



Guidelines for the application of

**Directive 2000/14/EC of the European
Parliament and of the Council of 8 May 2000**

**on the approximation of the laws of the
Member States relating to the noise emission in
the environment by equipment for use
outdoors**

Update June 2017

Note

The members of the "Working Group on Outdoor Machinery" prepared in December 2001 a "*Position paper on guidelines for the application of the European Parliament and Council Directive 2000/14/EC on the approximation of the laws of the member States relating to the noise emission in the environment by equipment for use outdoors*" after receipt of the guide from a drafting subcommittee.

An editorial update of these Guidelines was proposed by the Commission in September 2016 and completed in March 2017, in order to take into consideration a number of changes in the legal framework, in standards and in other references during more than 15 years. No changes to the substantial contents of the Guidelines have been made. The update was carried out by the Commission services in charge of Directive 2000/14/EC – the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) –, also with contributions of the members of the Noise Committee Working Group and other experts.

After a written procedure and some other editorial changes and improvements, the update of these Guidelines has been endorsed by the Noise Committee Working Group in June 2017, to make it available on the European Commission's sectoral website on EUROPA:

<http://ec.europa.eu/growth/sectors/mechanical-engineering/noise-emissions/>.

Any query can be addressed to the functional e-mailbox: GROW-DIR-NOISE@ec.europa.eu.

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Foreword

These Guidelines are intended to contribute to better understanding and to facilitate the application of Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors¹ (the "Outdoor Noise Directive", OND), throughout the single internal market of the 28 Member States of the European Union (EU), as well as in the European Economic Area (EEA) and in other countries where this legislation is applicable.

These Guidelines are addressed to the users of the Directive to ensure both the free circulation of the CE-marked products in the scope as well as a high level of protection throughout the Union. It is intended to answer the questions that are likely to be asked by the Directive's users, such as national authorities, manufacturers, their representatives and other economic operators, notified bodies, standardisation bodies and users of equipment.

This document shall not be considered as an official statement of the position of the European Commission. Only the text of the Directive is authentic in law, and it is the relevant national transposition of the Directive which is legally binding. Accordingly, the text of the Directive is applicable where there are differences between the provisions of the Directive and the contents of these Guidelines.

Although the Directive is only really applicable after it has been transposed into national law in each of the EU Member States, such transposition must not change the spirit of the Union legislation. The Guidelines are intended to explain this spirit.

The Commission has produced a horizontal guide² for the implementation of the EU harmonisation legislation on health and safety of products in the internal market based on the "New/Global Approach" and the "New Legislative Framework", which may be of particular interest to the authorities responsible for market surveillance and the notified bodies, as well as for all the sectorial economic operators, stakeholders and interested parties.

The attention of the reader is drawn to the fact that these Guidelines covers only the provisions of Directive 2000/14/EC on noise emission in the environment by equipment for use outdoors. Some of the equipment in the scope may be covered also by other EU legislation, such as the Machinery Directive 2006/42/EC³.

¹ OJ L 162, 3.7.2000, p. 1. Amended by Directive 2005/88/EC of the European Parliament and of the Council of 14 December 2005 (OJ L 344, 27.12.2005, p. 44) and by Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (OJ L 87, 31.3.2009, p. 87); corrected by Corrigendum 2005/88/EC (OJ L 165, 17.6.2006, p. 35). See: <http://ec.europa.eu/growth/sectors/mechanical-engineering/noise-emissions>.

² The 'Blue Guide' on the implementation of EU product rules 2016. See: <http://ec.europa.eu/DocsRoom/documents/18027>.

³ Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (OJ L 157, 9.6.2006, p. 24). See: <http://ec.europa.eu/growth/sectors/mechanical-engineering/machinery/>.

Part 1 - Background and general remarks

1.1. Background

The Fifth Environmental Action Programme⁴ identified noise as one of the most pressing environmental problems in urban areas and the need to take action with regard to various noise sources.

In its Green Paper "Future noise policy"⁵ the European Commission addressed noise in the environment as one of the main local environmental problems in Europe, and announced its intention to propose a framework directive to control noise emission by equipment for use outdoors.

In the EU internal market, requirements for the noise emission by equipment for use outdoors have to be harmonised, while at the same time a high level of environmental protection and consumer protection must be achieved without creating obstacles to the free movement.

Noise caused by equipment for use outdoors affecting health and associated well-being is mainly perceived by citizens at the local level. To obtain a high level of protection, the level of noise emitted in the environment by equipment for use outdoors should be reduced in order to protect the health and well-being of citizens and to provide the interested public concerned with information on the noise emitted by equipment for use outdoors.

It is clear that marking equipment with its guaranteed sound power level will enable consumers and users to make an informed choice of equipment.

In February 1998, the Commission presented a proposal for a Directive concerning the noise emission of equipment used outdoors to the European Parliament and the Council of the European Union. The European Parliament and the Council discussed and in parts changed the proposal also taking into account comments of the Economic and Social Committee and the Committee of the Regions. On 8 May 2000, the new Directive 2000/14/EC on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors was adopted. The Directive was published in the Official Journal on 3 July 2000 (L 162) and entered into force the same day.

Later on, the Directive was amended by Directive 2005/88/EC of the European Parliament and of the Council of 14 December 2005 amending Directive 2000/14/EC on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors (OJ L 344, 27.12.2005), in order to modify provisions related to certain types of equipment subject to noise limits as listed in Article 12 and the stage II limits (then with a Corrigendum on 17.6.2006), as well as to reports in Article 20. Finally, Regulation (EC) No 219/2009 (OJ L 87, 31.3.2009) modified Article 18 concerning the Noise Committee and the adoption of implementing measures for the adaptation to technical progress of Annex III.

1.2. General remarks

The Directive is based on Article 95 of the EC Treaty (now replaced by Article 114 of the Treaty on the Functioning of the European Union, TFEU)⁶ concerning the approximation of the laws of the Member States in order to prevent obstacles to the free movement of equipment. It lays down provisions (noise limits, information of the public on the noise emitted by the equipment, conformity

⁴ OJ C 138, 17.5.1993, p. 1. See: <http://ec.europa.eu/environment/archives/action-programme/5th.htm>.

⁵ COM(96) 540 final. See: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=URISERV%3A121224>.

⁶ OJ C 326, 26.10.2012, p. 47. See: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A12012E%2FTXT>.

assessment procedures, etc.) concerning the noise emission by equipment for use outdoors. In general, it follows the principles and concepts concerning modules for various phases of the conformity assessment procedure and the rules for affixing and use of the CE conformity marking, which are intended to be used in technical harmonisation Directives (see 93/465/EEC: Council Decision of 22 July 1993 concerning the modules for the various phases of the conformity assessment procedures and the rules for the affixing and use of the CE conformity marking, which are intended to be used in the technical harmonization directives⁷).

The provisions of the Directive concern equipment being placed in the European market or put into service in Europe for the first time after 3 January 2002. The Directive does not cover equipment being placed in the European market or put into service in Europe for the first time before 3 January 2002 and equipment already in use. Nevertheless, between 3 July 2001 and 3 January 2002, the equipment may follow the provision of the Directive at the choice of the manufacturer.

For an overview of the text of the Directive, turn to the first flow chart in Part 2 that gives a view of the provisions of the Directive.

The first thing to note is there are two lists of equipment concerned:

- equipment **subject** to permissible levels (limits) (22 types of equipment);
- equipment **not subject** to permissible levels (limits) (41 types of equipment).

As the sound power level of any equipment strongly depends on the measurement method used, such methods are laid down for each type of equipment covered. There is a basic noise emission standard laying down basic provisions such as the number and position of microphones used, test areas, averaging of sound pressure values, computing sound power level from sound pressure level values, etc.; in addition, operating conditions are laid down for each type of equipment.

The manufacturer⁸ placing the equipment on the market in the Union shall be responsible for ensuring that the equipment is in conformity with the provisions of this Directive and of any other EU legislation that apply to it. The manufacturer is offered different modules for use in conformity assessment procedures. For equipment subject to permissible sound power levels, a procedure is evoked consisting of the involvement of a notified body to check conformity with the Directive's provisions in both the design phase and the production phase. For equipment not subject to permissible sound power levels, self-certification is considered appropriate.

The permissible sound power levels given in Article 12 may not be exceeded. Thus strictly, if exceeded, the equipment may not be placed on the market.

Two stages have been selected, in order to allow manufacturers who do not already comply with the requirements sufficient time to adapt their equipment to more demanding limit values.

The manufacturer shall affix to all equipment the CE marking and the indication of the guaranteed sound power level estimated from noise measurements. He shall accompany the equipment with an EC declaration of conformity saying that the equipment is in conformity with the provisions of this Directive and any other pertinent EU legislation.

Member States shall not prohibit, restrict or impede the placing on the market in their territory of equipment which complies with the requirements of this Directive, bears the CE marking and the indication of the guaranteed sound power level and is accompanied by an EC declaration of conformity.

On the other hand, Member States have to make sure that equipment covered by this Directive complies with the requirements when placed on the market⁹ in the Member States. Member States

⁷ OJ L 220, 30.8.1993, p. 23.

⁸ Throughout these Guidelines "the manufacturer" means "the manufacturer, his authorised representative established in the Union or any person placing the equipment on the market" and either he or she is implied.

⁹ Throughout these Guidelines "place on the market" means "place on the market or put into service".

have to take appropriate measures to ensure that non-complying equipment will comply in future or shall be withdrawn from the market and if necessary these measures may be taken in cooperation with other Member States.

Monitoring is indispensable and the technical and administrative standards of notified bodies throughout the Union should be the same, but this can only be achieved by setting minimum criteria they have to meet.

Very importantly, this Directive does not affect requirements to protect workers by regulating the use of outdoor equipment. Evidently, in order to protect citizens against unreasonably high noise exposure, Member States should be able to restrict the use of equipment in the environment.

The collection of noise data is considered to be indispensable as a basis for informed consumer choice and for the Member States' and the Commission's further assessment of new technological development leading possibly to further legislative action. To simplify matters, the manufacturer has to send a copy of the EC declaration of conformity for each model of equipment containing the indication of the measured and the guaranteed sound power level to the Member State and the Commission.

It is recognised that proper implementation and application of this Directive is indispensable to meet the detailed objectives of this Directive and a closer cooperation in market surveillance is necessary by means of a continuous exchange of information. So a standing committee has been established and it is known as "Noise Committee".

Additionally, the technical provisions concerning the measurement methods must be supplemented and adapted as necessary to technical progress and the progress in European standardisation. To that end, provision has been made for a simplified procedure to amend the Directive in order to adapt quickly the technical annexes to the Directive. This shall occur, provided that such amendments do not have any direct impact on the measured sound power level of equipment falling under noise limits, see Article 12.

Part 2 - Flow charts

The following flow charts give a view on the content of Directive 2000/14/EC itself and guidance on the steps that the manufacturer has to follow, with or without a notified body, to place equipment on the market and check that the production of the equipment complies with the Directive. (Detailed information is given in Part 3)

The following flow charts are given:

General view of the Directive

For equipment covered by Article 12 with limit values

Evaluation prior to placing on the market and during production
(Annex VI "Internal control of production with assessment of technical documentation and periodical checking")

Evaluation prior to placing on the market and during production
(Annex VII "Unit verification")

Evaluation prior to placing on the market and during production
(Annex VIII "Full quality assurance")

For equipment covered by Article 13 without limit values

Evaluation prior to placing on the market and during production
(Annex V "Internal control of production")

Figure 1 - General view of the Directive

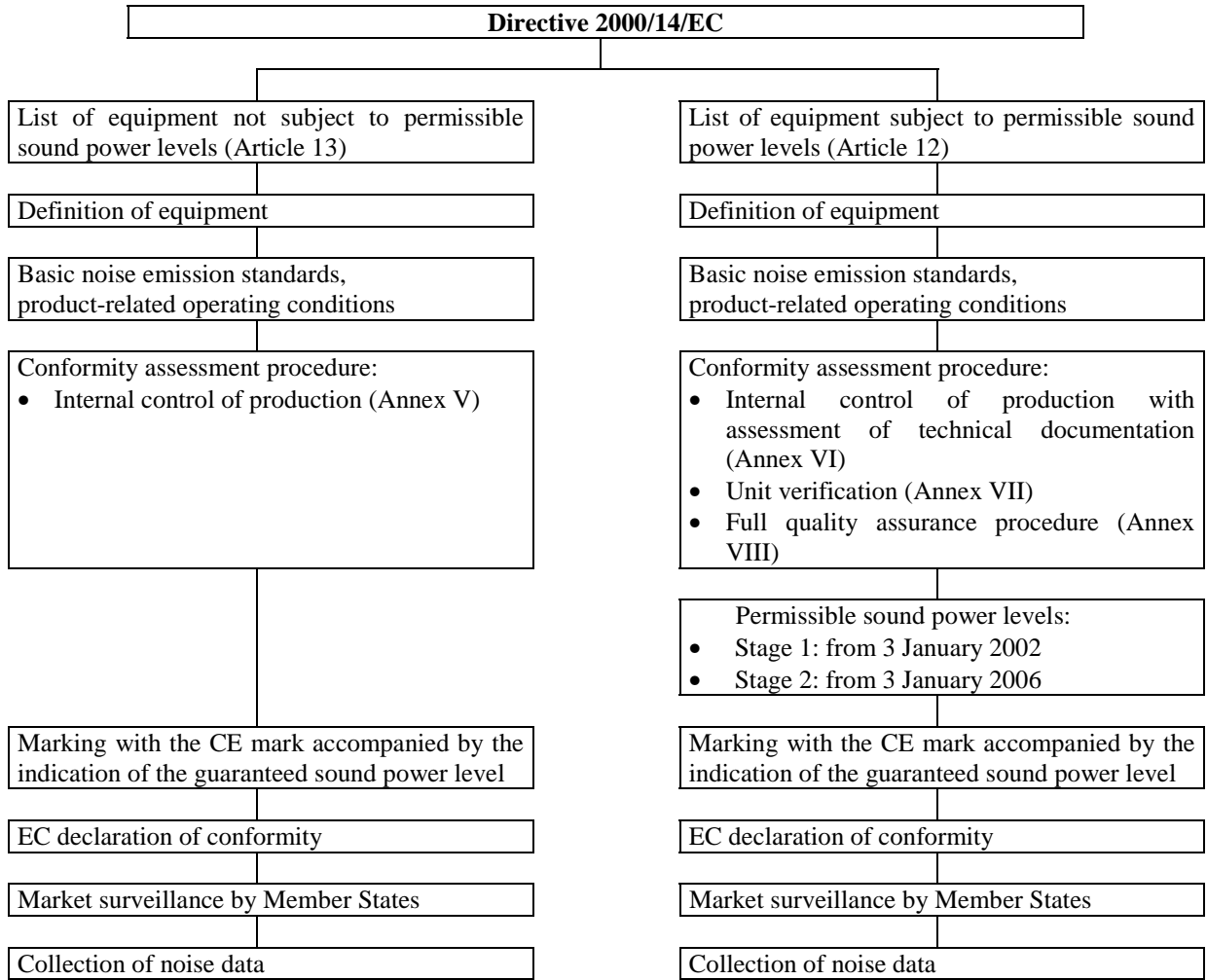


FIGURE 2 — EQUIPMENT LISTED IN ARTICLE 12 WITH LIMIT VALUES
Evaluation prior to placing on the market and during production
Annex VI "Internal control of production with assessment of technical documentation and periodical checking"

