduce response burdens, the national authorities and the Commission shall, subject to the limits and the conditions fixed by each Member State and by the Commission in their respective fields of competence, have access to administrative data sources.

2. In order to reduce the administrative burden on small enterprises, enterprises of less than 10 employees shall be excluded from surveys, unless they contribute significantly to the generation of waste.

3. Member States shall produce statistical results, following the breakdown set out in Annexes I and II.

4. The exclusion referred to in paragraph 2 must be consistent with the coverage and quality objectives as referred to in Section 7(1) of Annexes I and II.

5. Member States shall transmit the results, including confidential data, to Eurostat in an appropriate format and within a set period of time from the end of the respective reference periods, as laid down in Annexes I and II.

6. The treatment of confidential data and the transmission of such data as provided for in paragraph 5 shall be carried out in accordance with the existing Community provisions governing statistical confidentiality.

*Article 4*

**Transitional period**

1. During a transitional period, which may not exceed two years after the entry into force of this Regulation, the Commission may, at the request of a Member State and in accordance with the procedure referred to in Article 7(2), grant derogations from the provisions of Section 5 of Annexes I and II, for the production of results relating to Section 8(1.1), items 13 to 17 of Annex I and to Section 8(2) of Annex II.

2. The derogations referred to in paragraph 1 can be granted to individual Member States only for the data of the first reference year.

*Article 5*

**Import and export of waste**

1. The Commission shall draw up a programme for pilot studies on the import and export of waste to be carried out on a voluntary basis by Member States. The pilot studies shall aim to assess the relevance and feasibility of obtaining data, and to evaluate the costs and benefits of collecting the data, and the burden on businesses.

2. The Commission programme for pilot studies shall be consistent with the contents of Annexes I and II, particularly the aspects related to the scope and coverage of wastes, waste categories for the classification of waste, reference years and periodicity, taking into account the reporting obligations under Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community [1].

3. The Commission shall finance up to 100 % of the costs for conducting the pilot studies.

4. On the basis of the conclusions of the pilot studies, the Commission shall inform the European Parliament and the Council of the possibilities of compiling statistics for the activities and characteristics covered by the pilot studies for import and export of waste. The Commission shall adopt the necessary implementation measures in accordance with the procedure referred to in Article 7(2).

5. The pilot studies should be conducted within three years of the entry into force of this Regulation.

*Article 6*

**Implementation measures**

The measures necessary for the implementation of this Regulation, shall be adopted in accordance with the procedure referred to in Article 7(2). These shall include measures:

(a) for adjustment to economic and technical developments in the collection and statistical processing of data, as well as the processing and the transmission of results;

(b) for adaptation of the specifications listed in Annexes I, II and III;

(c) for the production of results in accordance with Article 3(2), (3) and (4), taking into account the economic structures and technical conditions in a Member State; such measures may allow an individual Member State not to report certain items in the breakdown, provided the impact on the quality of the statistics is proven to be limited. In all cases where exemptions are given, the total amount of waste for each item listed in Sections 2(1) and 8(1) of Annex I shall be compiled;

[1] OJ L 30, 6.2.1993, p. 1. Regulation as last amended by Commission Regulation (EC) No 2557/2001 (OJ L 349, 31.12.2001, p. 1).

(d) for the definition of the proper quality evaluation criteria and the contents of the quality reports as referred to in Section 7 of Annexes I and II;

(e) for setting out the appropriate format for the transmission of results by Member States within two years of the date of entry into force of this Regulation;

(f) for compiling the list for granting transitional periods and derogations to Member States, as specified in Article 4;

(g) for implementation of the results of the pilot studies, as specified in Article 5(4), Annex I Section 1(2), Annex I Section 2(2) and Annex II Section 8(3).

*Article 7*

**Committee procedure**

1. The Commission shall be assisted by the Statistical Programme Committee established by Council Decision 89/382/EEC, Euratom of 19 June 1989 establishing a committee on the statistical programmes of the European Communities ([1]).

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its rules of procedure.

4. The Commission shall transmit to the Committee set up by Directive 75/442/EEC the draft measures that it intends to submit to the Statistical Programme Committee.

*Article 8*

**Report**

1. The Commission shall, within five years of the date of entry into force of this Regulation and every three years thereafter, submit a report to the European Parliament and the Council on the statistics compiled pursuant to this Regulation and in particular on their quality and the burden on businesses.

2. The Commission shall, within two years of the date of entry into force of this Regulation, submit to the European Parliament and the Council a proposal abolishing overlapping reporting obligations.

*Article 9*

**Entry into force**

This Regulation shall enter into force on the 20th day following its publication in the *Official Journal of the European Communities*.

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

Done at . . .

| *For the European Parliament* | *For the Council* |
|---|---|
| *The President* | *The President* |

([1]) OJ L 181, 28.6.1989, p. 47.

*ANNEX I*

## GENERATION OF WASTE

SECTION 1

### Coverage

1. The statistics are to be compiled for all activities classified within the coverage of Sections C to Q, of NACE REV. 1. These sections cover all economic activities, except agriculture, hunting, forestry (A) and fishing (B), which are outside the domain of this Annex.

   This Annex also covers:

   (a) waste generated by households;

   (b) waste arising from recovery and/or disposal operations.

2. The Commission will draw up a programme for pilot studies to be carried out on a voluntary basis by Member States in order to assess the relevance of including sections A and B of NACE REV. 1 in the coverage list referred to in point 1. The Commission will finance up to 100 % of the costs for these pilot studies. On the basis of the conclusions of these pilot studies, the Commission will adopt the necessary implementation measures in accordance with the procedure referred to in Article 7(2) of this Regulation.

SECTION 2

### Waste categories

1. Statistics on the following waste categories are to be produced:

**Aggregates list**

| Item No | EWC-Stat/Version 2 | | Hazardous/ non-hazardous waste |
|---|---|---|---|
| | Code | Description | |
| 1 | 01.1 | Spent solvents | Non-hazardous |
| 2 | 01.1 | Spent solvents | Hazardous |
| 3 | 01.2 | Acid, alkaline or saline wastes | Non-hazardous |
| 4 | 01.2 | Acid, alkaline or saline wastes | Hazardous |
| 5 | 01.3 | Used oils | Non-hazardous |
| 6 | 01.3 | Used oils | Hazardous |
| 7 | 01.4 | Spent chemical catalysts | Non-hazardous |
| 8 | 01.4 | Spent chemical catalysts | Hazardous |
| 9 | 02 | Chemical preparation wastes | Non-hazardous |
| 10 | 02 | Chemical preparation wastes | Hazardous |
| 11 | 03.1 | Chemical deposits and residues | Non-hazardous |
| 12 | 03.1 | Chemical deposits and residues | Hazardous |
| 13 | 03.2 | Industrial effluent sludges | Non-hazardous |
| 14 | 03.2 | Industrial effluent sludges | Hazardous |
| 15 | 05 | Health care and biological wastes | Non-hazardous |
| 16 | 05 | Health care and biological wastes | Hazardous |
| 17 | 06 | Metallic wastes | Non-hazardous |
| 18 | 06 | Metallic wastes | Hazardous |
| 19 | 07.1 | Glass wastes | Non-hazardous |
| 20 | 07.2 | Paper and cardboard wastes | Non-hazardous |
| 21 | 07.3 | Rubber wastes | Non-hazardous |