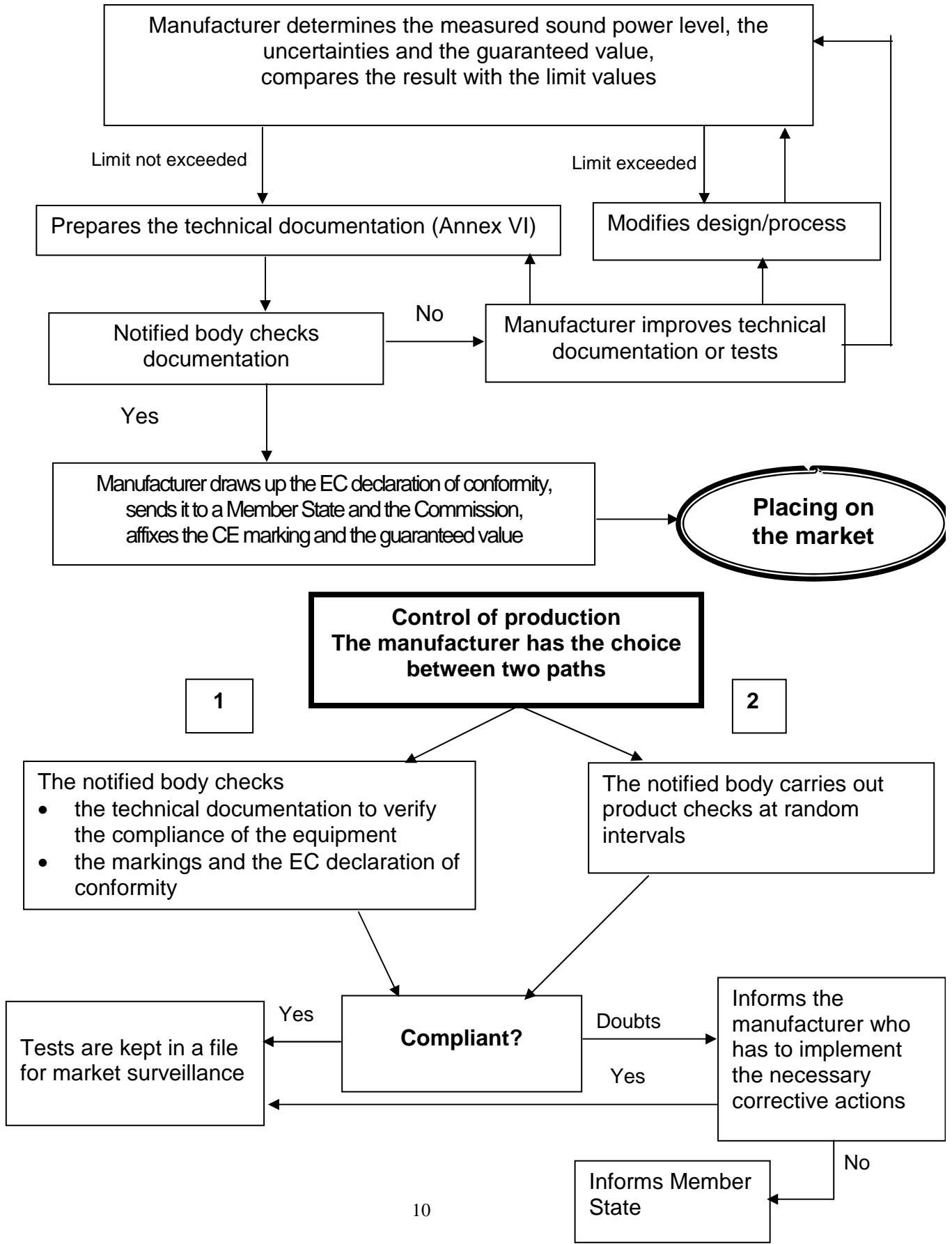


FIGURE 3 — EQUIPMENT LISTED IN ARTICLE 12 WITH LIMIT VALUES
Evaluation prior to placing on the market and during production
Annex VII "Unit verification"

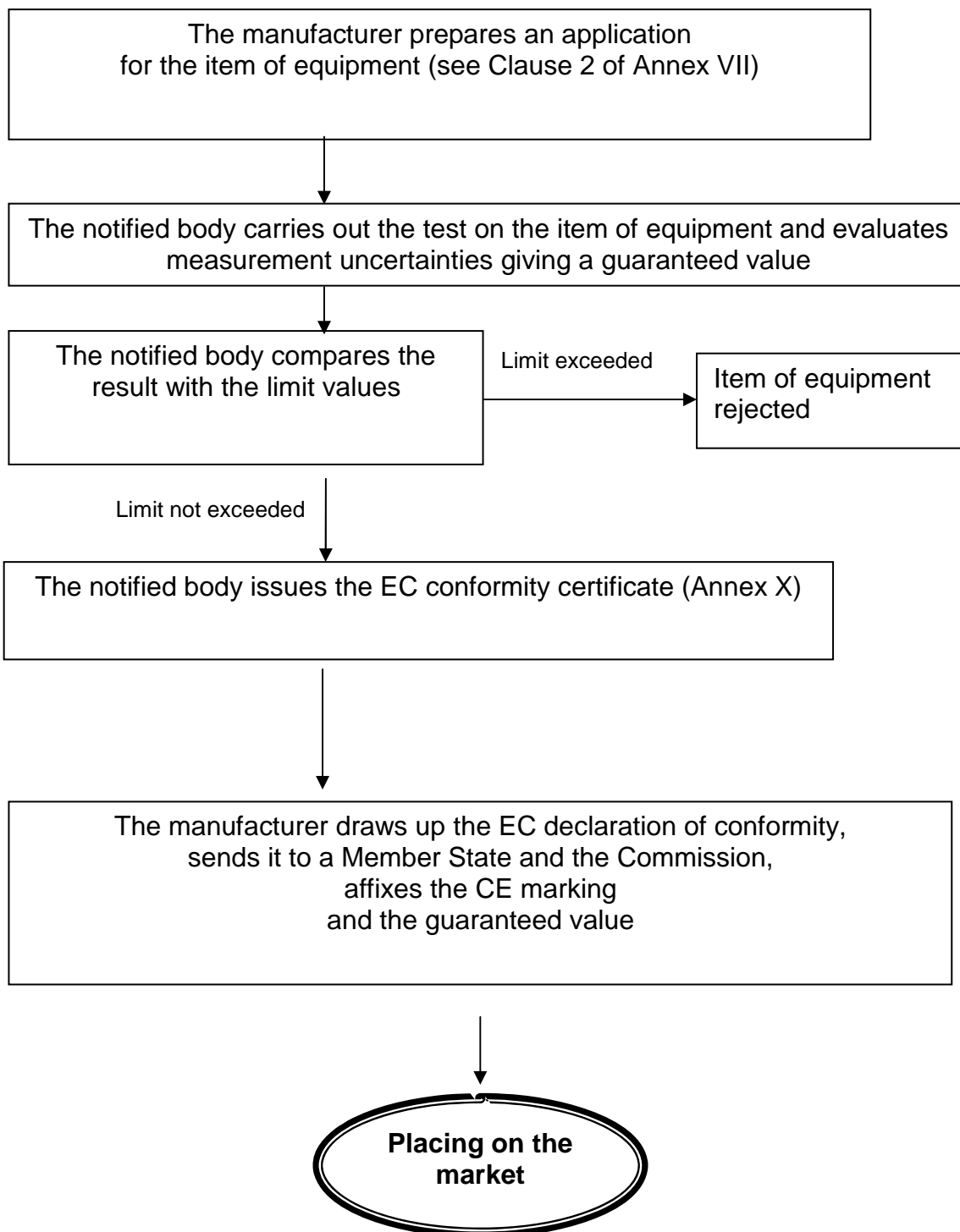


FIGURE 4 — EQUIPMENT LISTED IN ARTICLE 12 WITH LIMIT VALUES
Evaluation prior to placing on the market and during production
Annex VIII "Full quality assurance"

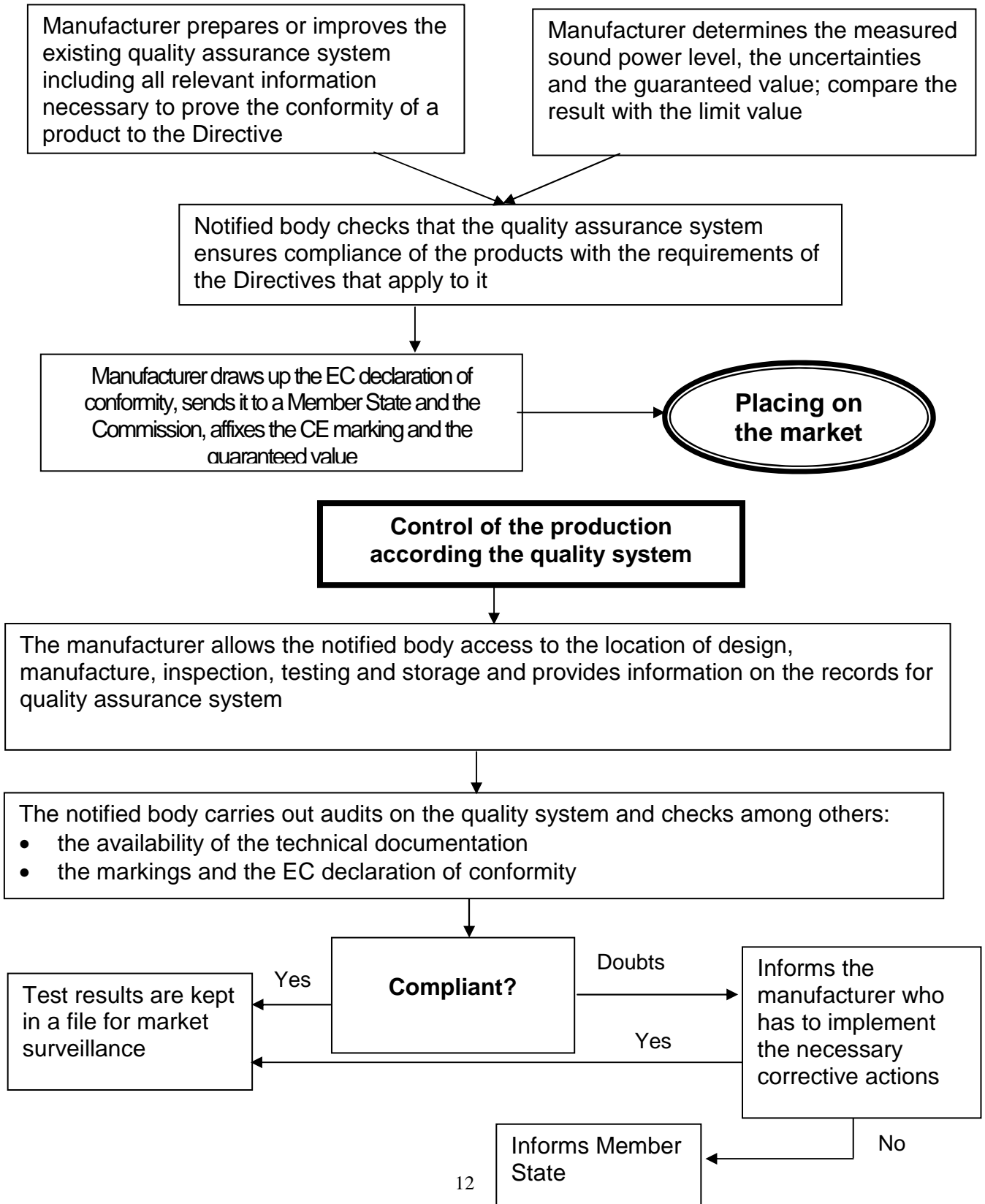
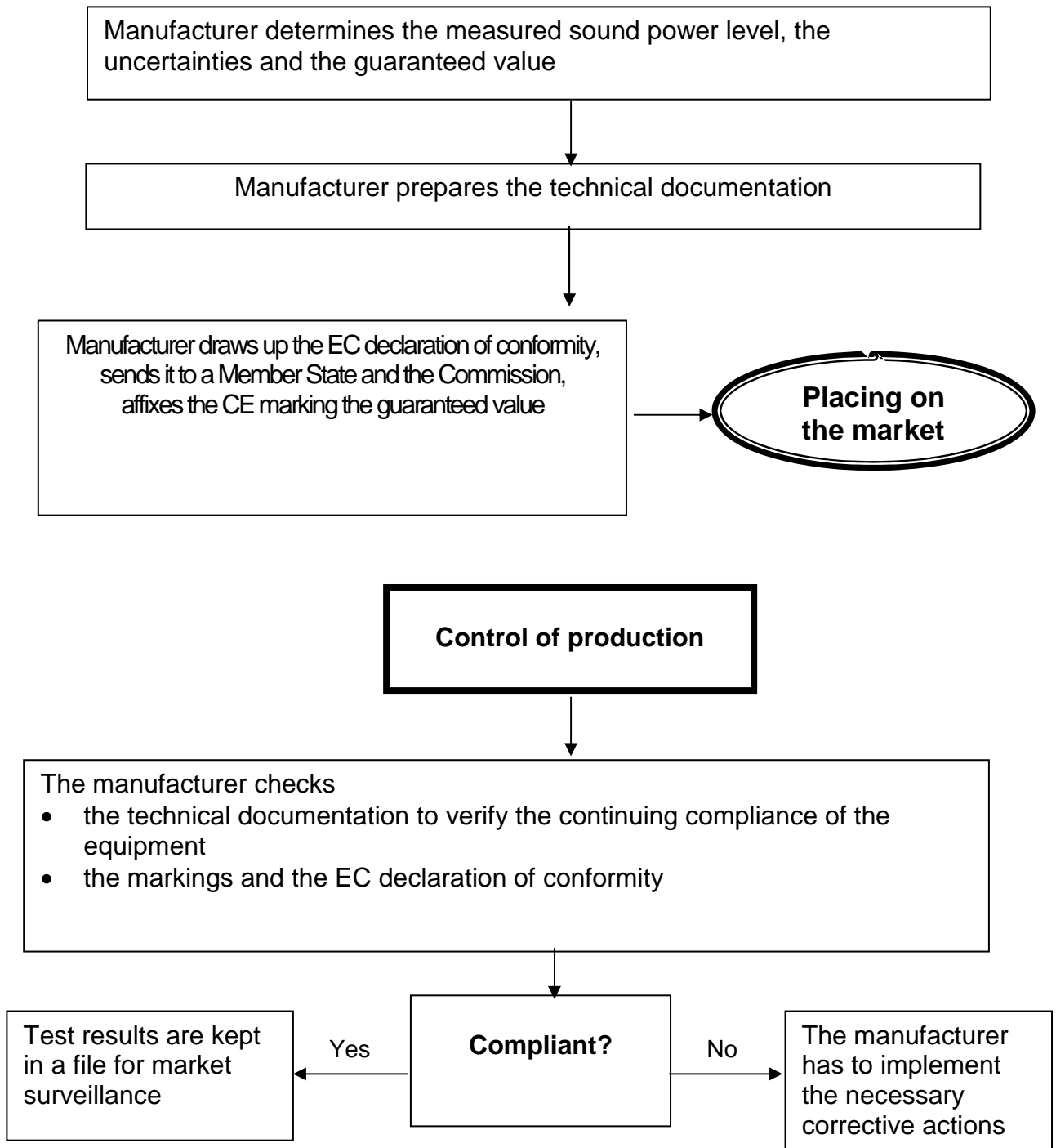


FIGURE 5 — EQUIPMENT LISTED IN ARTICLE 13 WITHOUT LIMIT VALUES
Evaluation prior to placing on the market and during production
Annex V "Internal control of production"



Part 3 - Comments on the Directive clause by clause

The text in blue and italic is the copy of the Directive, the text in black and straight represents the comments.

The term "Community" in the Directive should be read as "Union" for "European Union".

Throughout these Guidelines:

- "**the manufacturer**" means "the manufacturer, his authorised representative established in the Union or any person placing the equipment on the market" and either he or she is implied;
- "**marking**" means CE marking accompanied by the label with the indication of the guaranteed sound power level including the pictogram.

For the purpose of these Guidelines, the following definitions apply.

Item of equipment: single machine/non powered equipment (unique serial number).

Model (of equipment): group of equipment within a given type of equipment.

Type of equipment: group of machines/non-powered equipment, called by a generic name, that conform with the definitions given in Articles 12 and 13 (construction winches, drill rigs, glass recycling containers, etc.).

The Directive uses "type of equipment" for both "model" and "type of equipment" as defined here above, it also uses "category" for "type of equipment".

Standards used in the Directive

Disclaimer: whenever Directive 2000/14/EC gives a dated reference to a standard, in particular in Annex III, it means that **only the use of that version is valid to measure the sound power level of equipment and comply with the requirements of the Directive**; no deviation/update is allowed. When new/updated references are indicated in these Guidelines, it is **for information purpose only**.

ENV 206:1990 *Concrete - Performance, production, placing and compliance criteria*.

Note: this standard has been withdrawn and replaced by EN 206:2013+A1:2016 *Concrete. Specification, performance, production and conformity*.

EN 500-4 rev. 1:1998, Annex C *Mobile road construction machinery - Safety - Part 4: Specific requirements for compaction machines*.

Note: The Directive refers to this document which was in fact a working document. The document was submitted to CEN enquiry in 2002 with the text of Annex E (previously annex C) given in the comments in Annex III for the noise test code.

The standard has been withdrawn and replaced by EN 500-4:2011 *Mobile road construction machinery - Safety - Part 4: Specific requirements for compaction machines*, harmonised under the Machinery Directive 2006/42/EC since 20.7.2011.

EN 791:1995 *Drill rigs - Safety*.

Note: this standard has been withdrawn and replaced by EN 16228:2014 *Drilling and foundation equipment - Safety* (parts 1 to 7), harmonised under the Machinery Directive 2006/42/EC since 13.12.2015.

ISO 1180:1983 *Shanks for pneumatic tools and fitting dimensions of chuck bushings - ISO 1180:1983/Add1:1985*.

EN ISO 3744:1995 *Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane* (ISO 3744:1994).