| Item No | EWC-Stat/Version 2 | | Hazardous/ non-hazardous waste |
|---|---|---|---|
| | Code | Description | |
| 22 | 07.4 | Plastic wastes | Non-hazardous |
| 23 | 07.5 | Wood wastes | Non-hazardous |
| 24 | 07.6 | Textile wastes | Non-hazardous |
| 25 | 07.6 | Textile wastes | Hazardous |
| 26 | 08 | Discarded equipment | Non-hazardous |
| 27 | 08 | Discarded equipment | Hazardous |
| 28 | 08.1 | Discarded vehicles | Non-hazardous |
| 29 | 08.41 | Batteries and accumulators wastes | Non-hazardous |
| 30 | 08.41 | Batteries and accumulators wastes | Hazardous |
| 31 | 09 | Animal and vegetal wastes (excluding animal waste of food preparation and products) | Non-hazardous |
| 32 | 09.11 | Animal waste of food preparation and products | Non-hazardous |
| 33 | 10.1 | Household and similar wastes | Non-hazardous |
| 34 | 10.2 | Mixed and undifferentiated materials | Non-hazardous |
| 35 | 10.3 | Sorting residues | Non-hazardous |
| 36 | 11 | Common sludges | Non-hazardous |
| 37 | 12.1 + 12.2 + 12.3 + 12.5 | Mineral wastes (excluding combustion wastes, contaminated soils and polluted dredging spoils) | Non-hazardous |
| 38 | 12.1 + 12.2 + 12.3 + 12.5 | Mineral wastes (excluding combustion wastes, contaminated soils and polluted dredging spoils) | Hazardous |
| 39 | 12.4 | Combustion wastes | Non-hazardous |
| 40 | 12.4 | Combustion wastes | Hazardous |
| 41 | 12.6 | Contaminated soils and polluted dredging spoils | Hazardous |
| 42 | 13 | Solidified, stabilised or vitrified wastes | Non-hazardous |
| 43 | 13 | Solidified, stabilised or vitrified wastes | Hazardous |

2. In accordance with the reporting obligation under Directive 94/62/EC, the Commission will draw up a programme for pilot studies to be carried out on a voluntary basis by Member States in order to assess the relevance of including packaging waste entries (EWC-Stat Version 2) in the breakdown list set out in point 1. The Commission will finance up to 100 % of the costs for these pilot studies. On the basis of the conclusions of these pilot studies, the Commission will adopt the necessary implementation measures in accordance with the procedure referred to in Article 7(2) of this Regulation.

SECTION 3

**Characteristics**

1. Characteristics for the waste categories:

for each waste category listed in Section 2(1), the quantity of waste generated will be compiled.

2. Regional characteristics:

population or dwellings served by a collection scheme for mixed household and similar waste (NUTS 2 level).

SECTION 4

**Reporting unit**

1. The reporting unit to be used for all waste categories is 1 000 tonnes of (normal) wet waste. For the waste categories 'sludge' an additional figure for dry matter should be provided.

2. The reporting unit for regional characteristics should be the percentage of the population or dwellings.

SECTION 5

**First reference year and periodicity**

1. The first reference year is the second calendar year following the entry into force of this Regulation.

2. Member States will furnish data for every second year after the first reference year.

SECTION 6

**Transmission of results to Eurostat**

The results are to be transmitted within 18 months of the end of the reference year.

SECTION 7

**Report on the coverage and quality of statistics**

1. For each item listed in Section 8 (activities and households), Member States will indicate the percentage to which the compiled statistics represent the universe of waste of the respective item. The minimum requirement for the coverage will be defined in accordance with the procedure referred to in Article 7(2) of this Regulation.

2. Member States will submit a quality report, indicating the degree of precision for the collected data. A description will be given on the estimations, aggregations or exclusions, and the way these procedures affect the distribution of waste categories, listed in Section 2(1) by economic activities and households, as referred to in Section 8.

3. The Commission will include the coverage and quality reports in the report provided for in Article 8 of this Regulation.

SECTION 8

**Production of results**

1. The results for the characteristics listed in Section 3(1), are to be compiled for:

1.1. the following sections, divisions, groups and classes of NACE REV. 1:

| Item No | NACE REV. 1.1 code | Description |
|---|---|---|
| 1 | C | Mining and quarrying |
| 2 | DA | Manufacture of food products, beverages and tobacco |
| 3 | DB + DC | Manufacture of textiles and textile products + manufacture of leather and leather products |
| 4 | DD | Manufacture of wood and wood products |
| 5 | DE | Manufacture of pulp, paper and paper products; publishing and printing |
| 6 | DF | Manufacture of coke, refined petroleum products and nuclear fuel |
| 7 | DG + DH | Manufacture of chemicals, chemical products, manmade fibres + manufacture of rubber and plastic products |
| 8 | DI | Manufacture of other non-metallic mineral products |
| 9 | DJ | Manufacture of basic metals and fabricated metal products |
| 10 | DK + DL + DM | Manufacture of machinery and equipment + manufacture of electrical and optical equipment + manufacture of transport equipment |

| Item No | NACE REV. 1.1 code | Description |
|---|---|---|
| 11 | DN excluded 37 | Manufacturing n.e.c. |
| 12 | E | Electricity, gas, steam and hot water and water supply |
| 13 | F | Construction |
| 14 | G-Q excluded 90 and 51.57 | Services activities: wholesale and retail trade; repair of motor vehicles, motor cycles and personal and household goods + hotels and restaurants + transport, storage and communications + financial intermediation + real estate, renting and business activities + public administration, defence and compulsory social security + education + health and social work + other community, social and personal activities + activities of households + extra-territorial organisations and bodies |
| 15 | 37 | Recycling |
| 16 | 51.57 | Wholesale of waste and scrap |
| 17 | 90 | Sewage and refuse disposal, sanitation and similar activities |

1.2. households

| | | |
|---|---|---|
| 18 | | Waste generated by households |

2. For economic activities, statistical units are local units or kind-of-activity units, as defined in Council Regulation (EEC) No 696/93 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the Community [1], according to each Member State's statistical system.

In the quality report, to be produced under Section 7, a description of how the chosen statistical unit affects the groupings of NACE REV. 1 data distribution should be included.

[1] OJ L 76, 30.3.1993, p. 1. Regulation as amended by the 1994 Act of Accession.

*ANNEX II*

## RECOVERY AND DISPOSAL OF WASTE

SECTION 1

### Coverage

1. The statistics are to be compiled for all recovery and disposal facilities which run any of the operations referred to in Section 8(2) and which belong to or are part of the economic activities according to the groupings of NACE REV. 1, mentioned in Annex I, Section 8(1.1).

2. Facilities whose waste treatment activities are limited to the recycling of waste on the site where the waste was generated, are not covered by this Annex.

SECTION 2

### Waste categories

The list of waste categories for which the statistics are to be compiled, according to each recovery or disposal operation as referred to in Section 8(2), are the following:

**Incineration**

| Item No | EWC-Stat Version 2 | | Hazardous/ non-hazardous waste |
|---|---|---|---|
| | Code | Description | |
| 1 | 01 + 02 + 03 | Chemical wastes excluding used oils (chemical compound waste + chemical preparation wastes + other chemical wastes) | Non-hazardous |
| 2 | 01 + 02 + 03 | Chemical wastes excluding used oils (chemical compound waste + chemical preparation wastes + other chemical wastes) | Hazardous |
| 3 | 01.3 | Used oils | Non-hazardous |
| 4 | 01.3 | Used oils | Hazardous |
| 5 | 05 | Health care and biological wastes | Non-hazardous |
| 6 | 05 | Health care and biological wastes | Hazardous |
| 7 | 10.1 | Household and similar waste | Non-hazardous |
| 8 | 10.2 | Mixed and undifferentiated materials | Non-hazardous |
| 9 | 10.3 | Sorting residues | Non-hazardous |
| 10 | 11 | Common sludges | Non-hazardous |
| 11 | 06 + 07 + 08 + 09 + 12 + 13 | Other wastes (metallic wastes + non-metallic wastes + discarded equipment + animal and vegetal wastes + mineral wastes + solidified, stabilised or vitrified wastes) | Non-hazardous |
| 12 | 06 + 07 + 08 + 09 + 12 + 13 | Other wastes (metallic wastes + non-metallic wastes + discarded equipment + animal and vegetal wastes + mineral wastes + solidified, stabilised or vitrified wastes) | Hazardous |

**Operations which may lead to recovery (excluding energy recovery)**

| Item No | EWC-Stat Version 2 | | Hazardous/ non-hazardous waste |
|---|---|---|---|
| | Code | Description | |
| 1 | 01.3 | Used oils | Non-hazardous |
| 2 | 01.3 | Used oils | Hazardous |
| 3 | 06 | Metallic wastes | Non-hazardous |
| 4 | 06 | Metallic wastes | Hazardous |

| Item No | EWC-Stat Version 2 | | Hazardous/ non-hazardous waste |
|---|---|---|---|
| | Code | Description | |
| 5 | 07.1 | Glass wastes | Non-hazardous |
| 6 | 07.2 | Paper and cardboard wastes | Non-hazardous |
| 7 | 07.3 | Rubber wastes | Non-hazardous |
| 8 | 07.4 | Plastic wastes | Non-hazardous |
| 9 | 07.5 | Wood wastes | Non-hazardous |
| 10 | 07.6 | Textile wastes | Non-hazardous |
| 11 | 07.6 | Textile wastes | Hazardous |
| 12 | 09 | Animal and vegetal wastes (excluding animal waste of food preparation and products) | Non-hazardous |
| 13 | 09.11 | Animal waste of food preparation and products | Non-hazardous |
| 14 | 12 | Mineral waste | Non-hazardous |
| 15 | 12 | Mineral waste | Hazardous |
| 16 | 01 + 02 + 03 + 05 + 08 + 10 + 11 + 13 | Other wastes, excluding used oils (chemical compound wastes + chemical preparation wastes + other chemical wastes + health care and biological wastes + discarded equipment + mixed ordinary wastes + common sludges + solidified, stabilised or vitrified wastes) | Non-hazardous |
| 17 | 01 + 02 + 03 + 05 + 08 + 10 + 11 + 13 | Other wastes, excluding used oils (chemical compound wastes + chemical preparation wastes + other chemical wastes + health care and biological wastes + discarded equipment + mixed ordinary wastes + common sludges + solidified, stabilised or vitrified wastes) | Hazardous |

**Disposal (other than incineration)**

| Item No | EWC-Stat Version 2 | | Hazardous/ non-hazardous waste |
|---|---|---|---|
| | Code | Description | |
| 1 | 01 + 02 + 03 | Chemical wastes, excluding used oils (chemical compound waste + chemical preparation wastes + other chemical wastes) | Non-hazardous |
| 2 | 01 + 02 + 03 | Chemical wastes, excluding used oils (chemical compound waste + chemical preparation wastes + other chemical wastes) | Hazardous |
| 3 | 01.3 | Used oils | Non-hazardous |
| 4 | 01.3 | Used oils | Hazardous |
| 5 | 09 | Animal and vegetal wastes | Non-hazardous |
| 6 | 10.1 | Household and similar waste | Non-hazardous |
| 7 | 10.2 | Mixed and undifferentiated materials | Non-hazardous |
| 8 | 10.3 | Sorting residues | Non-hazardous |
| 9 | 11 | Common sludges | Non-hazardous |
| 10 | 12 | Mineral wastes | Non-hazardous |
| 11 | 12 | Mineral wastes | Hazardous |

| Item No | EWC-Stat Version 2 | | Hazardous/ non-hazardous waste |
|---|---|---|---|
| | Code | Description | |
| 12 | 05 + 06 + 07 + 08 + 13 | Other wastes (health care and biological wastes + metallic wastes + non-metallic wastes + discarded equipment + solidified, stabilised or vitrified wastes) | Non-hazardous |
| 13 | 05 + 06 + 07 + 08 + 13 | Other wastes (health care and biological wastes + metallic wastes + non-metallic wastes + discarded equipment + solidified, stabilised or vitrified wastes) | Hazardous |

SECTION 3

**Characteristics**

The characteristics, for which the statistics are to be compiled on recovery and disposal operations, as referred to in Section 8(2) are set out in the table below.

| Item No | Description |
|---|---|
| | **Number and capacity of recovery and disposal operations per region** |
| 1 | Number of operation facilities, NUTS 2 level |
| 2 | Capacity in units according to the operations, NUTS 2 level |
| | **Waste treated per recovery and disposal operation, including import** |
| 3 | Total quantities of waste treated, by the operation specific waste categories listed in Section 2, excluding recycling of waste on the site where the waste was generated, NUTS 1 level |

SECTION 4

**Reporting unit**

The reporting unit to be used for all waste categories is 1 000 tonnes of (normal) wet waste. For the waste categories 'sludge' an additional figure for dry matter should be provided.

SECTION 5

**First reference year and periodicity**

1. The first reference year is the second calendar year following the entry into force of this Regulation.

2. Member States will furnish data for every second year, after the first reference year, for the facilities which are referred to in Section 8(2).

SECTION 6

**Transmission of results to Eurostat**

The results are to be transmitted within 18 months of the end of the reference year.

SECTION 7

**Report on the coverage and quality of statistics**

1. For the characteristics listed in Section 3, and for each item amongst the types of operations listed in Section 8(2), Member States will indicate the percentage to which the compiled statistics represent the universe of waste of the respective item. The minimum requirement for the coverage will be defined in accordance with the procedure referred to in Article 7(2) of this Regulation.

2. For the characteristics listed in Section 3, Member States will submit a quality report, indicating the degree of precision of the collected data.

3. The Commission will include the coverage and quality reports in the report provided for in Article 8 of this Regulation.

SECTION 8

**Production of results**

1. The results are to be compiled for each item amongst the types of operations listed in Section 8(2), according to the characteristics as referred to in Section 3.

2. List of recovery and disposal operations; the codes refer to the codes in the Annexes to Directive 75/442/EEC:

| Item No | Code | Types of recovery and disposal operations |
|---|---|---|
| | | **Incineration** |
| 1 | R1 | Use principally as a fuel or other means to generate energy |
| 2 | D10 | Incineration on land |
| | | **Operations which may lead to recovery (excluding energy recovery)** |
| 3 | R2 + | Solvent reclamation/regeneration |
| | R3 + | Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) |
| | R4 + | Recycling/reclamation of metals and metal compounds |
| | R5 + | Recycling/reclamation of other inorganic materials |
| | R6 + | Regeneration of acids or bases |
| | R7 + | Recovery of components used for pollution abatement |
| | R8 + | Recovery of components from catalysts |
| | R9 + | Oil refining or other reuses of oil |
| | R10 + | Land treatment resulting in benefit to agriculture or ecological improvement |
| | R11 | Use of wastes obtained from any of the operations numbered R1 to R10 |
| | | **Disposal operations** |
| 4 | D1 + | Deposit into or onto land (e.g. landfill etc.) |
| | D3 + | Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.) |
| | D4 + | Surface impoundment (e.g. placement of liquid or sludge discards into pits, pounds or lagoons, etc.) |
| | D5 + | Special engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment etc.) |
| | D12 | Permanent storage (e.g. emplacement of containers in a mine etc.) |
| 5 | D2 + | Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.) |
| | D6 + | Release into a water body except seas/oceans |
| | D7 | Release into seas/oceans including sea-bed insertion |

3. The Commission will draw up a programme for pilot studies, to be carried out on a voluntary basis by Member States. The pilot studies will aim to assess the relevance and feasibility of obtaining data on the amounts of waste conditioned by preparatory operations, as defined in Annexes II.A and II.B to Directive 75/442/EEC. The Commission will finance up to 100 % of the costs for conducting these pilot studies. On the basis of the conclusions of these pilot studies, the Commission will adopt the necessary implementation measures in accordance with the procedure referred to in Article 7(2) of this Regulation.

4. Statistical units are local units or kind-of-activity units, as defined in Regulation (EEC) No 696/93, according to each Member State's statistical system.

   In the quality report, to be produced under Section 7, a description of how the chosen statistical unit affects the groupings of NACE REV. 1 data distribution should be included.