Note: this standard has been withdrawn and replaced by EN ISO 3744:2010 *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*, harmonised under the Machinery Directive 2006/42/EC since 8.4.2011.

EN ISO 3746:1995 *Acoustics - Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995/Cor 1:1995)*.

Note: this standard has been withdrawn and replaced by EN ISO 3746:2010 *Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:2010)*, harmonised under the Machinery Directive 2006/42/EC since 8.4.2011.

ISO 6395:1988 *Acoustics - Measurement of exterior noise emitted by earth-moving machinery - Dynamic test conditions - ISO 6395:1988/Amd 1:1996*.

Note: this standard has been withdrawn and replaced by ISO 6395:2008 *Earth-moving machinery - Determination of sound power level - Dynamic test conditions*.

ISO 7960:1995 *Airborne noise emitted by machine tools - Operating conditions for woodworking machines*.

ISO 8528-1:1993 *Reciprocating internal combustion engine driven alternating current generating sets - Part 1: Application, ratings and performance*.

Note: this standard has been withdrawn and replaced by ISO 8528-1:2005 *Reciprocating internal combustion engine driven alternating current generating sets - Part 1: Application, ratings and performance*.

ISO 8528-10:1998 *Reciprocating internal combustion engine driven alternating current generating sets - Part 10: Measurement of airborne noise by the enveloping surface method*.

EN ISO 9001 *Quality management systems - Requirements*.

Note: the latest version of this standard is EN ISO 9001:2015 *Quality management systems - Requirements (ISO 9001:2015)*, harmonised under Regulation (EC) No 765/2008, Decision No 768/2008/EC and Regulation (EC) No 1221/2009 since 11.12.2015.

ISO 9207:1995: *Manually portable chain-saws with internal combustion engine - Determination of sound power levels - Engineering method (Grade 2)*.

Note: this standard has been withdrawn and replaced by ISO 22868:2011 *Forestry and gardening machinery - Noise test code for portable hand-held machines with internal combustion engine - Engineering method (Grade 2 accuracy)*. The European standard EN ISO 22868:2011 is harmonised under the Machinery Directive 2006/42/EC since 20.7.2011.

ISO 10884:1995 *Manually portable brush-cutters and grass-trimmers with internal combustion engine - Determination of sound power levels - Engineering method (Grade 2)*.

Note: this standard has been withdrawn and replaced by ISO 22868:2011 *Forestry and gardening machinery - Noise test code for portable hand-held machines with internal combustion engine - Engineering method (Grade 2 accuracy)*. The European standard EN ISO 22868:2011 is harmonised under the Machinery Directive 2006/42/EC since 20.7.2011.

ISO 11094:1991 *Acoustics - Test code for the measurement of airborne noise emitted by power lawn mowers, lawn tractors, lawn and garden tractors, professional mowers, and lawn and garden tractors with mowing attachments*.

Note: this standard has been withdrawn and replaced by ISO 5395-1:2013 *Garden equipment - Safety requirements for combustion-engine-powered lawnmowers - Part 1: Terminology and common tests*.

Other standards referred in the comments and in Part 4 of the Guidelines

EN 280:2013+A1:2015 *Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests*.

EN 500-2:2006+A1:2008 *Mobile road construction machines - Safety - Part 2: Specific requirements for road-milling machines*.

EN 500-5:1995 *Mobile road construction machinery - Safety - Part 5: Specific requirements for joints cutters*.

EN 500-6:2006+A1:2008 *Mobile road construction machines - Safety - Part 6: Specific requirements for paver-finishers*.

EN 709:1997+A4:2009 *Agricultural and forestry machinery - Pedestrian controlled tractors with mounted rotary cultivators, motors hoes with drive wheel(s) - Safety*.

EN 774:1996 *Garden equipment - Hand-held, integrally powered hedge trimmers - Safety*.

EN 786:1996+A2:2009 *Garden equipment - Electrically powered walk-behind and hand-held lawn trimmers and lawn edge trimmers - Mechanical safety*.

EN 836:1997 *Garden equipment - Powered lawnmowers - Safety*.

EN 996:1995 *Piling equipment - Safety requirements*.

EN 1870-1:1999 *Safety of woodworking machines - Circular sawing machines - Circular saw benches (with and without sliding table) and dimension saws*.

EN 1870-18:2013 *Safety of woodworking machines - Circular sawing machines - Dimension saws*.

EN 1870-19:2013 *Safety of woodworking machines - Circular sawing machines - Circular saw benches (with and without sliding table) and building site saws*.

ISO 3857-2:1977 *Compressors, pneumatic tools and machines - Vocabulary - Part 2: Compressors*.

ISO 4306-2:2012 *Cranes - Vocabulary - Part 2: Mobile cranes*.

ISO 4306-3:1991 *Cranes - Vocabulary - Part 3: Tower cranes*.

EN ISO 4871:2009 *Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*.

ISO 5053-1:2015 *Industrial trucks - Terminology and classification - Part 1: Type of industrial trucks*.

EN ISO 5395-1:2013 *Garden equipment - Safety requirements for combustion-engine-powered lawnmowers - Part 1: Terminology and common tests (ISO 5395-1:2013)*.

EN ISO 5395-2:2013+A1:2016 *Garden equipment - Safety requirements for combustion-engine-powered lawnmowers - Part 2: Pedestrian-controlled lawnmowers - Amendment 1: OPC, cutting means, pressurized hoses (ISO 5395-2:2013/Amd 1:2016)*.

EN ISO 5395-3:2013+A1:2017 *Garden equipment - Safety requirements for combustion-engine-powered lawnmowers - Part 3: Ride-on lawnmowers with seated operator - Amendment 1: OPC, Parking brake, ROPS, pressurized hoses, cutting means, grass catcher and test probe (ISO 5395-3:2013/Amd 1:2017).*

EN ISO 6165:2012 *Earth-moving machinery - Basic types - Identification and terms and definitions (ISO 6165:2012).*

ISO 6531:2017 *Machinery for forestry - Portable chain-saws - Vocabulary.*

ISO 7574-1:1985 *Acoustics - Statistical methods for determining and verifying stated noise emission values of machinery and equipment - Part 1: General consideration and definitions.*

ISO 7574-2:1985 *Acoustics - Statistical methods for determining and verifying stated noise emission values of machinery and equipment - Part 2: Methods for stated values for individual machines.*

ISO 7574-3:1985 *Acoustics - Statistical methods for determining and verifying stated noise emission values of machinery and equipment - Part 3: Simple (transition) method for stated values for batches of machines.*

ISO 7574-4:1985 *Acoustics - Statistical methods for determining and verifying stated noise emission values of machinery and equipment - Part 4: Methods for stated values for batches of machines.*

EN ISO 9000:2015 *Quality management systems - Fundamentals and vocabulary (ISO 9000:2015).*

EN ISO 11806-1:2011 *Agricultural and forestry machinery - Safety requirements and testing for portable, hand-held, powered brush cutters and grass-trimmers - Machines fitted with an integral combustion engine.*

EN ISO 10517:2009/A1:2013 *Powered hand-held hedge trimmers - Safety (ISO 10517:2009/Amd 1:2013).*

EN 12151:2007 *Machinery and plants for the preparation of concrete and mortar - Safety requirements.*

EN 12158-1:2000+A1:2010 *Builders hoists for goods - Part 1: Hoists with accessible platforms.*

EN 12158-2:2000+A1:2010 *Builders hoists for goods - Part 2: Inclined hoists with non-accessible load carrying devices.*

EN 13021:2003+A1:2008 *Winter service machines - Safety requirements.*

EN 13525:2005+A2:2009 *Forestry machinery - Wood chippers - Safety.*

EN 13683:2003+A2:2011 *Garden equipment - Integrally powered shredders/chippers - Safety.*

EN 13684:2004+A3:2009 *Garden equipment - Pedestrian controlled aerators and scarifiers - Safety.*

EN 13862:2001+A1:2009 *Floor cutting-off machines - Safety.*

ISO 14396:2002 *Reciprocating internal combustion engines - Determination and method for the measurement of engine power - Additional requirements for exhaust emission tests in accordance with ISO 8178..*

EN 16228-1:2014 *Drilling and foundation equipment - Safety - Common requirements.*

EN 16228-2:2014 *Drilling and foundation equipment - Safety - Mobile drill rigs for civil and geotechnical engineering, quarrying and mining.*

EN 16228-3:2014 *Drilling and foundation equipment - Safety - Horizontal directional drilling equipment (HDD).*

EN 16228-4:2014 *Drilling and foundation equipment - Safety - Foundation equipment.*

EN 16228-5:2014 *Drilling and foundation equipment - Safety - Diaphragm walling equipment.*

EN 16228-6:2014 *Drilling and foundation equipment - Safety - Jetting, grouting and injection equipment.*

EN 16228-7:2014 *Drilling and foundation equipment - Safety - Interchangeable auxiliary equipment.*

DIRECTIVE 2000/14/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 8 May 2000

on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors

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,

Having regard to the opinion of the Economic and Social Committee,

Acting in accordance with the procedure laid down in Article 251 of the Treaty),

Whereas:

(1) Within the framework of the internal market, requirements for the noise emission by equipment for use outdoors have to be harmonised in order to prevent obstacles to the free movement of such equipment. Reducing permissible noise levels for such equipment will protect the health and well-being of citizens as well as protect the environment. The public should also be provided with information on the noise emitted by such equipment.

(2) Community legislation concerning noise emission by equipment for use outdoors has consisted to date of the following nine directives covering some types of construction machinery and lawnmowers: Council Directive 79/113/EEC of 19 December 1978 on the approximation of the laws of the Member States relating to the determination of the noise emission of construction plant and equipment), Council Directive 84/532/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to common provisions for construction plant and equipment), Council Directive 84/533/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to the permissible sound power level of compressors, Council Directive 84/534/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to the permissible sound power level of tower cranes, Council Directive 84/535/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to the permissible sound power level of welding generators, Council Directive 84/536/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to the permissible sound power level of power generators, Council Directive 84/537/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to the permissible sound power level of powered hand-held concrete-breakers and picks, Council Directive 84/538/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to the permissible sound power level of lawnmowers and Council Directive 86/662/EEC of 22 December 1986 on the limitation of noise emitted by hydraulic excavators, rope-operated excavators, dozers, loaders and excavator-loaders, hereinafter referred to as 'existing Directives'; these Directives lay down the requirements with regard to permissible noise levels, noise test codes, marking and conformity assessment procedures for each type of equipment separately. A simplification of this legislation and the creation of a framework for the reduction of noise emission by equipment for use outdoors is appropriate.

(3) This Directive is based on the principles and concepts set out in the Council Resolution of 7 May 1985 on a new approach to technical harmonisation and standards. The aforementioned principles have been further developed in the Council Decision 93/465/EEC of 22 July 1993 concerning the modules for the various phases of the conformity assessment procedure and the rules for the affixing and use of the CE conformity marking, which are intended to be used in the technical harmonisation directives.

(4) The Fifth Environmental Action Programme attached to the resolution of 1 February 1993 identifies noise as one of the most pressing environmental problems in urban areas and the need to take action with regard to various noise sources.

(5) In its Green Paper 'Future Noise Policy', the Commission addressed noise in the environment as one of the main local environmental problems in Europe, and announced its intention to propose a framework directive to control noise emission by equipment for use outdoors.

(6) Member States should ensure that equipment covered by this Directive complies with the requirements thereof when placed on the market or put into service in the Member States. Requirements protecting workers by regulating the use of outdoor equipment are not affected by this Directive.

(7) Member States should not prohibit, restrict or impede the placing on the market or putting into service in their territory of equipment which complies with the requirements of this Directive, bears the CE marking and the indication of the guaranteed sound power level and is accompanied by an EC declaration of conformity.

(8) The manufacturer or his authorised representative established in the Community should be responsible for ensuring that the equipment is in conformity with the provisions of this Directive and of any other directives that apply to it. The manufacturer or his authorised representative established in the Community should affix the CE marking and the indication of the guaranteed sound power level to the equipment and ensure that the equipment is accompanied by an EC declaration of conformity in order to certify thereby that the equipment is in conformity with the provisions of this Directive and any other pertinent directives.

(9) Member States, if necessary in cooperation with other Member States, should take all appropriate measures to ensure that non-complying equipment will comply in future or is withdrawn from the market. A sound implementation and application of this Directive is indispensable to meet the objectives of this Directive. A closer cooperation in the market surveillance by means of a continuous exchange of information is necessary. Therefore a Committee should be established.

(10) Marking of equipment for use outdoors with its guaranteed sound power level is essential in order to enable consumers and users to make an informed choice of equipment and as a basis for regulation on use or economic instruments to be adopted at the local or national level. This marking must be clear and unambiguous. The indicated values should be guaranteed by the manufacturer. It is appropriate that the indication of the noise emission in the form of the guaranteed sound power level should accompany the CE marking. A unified, fixed procedure to assess noise emission values is an indispensable condition for reliable marking.

(11) Existing directives concerning compressors, tower cranes, welding and power generators, and concrete-breakers and picks require the Commission to submit proposals to reduce the permissible noise levels. Noise reduction technology for some other equipment for use outdoors (e.g. graders, loader-type landfill compactors, dumpers, combustion-engine driven counterbalanced lift trucks, mobile cranes, builders' hoists, construction winches, compaction machines, paver-finishers and hydraulic power packs) is available but not generally used. Surveys show that the noise emission values of equipment for use outdoors of the same power currently on the market can differ by more than 10 dB. It is appropriate to reduce noise emissions by equipment subject to noise limits down to the level of the better performers on the market today in two stages, in order to allow manufacturers who do not already comply with the requirements sufficient time to adapt their equipment to the more demanding limit values.

(12) Different conformity assessment procedures may be considered appropriate for different categories of equipment. Decision 93/465/EEC offers different modules for use in conformity assessment procedures. For equipment subject to permissible sound power levels, a procedure consisting of an involvement of a notified body for checking the conformity with the provisions of this Directive in the design and the production phase is considered to be appropriate. Self certification is considered appropriate for equipment subject to noise marking only. Monitoring is indispensable.

(13) The technical and administrative standards of notified bodies throughout the Community should be the same. This can only be achieved by setting minimum criteria they have to meet.

(14) The collection of noise data is considered to be indispensable as a basis for informed consumer choice and for the Member States' and the Commission's further assessment of new technological development and the need for further legislative action. These noise data can be collected by simply sending a copy of the EC declaration of conformity to the Member State and the Commission.

(15) In order to protect citizens against unreasonably high noise exposure, Member States should be able to restrict, in accordance with the provisions of the Treaty, the use of equipment in the environment.

(16) The technical provisions concerning the measurement methods must be supplemented and adapted as necessary to technical progress and the progress in European standardisation. 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.

(17) It is important to have lower noise emission limits for lawnmowers and lawn trimmers/lawn edge trimmers which have remained unchanged since the adoption of Directive 84/538/EEC. To give guidance to industry, indicative figures for lower limits should be introduced for stage II. The Commission should submit a report to the European Parliament and the Council on whether and to what extent technical progress allows a reduction of limit values for lawnmowers and lawn trimmers/lawn edge trimmers, and, if appropriate, submit a proposal to amend this Directive.

(18) This Directive replaces the existing directives; the existing directives must be repealed when the requirements of this Directive come into force. Transitional periods are necessary to allow a smooth transition from the existing directives to this Directive,

HAS ADOPTED THIS DIRECTIVE:

The citations and the recitals included in the preamble to Directive 2000/14/EC indicate the legal basis of the act, the procedure according to which it was adopted, the references to the previous European legislation on noise emission by equipment for use outdoors, and the reasoning for the adoption of the new Directive.

Article 1 ***Objectives***

The aim of this Directive is to harmonise the laws of the Member States relating to noise emission standards, conformity assessment procedures, marking, technical documentation and collection of data concerning the noise emission in the environment of equipment for use outdoors. It will contribute to the smooth functioning of the internal market, while protecting human health and well-being.

Directive 2000/14/EC indicates the requirements equipment has to fulfil when placed for the first time on the European market.

Any equipment already placed on the market or put into service within the European Union before 3 January 2002 is excluded from the Directive.

The Directive does apply to second-hand equipment used in any country outside the European Union when it is imported for the first time into the Union.

The Directive is addressed to evaluation and limitation of noise emission in the environment; it does not cover the noise emissions at the workstations, which is covered by the Machinery Directive 2006/42/EC (which replaced the previous Directive 98/37/EC as by 29 December 2009).

The relation between this Directive and the Machinery Directive 2006/42/EC is that for equipment covered by both Directives, the sound pressure level at workstation(s) and the guaranteed sound power level shall be indicated in the instruction handbook; furthermore, the guaranteed sound power level shall be labelled on the equipment. For more information, see the Annex to Part 3 which has been agreed by the standing committee of the Machinery Directive.

Article 2 *Scope*

1. This Directive applies to equipment for use outdoors listed in Articles 12 and 13 and defined in Annex I. [...]

Whereas Article 1 in general addresses all equipment for use outdoors, Article 2 restricts the scope to a limited number of types of equipment. So the Commission may propose adapting this Directive in the future to add other types of equipment to its scope. See Article 20.

There are 63 types of equipment covered by this Directive.

To determine whether a type of equipment is covered or not, it is necessary to check:

- whether it is listed in Article 12 or Article 13;
- whether the equipment is intended to be used outdoors (see definition in Article 3).

If the equipment is not listed, it means that it is not covered by the Directive (for example soil stabilisers).

For equipment listed in Article 12 or 13, but placed on the market integrated in a more complex assembly, the applicability of the Directive is determined as follows:

- If the final assembly placed on the market as an entire unit is listed in Articles 12 or 13 the Directive is applicable to the final assembly (plaster sprayers). Furthermore, if the equipment is integrated after having been placed on the market as an entire unit, the Directive is also applicable to the original equipment.
- If the final assembly is **not** listed in Article 12 or 13 and if the equipment is listed in Article 12 or 13 and put on the market as an entire unit (refrigerating units), the Directive is applicable to the equipment.

Examples:

Compressors that are included in concrete and plaster sprayers are not covered as compressors, but the resulting machine (concrete or plaster sprayer) is covered.

The Directive covers refrigerating units on trucks; they are included in a more complex unit that is not covered by the Directive, i.e. the truck, but they are placed on the market as a complete unit.

[...]

This Directive only covers equipment that is placed on the market or put into service as an entire unit suitable for the intended use.

[...]

Various types of equipment covered (e.g. excavators) or otherwise (e.g. agricultural tractors) by this Directive can be used in conjunction with interchangeable equipment.

It is not in the spirit of this Directive to impose multiple certifications to the same basic machine depending on the interchangeable equipment installed.

For this reason, the manufacturer needs to define the "basic machine" called in this Directive "entire unit" based on its main use. This use is reflected in the customs declaration (NC code) as given in the Commission Regulation (EC) No 2263/2000¹⁰.

When the basic machine is defined, the manufacturer shall check if it conforms to one of the definitions given in Annex I, and apply the Directive only to that basic machine.

Equipment that requires only final assembly work without any additional part before being put into service is considered as an entire unit.

[...]

Non-powered attachments that are separately placed on the market or put into service shall be excluded, except for hand-held concrete-breakers and picks and for hydraulic hammers.

[...]

The Directive is not applicable to interchangeable equipment, that is called in this Directive "non-powered attachments". But note the exceptions: hydraulic hammers are covered and furthermore concrete breakers and picks are always covered by this Directive whether they are powered equipment or non-powered attachments.

[...]

2. The following shall be excluded from the scope of this Directive:

— *all equipment primarily intended for the transport of goods or persons by road or rail or by air or on waterways;*

[...]

Equipment listed in Article 12 or 13 mounted on lorries is covered by this Directive for the operational function and not for the transport aspect.

[...]

— *equipment specially designed and constructed for military and police purposes and for emergency services.*

[...]

By emergency services, it is understood fire brigade, civil protection, ambulances. Car breakdown services are not considered as emergency services in the sense of this Directive.

Article 3 **Definitions**

It is recommended that for all problems concerning these definitions, reference should be made to the relevant literature, especially "The 'Blue Guide' on the implementation of EU product rules 2016" (see also Article 4).

For the purpose of this Directive the following definitions shall apply:

(a) *'equipment for use outdoors' means all machinery defined in Article 1(2) of Directive 98/37/EC of the European Parliament and of the Council of 22 June 1998 on the approximation of the laws of the Member States relating to machinery⁽¹⁾ which is either self-propelled or can be moved and which, irrespective of the driving element(s), is intended to be used, according to its type, in the open air and which contributes to environmental noise exposure. The use of equipment in an ambience where the transmission of sound is not or not significantly affected (for instance under tents, under roofs for protection against rain or in the shell of houses) is regarded as use in the open air. It also means non-*

¹⁰ Commission Regulation (EC) No 2263/2000 of 13 October 2000 amending Annex I to Council Regulation (EEC) No 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff (OJ L 264, 18.10.2000, p. 1).

⁽¹⁾ OJ L 207, 23.7.1998, p. 1. Directive as amended by Directive 98/79/EC (OJ L 331, 7.12.1998, p. 1).

powered equipment for industrial or environmental applications which is intended, according to its type, to be used outdoors and which contributes to environmental noise exposure. All these types of equipment are hereinafter referred to as 'equipment';

[...]

The referred Directive 98/37/EC on Machinery was replaced by the Machinery Directive 2006/42/EC¹¹ as by December 2009.

Extract from the Machinery Directive 2006/42/EC, Article 2:

"For the purposes of this Directive [...] 'machinery' means:

- an assembly, fitted with or intended to be fitted with a drive system other than directly applied human or animal effort, consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application,*
- an assembly referred to in the first indent, missing only the components to connect it on site or to sources of energy and motion,*
- an assembly referred to in the first and second indents, ready to be installed and able to function as it stands only if mounted on a means of transport, or installed in a building or a structure,*
- assemblies of machinery referred to in the first, second and third indents or partly completed machinery referred to in point (g) which, in order to achieve the same end, are arranged and controlled so that they function as an integral whole,*
- an assembly of linked parts or components, at least one of which moves and which are joined together, intended for lifting loads and whose only power source is directly applied human effort".*

Equipment is only covered by Directive 2000/14/EC, if it is:

- designed and produced by the manufacturer in order to be used in the open air, equipment that is only by chance used in the open air is not covered;
- used in open air: which means outside buildings or within any enclosing structure that has no meaningful effect on the transmission of noise like tents, protective roofs or any open structure;
- self-propelled: which means that it moves by its own power source and transmission, or able to be moved, which means that it is designed to be portable or transportable, that is to say capable of being carried or moved from one location to another. Generally, those kinds of equipment are fitted with wheels, skids, carrying handles, trailer or lifting points.

As a consequence, the following are excluded:

- equipment intended to operate indoors (exclusive operation in shipholds is assimilated to working indoors), including underground (equipment operating temporarily underground may be covered by the Directive if it is intended to be used mainly elsewhere);
- fixed machinery, which is not intended to be moved during its operational life like compressors permanently fixed outside of buildings or pumps permanently installed outside a plant.

The non-powered equipment covered by the Directive are glass recycling containers and mobile waste containers.

[...]

(b) 'conformity assessment procedures' means the procedures laid down in Annexes V to VIII, based on Decision 93/465/EEC;

The referred act is the Council Decision 93/465/EEC of 22 July 1993 concerning the modules for the various phases of the conformity assessment procedures and the rules for the affixing and use of the CE

¹¹ Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast) (OJ L 157 9.6.2006, p. 24), as amended by Regulation (EC) No 596/2009 of the European Parliament and of the Council of 18 June 2009 (OJ L 188, 18.7.2009, p. 14; by Directive 2009/127/EC of the European Parliament and of the Council of 21 October 2009 (OJ L 310, 25.11.2009, p. 29); and by Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 (OJ L 60, 2.3.2013, p. 1); and as corrected by Corrigendum (OJ L 076, 16.3.2007, p. 35).

conformity marking, which are intended to be used in the technical harmonisation Directives¹². It was repealed by Decision No 768/2008/EC of the European Parliament and of the Council of 9 July 2008 on a common framework for the marketing of products, and repealing Council Decision 93/465/EEC¹³, with respect to conformity assessment procedures; when Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93¹⁴ sets out the general principles governing the CE marking.

Different modules are offered for the conformity assessment of equipment. Each one contains all the various phases to be followed in order to be able to affix the CE marking and issue the EC declaration of conformity.

For the equipment submitted to limits and listed in Article 12, three modules are offered "Internal control of production with assessment of technical documentation and periodical checking" (Annex VI), "Unit verification" (Annex VII) and "Full quality assurance" (Annex VIII). See also Article 14(1).

For equipment not submitted to limits and listed in Article 13, there is only one module "Internal control of production" (Annex V), which is self-certification. See also Article 14(2).

[...]

(c) *'marking' means the visibly, legibly and indelibly affixing on the equipment of the CE marking defined in Decision 93/465/EEC accompanied by the indication of the guaranteed sound power level;*

[...]

The marking for this Directive includes two separate marks:

- CE marking;
- indication of the guaranteed sound power level including a particular pictogram.

See also Article 11 and Annex IV.

[...]

(d) *'sound power level L_{WA} ' means the A-weighted sound power level in dB in relation to 1 pW as defined in EN ISO 3744:1995 and EN ISO 3746:1995;*

[...]

Those standards, which are defined as "basic noise emission standards" in Annex III to the Directive, are available from national standard bodies.

The standard EN ISO 3744:1995 *Acoustics - Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)* has been withdrawn and replaced by EN ISO 3744:2010. The standard EN ISO 3746:1995 *Acoustics - Determination of sound power levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995/Cor 1:1995)* has been withdrawn and replaced by EN ISO 3746:2010.

[...]

(e) *'measured sound power level' means a sound power level as determined from measurements as laid down in Annex III; measured values may be determined either from a single machine representative for the type of equipment or from the average of a number of machines;*

(f) *'guaranteed sound power level' means a sound power level determined in accordance with the requirements laid down in Annex III which includes the uncertainties due to production variation and*

¹² OJ L 220, 30.8.1993, p. 23.

¹³ OJ L 218, 13.8.2008, p. 82.

¹⁴ OJ L 218, 13.8.2008, p. 30.

measurement procedures and where the manufacturer, or his authorised representative established in the Community, confirms that according to the technical instruments applied and referred to in the technical documentation it is not exceeded.

See Part 4 of these Guidelines.

Article 4 **Placing on the market**

1. Equipment referred to in Article 2(1) shall not be placed on the market or put into service until the manufacturer, or his authorised representative established in the Community, ensures that:

- the equipment satisfies the requirements concerning the noise emission in the environment of this Directive;*
- the conformity assessment procedures referred to in Article 14 have been completed;*
- the equipment bears CE marking and the indication of the guaranteed sound power level and is accompanied by an EC declaration of conformity.*

[...]

This article indicates that equipment has to fulfil the requirements of the Directive in the following situations whichever happens first:

- when placed on the European market for the first time (if they are new or already used in any country outside the European Union);
- when put into service for the first time in the European Union.

Any equipment already placed on the market or put into service within the European Union before 3 January 2002 is not covered by the Directive.

Definitions for clarification

- The following definitions come from "The 'Blue Guide on the implementation of EU product rules 2016" available on the website of the European Union¹⁵. **Making available on the market** (§ 2.2): a product is made available on the market when supplied for distribution, consumption or use on the Union market in the course of a commercial activity, whether in return for payment or free of charge.
- **Placing on the market** (§ 2.3): a product is placed on the market when it is made available for the first time on the Union market.
- **Putting into service or use (and installation)** (§ 2.5): it takes place at the moment of first use within the Union by the end user for the purposes for which it was intended.

The flow charts in Part 2 of these Guidelines give the complete breakdown of the necessary operations to place equipment on the market in conformity with this Directive in relation to the module applied.

Equipment intended for export to non-EU markets does not need to comply with this Directive.

[...]

2. Where neither the manufacturer nor his authorised representative is established in the Community, the obligations of this Directive shall apply to any person placing the equipment on the market or putting it into service in the Community.

Retailers are not usually affected by the Directive unless they are also the manufacturer or are responsible for importing the equipment and placing it for the first time on the Union market.

Users are not affected by the Directive unless they are purchasing and importing equipment from outside of the Union for their own use. The obligations of the Directive will then apply to them as they are putting the equipment into service for the first time within the Union.

¹⁵ <http://ec.europa.eu/DocsRoom/documents/18027>.

Whenever second-hand equipment used in any country or territory outside the Union is imported for the first time into the Union, the importer shall fulfil the requirements of this article.

Article 5
Market surveillance

1. Member States shall take all appropriate measures to ensure that equipment referred to in Article 2(1) may be placed on the market or put into service only if it conforms to the provisions of this Directive, bears the CE marking and the indication of the guaranteed sound power level and is accompanied by an EC declaration of conformity.

2. The competent authorities of the Member States shall assist each other in the fulfilment of their obligations to carry out market surveillance.

Market surveillance is the exclusive responsibility of the Member States which set up appropriate procedures. The Commission is not in charge of the market surveillance but will be expected to coordinate the exchange of information between Member States.

Article 6
Free movement

1. Member States shall not prohibit, restrict or impede the placing on the market or putting into service in their territory of equipment referred to in Article 2(1) which complies with the provisions of this Directive, bears the CE marking and the indication of the guaranteed sound power level and is accompanied by an EC declaration of conformity.

2. At trade fairs, exhibitions, demonstrations, and similar events, Member States shall not prevent the showing of equipment referred to in Article 2(1) which does not conform to the provisions of this Directive, provided that a visible sign clearly indicates that such equipment does not conform and that it is not placed on the market or put into service until it has been brought into conformity by the manufacturer or his authorised representative established in the Community. During demonstrations adequate safety measures shall be taken to ensure the protection of persons.

The second paragraph of this article authorises the display of equipment that does not comply with the Directive at fairs, exhibitions and demonstrations.

This paragraph also authorises showing equipment intended for markets outside the Union.

The visible sign, generally a plate on the machine or next to it, may combine equivalent declaration(s) requested by other applicable Directives.

Article 7
Presumption of conformity

Member States shall presume that equipment referred to in Article 2(1) bearing the CE marking and the indication of the guaranteed sound power level and which is accompanied by the EC declaration of conformity conforms to all the provisions of this Directive.

If a piece of equipment bears the CE marking, bears the indication of the guaranteed sound power level, and is accompanied by the EC declaration of conformity, Member States shall presume that the equipment conforms to all provisions of the Directive (e.g. does not exceed the permissible sound power level, if any). The equipment may circulate freely in the Union but is still subject to market surveillance.

Article 8
EC declaration of conformity

1. The manufacturer, or his authorised representative established in the Community, of equipment referred to in Article 2(1) shall, in order to certify that an item of equipment is in conformity with the provisions of this Directive, draw up an EC declaration of conformity for each type of equipment manufactured; the minimum content of this declaration of conformity is laid down in Annex II.
[...]

(a) General

EC declaration of conformity for the market

This EC declaration of conformity:

- is provided along with each item of equipment with the description of the equipment;
- is one of the proofs of conformity;
- may be combined with the declaration(s) of conformity required for other Directive(s) like the Machinery Directive 2006/42/EC.

EC declaration of conformity, specimen for the authorities

Furthermore, specimens of the EC declaration of conformity shall be issued for each model of equipment (see definition at the beginning of Part 3):

- to be sent to a Member State and the Commission for the collection of data (see Article 16);
- to be incorporated in the technical documentation which shall be kept for 10 years from the date when the last item of equipment was manufactured.

(b) Second-hand equipment

Whenever second-hand equipment used in any country or territory outside the Union is imported for the first time into the Union, the importer shall fulfil the requirements of this article.

[...]

2. A Member State may require that the declaration of conformity be drawn up in or translated into the official Community language or languages determined by the Member State when equipment is placed on the market or put into service in its territory.

[...]

The Directive itself gives no requirement about the language of the EC declaration of conformity but the national law transposing the Directive may require a particular language, so it is recommended to check the national law on that particular point.

The EC declaration of conformity may be multilingual.

3. The manufacturer, or his authorised representative established in the Community, of equipment referred to in Article 2(1) shall keep a specimen of the EC declaration of conformity for 10 years from the date on which the equipment was last manufactured, together with the technical documentation as provided for in Annex V point 3, Annex VI point 3, Annex VII point 2, Annex VIII points 3.1 and 3.3.

The manufacturer shall keep a specimen of the EC declaration of conformity for each model of equipment for 10 years from the date on which the equipment was last manufactured. It is not mandatory to keep a copy of that declaration for each item of equipment sold.

Article 9

Non-compliance of equipment

1. Where a Member State ascertains that equipment referred to in Article 2(1) which is placed on the market or put into service does not comply with the requirements of this Directive, it shall take all appropriate measures so that the manufacturer or his authorised representative established in the Community shall bring the equipment into conformity with the provisions of this Directive.

[...]

Only a Member State may initiate an administrative procedure prohibiting marketing against a manufacturer.

The non-compliance of equipment may appear:

- in case of market surveillance;
- during production control by a notified body as stated in Annex VI (see Figure 2 in Part 2 of these Guidelines);
- during inspection of the production control system as stated in Annex VIII (see Figure 4 in Part 2 of these Guidelines).

Reason for non-compliance of equipment can be either:

- no CE marking;
- no guaranteed sound power level marking;
- no EC declaration of conformity;
- lack or insufficiency of technical documentation;
- no implementation of corrective action formally agreed between the notified body and the manufacturer following a production control;
- affixed guaranteed value is exceeded but remains below the limit value for equipment under Article 12 and no immediate corrective action has been taken by the manufacturer.