*ANNEX III*

**WASTE STATISTICAL NOMENCLATURE**

**as referred to in Annex I, Section 2(1) and Annex II, Section 2 EWC-Stat REV. 2 (mainly substance oriented waste statistical nomenclature)**

| | | |
|---|---|---|
| 01 | | Chemical compound wastes |
| 01.1 | | Spent solvents |
| 01.11 | | Halogenated spent solvents |
| | 1 | Hazardous |
| | | aqueous solvent mixes containing halogens |
| | | chlorofluorocarbons |
| | | degreasing wastes containing solvents without a liquid phase |
| | | halogenated solvents and solvent mixes |
| | | organic halogenated solvents, washing liquids and mother liquors |
| | | other halogenated solvents |
| | | other halogenated solvents and solvent mixes |
| | | sludges containing halogenated solvents |
| | | sludges or solid wastes containing halogenated solvents |
| 01.12 | | Non-halogenated spent solvents |
| | 0 | Non-hazardous |
| | | wastes from solvent extraction |
| | 1 | Hazardous |
| | | aqueous solvent mixes free of halogens |
| | | other organic solvents, washing liquids and mother liquors |
| | | other solvents and solvent mixes |
| | | sludges containing other solvents |
| | | sludges or solid wastes containing other solvents |
| | | sludges or solid wastes free of halogenated solvents |
| | | solvent mixes or organic liquids free of halogenated solvents |
| | | solvents |
| | | solvents and solvent mixes free of halogenated solvents |
| 01.2 | | Acid, alkaline or saline wastes |
| 01.21 | | Acid wastes |
| | 0 | Non-hazardous |
| | | cyanide-free wastes not containing chromium |
| | | acids |
| | 1 | Hazardous |
| | | acidic pickling solutions |
| | | acids not otherwise specified |
| | | bleach solutions and bleach fixer solutions |
| | | cyanide-free wastes containing chromium |

electrolyte from batteries and accumulators

fixer solutions

hydrochloric acid

nitric acid and nitrous acid

phosphoric and phosphorous acid

sulphuric acid

sulphuric acid and sulphurous acid

waste not otherwise specified

01.22 Alkaline wastes

0 Non-hazardous

alkalines

1 Hazardous

alkalis not otherwise specified

ammonia

calcium hydroxide

cyanidic (alkaline) wastes containing heavy metals other than chromium

cyanidic (alkaline) wastes which do not contain heavy metals

metal hydroxide sludges and other sludges from metal insolubilisation treatment

soda

solvent based developer solutions

wastes containing cyanide

wastes not otherwise specified

water based developer and activator solutions

water based offset plate developer solutions

01.23 Saline solutions

0 Non-hazardous

saline solutions containing sulphates, sulphites or sulphides

saline solutions containing chlorides, fluorides and halides

saline solutions containing phosphates and related solid salts

saline solutions containing nitrates and related compounds

1 Hazardous

waste from electrolytic refining

01.24 Other saline wastes

0 Non-hazardous

barite-containing drilling muds and wastes

carbonates

chloride-containing drilling muds and wastes

metallic oxides

phosphates and related solid salts

salts and solutions containing organic compounds

sludges from copper hydrometallurgy

solid salts containing ammonium

solid salts containing chlorides, fluorides and other halogenated solid salts

solid salts containing nitrides (nitrometallic)

solid salts containing sulphates, sulphites or sulphides

waste containing sulphur

waste from potash and rock salt processing

wastes not otherwise specified

1 Hazardous

metallic salts

other wastes

phosphatising sludges

salt slags from secondary smelting

salts and solutions containing cyanides

sludges from zinc hydrometallurgy (including jarosite, goethite)

waste from treatment of salt slags and black drosses treatment

wastes containing arsenic

wastes containing mercury

wastes containing other heavy metals

01.3 Used oils

01.31 Used motor oils

1 Hazardous

chlorinated engine, gear and lubricating oils

non-chlorinated engine, gear and lubricating oils

other engine, gear and lubricating oils

01.32 Other used oils

0 Non-hazardous

oil-containing drilling muds and wastes

desalted sludges

sludges from plant, equipment and maintenance operations

sludges from grinding, honing and lapping

polishing sludges

wastes not otherwise specified

1 Hazardous

acid alkyl sludges

brake fluids

chlorinated emulsions

hydraulic oils containing only mineral oil

hydraulic oils, containing PCBs or PCTs

insulating or heat transmission oils and other liquids containing PCBs or PCTs

machining sludges

mineral insulating and heat transmission oils

non-chlorinated emulsions

non-chlorinated hydraulic oils (not emulsions)

non-chlorinated insulating and heat transmission oils and other liquids

oil waste not otherwise specified

other chlorinated hydraulic oils (not emulsions)

other chlorinated insulating and heat transmission oils and other liquids

other hydraulic oils

spent waxes and fats

synthetic insulating and heat transmission oils and other liquids

synthetic machining oils

tank bottom sludges

waste machining emulsions containing halogens

waste machining emulsions free of halogens

waste machining oils containing halogens (not emulsioned)

waste machining oils free of halogens (not emulsioned)

01.4 Spent chemical catalysts

01.41 Spent chemical catalysts

0 Non-hazardous

other spent catalysts

spent catalysts containing precious metals

spent catalysts e.g. from $NO_x$ removal

spent catalysts e.g. from removal of $NO_x$

02 Chemical preparation wastes

02.1 Off-specification chemical wastes

02.11 Agrochemical product wastes

1 Hazardous

agrochemical wastes

inorganic pesticides, biocides and wood preserving agents

pesticides

02.12 Unused medicines

0 Non-hazardous

discarded chemicals and medicines

medicines

02.13 Paints, varnish, inks and adhesive wastes

0 Non-hazardous

aqueous liquid waste containing ink

aqueous liquid wastes containing adhesives and sealants

aqueous sludges containing adhesives and sealants

aqueous sludges containing ink

aqueous sludges containing paint or varnish

aqueous suspensions containing paint or varnish

dried ink

dye stuffs and pigments

hardened adhesives and sealants

hardened paints and varnishes

powder paints

waste coating powders

waste from paint or varnish removal

waste from water-based ink

waste from water-based paints and varnishes

waste printing toner (including cartridges)

wastes from water-based adhesives and sealants

wastes not otherwise specified

1 Hazardous

adhesives and sealants sludges containing halogenated solvents

adhesives and sealants sludges free of halogenated solvents

ink sludges containing halogenated solvents

ink sludges free of halogenated solvents

paint, inks, adhesives and resins

sludges from paint or varnish removal containing halogenated solvents

sludges from paint or varnish removal free of halogenated solvents

waste adhesives and sealants containing halogenated solvents

waste adhesives and sealants free of halogenated solvents

waste ink containing halogenated solvents

waste ink free of halogenated solvents

waste paints and varnish containing halogenated solvents

waste paints and varnish free of halogenated solvents

02.14 Other chemical preparation wastes

0 Non-hazardous

aerosols

bleaching sludges from hypochlorite and chlorine processes

bleaching sludges from other bleaching processes

detergents

industrial gases in high pressure cylinders, LPG containers and industrial aerosol containers (including halons)

photographic film and paper containing silver or silver compounds

waste from chemical treatment

waste from nitrogen chemical processes and fertiliser manufacture

wastes from preserving agents

wastes from production of silicon and silicon derivatives

wastes not otherwise specified

1 Hazardous

non-halogenated organic wood preservatives

organochlorinated wood preservatives

organometallic wood preservatives

inorganic wood preservatives

sludges containing mercury

discarded chemicals

photochemicals

02.2 Unused explosives

02.21 Waste explosives and pyrotechnical products

1 Hazardous

fireworks waste

other waste explosives

02.22 Waste ammunition

1 Hazardous

waste ammunition

02.3 Mixed chemical wastes

02.31 Minor mixed chemical wastes

0 Non-hazardous

other waste containing inorganic chemicals, e.g. lab chemicals not otherwise specified, fire extinguishing powders

other waste containing organic chemicals, e.g. lab chemicals not otherwise specified