Member States are free to define their own procedure, but the general approach can be along the following lines.

When non-compliance has been identified, the Member State officially informs the manufacturer and gives him a deadline to bring the equipment back into conformity. The allocated time needs to be proportionate to the degree of non-conformity.

This gives time for the manufacturer to organise his defence to avoid the measure becoming confirmed and consequently extended throughout the whole Union, because during this phase, the Commission and the other Member States are not informed.

[...]

2. Where

(a) the limit values referred to in Article 12 are exceeded; or

(b) non-compliance with other provisions of this Directive continues despite measures taken under paragraph 1;

the Member State concerned shall take all appropriate measures to restrict or prohibit the placing on the market or putting into service of the equipment in question or to ensure that it is withdrawn from the market. The Member State shall immediately inform the Commission and the other Member States of such measures.

3. The Commission shall enter into consultations with the parties concerned as soon as possible. Where, after such consultation, the Commission finds that:

- *the measures are justified, it shall immediately so inform the Member State which took the initiative and the other Member States;*
- *the measures are unjustified, it shall immediately so inform the Member State which took the initiative, the other Member States and the manufacturer or his authorised representative established in the Community.*

[...]

The parties concerned may be:

- the Member States, especially the Member State where the manufacturer is established;
- the manufacturer;
- the notified bodies.

Once the Commission has decided that the measure is justified, it is rather late for the manufacturer to defend himself.

If the measures are justified, the Member State restricts or prohibits the placing on the market of all the items of equipment of the same model; a recall action may be also imposed.

If the measures are not justified and the manufacturer considers he has suffered a loss during such procedures, he should inform the Member State which initiated the safeguard clause and proceed in accordance with the laws of that State.

[...]

4. The Commission shall ensure that the Member States are kept informed of the progress and outcome of this procedure.

Article 10 **Legal remedies**

Any measure taken by a Member State pursuant to this Directive which restricts the placing on the market or putting into service of equipment covered by this Directive shall state the exact reasons on which it is based. Such a measure taken shall be notified as soon as possible to the party concerned, who shall at the same time be informed of the legal remedies available to him under the laws in force in the Member State concerned and of the time limits to which such remedies are subject.

Article 11 **Marking**

1. Equipment referred to in Article 2(1) placed on the market or put into service which complies with the provisions of this Directive shall bear the CE marking of conformity. The marking shall consist of the initials 'CE'. The form of the marking to be used is shown in Annex IV.

[...]

There is only one CE marking on an item of equipment that indicates compliance with all the relevant EU harmonisation legislations for that item of equipment.

[...]

2. The CE marking shall be accompanied by the indication of the guaranteed sound power level. A model of this indication is given in Annex IV.

[...]

The pictogram shown in the model given in Annex IV is part of the marking. It has been changed compared to the Directives which have been repealed by this one. Furthermore, the sound pressure level at the operator station and the corresponding marking are no longer covered by this Directive 2000/14/EC. See also the comment on Article 21.

The rules for the size of the plate are given in the same Annex.

[...]

3. The CE marking of conformity and the indication of the guaranteed sound power level shall be affixed in a visible, legible and indelible form to each item of equipment.

[...]

CE marking and the indication of the guaranteed sound power level do not need to be close one to the other.

CE marking is generally affixed outside of the machine; the guaranteed sound power level may be outside of the machine or at the operator station. Locations for marking which are partly covered by components or that need removal of equipment parts or need mirrors or similar devices should be avoided. Marking

has a fundamental role for the information of customers; labels placed under the seats of equipment or on removable attachments do not fulfil the visibility and indelibility conditions of this article.

[...]

4. The affixing of markings or inscriptions on the equipment which are likely to be misleading with regard to the meaning or the form of the CE marking or to the indication of the guaranteed sound power level shall be prohibited. Any other marking may be affixed to the equipment, provided that the visibility and legibility of the CE marking and the indication of the guaranteed sound power level is not thereby reduced.

5. Where the equipment referred to in Article 2(1) is subject to other directives concerning other aspects and which also provide for the affixing of the CE marking, the marking shall indicate that such equipment also fulfils the provisions of those directives. However, should one or more of these directives allow the manufacturer, during a transitional period, to choose which arrangements to apply, the CE marking shall indicate that the equipment only fulfils the provisions of the directives applied by the manufacturer. In this case the particulars of those directives, as published in the Official Journal of the European Communities, must be given in the documents, notices or instructions required by those directives and accompanying such equipment.

The CE marking, as presented in Annex IV, is the same for all the EU harmonization legislation (Regulations and Directives) under the New/Global Approach and the New Legislative Framework, as defined in the relevant legislation. Each item of equipment shall bear a single CE marking valid for all the EU legislations applied. The list of the Regulations and/or Directives applied appears in the EC/EU declaration(s) of conformity which accompany/ies each item of equipment.

Article 12

Equipment subject to noise limits

In this clause, the definitions of Annex I of the Directive and the reference to the methods of measurement of Annex III have been introduced to ease reading.

A model of equipment may be fitted with different components, for example engines, equivalent under the functional aspect.

The manufacturer has to judge the effect these different possibilities have on the equipment noise emission and choose among different options:

- The noise emission is substantially equivalent, thus the different components can be considered within the uncertainties due to production variation.
- The noise emission is different and he may choose to consider the noisiest configuration for the determination of the guaranteed sound power level.
- The noise emission is different and he may choose to certify each configuration separately.

The guaranteed sound power level of equipment listed below shall not exceed the permissible sound power level as laid down in the following tables of limit values:

Builders' hoists for the transport of goods (combustion-engine-driven)

Definition: Annex I, item 3.

A power-operated, temporarily installed builders' hoist intended for use by persons who are permitted to enter engineering and construction sites, serving

(i) defined landing levels, having a platform

- *designed for the transportation of goods only which permits the access of persons during loading and unloading*
- *which permits the access and travel by authorised persons during erection, dismantling and maintenance*
- *guided*
- *travelling vertical or along a path within 15° max. of the vertical*

- supported or sustained by: wire rope, chain, screwed spindle and nut; rack and pinion, hydraulic jack (direct or indirect), or an expanding linkage mechanism
- where masts may or may not require support from separate structures, or
- (ii) either one upper landing or a work area extending to the end of the guide (e.g. a roof) having a load-carrying device:
 - designed for the transportation of goods only
 - designed that there is no need to step on it for loading or unloading purposes or for maintenance, erection and dismantling
 - from which persons are prohibited at any time
 - guided
 - which is designed to travel at an angle of at least 30° to the vertical but may be used at any angle
 - sustained by steel wire rope and a positive drive system
 - controlled by constant pressure type controls
 - which does not benefit from the use of any counterweight
 - having a maximum rated load of 300 kg
 - having a maximum speed of 1 m/s
 - and where the guides require support from separate structures.

Measurement: Annex III, Part B, item 3

Compaction machines (only vibrating and non-vibrating rollers, vibratory plates and vibratory rammers)

Definition: Annex I, item 8.

The definition comes from EN 500-4:1995 *Mobile road construction machines - Safety - Part 4: Specific requirements for compaction machines* and it can be found also in the latest version of the standard, EN 500-4:2011.

A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows:

- rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine,
- walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operating facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control,
- towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit,
- vibratory plates and vibratory rammers: compaction machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine,
- explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.

The compaction machine which is attachment to a carrying machine is covered by this Directive only if the attachment is powered.

If it depends from the carrying machine as the power source, it is excluded as regulated by Article 2.

For other types of compaction machines see Article 13.

Measurement: Annex III, Part B, item 8

Compressors (<350 kW)

Definition: Annex I, item 9.

The definition comes from ISO 3857-2:1977 *Compressors, pneumatic tools and machines - Vocabulary - Part 2: Compressors*.

Any machine for use with interchangeable equipment which compresses air, gases or vapours to a pressure higher than the inlet pressure. A compressor comprises the bare compressor itself, the prime mover and any component or device supplied, which is necessary for safe operation of the compressor.

Excluded are the following categories of device:

- fans, i.e. devices producing air circulation at a positive pressure of not more than 110 000 pascals,
- vacuum pumps, i.e. devices or appliances for extracting air from an enclosed space at a pressure not exceeding atmospheric pressure,
- gas turbine engines.

Measurement: Annex III, Part B, item 9

Concrete-breakers and picks, hand-held

Definition: Annex I, item 10.

The definition comes from the repealed Directive 84/537/EEC.

Powered (by any method) concrete-breakers and picks used to perform work on civil engineering and building sites.

Measurement: Annex III, Part B, item 10

Construction winches (combustion-engine driven)

Definition: Annex I, item 12.

A power-operated, temporarily installed lifting appliance which is equipped with means for raising and lowering a suspended load.

The construction winches with electric motor are covered by Article 13.

Measurement: Annex III, Part B, item 12

Dozers (<500kW)

Definition: Annex I, item 16.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

A self-propelled wheeled or crawler machine used to exert a push or pull force through mounted equipment.

Measurement: Annex III, Part B, item 16

Dumpers (<500 kW)

Definition: Annex I, item 18.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

A self-propelled wheeled or crawler machine having an open body, which either transports and dumps or spreads material. Dumpers may be equipped with integral self-loading equipment.

The definition includes compact dumpers and walk-behind types.

Measurement: Annex III, Part B, item 18

Excavators, hydraulic or rope-operated (<500 kW)

Definition: Annex I, item 20.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

A self-propelled crawler or wheeled machine having an upper structure capable of a minimum of 360° rotation, which excavates, swings and dumps material by the action of a bucket fitted to the boom and arm or telescopic boom, without moving the chassis or under-carriage during any one cycle of the machine.

Measurement: Annex III, Part B, item 20

Excavator-loaders (<500 kW)

Definition: Annex I, item 21.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

A self-propelled wheeled or crawler machine having a main structural support designed to carry both a front-mounted bucket loading mechanism and a rear-mounted backhoe. When used in the backhoe mode, the machine normally digs below ground level with bucket motion towards the machine. The backhoe lifts, swings and discharges material while the machine is stationary. When used in the loader mode, the machine loads or excavates through forward motion of the machine, and lifts, transports and discharges material.

Measurement: Annex III, Part B, item 21

Graders (<500 kW)

Definition: Annex I, item 23.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

A self-propelled wheeled machine having an adjustable blade, positioned between front and rear axles, which cuts, moves and spreads material usually to grade requirements.

Measurement: Annex III, Part B, item 23

Hydraulic power packs

Definition: Annex I, item 29.

Any machine for use with interchangeable equipment which compresses liquids to a pressure higher than the inlet pressure. It means an assembly of a prime mover, pump, with or without reservoir and accessories (e.g. controls, pressure relief valve).

Measurement: Annex III, Part B, item 29

Landfill compactors, loader-type with bucket (<500 kW)

Definition: Annex I, item 31.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

A self-propelled wheeled compaction machine having a front-mounted loader linkage with a bucket having steel wheels (drums) primarily designed to compact, move, grade, and load soil, landfill or sanitary (refuse) materials.

Measurement: Annex III, Part B, item 31

Lawnmowers (excluding agricultural and forestry equipment, and multi-purpose devices, the main motorised component of which has an installed power of more than 20 kW)

Definition: Annex I, item 32.

The definition comes from EN 836:1997 *Garden equipment - Powered lawnmowers - Safety* (withdrawn). It can be found also in the standards which replaced it, EN ISO 5395-1:2013, EN ISO 5395-2:2013+A1:2016 and EN ISO 5395-3:2013+A1:2017.

A walk-behind or ride-on grass cutting machine or a machine with grass-cutting attachment(s) where the cutting device operates in a plane approximately parallel to the ground and which uses the ground to determine the height of cut by means of wheels, air cushion or skids, etc., and which utilises an engine or an electric motor for a power source. The cutting devices are:

- *either rigid cutting elements*
- *or non-metallic filament line(s) or freely pivoting non-metallic cutter(s) with a kinetic energy of more than 10 J each; the kinetic energy is determined using EN 786:1997, Annex B.*

Also a walk-behind or ride-on grass cutting machine or a machine with grass-cutting attachment(s) where the cutting device is rotating about a horizontal axis to provide a shearing action with a stationary cutter bar or knife (cylinder mower).

Self-propelled machines or vehicles with operator which are primarily designed for cutting grass and auxiliary garden work are not considered as multi-purpose devices even if they can be fitted with attachments (this definition covers the same machines as the previous Directive 84/538/EEC).

The machines excluded by the text in brackets are:

- agricultural and forestry equipment on which attachment may be installed;
- agricultural and forestry equipment designed for cutting grass; (called mowers if they are non-powered attachments, motor mowers if they are powered equipment).
- multi-purpose devices which are used with different type of attachment having his main motorised component with an installed power of more than 20 kW.

EN 836 refers to "blade" rather than "knife".

Measurement: Annex III, Part B, item 32

Lawn trimmers/lawn edge trimmers

Definition: Annex I, item 33.

The definition comes from EN 786:1996 *Garden equipment - Electrically powered walk-behind and hand-held lawn trimmers and lawn edge trimmers - Mechanical safety* and it can be found also in the latest version of the standard, EN 786:1996+A2:2009.

An electrically powered walk-behind or hand-held grass cutting machine with cutting element(s) of non-metallic filament line(s) or freely pivoting non-metallic cutters with a kinetic energy of not more than 10 J each, intended to cut grass or similar soft vegetation. The cutting element(s) operate(s) in a plane approximately parallel (lawn trimmer) or perpendicular (lawn edge trimmer) to the ground. The kinetic energy is determined using EN 786:1997, Annex B.

Cutters should read "cutter(s)", as all other items.

Measurement: Annex III, Part B, item 33

Lift trucks, combustion-engine driven, counterbalanced (excluding 'other counterbalanced lift trucks' as defined in Annex I, item 36, second indent with a rated capacity of not more than 10 tonnes)

Definition: Annex I, item 36.

The definition comes from ISO 5053:1987 *Powered industrial trucks - Terminology* and it can be found also in the standard which replaced it, ISO 5053-1:2015.

A wheeled, internal combustion-engine driven lift truck with counterweight and lifting equipment (mast, telescopic arm or articulated arm). These are:

- *rough terrain trucks (wheeled counterbalanced trucks intended primarily for operation on unimproved natural terrain and on disturbed terrain of, e.g., construction sites),*
- *other counterbalanced lift trucks, excluded are those counterbalanced lift trucks that are specifically constructed for container handling.*

Telehandlers are a type of rough terrain truck.

Industrial trucks are lift trucks.

Lift trucks excluded here are included in Article 13.

Measurement: Annex III, Part B, item 36

Loaders (<500 kW)

Definition: Annex I, item 37.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

A self-propelled wheeled or crawler machine having an integral front-mounted bucket-supporting structure and linkage, which loads or excavates through forward motion of the machine, and lifts, transports and discharges material.

Measurement: Annex III, Part B, item 37

Mobile cranes

Definition: Annex I, item 38.

The definition comes from ISO 4306-2:1994 *Cranes - Vocabulary - Part 2: Mobile cranes* and can be found also in the latest version of the standard, ISO 4306-2:2012.

A self-powered jib crane capable of travelling, loaded or unloaded, without the need for fixed runways and relying on gravity for stability. It operates on tyres, crawlers or with other mobile arrangements. In fixed positions it may be supported by outriggers or other accessories increasing its stability. The superstructure of a mobile crane may be of the type of full-circle slewing, of limited slewing or non-slewing. It is normally equipped with one or more hoists and/or hydraulic cylinders for lifting and lowering the jib and the load. Mobile cranes are equipped either with telescopic jibs, with articulated jibs, with lattice jibs, or a combination of these, of such a design that may readily be lowered. The loads suspended from the jib may be handled by hook block assemblies or other load-lifting attachments for special services.

Measurement: Annex III, Part B, item 38

Motor hoes (<3 kW)

Definition: Annex I, item 40.

The definition comes from EN 709:1997 *Agricultural and forestry machinery - Pedestrian controlled tractors with mounted rotary cultivators, motor hoes with drive wheel(s) - Safety* and it can be found also in the latest version of the standard, EN 709:1997+A4:2009.

A self-propelled machine designed to be pedestrian-controlled:

- *with or without support wheel(s), in such a way that its working elements act as hoeing tools to ensure propulsion (motor hoe)*
- *and propelled by one or various wheel(s) directly actuated from the engine and equipped with hoeing tools (motor hoe with drive wheel(s)).*

Measurement: Annex III, Part B, item 40

Paver-finishers (excluding paver-finishers equipped with a high-compaction screed)

Definition: Annex I, item 41.

The definition comes from EN 500-6:1995 *Mobile road construction machines - Safety - Part 6: Specific requirements for paver-finishers* and it can be found also in the latest version of the standard, EN 500-6:2006+A1:2008.

A mobile road construction machine used for the purpose of applying layers of construction material, such as bituminous mix, concrete and gravel on surfaces. Paver-finishers may be equipped with a high-compaction screed.

Paver-finishers equipped with a high-compaction screed are covered by Article 13.

Measurement: Annex III, Part B, item 41

Power generators (<400 kW)

Definition: Annex I, item 45.

The definition comes from the repealed Directive 84/536/EEC.

Any device comprising an internal combustion engine driving a rotary electrical generator producing a continuous supply of electrical power.

Power generators larger than 400 kW are covered in Article 13.
ISO 8528-1 offers a different definition.

Measurement: Annex III, Part B, item 45

Tower cranes

Definition: Annex I, item 53.

The definition comes from ISO 4306-3:1991 *Cranes - Vocabulary - Part 3*.

A slewing jib crane with the jib located at the top of a tower which stays approximately vertical in the working position. This power-driven appliance is equipped with means for raising and lowering suspended loads and for the movement of such loads by changing the load-lifting radius, slewing, travelling of the complete appliance. Certain appliances perform several but not necessarily all of these movements. The appliance can be installed in a fixed position or equipped with means for displacing or climbing.

Measurement: Annex III, Part B, item 53

Welding generators

Definition: Annex I, item 57.

The definition comes from the repealed Directive 84/535/EEC.

Any rotary device which produces a welding current.

Measurement: Annex III, Part B, item 57

Table of limit values

Net installed power: this Directive does not offer any definition of net installed power.

In the description of the test of powered equipment free of load (Annex III, Part A, Clause 2.2), the net power is described in a note as follows:

Net power means the power in 'EC kW' obtained on the test bench at the end of the crankshaft, or its equivalent, measured in accordance with the EC method of measuring the power of internal combustion engines for road vehicles, except that the power of the engine cooling fan is excluded.

The definition is the same as the one given 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 machinery¹⁶ (repealed by Regulation (EU) 2016/1628¹⁷ as by 1 January 2017) for the power definition in view of exhaust emission values of diesel engines. This same definition is used for the amendment of the same Directive to include some kinds of spark ignition reciprocating internal combustion engines.

Note: The EC method of measuring power for all types of reciprocating internal combustion engines is given in Directive 80/1269/EEC as amended. This Directive is referred to in 97/68/EC.

This power definition is different from the ones used in the Directives repealed by Article 21 of this Directive and in various harmonised standards for the Machinery Directive.

A specific Regulation No. 120 *Uniform provisions concerning the approval of internal combustion engines to be installed in agricultural and forestry tractors and in non-road mobile machinery, with regard to the measurement of the net power, net torque and specific fuel consumption* was issued by the United Nations Economic Commission for Europe (UNECE) with the purpose of bringing harmonisation where the proliferation of incoherent power standards has caused multiple power declarations on the same model of equipment.

It is recommended to adopt the definition from Directive 97/68/EC – repealed by Regulation (EU) 2016/1628 from 1 January 2017.

Further guidance on the list of accessories to be installed on the engine for net power determination can be found in ISO 14396:2002.

For equipment with variable power ratings, only use the equipment highest net power rating to determine the applicable sound power level limit value.

¹⁶ OJ L 059, 27.2.1998, p. 1.

¹⁷ OJ L 252, 16.9.2016, p. 53.

Type of equipment	Net installed power P (in kW) Electric power P_{el} ⁽¹⁾ in kW Mass of appliance m in kg Cutting width L in cm	Permissible sound power level in dB/1 pW	
		Stage I as from 3 January 2002	Stage II as from 3 January 2006
Compaction machines (vibrating rollers, vibratory plates, vibratory rammers)	$P \leq 8$	108	105 ⁽²⁾
	$8 < P \leq 70$	109	106 ⁽²⁾
	$P > 70$	$89 + 11 \lg P$	$86 + 11 \lg P$ ⁽²⁾
Tracked dozers, tracked loaders, tracked excavator- loaders	$P \leq 55$	106	103 ⁽²⁾
	$P > 55$	$87 + 11 \lg P$	$84 + 11 \lg P$ ⁽²⁾
Wheeled dozers, wheeled loaders, wheeled excavator- loaders, dumpers, graders, loader-type landfill compactors, combustion- engine driven counter- balanced lift trucks, mobile cranes, compaction machines (non-vibrating rollers), paver-finishers, hydraulic power packs	$P \leq 55$	104	101 ⁽²⁾ ⁽³⁾
	$P > 55$	$85 + 11 \lg P$	$82 + 11 \lg P$ ⁽²⁾ ⁽³⁾
Excavators, builders' hoists for the transport of goods, construction winches, motor hoes	$P \leq 15$	96	93
	$P > 15$	$83 + 11 \lg P$	$80 + 11 \lg P$
Hand-held concrete-breakers and picks	$m \leq 15$	107	105
	$15 < m < 30$	$94 + 11 \lg m$	$92 + 11 \lg m$ ⁽²⁾
	$m \geq 30$	$96 + 11 \lg m$	$94 + 11 \lg m$
Tower cranes		$98 + \lg P$	$96 + \lg P$
Welding and power generators	$P_{el} \leq 2$	$97 + \lg P_{el}$	$95 + \lg P_{el}$
	$2 < P_{el} \leq 10$	$98 + \lg P_{el}$	$96 + \lg P_{el}$
	$P_{el} > 10$	$97 + \lg P_{el}$	$95 + \lg P_{el}$
Compressors	$P \leq 15$	99	97
	$P > 15$	$97 + 2 \lg P$	$95 + 2 \lg P$
Lawnmowers, lawn trim- mers/lawn-edge trimmers	$L \leq 50$	96	94 ⁽²⁾
	$50 < L \leq 70$	100	98
	$70 < L \leq 120$	100	98 ⁽²⁾
	$L > 120$	105	103 ⁽²⁾

⁽¹⁾ P_{el} for welding generators: conventional welding current multiplied by the conventional load voltage for the lowest value of the duty factor given by the manufacturer.

P_{el} for power generators: prime power according to ISO 8528-1:1993, Clause 13.3.2

⁽²⁾ The figures for stage II are merely indicative for the following types of equipment:

- walk-behind vibrating rollers;
- vibratory plates (> 3 kW);
- vibratory rammers;
- dozers (steel tracked);
- loaders (steel tracked > 55 kW);
- combustion-engine driven counterbalanced lift trucks;
- compacting screed paver-finishers;
- hand-held internal combustion-engine concrete-breakers and picks ($15 < m < 30$);
- lawnmowers, lawn trimmers/lawn-edge trimmers.

Definitive figures will depend on amendment of the Directive following the report required in Article 20(1). In the absence of any such amendment, the figures for stage I will continue to apply for stage II.

⁽³⁾ For single-engine mobile cranes, the figures for stage I shall continue to apply until 3 January 2008. After that date, stage II figures shall apply.

The permissible sound power level shall be rounded to the nearest whole number (less than 0,5, use lower number; greater than or equal to 0,5, use higher number).

Article 13
Equipment subject to noise marking only

In this clause, the definitions of Annex I of the Directive have been introduced to ease reading.

A parameter is given for each type of equipment that should be indicated in the EC declaration of conformity to allow a meaningful data collection (see Article 16). Although this is not a specific requirement of the Directive, the collaboration of manufacturers is strongly encouraged.

Wherever "installed power" is indicated it should be reminded that:

- "net installed power" refers to the parameter for reciprocating internal combustion engines (see also comments in Article 12);
- "installed power" refers to electric motors.

A model of equipment may be fitted with different components e.g. engines, equivalent under the functional aspect.

The manufacturer has to judge the effect these different possibilities have on the equipment noise emission and choose among different options:

- the noise emission is substantially equivalent, thus the different components are considered within the uncertainties due to production variation;
- the noise emission is different and he may choose to consider the noisiest configuration for the determination of the guaranteed sound power level;
- the noise emission is different and he may choose to certify each configuration separately.

The guaranteed sound power level of equipment listed below shall be subject to noise marking only:

Aerial access platforms with combustion engine

Definition: Annex I, item 1.

The definition comes from EN 280:2001 *Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests* and it can be found also in the latest version of the standard, EN 280:2013+A1:2015.

Parameter to be indicated in the declaration of conformity: installed power (kW).

Equipment consisting as a minimum of a work platform, an extending structure and a chassis. The work platform is a fenced platform or a cage which can be moved under load to the required working position. The extending structure is connected to the chassis and supports the work platform; it allows movement of the work platform to its required position.

Measurement: Annex III, Part B, item 1

Brush cutters

Definition: Annex I, item 2.

The definition comes from EN ISO 11806:1997 *Agricultural and forestry machinery - Portable hand-held combustion engine driven brush cutters and grass trimmers - Safety* and it can be found also in the latest version of the standard, EN ISO 11806-1:2011.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A combustion-engine driven portable hand-held unit fitted with a rotating blade made of metal or plastic intended to cut weeds, brush, small trees and similar vegetation. The cutting device operates in a plane approximately parallel to the ground.

Measurement: Annex III, Part B, item 2

Builders' hoists for the transport of goods (with electric motor)

Definition: Annex I, item 3.

The definition comes from EN 12158:2000+A1:2010 *Builders hoists for goods, Part 1: Hoists with accessible platforms* and *Part 2: Inclined hoists with non-accessible load carrying devices*.
Parameter to be indicated in the declaration of conformity: installed power (kW).

A power-operated, temporarily installed builders' hoist intended for use by persons who are permitted to enter engineering and construction sites, serving

(i) defined landing levels, having a platform:

— *designed for the transportation of goods only which permits the access of persons during loading and unloading*

— *which permits the access and travel by authorised persons during erection, dismantling and maintenance*

— *guided*

— *travelling vertical or along a path within 15° max. of the vertical*

— *supported or sustained by: wire rope, chain, screwed spindle and nut; rack and pinion, hydraulic jack (direct or indirect), or an expanding linkage mechanism*

— *where masts may or may not require support from separate structures, or*

(ii) either one upper landing or a work area extending to the end of the guide (e.g. a roof) having a load-carrying device:

— *designed for the transportation of goods only*

— *designed that there is no need to step on it for loading or unloading purposes or for maintenance, erection and dismantling*

— *from which persons are prohibited at any time*

— *guided*

— *which is designed to travel at an angle of at least 30° to the vertical but may be used at any angle*

— *sustained by steel wire rope and a positive drive system*

— *controlled by constant pressure type controls*

— *which does not benefit from the use of any counterweight*

— *having a maximum rated load of 300 kg*

— *having a maximum speed of 1 m/s*

— *and where the guides require support from separate structures.*

Builders' hoists for the transport of goods (combustion engine-driven) are covered by Article 12.

Measurement: Annex III, Part B, item 3

Building site band saw machines

Parameter to be indicated in the declaration of conformity: installed power (kW).

Definition: Annex I, item 4.

A hand-fed powered machine weighing less than 200 kg fitted with a single saw blade in the form of a continuous band mounted on and running between two or more pulleys.

Measurement: Annex III, Part B, item 4

Building site circular saw benches

Definition: Annex I, item 5.

The definition comes from EN 1870-1:1999 *Safety of woodworking machines - Circular sawing machines - Circular saw benches (with and without sliding table) and dimension saws* and it can be found also in the standards which replaced it, EN 1870-18:2013 and EN 1870-19:2013.

Parameter to be indicated in the declaration of conformity: sawblade diameter (mm).

A hand-fed machine weighing less than 200 kg fitted with a single circular sawblade (other than a scoring saw) with a diameter of 350 mm or more, up to a maximum diameter of 500 mm, which is fixed during the normal cutting operation, and a horizontal table, all or part of which is fixed during operation. The sawblade is mounted on a horizontal non-tilting spindle, the position of which remains stationary during machining. The machine may have any of the following features:

- *The facility for the sawblade to be raised and lowered through the table.*
- *Machine frame below the table may be open or enclosed.*
- *The saw may be fitted with an additional, manually operated travelling table (not adjacent to the sawblade).*

Measurement: Annex III, Part B, item 5

Chain saws, portable

Definition: Annex I, item 6.

The definition comes from ISO 6531:1999 *Machinery for forestry - Portable hand-held chain-saws - Vocabulary* and it can be found also in the latest version of the standard, ISO 6531:2017.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A power-driven tool designed to cut wood with a saw chain and consisting of an integrated compact unit of handles, power source and cutting attachment, designed to be supported with two hands.

Measurement: Annex III, Part B, item 6

Hydraulic or pneumatic devices with no integrated power source are excluded.

Combined high pressure flushers and suction vehicles

Parameter to be indicated in the declaration of conformity: installed power (kW).

Definition: Annex I, item 7.

A vehicle which may work either as a high pressure flusher or as a suction vehicle. See high pressure flusher, suction vehicle.

Measurement: Annex III, Part B, item 7

Compaction machines (only explosion rammers)

Definition: Annex I, item 8.

The definition comes from EN 500-4:1995 *Mobile road construction machines - Safety - Part 4: Specific requirements for compaction machines* and it can be found also in the latest version of the standard, EN 500-4:2011.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows:

- *rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine,*
- *walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operating facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control,*
- *towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit,*
- *vibratory plates and vibratory rammers: compaction machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine,*
- *explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.*

The compaction machine which is attachment to a carrying machine is covered by this Directive only if the attachment is powered. If it depends from the carrying machine as the power source, it is excluded.

The other compaction machines are covered by Article 12.

Measurement: Annex III, Part B, item 8

Concrete or mortar mixers

Definition: Annex I, item 11.

The definition comes from EN 12151:2007 *Machinery and plants for the preparation of concrete and mortar - Safety requirements*.

Parameter to be indicated in the declaration of conformity: drum capacity (m³).

A machine to prepare concrete or mortar, irrespective of the loading, mixing and emptying process. It may be operated intermittently or constantly. Concrete mixers on trucks are called truck mixers (see definition 55).

Measurement: Annex III, Part B, item 11

Construction winches (with electric motor)

Parameter to be indicated in the declaration of conformity: installed power (kW).

Definition: Annex I, item 12.

A power-operated, temporarily installed lifting appliance which is equipped with means for raising and lowering a suspended load.

Construction winches (combustion engine-driven) are covered by Article 12.

Measurement: Annex III, Part B, item 12

Conveying and spraying machines for concrete and mortar

Definition: Annex I, item 13.

Parameter to be indicated in the declaration of conformity: installed power (kW).

Items of plant pumping and spraying concrete or mortar, with or without agitator, whereby the material to be transported is conveyed to the placing position through pipelines, distribution devices or distribution booms. Conveyance is carried out:

- *for concrete mechanically, by piston or rotor pumps*
- *for mortar mechanically by piston, worm, hose and rotor pumps or pneumatically by compressors with or without air chamber.*

These machines may be mounted on trucks, trailers, special vehicles.

Measurement: Annex III, Part B, item 13

Conveyor belts

Parameter to be indicated in the declaration of conformity: installed power (kW).

Definition: Annex I, item 14.

A temporarily installed machine suitable to transport material by means of a power-driven belt.

Measurement: Annex III, Part B, item 14

Cooling equipment on vehicles

Parameter to be indicated in the declaration of conformity: output (refrigerating/heating) power (kW).

Definition: Annex I, item 15

A cargo space refrigeration unit on vehicle categories N2, N3, O3 and O4 as defined by Directive 70/156/EEC.

The refrigeration unit may be powered by means of an integral part of the refrigeration unit, a separate part attached to the vehicle body, a driving engine of the vehicle, or by an independent or standby power source.

Measurement: Annex III, Part B, item 15

Drill rigs

Definition: Annex I, item 17.

The definition comes from EN 791:1995 *Drill rigs - Safety* and it can be found also in the standards which replaced it, EN 16228:2014 (parts 1 to 7).

Parameter to be indicated in the declaration of conformity: installed power (kW).

A machine which is used for drilling holes on construction sites by

- percussive drilling*
- rotary drilling*
- rotary percussive drilling.*

Drill rigs are stationary during drilling. They may move from one place of work to another, under their own power. Self-propelled drill rigs include those mounted on lorries, wheeled chassis, tractors, crawlers, skid bases (pulled by winch). When drill rigs are mounted on lorries, tractors and trailers, or are wheel-based, transportation may be carried out at higher speeds and on public roads.

Measurement: Annex III, Part B, item 17

Equipment for loading and unloading silos or tanks on trucks

Parameter to be indicated in the declaration of conformity: installed power (kW).

Definition: Annex I, item 19.

Powered devices attached to silo or tanker trucks for loading or unloading of liquids or bulk material by means of pumps or similar equipment.

Measurement: Annex III, Part B, item 19

Glass recycling containers

Parameter to be indicated in the declaration of conformity: container capacity (m³).

Definition: Annex I, item 22.