02.32 Chemical wastes mixed for treatment

0 Non-hazardous

premixed wastes for final disposal

02.33 Packaging polluted by hazardous substances

03 Other chemical wastes

03.1 Chemical deposits and residues

03.11 Tars and carbonaceous wastes

0 Non-hazardous

asphalt

wastes not otherwise specified

carbon black

anode scraps

wastes from the production of anodes for aqueous electrolytical processes

1 Hazardous

acid tars

other tars

tars and other carbon-containing wastes from anode manufacture

03.12 Oils/water emulsions sludges

1 Hazardous

bilge oils from inland navigation

bilge oils from jetty sewers

desalter sludges or emulsions

interceptor sludges

oil/water separator sludges

oil/water separator solids

other emulsions

waste from marine transport tank cleaning, containing chemicals

waste from railway and road transport tank cleaning, containing chemicals

waste from storage tank cleaning, containing chemicals

03.13 Chemical reaction residues

0 Non-hazardous

dregs and green liquor sludge (from black liquor treatment)

tanning liquor containing chromium

tanning liquor free of chromium

wastes not otherwise specified

1 Hazardous

aqueous washing liquids and mother liquors

halogenated still bottoms and reaction residues

non-vitrified solid phase

other still bottoms and reaction residues

03.14 Spent filtration and absorbent materials

0 Non-hazardous

sludges from decarbonation

spent activated carbon

saturated or spent ion exchange resins

solutions and sludges from regeneration of ion exchangers

1 Hazardous

activated carbon from chlorine production

filter cake from gas treatment

halogenated filter cakes, spent absorbents

other filter cakes, spent absorbents

saturated or spent ion exchange resins

solutions and sludges from regeneration of ion exchangers

spent activated carbon

spent filter clays

03.2 Industrial effluent sludges

03.21 Sludges from industrial processes and effluent treatment

0 Non-hazardous

anaerobic treatment sludges of animal and vegetal wastes

anaerobic treatment sludges of municipal and similar wastes

de-inking sludges from paper recycling

landfill leachate

sludges containing chromium

sludges free of chromium

sludges from on-site effluent treatment

sludges not otherwise specified

wastes not otherwise specified

03.22 Sludges containing hydrocarbons

0 Non-hazardous

wastes not otherwise specified

1 Hazardous

aqueous liquid waste from oil regeneration

aqueous washing liquids

steam degreasing wastes

waste from marine transport tank cleaning, containing oil

waste from railway and road transport tank cleaning containing oil

waste from storage tank cleaning, containing oil

grease and oil mixture from oil/waste water separation

04 Radioactive wastes

04.1 Nuclear waste

04.11 Nuclear wastes

04.2 Spent ionising sources

04.21 Spent ionising sources

04.3 Equipment and products contaminated by radioactivity

04.31 Equipment and products contaminated by radioactivity

04.4 Soils contaminated by radioactivity

04.41 Soils contaminated by radioactivity

05 Health care and biological wastes

05.1 Infectious health care wastes

05.11 Human infectious health care wastes

0 Non-hazardous

body parts and organs including blood bags and blood preserves

1 Hazardous

other wastes whose collection and disposal is subject to special requirements in view of the prevention of infection

05.12 Animal infectious health care wastes

0 Non-hazardous

sharps

05.2 Non-infectious health care wastes

05.21 Non-infectious human health care wastes

05.22 Non-infectious animal health care wastes

05.3 Genetic engineering wastes

05.31 Genetic engineering wastes

1 Hazardous

other wastes whose collection and disposal is subject to special requirements in view of the prevention of infection

06 Metallic wastes

06.1 Ferrous metal waste and scrap

06.11 Ferrous metal waste and scrap

0 Non-hazardous

discarded moulds

ferrous metal filings and turnings

other ferrous metals particles

iron and steel

ferrous materials removed from bottom ash

06.2 Non-ferrous metal waste and scrap

06.21 Waste precious metal

1 Hazardous

waste containing silver from on-site treatment of photographic waste

06.22 Waste aluminium packaging

06.23 Other waste aluminium

0 Non-hazardous

aluminium

06.24 Copper waste

0 Non-hazardous

copper, bronze, brass

cables

06.25 Lead waste

0 Non-hazardous

lead

06.26 Other metal wastes

0 Non-hazardous

non-ferrous metal filings and turnings

other non-ferrous metal particules

zinc

tin

06.3 Mixed metal wastes

06.31 Mixed metallic packaging

0 Non-hazardous

metallic

small metals (cans etc.)

other metals

06.32 Other mixed metallic wastes

0 Non-hazardous

wastes not otherwise specified

mixed metals

07 Non-metallic wastes

07.1 Glass wastes

07.11 Glass packaging

0 Non-hazardous

glass

07.12 Other glass wastes

0 Non-hazardous

waste glass

glass

07.2 Paper and cardboard wastes

07.21 Waste paper and cardboard packaging

0 Non-hazardous

paper and cardboard

07.22 Waste composite packaging carton

07.23 Other paper and cardboard wastes

0 Non-hazardous

fibre and paper sludge

wastes not otherwise specified

paper and cardboard

07.3 Rubber wastes

07.31 Used tyres

0 Non-hazardous

used tyres

07.32 Other rubber wastes

07.4 Plastic wastes

07.41 Plastic packaging wastes

0 Non-hazardous

plastic

07.42 Other plastic wastes

0 Non-hazardous

waste plastics (excluding packaging)

plastics particles

waste from the plastic converter industry

plastic

small plastics

other plastics

07.5 Wood wastes

07.51 Wood packaging

0 Non-hazardous

wooden

07.52 Sawdust and shavings

0 Non-hazardous

sawdust

shavings, cuttings, spoiled timber/particle board/veneer

07.53 Other wood wastes

0 Non-hazardous

waste bark and cork

bark

wood

07.6 Textile wastes

07.61 Worn clothing

07.62 Miscellaneous textiles wastes

0 Non-hazardous

absorbents, filter materials, wiping cloths, protective clothing

clothes

non-halogenated wastes from dressing and finishing

textiles

wastes from composite materials (impregnated textile, elastomer, plastomer)

wastes from processed mixed textile fibres

wastes from processed textile fibres mainly of animal origin

wastes from processed textile fibres mainly of artificial or synthetic origin

wastes from processed textile fibres mainly of vegetable origin

wastes from unprocessed mixed textile fibres before spinning and weaving

wastes from unprocessed textile fibres and other natural fibrous substances mainly of vegetable origin

wastes from unprocessed textile fibres mainly artificial or synthetic

wastes from unprocessed textile fibres mainly of animal origin

1 Hazardous

halogenated wastes from dressing and finishing

07.63 Leather wastes

0 Non-hazardous

waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium

wastes from dressing and finishing

wastes not otherwise specified

08 Discarded equipment

08.1 Discarded vehicles

08.11 Discarded private cars

0 Non-hazardous

end-of-life vehicles

08.12 Other discarded vehicles

0 Non-hazardous

discarded vehicles

08.2 Discarded electrical and electronic equipment

08.21 Discarded major household equipment

08.22 Discarded minor household equipment

08.23 Other discarded electrical and electronic equipment

0 Non-hazardous

single-use cameras with batteries

single-use cameras without batteries

other discarded electronic equipment (e.g. printed circuit boards)

electronic equipment (e.g. printed circuit boards)

08.3 Bulky household equipment

08.31 Bulky household equipment

08.4 Discarded machines and equipment components

08.41 Batteries and accumulators wastes

0 Non-hazardous

alkaline batteries

other batteries and accumulators

batteries

1 Hazardous

transformers and capacitors containing PCB or PCTs

lead batteries

Ni-Cd batteries

mercury dry cells

08.42 Spent catalytic equipment

0 Non-hazardous

catalysts containing precious metals removed from vehicles

other catalysts removed from vehicles

08.43 Other discarded machines and equipment components

0 Non-hazardous

wastes not otherwise specified

equipment containing chlorofluorocarbons

other discarded equipment

equipment containing chloroflurocarbons

1 Hazardous

fluorescent tubes and other mercury containing waste

09 Animal and vegetal wastes

09.1 Waste of food preparation and products

09.11 Animal waste of food preparation and products

0 Non-hazardous

animal tissue waste

sludges from washing and cleaning

fleshings and lime split waste

liming waste

organic matter from natural products (e.g. grease, wax)