A container, built of whatever material, that is used for the collection of bottles. It is equipped with at least one opening for filling in bottles and another one for emptying the container.

Measurement: Annex III, Part B, item 22

Grass trimmers/grass edge trimmers

Definition: Annex I, item 24.

The definition comes from EN ISO 11806:1997 *Agricultural and forestry machinery - Portable hand-held combustion engine driven brush cutters and grass trimmers - Safety* and it can be found also in the latest version of the standard, EN ISO 11806-1:2011.

Parameter to be indicated in the declaration of conformity: cutting width (mm).

A combustion-engine driven portable hand-held unit fitted with flexible line(s), string(s), or similar non-metallic flexible cutting elements, such as pivoting cutters, intended to cut weeds, grass or similar soft vegetation. The cutting device operates in a plane approximately parallel (grass trimmer) or perpendicular (grass edge trimmer) to the ground.

In the case of walk-behind grass trimmers, the cutting energy will be normally larger than 10 J. In these cases, the machine shall be classified as lawnmower.

Measurement: Annex III, Part B, item 24

Hedge trimmers

Definition: Annex I, item 25.

The definition comes from EN 774:1996 *Garden equipment - Hand-held, integrally powered hedge trimmers - Safety* (withdrawn) and it can be found also in the standard which replaced it, EN ISO 10517:2009/A1:2013 *Powered hand-held hedge trimmers - Safety (ISO 10517:2009/Amd 1:2013)*.

Parameter to be indicated in the declaration of conformity: installed power (kW).

Hand-held, integrally driven powered equipment which is designed for use by one operator for trimming hedges and bushes utilising one or more linear reciprocating cutter blades.

Measurement: Annex III, Part B, item 25

High pressure flushers

Parameter to be indicated in the declaration of conformity: installed power (kW).

Definition: Annex I, item 26.

A vehicle equipped with a device to clean sewers or similar installations by means of a high pressure water jet. The device may be either mounted on a proprietary vehicular truck chassis or incorporated into its own chassis embodiment. The equipment may be fixed or demountable as in the case of an exchangeable bodywork system.

Measurement: Annex III, Part B, item 26

High pressure water jet machines

Definition: Annex I, item 27

Parameter to be indicated in the declaration of conformity: nominal flow (l/h).

A machine with nozzles or other speed-increasing openings which allow water, also with admixtures, to emerge as a free jet. In general, high pressure water jet machines consist of a drive, a pressure generator, hose lines, spraying devices, safety mechanisms, controls and measurement devices. High pressure water jet machines may be mobile or stationary:

- mobile high-pressure water jet machines are mobile, readily transportable machines which are designed to be used at various sites, and for this purpose are generally fitted with their own undergear or are vehicle-mounted. All necessary supply lines are flexible and readily disconnectable*
- stationary high pressure water jet machines are designed to be used at one site for a length of time but capable of being moved to another site with suitable equipment. Generally skid or frame-mounted with supply line capable of being disconnected.*

Measurement: Annex III, Part B, item 27

Hydraulic hammers

Definition: Annex I, item 28.

Parameter to be indicated in the declaration of conformity: mass (kg).

Equipment which uses the hydraulic power source of the carrier machine to accelerate a piston (sometimes gas assisted), which then hits a tool. The stress wave generated by kinetic action flows through the tool into the material, which causes the material to break. Hydraulic hammers need a supply of pressurised oil to function. The complete carrier/hammer unit is controlled by an operator, usually seated in the cabin of the carrier.

Measurement: Annex III, Part B, item 28

Joint cutters

Definition: Annex I, item 30.

The definition comes from EN 500-5:1995 *Mobile road construction machinery - Safety - Part 5: Specific requirements for joints cutters* (withdrawn) and it can be found also in the standard which replaced it, EN 13862:2001+A1:2009 *Floor cutting-off machines - Safety*.

Parameter to be indicated in the declaration of conformity: maximum blade diameter (mm).

A mobile machine intended for the production of joints in concrete, asphalt and similar road surfaces. The cutting tool is a rotating high speed disc. The forward motion of the joint cutter can be:

- *manual*
- *manual with mechanical assistance*
- *power-driven.*

Measurement: Annex III, Part B, item 30

Leaf blowers

Definition: Annex I, item 34.

Parameter to be indicated in the declaration of conformity: nominal air flow (m³/s).

A powered machine appropriate to clear lawns, paths, ways, streets, etc. of leaves and other material by means of a high velocity air flow. It may be portable (hand-held) or not portable but mobile.

Measurement: Annex III, Part B, item 34

Leaf collectors

Definition: Annex I, item 35.

Parameter to be indicated in the declaration of conformity: nominal air flow (m³/s).

A powered machine suitable for collecting leaves and other debris using a suction device consisting of a power source which produces a vacuum inside the machine and a suction nozzle and a container for the collected material. It may be portable (hand-held) or not portable but mobile.

Measurement: Annex III, Part B, item 35

Lift trucks, combustion-engine driven, counterbalanced (only 'other counterbalanced lift trucks' as defined in Annex I, item 36, second indent, with a rated capacity of not more than 10 tonnes)

Definition: Annex I, item 36.

The definition comes from ISO 5053:1987 *Powered industrial trucks - Terminology* and it can be found also in the standard which replaced it, ISO 5053-1:2015.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A wheeled, internal combustion-engine driven lift truck with counterweight and lifting equipment (mast, telescopic arm or articulated arm). These are:

- *rough terrain trucks (wheeled counterbalanced trucks intended primarily for operation on unimproved natural terrain and on disturbed terrain of, e.g., construction sites)*
- *other counterbalanced lift trucks, excluded are those counterbalanced lift trucks that are specifically constructed for container handling.*

The other lift trucks are covered by Article 12.

Measurement: Annex III, Part B, item 36

Mobile waste containers

Definition: Annex I, item 39.

Parameter to be indicated in the declaration of conformity: container capacity (m³).

An appropriate designed container fitted with wheels intended to store waste temporarily, and which is equipped with a cover.

Measurement: Annex III, Part B, item 39

Paver-finishers (equipped with a high-compaction screed)

Definition: Annex I, item 41.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A mobile road construction machine used for the purpose of applying layers of construction material, such as bituminous mix, concrete and gravel on surfaces. Paver-finishers may be equipped with a high-compaction screed.

Definition for high-compaction screed

A high-compaction screed is a device mounted on a paver finisher that in addition to its pre-compacting system, is equipped with a system for high extra compaction which may consist of at least two of those compaction systems: vibrators, tamper bars or pressure bars.

Measurement: Annex III, Part B, item 41

Piling equipment

Definition: Annex I, item 42.

The definition comes from EN 996:1995 *Piling equipment - Safety requirements* (withdrawn) and it can be found also in the standards which replaced it, EN 16228:2014 (parts 1 to 7).

Parameter to be indicated in the declaration of conformity:

- for impact hammers: nominal or striking or impact energy (J);
- for vibrators: eccentric moment (Nm);
- for static pile pushing/pulling devices: pushing force (N).

Pile installation and extraction equipment, e.g. impact hammers, extractors, vibrators or static pile pushing/pulling devices of an assembly of machines and components used for installation or extraction of piles, which also includes:

- *piling rig consisting of carrier machine (crawler, wheel or rail mounted, floating leader attachment, leader or guiding system)*
- *accessories, e.g. pile caps, helmets, plates, followers, clamping devices, pile handling devices, pile guides, acoustic shrouds and shock/vibration absorbing devices, power packs/generators and personal lifting devices or platforms.*

Piling equipment is that part of an aggregated machine which actually applies the driving force to the pile or sheet: impact hammer, extractors, vibrator or static push/pull devices. Thus, neither the carrier crane nor any other part of the rig or its accessories is part of the test.

Measurement: Annex III, Part B, item 42

Pipelayers

Definition: Annex I, item 43.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A self-propelled crawler or wheeled machine specifically designed to handle and lay pipes and carry pipeline equipment. The machine, the design of which is based on a tractor, has especially designed components such as undercarriage, main frame, counterweight, boom and load-hoist mechanism, and vertically pivoting side boom.

Another definition from ISO 6165 and coherent with EN 474-9 is:

Pipelayer: self-propelled crawler or wheeled machine, having pipe-laying equipment with main frame, load-hoist mechanism, vertically pivotable side boom, and counterweight, primarily designed to handle and lay pipes.

Furthermore, there are pipelayers where the vertically pivoting boom is not mounted on the side of the machine, but on a rotating upper structure, this design is not yet covered by standards.

Measurement: Annex III, Part B, item 43

Piste caterpillars

Definition: Annex I, item 44.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A self-propelled crawler machine used to exert a push or pull force on snow and ice through mounted equipment.

Measurement: Annex III, Part B, item 44

Power generators (≥ 400 kW)

Definition: Annex I, item 45.

The definition comes from the repealed Directive 84/536/EEC.

Parameter to be indicated in the declaration of conformity: electric power (kW).

Any device comprising an internal combustion engine driving a rotary electrical generator producing a continuous supply of electrical power.

Power generators lower than 400 kW are covered by Article 12.

ISO 8528-1:1993 *Reciprocating internal combustion engine driven alternating current generating sets - Part 1: Application, ratings and performance* (replaced by the 2005 version) offers a different definition.

Measurement: Annex III, Part B, item 45

Power sweepers

Definition: Annex I, item 46.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A sweeping collection machine having equipment to sweep debris into the path of a suction inlet that would then pneumatically by way of a high velocity airstream or with a mechanical pick-up system convey the debris to a collection hopper. The sweeping and collecting devices may either be mounted to a proprietary vehicular truck chassis or incorporated into its own chassis embodiment. The equipment can be fixed or demountable as in the case of an exchangeable bodywork system.

Measurement: Annex III, Part B, item 46

Refuse-collection vehicles

Definition: Annex I, item 47.

Parameter to be indicated in the declaration of conformity: installed power (kW)

A vehicle designed for the collection and transportation of domestic and bulky waste based on loading via containers or by hand. The vehicle may be equipped with a compaction mechanism. A refuse-collection vehicle comprises a chassis with cab onto which the bodywork is mounted. It may be equipped with a container lifting device.

Measurement: Annex III, Part B, item 47

Road milling machines

Definition: Annex I, item 48

The definition comes from EN 500-2:1995 *Mobile road construction machinery - Safety - Part 2: Specific requirements for road-milling machines* and it can be found also in the latest version of the standard, EN 500-2:2006+A1:2008, clauses 3.1 and 3.2.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A mobile machine used for removing material from paved surfaces using a power-driven cylindrical body, on which surface the milling tools are fitted; the cutter drums rotate during the cutting operation.

Measurement: Annex III, Part B, item 48

Scarifiers

Definition: Annex I, item 49.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A walk-behind or ride-on powered machine which uses the ground to determine the depth of cut and which is equipped with an assembly appropriate to slit or scratch the surface of the lawn in gardens, parks and other similar areas.

EN 13684:2004+A3:2009 *Garden equipment - Pedestrian controlled aerators and scarifiers - Safety* addresses the same kind of equipment with a wider scope and different definition as reported below.

Lawn scarifier: a machine designed to scratch the surface, or earth face thereby also combing the lawn. It applies to pedestrian controlled integrally powered lawn aerators and scarifiers which are designed for regenerating lawns by, for instance, combing out grass thatch and moss or cutting vertically into the lawn face using tines which rotate about a horizontal axis.

Measurement: Annex III, Part B, item 49

Shredders/chippers

Definition: Annex I, item 50.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A powered machine designed for use in a stationary position having one or more cutting devices for the purpose of reducing bulk organic materials to smaller pieces. Generally it consists of a feed intake opening through which material (which may be held by an appliance or not) is inserted, a device which cuts up the material by whatever method (cutting, chopping, crushing or other methods) and a discharge chute through which the cut material is discharged. A collecting device may be attached.

This definition covers equally "garden equipment" and "forestry equipment" even though these equipment types differ in terms of dimensions and mode of operation.

In the case of "shredder/chipper" garden equipment, as defined in EN 13683:2003+A2:2011 *Garden equipment - Integrally powered shredders/chippers - Safety*, the definition can be integrated as follows:

it applies to shredders/chippers with feed intake openings in the form of a single opening or an opening divided into a number of segments.

In the case of forestry equipment, the standard EN 13525:2005+A2:2009 *Forestry machinery - Wood chippers - Safety* defines a wood chipper as a powered machine designed to reduce wood into chips using chipping components, as a rotating disc or drum or similar device with cutting tools or screw arrangement that performs the chipping operation and may perform also the infeed operation. Chippers have mechanical infeed components or the chipping components act as mechanical infeed components, which are fed in a horizontal or near horizontal plane and which are designed to be loaded manually when stationary. The wood chippers are powered either by an electric motor or by an integral combustion engine.

The measurement cycle described in Annex III.B.50 cannot apply to wood chippers defined in EN 13525. The Noise Committee (see Article 18) in the meeting of 16 November 2001, following the advice of the Working Group on Outdoor Equipment, decided that the Directive 2000/14/EC should cover both

types of equipment and be updated to take into consideration the technical progress of testing and the differences of the equipment types involved. It further asked that this guidance document should fill the gap until the final act comes into force.

As a consequence, in the following text:

- "shredder(s)/chipper(s)" will designate garden equipment;
- "wood chipper(s)" will designate forestry equipment;
- the measurement cycle described in Annex III.B.50 will be updated to technical progress for shredders/chippers and integrated with a suitable one for wood chippers;
- the choice between the two cycles shall be taken according to the definitions above.

Measurement: Annex III, Part B, item 50

Snow-removing machines with rotating tools (self-propelled, excluding attachments)

Definition: Annex I, item 51.

The definition comes from EN 13021:2003+A1:2008 *Winter service machines - Safety requirements*.
Parameter to be indicated in the declaration of conformity: installed power (kW).

A machine with which snow can be removed from traffic areas by rotating means, accelerated and ejected by blower means.

Measurement: Annex III, Part B, item 51

Suction vehicles

Definition: Annex I, item 52.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A vehicle equipped with a device to collect water, mud, sludge, refuse or similar material from sewers or similar installations by means of a vacuum. The device may be either mounted on a proprietary vehicular truck chassis or incorporated into its own chassis embodiment. The equipment may be fixed or demountable as in the case of an exchangeable bodywork system.

Measurement: Annex III, Part B, item 52

Trenchers

Definition: Annex I, item 54.

The definition comes from ISO 6165:1997 *Earth-moving machinery - Basic types - Vocabulary* and it can be found also in the European standard based on the last version of the standard, EN ISO 6165:2012.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A self-propelled, ride-on or pedestrian-controlled, crawler or wheeled machine, having a front- or rear-mounted excavator linkage and attachment, primarily designed to produce trenches in a continuous operation, through a motion of the machine.

Measurement: Annex III, Part B, item 54

Truck mixers

Definition: Annex I, item 55.

Parameter to be indicated in the declaration of conformity: drum capacity (m³).

A vehicle which is equipped with a drum to transport ready-mixed concrete from the concrete mixing plant to the job site; the drum may rotate when the vehicle is driving or stands still. The drum is emptied on the job site by rotating the drum. The drum is driven either by the driving engine of the vehicle or by a supplementary engine.

Self-loading mobile concrete mixers do not fall under this definition.

Measurement: Annex III, Part B, item 55

Water pump units (not for use under water)

Definition: Annex I, item 56.

Parameter to be indicated in the declaration of conformity: installed power (kW).

A machine consisting of a water pump itself and the driving system. Water pump means a machine for the raising of water from a lower to a higher energy level.

Measurement: Annex III, Part B, item 56

Article 14 **Conformity assessment**

1. Before placing on the market or putting into service any equipment referred to in Article 12 the manufacturer, or his authorised representative established in the Community, shall subject each type of equipment to one of the following conformity assessment procedures:

- the internal control of production with assessment of technical documentation and periodical checking procedure referred to in Annex VI, or*
- the unit verification procedure referred to in Annex VII, or*
- the full quality assurance procedure referred to in Annex VIII.*

[...]

This clause applies only to equipment listed in Article 12 which means equipment subject to noise limits.

It is the task of the manufacturer (see Article 4) to choose among the three options above:

- The internal control of production with assessment of technical documentation and periodical checking is addressed to the manufacturer who has no quality assurance system or does not want to implement the existing one with the provisions of this Directive. See details in Annex VI.
- The unit verification procedure may be used for low-volume equipment (equipment manufactured in small series). It may also be used for second-hand equipment coming from outside the Union that was not initially certified in this Directive. See details in Annex VII.
- The full quality assurance is addressed to the manufacturer who is working with a quality assurance system. See details in Annex VIII.

Note: The application of the quality assurance standard EN ISO 9001 alone is not sufficient to comply with this Directive. See Annex VIII.

The manufacturer is free to choose any notified body from the list published in the NANDO database. (see Article 15).

[...]