09.12 Vegetal waste of food preparation and products

0 Non-hazardous

sludges from washing and cleaning

plant tissue waste

sludges from washing, cleaning, peeling, centrifuging and separation

materials unsuitable for consumption or processing

wastes not otherwise specified

wastes from washing, cleaning and mechanical reduction of the raw material

sludges from on-site effluent treatment

09.13 Mixed waste of food preparation and products

0 Non-hazardous

materials unsuitable for consumption or processing

oil and fat

organic compostable kitchen waste (including frying oil and kitchen waste from canteens and restaurants)

wastes not otherwise specified

09.2 Green wastes

09.21 Green wastes

0 Non-hazardous

waste from forestry exploitation

compostable wastes

09.3 Animal faeces, urine and manure

09.31 Slurry and manure

0 Non-hazardous

animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site

10 Mixed ordinary wastes

10.1 Household and similar wastes

10.11 Household wastes

0 Non-hazardous

mixed municipal waste

10.12 Street cleaning wastes

0 Non-hazardous

waste from markets

street cleaning residues

10.2 Mixed and undifferentiated materials

10.21 Mixed packaging

0 Non-hazardous

mixed

10.22 Other mixed and undifferentiated materials

0 Non-hazardous

aqueous liquid waste from vitrified waste tempering

composite packaging

inorganic off-specification batches

organic off-specification batches

other inorganic wastes with metals not otherwise specified

photographic film and paper free of silver or silver compounds

solid wastes from ships' cargoes

spent blasting grit

waste not otherwise specified

wastes whose collection and disposal is not subject to special requirements in view of the prevention of infection

wastes whose collection and disposal is not subject to special requirements in view of the prevention of infection (e.g. dressing, plaster casts, linen, disposable clothing, diapers)

welding wastes

10.3 Sorting residues

10.31 Vehicle shredder wastes

0 Non-hazardous

light fraction from automobile shredding

10.32 Other sorting residues

0 Non-hazardous

rejects from paper and cardboard recycling

shredder residues

non-composted fraction of municipal and similar wastes

non-composted fraction of animal and vegetable wastes

off specification compost

wastes not otherwise specified

screenings

11 Common sludges

11.1 Waste water treatment sludges

11.11 Sludges from treatment of public sewerage water

0 Non-hazardous

sludges from treatment of urban waste water

11.12 Biodegradable sludges from treatment of other waste water

0 Non-hazardous

sludges from on-site effluent treatment

waste from cooling columns

wastes not otherwise specified

sludges from the treatment of industrial waste water

wastes not otherwise specified

11.2 Sludges from purification of drinking and process water

11.21 Sludges from purification of drinking and process water

0 Non-hazardous

boiler feedwater sludges

sludges from water clarification

wastes not otherwise specified

11.3 Unpolluted dredging spoils

11.31 Unpolluted dredging spoils

0 Non-hazardous

dredging spoil

11.4 Cesspit contents

11.41 Cesspit contents

0 Non-hazardous

septic tank sludge

12 Mineral wastes

12.1 Construction and demolition wastes

12.11 Concrete, bricks and gypsum waste

0 Non-hazardous

wastes not otherwise specified

wastes from other cement-based composite materials

concrete

bricks

gypsum based construction materials

12.12 Waste hydrocarbonised road-surfacing material

0 Non-hazardous

asphalt containing tar

asphalt (not containing tar)

tar and tar products

1 Hazardous

insulation materials containing asbestos

12.13 Mixed construction wastes

0 Non-hazardous

other insulation materials

mixed construction and demolition waste

12.2 Asbestos wastes

12.21 Asbestos wastes

0 Non-hazardous

wastes from asbestos-cement manufacture

discarded equipment containing free asbestos

wastes from the asbestos processing industry

asbestos based construction materials

1 Hazardous

wastes containing asbestos from electrolysis

12.3 Waste of naturally occurring minerals

12.31 Waste of naturally occurring minerals

0 Non-hazardous

aqueous sludges containing ceramic materials

dusty and powdery waste

fresh-water drilling muds and wastes

other non-compostable wastes

red mud from the alumina production

soil and stones

soil from cleaning and washing beet

solid wastes from primary filtration and screening

tailings

waste from mineral metaliferous excavation

waste from mineral non-metaliferous excavation

waste from stone cutting and sawing

waste from the dressing of metalferous minerals

waste from the dressing of non-metalferous minerals

waste from washing and cleaning of minerals

waste gravel and crushed rocks

waste preparation mixture before thermal processing

waste sand and clays

wastes from desanding

wastes not otherwise specified

12.4 Combustion wastes

12.41 Waste from flue gas purification

0 Non-hazardous

calcium based reaction wastes from flue gas desulphurisation in sludge form

calcium based reaction wastes from flue gas desulphurisation in solid form

flue gas dust

other sludges from gas treatment

other solid wastes from gas treatment

sludges from gas treatment

solid wastes from gas treatment

1 Hazardous

aqueous liquid waste from gas treatment and other aqueous liquid wastes

flue gas dust

fly ash and other flue gas treatment wastes

sludges from gas treatment

solid waste from gas treatment

12.42 Slags and ashes from thermal treatment and combustion

0 Non-hazardous

aqueous sludges from boiler cleansing

bottom ash

bottom ash and slag

dross and skimmings (first and second smelting)

furnace dust

furnace slag

other particulates and dust

other particulates and dust (including ball mill dust)

other sludges

peat fly ash

phosphorous slag

pyrolysis wastes

slags (first and second smelting)

solid waste from gas treatment

unprocessed slag

waste from the processing of slag

wastes not otherwise specified

1 Hazardous

black drosses from secondary smelting

boiler dust

calcium arsenate

dross and skimmings (first and second smelting)

fly ash

oil fly ash

other particulates and dust

primary smelting slags/white drosses

skimmings

slags (first and second smelting)

12.5 Various mineral wastes

12.51 Artificial mineral wastes

0 Non-hazardous

alumina dust

aqueous suspensions containing ceramic materials

gypsum from titanium dioxide production

off specification calcium carbonate

other particulates and dust

phosphogypsum

tiles and ceramics

waste from calcination and hydration of lime

waste glass-based fibrous materials

wastes from spirits distillation

wastes not otherwise specified

12.52 Waste refractory materials

0 Non-hazardous

casting cores and moulds containing organic binders which have not undergone pouring

casting cores and moulds containing organic binders which have undergone pouring

furnace dust

spent linings and refractories

used carbon strips and fireproof materials from electrolysis

wastes not otherwise specified

1 Hazardous

spent pot linings

spent activated carbon from flue gas treatment

12.6 Contaminated soils and polluted dredging spoils

12.61 Polluted soils and rubble

1 Hazardous

oil spills

12.62 Polluted dredging spoil

13 Solidified, stabilised or vitrified waste

13.1 Solidified or stabilised waste

13.11 Solidified or stabilised waste

0 Non-hazardous

wastes stabilised/solidified with hydraulic binders

wastes stabilised/solidified with organic binders

wastes stabilised by biological treatment

13.2 Vitrified wastes

13.21 Vitrified wastes

0 Non-hazardous

vitrified wastes

## STATEMENT OF THE COUNCIL'S REASONS

### I. INTRODUCTION

1. On 28 January 1999 the Commission presented a proposal for a Council Regulation on waste management statistics ([1]).

2. The Economic and Social Committee delivered its opinion on 22 September 1999 ([2]).

3. The Commission subsequently amended its proposal and on 9 March 2001 submitted an amended proposal for a Regulation of the European Parliament and of the Council on waste statistics ([3]). The proposal is based on Article 285 of the Treaty.

4. The European Parliament adopted its opinion at first reading on 4 September 2001.

5. On 11 December 2001 the Commission submitted an amended proposal incorporating most of the European Parliament's amendments.

6. On 15 April 2002 the Council adopted its Common Position pursuant to Article 251 of the Treaty.

### II. OBJECTIVES

The aim of this proposal is to establish a framework for the production of Community statistics for monitoring the implementation of waste policy. Within the framework thus defined, Member States will have to submit regular statistics on waste generation, recovery and disposal.

### III. ANALYSIS OF THE COMMON POSITION

#### A. GENERAL COMMENTS

A logical classification system, one which is based on management practice but which is unambiguous (without overlaps, for example), scientifically justified and based on unequivocal common definitions, is essential for the production of statistics. Such preconditions do not yet exist in certain areas, such as waste arising from agriculture and fishing or the import and export of waste. The Common Position recommends that pilot studies should be conducted that assess the relevance and feasibility of obtaining data and evaluate the costs and benefits of collecting the data and the burden on enterprises, in order to decide whether such areas are to be incorporated into the scope of the Regulation.

A proper balance needs to be struck between relevant statistics which help achieve the objective sought and the workload on and cost to undertakings and public administrations. The Common Position favours high-quality statistics produced at regular intervals rather than over-frequent and excessively detailed statistics. However, data must be produced sufficiently frequently to ensure that statistical series are rapidly available. Moreover, synchronisation with other international requirements will help optimise the information system. For these reasons, a two-year period has been chosen in the end in the Common Position for all Community waste statistics.

The comparability of the data submitted by Member States must be guaranteed by establishing minimum quality standards. However, such comparability is not affected by Member States' freedom to choose their statistical methods. Member States must continue to enjoy such freedom in accordance with the subsidiarity principle; it enables methods to be adapted to Member States' different economic structures and technical conditions, thereby ensuring better overall quality at the lowest cost.

([1]) OJ C 87, 29.3.1999, p. 22.

([2]) OJ C 329, 17.11.1999, p. 17.

([3]) OJ C 180 E, 26.6.2001, p. 202.

The technical characteristics do not fall within the scope of legislative acts; they must be established in accordance with the committee procedure.

B. SPECIFIC COMMENTS

1. **Council position on the European Parliament's amendments**

1.1. The Council has incorporated *amendments 1, 5 and 25* into its Common Position.

1.2. The Council has taken over the following amendments in principle or in part:

*Amendments 2 and 11* (recital 7 and Article 4):

The Council cannot accept the total abolition of the transitional period since Member States must be given time to adapt their national statistical systems to the requirements of the Regulation which is to be adopted. The fact that work on this proposal has been going on for some time cannot justify the abolition of the transitional period, as it is only when the text is adopted, when its content is certain, that Member States will be able with confidence to start making the national changes necessary for its implementation.

Nevertheless, in order to respond to the concerns expressed by the European Parliament, the Council has:

— restricted the scope of the transitional period to those activities in respect of which major changes have to be made,

— underlined the individual nature of a Member State's request for derogation based on problems specific to that State which are to be examined in accordance with the committee procedure.

*Amendments 3 and 12* (Articles 1 and 5):

The Council acknowledges that there is a political need for the collection of data on the import and export of waste. However, preparatory work must be carried out in order to resolve certain technical problems (*inter alia* the development of a methodology and common definitions) before such areas are incorporated into the Regulation.

Nevertheless, the Council has amended paragraphs 4 and 5 of Article 5 in order to give a firmer guarantee that statistics on the import and export of waste will be collected as soon as possible.

*Amendment 4* (Article 1(4)):

The Council shares the European Parliament's reasoning. However, it has adopted a different wording, as a legislative text cannot refer to a text which no longer applies (Decision 94/3/EC). The emphasis is placed on the mainly substance-oriented statistical nomenclature. It is also stated that Annex III will have to be adapted in accordance with the committee procedure in order to take account of Commission Decision 2000/532/EC, which replaced Decision 94/3/EC (new paragraph 5 of the Common Position).

This new wording involves the following changes in order to make the text consistent:

— Annex II, Section 2: deletion of paragraphs 1 and 2,

— Annex III:

  — change in the title,

— deletion of the codes preceding the headings (as they no longer apply) and purely editorial correction of the headings as a result of the deletion of the codes (some headings appeared several times under different codes; once the codes were deleted, the repetition of the headings no longer made sense).

*Amendments 6, 7 and 8* (Article 3(1)):

The Council has incorporated the editorial amendments made by the European Parliament in the first subparagraph.

However, the Council cannot accept a uniform method of collection. Waste management is not organised by the same structures in all Member States. In accordance with the subsidiarity principle, it is for each Member State to adapt its method of collection to its own context. A uniform method of collection is unnecessary, unworkable and would lead to higher costs in return for poorer quality. The collection of data and results must be based on minimum quality standards, but the method used to comply with those standards must be chosen freely by Member States.

*Amendment 10* (Article 3(3)):

The Council has accepted the deletion requested by the European Parliament. However, the economic structures and technical conditions existing in a Member State may justify that State being unable to communicate certain data. Nevertheless, the Council considers that the quality of the data provided must not suffer as a result (for example, there cannot be exemptions from the production of overall results), and that this question must be analysed and settled on a case-by-case basis in accordance with the committee procedure. It has therefore transferred the deleted text, with a more restricted wording, to Article 6(c).

*Amendment 13* (Article 7(1)):

This amendment cannot be accepted as it stands because the appointment of two or more committees to assist the Commission with a view to the adoption of a single measure contravenes Decision 1999/468/EC. As the text in question is a legislative text relating to statistics, the Commission must be assisted by the Statistical Programme Committee in accordance with Article 19 of Regulation (EC) No 322/97. However, bearing in mind the European Parliament's wish to encourage cooperation between statisticians and technicians, Article 7(4) has been amended to strengthen the advisory role of the Committee for the adaptation to scientific and technical progress of EC legislation.

*Amendment 14* (Article 8(2)):

The Council shares the European Parliament's views that the proposals abolishing overlapping reporting obligations must be submitted as soon as possible. The words 'where appropriate' have been deleted in accordance with the European Parliament's amendment. However, it does not seem realistic to set a deadline before the first reporting year. A review of reporting obligations also forms part of the measures set out in the proposal for a sixth environmental action programme which is currently being examined by the European Parliament and the Council; the revisions planned for that programme and for this proposal must be conducted in parallel. Two years would appear to be a reasonable deadline.

*Amendments 15 and 20* (Annex I, Section 1 and Annex I, Section 8, paragraph 1.1):

The Council has accepted the deletion of the exclusion of Division 12 of NACE REV. 1.

With regard to waste arising from agriculture, hunting, forestry and fishing, the Council shares the European Parliament's opinion that these economic activities are not insignificant sources of waste for which a management policy must be put in place. The Council considers that assessment of the relevance and feasibility of obtaining data and evaluation of the costs and benefits of collecting the data, and the burden on enterprises in these areas should be clarified by pilot studies; to that end, it has added a new paragraph 2 to Annex I, Section 1.

*Amendments 16, 22 and 23* (Annex I, Section 2, List of categories, items 31 and 32 (new); Annex II, Section 2, 'Recovery' table, items 12 and 13 (new); Annex II, Section 2, 'Disposal' table, item 5):

The Council has accepted the spirit of the European Parliament's amendment, which aims to separate animal wastes from vegetal wastes, with regard to Annex I and the 'Recovery' table in Annex II, but has reworded it to take account of the terminology used in Annex III. It cannot accept it for the 'Disposal' table in Annex II because it is unworkable in the case of landfill, or would involve excessively high and unjustified costs in that case.

*Amendments 18 and 24* (Annex I, Section 5 and Annex II, Section 5):

The Council considers that it is more important to ensure the collection of high-quality data than to increase their frequency. An annual survey in an area in which data change little from one year to the next cannot be justified from the point of view of the additional costs which it would incur for both the community and undertakings. However, in order to take account of the concerns expressed by the European Parliament and to make the text consistent, the Council has reduced to two years the periodicity for the production of statistics in the two Annexes.

*Amendment 26* (Annex II, Section 8, 'Recovery' table):

The Council has accepted the amendment but has made the table heading clearer (recovery 'excluding energy recovery'), as the introduction of the word 'recovery' without further clarification could lead to confusion given that it also covers incineration with energy recovery (which is already included in the previous heading 'incineration'). In order to ensure consistency throughout the text, the same change has been made to Annex II, Section 2. The Council has retained the '+' signs to make it clear that the data to be supplied correspond to the total of the data for item 3.

*Amendment 27* (Annex II, Section 8, 'Disposal' table):

The Council has adopted the wording of the amendment but has retained the breakdown of the disposal operations in items 4 and 5 as they appeared in the Commission proposal. The intention is to bring data on disposal operations carried out in landfill sites (final disposal operations in a fixed permanent site) under the same heading: land treatment (D2) does not form part of this category and must remain under item 5, while surface impoundment (D4) must remain under item 4.

The Council has retained the '+' signs to make it clear that the data to be supplied correspond to the total of the data for item 4 and item 5.

1.3. The Council has not taken over the following amendments:

*Amendments 9* (Article 3(2)) *and 19* (Annex I, Section 7, paragraph 1):

These amendments relate to technical specifications which do not belong in a legislative text and which are not sufficiently justified with regard to the criteria adopted. Such technical specifications must be established in accordance with the committee procedure following a detailed examination of all the aspects to be taken into account.

*Amendment 17* (Annex I, Section 2, List of categories, old item 35 (item 36 in the Common Position)):

As Decision 2000/532/EC amended the European Waste Catalogue (EWC) with regard to this point, the Council considers it reasonable to wait until Annex III has been adapted to the new Decision before deciding whether a specific heading for 'dredging spoils' should be inserted into the Regulation.

*Amendments 21* (Annex I, Section 8, paragraph 2) *and 28* (Annex II, Section 8, paragraph 4):

The Council considers that Member States should be free to choose their statistical method on the basis of the business registers which they have at their disposal, especially since comparable results can be obtained irrespective of whether statistics are collected by local units or kind of activity units.

2. **Amended Commission proposal**

2.1. The Council's Common Position differs from the amended Commission proposal with regard to:

*amendments 2 and 11* (transitional period);

*amendments 15 and 20* (agriculture, hunting, forestry and fishing);

*amendments 16, 22 and 23* ('animal wastes' item). With regard to amendments 16 and 22, the Council considers that the need to include the item 'animal faeces, urine and manure', as set out in the amended Commission proposal, cannot be established until the pilot studies have been carried out concerning the inclusion of agriculture in the statistics (see point 1.2, amendments 15 and 20). It would still be possible to include it in accordance with the committee procedure;

*amendment 17* (Annex I, List of categories: dredging spoils);

*amendment 24* (frequency of production of data in the context of Annex II);

*amendment 27* (Annex II, Section 8, breakdown of disposal operations in items 4 and 5).

2.2. The Council has accepted the editorial clarifications made by the Commission to Annex II, Section 7(1), and Section 8(1).

Furthermore, the Council has:

— deleted the now superfluous codes in Annex II, Section 3(1), and Section 8(1);

— decided that Annex II, Section 8(1), should refer to all three items in Section 3 and not just to the total quantity of waste treated (item 3).

# COMMON POSITION (EC) No 39/2002

## adopted by the Council on 15 April 2002

## with a view to adopting Regulation (EC) No .../2002 of the European Parliament and of the Council of ... amending Council Regulation (EC) No 577/98 on the organisation of a labour force sample survey in the Community

(2002/C 145 E/06)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 285(1) thereof,

Having regard to the proposal from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

Acting in accordance with the procedure laid down in Article 251 of the Treaty [3],

Whereas:

(1) Council Regulation (EC) No 577/98 [4] lays down the basic provisions for a labour force sample survey, designed to provide comparable statistical information on the level and pattern of, and trends in, employment and unemployment in the Member States.

(2) An expeditious implementation by all Member States of the continuous labour force sample survey required by Regulation (EC) No 577/98 was considered a priority action in the action plan on EMU statistical requirements endorsed by the Council on 19 January 2001.

(3) Sufficient time has now passed since Regulation (EC) No 577/98 took effect to allow all Member States to make the arrangements and commitments needed fully to implement that Regulation. However not all Member States have made such arrangements and commitments. Therefore, the derogation that allows Member States to limit themselves to an annual survey should be subject to a time limit.

(4) The measures necessary for the implementation of Regulation (EC) No 577/98 should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission [5].

(5) Regulation (EC) No 577/98 should therefore be amended accordingly.

(6) The Statistical Programme Committee, established by Council Decision 89/382/EEC, Euratom [6] has been consulted in accordance with Article 3 of that Decision,

HAVE ADOPTED THIS REGULATION:

*Article 1*

Regulation (EC) No 577/98 is amended as follows:

1. in Article 1, the second paragraph shall be replaced by the following:

'The survey shall be a continuous survey providing quarterly and annual results; however, during a transitional period not extending beyond 2002, Member States which are unable to implement a continuous survey shall instead carry out an annual survey, to take place in the spring.

By way of derogation, the transitional period shall be extended

(a) until 2003 for Italy;

(b) until 2004 for Germany under the condition that Germany provides quarterly substitute estimates for the main labour force sample survey aggregates as well as annual average estimates for some specified labour force sample survey aggregates.';

[1] OJ C 270 E, 25.9.2001, p. 23.

[2] OJ C 48, 21.2.2002, p. 67.

[3] Opinion of the European Parliament of 11 December 2001 (not yet published in the Official Journal), Council Common Position of 15 April 2002 and Decision of the European Parliament of ... (not yet published in the Official Journal).

[4] OJ L 77, 14.3.1998, p. 3.

[5] OJ L 184, 17.7.1999, p. 23.

[6] OJ L 181, 28.6.1989, p. 47.

2. Article 8 shall be replaced by the following:

'*Article 8*

**Procedure**

1. The Commission shall be assisted by the Statistical Programme Committee instituted by Article 1 of Council Decision No 89/382/EEC, Euratom (*).

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC (**) shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its rules of procedure.

(*) OJ L 181, 28.6.1989, p. 47.
(**) OJ L 184, 17.7.1999, p. 23.'

*Article 2*

This Regulation shall enter into force on the day following its publication in the *Official Journal of the European Communities*.

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

Done at . . .

*For the European Parliament*
*The President*

*For the Council*
*The President*

## STATEMENT OF THE COUNCIL'S REASONS

### I. INTRODUCTION

1. On 13 June 2001, the Commission forwarded to the Council a proposal for a European Parliament and Council Regulation amending Regulation (EC) No 577/98 on the organisation of a labour force sample survey in the Community.

2. The above proposal is based on Article 285 of the Treaty according to which the procedure of co-decision with the European Parliament prescribed in Article 251 of the Treaty applies.

3. The European Parliament approved the Commission proposal without amendment at first reading on 11 December 2001.

4. The Economic and Social Committee delivered its opinion on 14 January 2002.

5. On 15 April 2002 the Council adopted its Common Position pursuant to Article 251 of the Treaty.

### II. OBJECTIVE OF THE PROPOSAL

The purpose of the proposal is to modify Regulation (EC) No 577/98 to ensure that all Member States implement a continuous labour force sample survey. It will withdraw the possibility for Member States which have difficulty in implementing a continuous survey to carry out only an annual survey.

The proposal also updates the comitology provisions in the Regulation in accordance with Council Decision 1999/468/EC of 28 June 1999.

### III. ANALYSIS OF THE COMMON POSITION

The Common Position follows the Commission proposal, approved by the European Parliament, with the addition of derogations for Italy and Germany to enable them to make the technical preparations necessary to implement a continuous survey.

For Italy, the derogation is for one year, until the end of 2003.

For Germany, the derogation is for two years, until the end of 2004, on the condition that Germany provides quarterly substitute estimates for the main labour force sample survey aggregates as well as annual average estimates for some specified labour force sample survey aggregates. The provision of this information will protect the integrity of EU statistics during the transitional period in which Germany will not provide data from a continuous survey, by ensuring the availability of more frequent and more specific data than that currently provided under the annual survey.

### IV. CONCLUSION

The Council considers that the modifications introduced in its Common Position are fully in line with the objectives of the proposed Regulation and provide for full implementation of the Regulation as soon as possible.