2. Before placing on the market or putting into service any equipment referred to in Article 13 the manufacturer, or his authorised representative established in the Community, shall subject each type of equipment to the internal control of production procedure referred to in Annex V.

[...]

This clause applies only to equipment listed in Article 13 which means equipment not subject to noise limits.

There is no involvement of notified bodies in this procedure.

[...]

3. Member States shall ensure that the Commission and any other Member State may, on a reasoned request, obtain all information used during the conformity assessment procedure concerning a type of

equipment and in particular the technical documentation provided for in Annex V item 3, Annex VI item 3, Annex VII item 2, Annex VIII items 3.1 and 3.3.

Such a request from a Member State will normally occur in the frame of market surveillance.

In case a market surveillance action gives a negative result, a flow of information among the parties involved (Member States, Commission, manufacturer) is required by the Directive. It is a common interest to ease this flow, and Member States shall be in a position to get the relevant parts of the technical documentation from the manufacturer, eventually in a language agreeable to the parties involved.

Article 15 Notified bodies

1. Member States shall appoint bodies under their jurisdiction to carry out or supervise the conformity assessment procedures referred to in Article 14(1).

2. Member States shall appoint only such bodies which comply with the criteria set out in Annex IX. The fact that a body complies with the criteria of Annex IX to this Directive does not mean that a Member State is obliged to appoint that body.

[...]

The notified bodies may be notified for only some type of equipment and for one or more certification procedure.

[...]

3. Each Member State shall notify the Commission and the other Member States of the bodies which they have appointed, together with the specific tasks and examination procedures which these bodies have been appointed to carry out and the identification numbers assigned to them beforehand by the Commission.

4. The Commission shall publish a list of the notified bodies in the Official Journal of the European Communities along with their identification numbers and the tasks for which they have been appointed. The Commission shall ensure that the list is kept up to date.

[...]

The list of bodies notified under Directive 2000/14/EC is available on the Commission's website, through the NANDO (New Approach Notified and Designated Organisation) Information System:

http://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=directive.notifiedbody&dir_id=25&type_dir=NO%20CPD&pro_id=99999&prc_id=99999&ann_id=99999&prc_anx=99999.

[...]

5. A Member State must withdraw its notification if it finds that the body no longer meets the criteria referred to in Annex IX. It shall forthwith inform the Commission and the other Member States accordingly.

Article 16 Collection of noise data

1. Member States shall take the measures necessary to ensure that the manufacturer, or his authorised representative established in the Community, shall send to the responsible authority of the Member State where he resides or where he places on the market or puts into service the equipment referred to in Article 2(1) and to the Commission a copy of the EC declaration of conformity for each type of equipment referred to in Article 2(1).

[...]

The manufacturer (see Article 4) has to send a specimen of the EC declaration of conformity to the Commission services in charge of Directive 2000/14/EC, by e-mail to the functional mailbox GROW-DIR-NOISE@ec.europa.eu, or to the following address:

European Commission
Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW)
Unit C3 Secretariat: Office BREY 10/181
Avenue d'Auderghem 45
B-1040 Bruxelles

The Commission has set up an online IT-tool, the "NOISE" database, to enable manufacturers and other operators to upload the relevant data of their equipment directly into the database, available from <https://webgate.ec.europa.eu/growth-portal>.

A further copy has to be sent to the responsible authority of a Member State of his choice (for example where he resides or where he puts on the market). See also Article 8.

The addresses of the relevant contact points and market surveillance authorities are available on the Commission's website on Noise Emissions by Outdoor Equipment: <http://ec.europa.eu/growth/sectors/mechanical-engineering/noise-emissions/>.

[...]

2. The Commission shall collect the data made available in accordance with paragraph 1 for all equipment.

3. Member States may, on request, obtain the collected data from the Commission.

4. The Commission shall publish the relevant information periodically, preferably annually. These publications shall at least contain the following data for each type or model of equipment:

- the net installed power or any other noise related value*
- the measured sound power level*
- the guaranteed sound power level*
- equipment description*
- manufacturer and/or brand name*
- model number/name.*

This publication should be in electronic format available on the Internet.

Article 17 **Regulation of use**

The provisions of this Directive shall not prevent Member States' entitlement to lay down, in due observance of the Treaty:

- measures to regulate the use of equipment referred to in Article 2(1) in areas which they consider sensitive, including the possibility of restricting the working hours of the equipment;*
- such requirements as they may deem necessary to ensure that persons are protected when using the equipment in question, provided that this does not mean that the equipment is modified in a way not specified in this Directive.*

Article 18 **Committee**

1. The Commission shall be assisted by a Committee.

2. Where reference is made to this paragraph, Articles 5a(1) to (4) and Article 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

Article 18a

The Commission shall adopt implementing measures for the adaptation to technical progress of Annex III, provided they do not have any direct impact on the measured sound power level of equipment listed in Article 12, in particular through the inclusion of references to relevant European standards.

Those measures, designed to amend non-essential elements of this Directive, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 18(2).

This Committee is known as the "Noise Committee" and meets regularly once or twice a year. It is chaired by the Commission and it is participated by representatives of the EU Member States and other countries where the Directive is applicable; and by European associations of manufacturers, notified bodies, standardisers, technical experts and other stakeholders and interested parties.

Article 19 **Committee powers**

The Committee shall:

- (a) exchange information and experiences concerning the implementation and practical application of this Directive and discuss matters of common interest in those fields;*
- (b) assist the Commission in the adaptation to technical progress of Annex III;*
- (c) provide advice to the Commission with respect to the conclusions and amendments referred to in Article 20(2).*

Article 20 **Reports**

1. Not later than 3 January 2007 and every four years thereafter, the Commission shall submit to the European Parliament and to the Council a report concerning the Commission's experience in the implementation and administration of this Directive. The report shall in particular contain:

- (a) a review of the noise data collected in accordance with Article 16 and other appropriate information;*
- (b) a statement of the need for revision of the lists in Articles 12 and 13, especially whether new equipment should be added in either Article 12 or Article 13 or equipment should be transferred from Article 13 to Article 12;*
- (c) a statement of the need and the possibilities for revision of the limit values laid down in Article 12 taking into account technological development;*
- (d) a statement setting out an integrated range of instruments to be used in continuing the reduction of noise by equipment.*

2. After having held all the necessary consultations, in particular with the Committee, the Commission shall on that occasion present its conclusions and where appropriate any amendment to this Directive.

Article 21 **Repeal**

1. Directives 79/113/EEC, 84/532/EEC, 84/533/EEC, 84/534/EEC, 84/535/EEC, 84/536/EEC, 84/537/EEC, 84/538/EEC, and 86/662/EEC shall be repealed on 3 January 2002.

[...]

The repeal of these Directives not later than 3 January 2002 required the revocation or derogation of the national relevant regulations which implemented these Directives.

The main differences between those repealed Directives and this one are:

- reduction of limit values except for earth-moving machinery and lawnmowers for stage 1;
- information in the technical documentation about the uncertainties;
- deletion of the sound pressure level for earth-moving machinery, tower cranes and lawnmowers;

- the use of the marking defined in those repealed Directives shall no longer be allowed in order to avoid confusion about which Directive applies. This does not prevent the manufacturer to continue to indicate on a label the sound pressure level provided the pictogram defined by the repealed Directives does not appear;
- addition of the CE marking and replacement of the "certificate of conformity" by the "declaration of conformity";
- conformity assessment procedures;
- role of the notified bodies.

[...]

2. Type-examination certificates issued and measurements of equipment carried out under the Directives mentioned in paragraph 1 may be used in drawing up the technical documentation provided for in Annex V point 3, Annex VI point 3, Annex VII point 2, Annex VIII points 3.1 and 3.3 of this Directive.

After Directive 2000/14/EC is transposed into national law, type-examination certificates issued under the above Directives are no longer valid from 3 January 2002. Equipment needs to be certified under this Directive before it can be placed on the EU market.

Measurements including test reports of equipment carried out under the above Directives that fulfil the test methods and test codes of Directive 2000/14/EC may be used in drawing up the technical documentation.

Article 22

Transposition and date of application

1. Member States shall adopt and publish the laws, regulations and administrative provisions necessary to comply with this Directive no later than 3 July 2001. They shall forthwith inform the Commission thereof.

[...]

The national law incorporated the contents of this Directive before 3 July 2001. The previous national law dealing with the same subject was repealed on 3 January 2002 when the Directive became applicable.

[...]

2. Member States shall apply these measures with effect from 3 January 2002. However, Member States shall allow the manufacturer, or his authorised representative established in the Community, to avail himself of the provisions of this Directive as from 3 July 2001.

[...]

It means that between 3 July 2001 and 2 January 2002 both regulations, the old one and this Directive, could be applied at the choice of the manufacturer.

Between 3 January 2002 and 2 January 2006, stage 1 of this Directive was applicable.

[...]

3. With regard to the reduced permissible sound power levels of stage II referred to in Article 12, these provisions shall apply with effect from 3 January 2006.

[...]

After 3 January 2006, stage 2 of this Directive is applicable. In the meantime, the Directive could be modified (see Article 20).

For the indicative limits shown in Article 12 for lawnmowers, lawn trimmers and lawn edge trimmers, they will come into force only as a consequence of an amending Directive, otherwise the limits of stage 1 will remain valid.

[...]

4. 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.

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

Article 23
Entry into force

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

Article 24
Addressees of the Directive

This Directive is addressed to the Member States.

ANNEX I
DEFINITIONS OF EQUIPMENT

[...]

The contents of Annex I "Definitions of equipment" have been introduced in Articles 12 and 13 (see above).

ANNEX II
EC DECLARATION OF CONFORMITY

The EC declaration of conformity must contain the following particulars:

- name and address of the manufacturer or his authorised representative established in the Community*
 - name and address of the person who keeps the technical documentation*
- [...]*

This information shall be indicated when the technical documentation is entrusted to a person different from the one indicated above. See Annexes V and VI.

- [...]*
- description of the equipment*
- [...]*

Description of equipment includes:

- Type of the equipment taken from the list of Articles 12 and 13.
- Type (model number/name), serial number (optional).
- The net installed power or any other noise-related value shall be indicated; for equipment listed in Article 12, it is the parameter indicated in the table of Article 12; recommended parameters are given for equipment listed in Article 13.

- [...]*
- conformity assessment procedure followed, and, where appropriate, name and address of the notified body involved*
- [...]*

The conformity assessment procedure is indicated as one of the following according to the procedure used by the manufacturer:

- Annex V;*
- Annex VI procedure 1 or 2 and the name and address of the notified body;*
- Annex VII and the name and address of the notified body;*
- Annex VIII and the name and address of the notified body.*

- [...]*
- measured sound power level of an equipment representative for this type*
 - guaranteed sound power level for this equipment*
 - a reference to this Directive*
 - the declaration that the equipment conforms to the requirements of this Directive*
 - where appropriate, the declaration(s) of conformity and references of the other Community Directives applied*
 - the place and date of the declaration*
 - particulars of the signatory authorised to sign the legally binding declaration for the manufacturer or his authorised representative established in the Community.*

The signature does not need to be hand-written.

The EC declaration of conformity may also be included in the instruction handbook.

ANNEX III
METHOD OF MEASUREMENT OF AIRBORNE NOISE EMITTED BY EQUIPMENT FOR USE OUTDOORS

Scope

This Annex lays down the methods of measurement of airborne noise that shall be used for the determination of the sound power levels of equipment covered by this Directive with a view to the conformity assessment procedures of this Directive.

[...]

Test

The noise tests are under the responsibility of the manufacturer; they may be carried out by the manufacturer at his own facilities or at his choice by an external organisation under his responsibility.

This external organisation may be:

- a competent laboratory in the field of noise measurement which can be a notified body;
- the notified body acting for the conformity assessment.

The tests are under the responsibility of the notified body only for Procedure 2 of Annex VI and unit verification of Annex VII. See also the comments on the various annexes related to conformity assessment.

Calibration of the measurement equipment

Calibration may be achieved by use of an acoustic calibrator that is periodically checked to a known acoustic reference.

The notified body has to check that the calibration is up to date.

See also Clause 5.2 of EN ISO 3744:1995.

Content of the test report

It is recommended to include the following in the test reports which are included in the technical documentation.

Note: The following list is in line with the content of ISO 3744 Clause 9 "Information to be recorded".

1. Basic requirements for production of a test report:

- description of the equipment:
 - make;
 - type and model;
 - serial number (optional);
- name and address of the person responsible for the test;
- unique identifier for the test report;
- on each page of the test report, a unique form of identifier (such as the unique identifier of the test report with a unique page number in the form "page ... of ... pages");
- the date(s) of the test(s);
- date of the test report;
- signature and legible name of person taking responsibility for the test report;
- signature and legible name of person(s) that performed the test;
- reference to the test method and procedures used (any standard or other specification relevant to the test method and deviations, additions to or exclusions from the specifications concerned) (only for tests carried out for production verification);

- where relevant to the validity or application of the test results, details of any sampling, equipment preparation or data analysis;
- test results;
- any design or performance specifications met or failed;
- estimation of uncertainty in the test results.

2. Technical details for inclusion in a test report

The technical details for inclusion in a test report are given in Clause 9 of the EN ISO 3744:1995 to which the following may be added:

- indication of meteorological environment:
 - air temperature;
 - barometric pressure;
 - relative humidity;
 - wind speed;
 - wind direction in relation to the equipment;
- if necessary correction factors K_{1A} , K_{2A} .

See also Annex III Part A.

Test methods that can be used during production surveillance

The labelled guaranteed value affixed on the equipment shall be determined using the test method and test code described in this annex. For the production surveillance, the manufacturer may use other types of test providing he has determined the correlation with the reference method and establishes an ongoing process to routinely check correlation validity. This shall be detailed in the technical documentation.

[...]

Part A of this Annex for each type of equipment referred to in Article 2(1) lays down

- *basic noise emission standards*
 - *general supplements to these basic noise emission standards*
- for measuring the sound pressure level on a measurement surface enveloping the source and for calculating the sound power level produced by the source.*

Part B of this annex for each type of equipment referred to in Article 2 (1) lays down

- *a recommended basic noise emission standard including*
 - *a reference to the basic noise emission standard chosen from Part A*
 - *the test area*
 - *the value of the constant K_{2A}*
 - *the shape of the measurement surface*
 - *the number and position of microphones to be used*
- *operating conditions including*
 - *the reference to a standard, if any*
 - *requirements relating to mounting of the equipment*
 - *a method to calculate the resulting sound power levels in the event that several tests with different operating conditions are to be used*
- *further information.*

When testing specific types of equipment, the manufacturer or his authorised representative in the Community may in general choose one of the basic noise emission standards of Part A and apply the operating conditions of Part B for this specific type of equipment. In the event of a dispute, however, the recommended basic noise emission standard laid down in Part B has to be used together with the operating conditions of Part B.

PART A
BASIC NOISE EMISSION STANDARD

For the determination of the sound power level of equipment for use outdoors as defined by Article 2(1) the basic noise emission standards

EN ISO 3744:1995
EN ISO 3746:1995

may generally be used subject to the following general supplements:
[...]

The standards may be obtained from the national standard organisation. The Member States do not supply copies of the standards.

Particular care shall be paid when choosing one standard or the other as it has heavy implications on uncertainties.

[...]

1. Measurement uncertainty

Measurement uncertainties are not taken into account in the framework of conformity assessment procedures in the design phase.

[...]

This clause refers to the initial approach of equipment noise tuning, not to the following procedures required by the Directive.

[...]

2. Operation of source during test

2.1. Fan speed

If the engine of the equipment or its hydraulic system is fitted with (a) fan(s) it (they) must operate during the test. The fan speed is, in accordance with one of the following conditions, stated and set by the manufacturer of the equipment and must appear in the test report, this speed being used in further measurements.

[...]

The manufacturer installing a variable speed fan as defined in paragraphs b and c here after shall indicate in the technical documentation the relationship between fan speed, ambient temperature and operating load.

In particular, it is recommended that the technical documentation include:

- description of fan drive type and number of fan speeds;
- maximum fan speed, minimum fan speed;
- explanation of the cooling system fan speed control logic (what are control inputs and resulting output);
- correlation between the fan(s) speed and the ambient temperature under actual operating conditions to be indicated in the instruction handbook.

Note: It should be considered that normal ambient temperature used for design is up to 40 °C.

In the case of multiple fans which do not operate in the field at the same time, the noise measurement shall be carried out in the noisiest possible condition in the field.

[...]

(a) *Fan drive directly connected to the engine*

If the fan drive is directly connected to the engine and/or hydraulic equipment (e.g. by belt drive) it must operate during the test.

(b) *Fan drive with several distinct speeds*

If the fan can work at several distinct speeds the test shall be carried out either

— *at its maximum working speed, or*

— *in a first test with the fan set at zero speed, in a second test the fan set at maximum speed. The resulting sound pressure level L_{pA} shall then be calculated by combining both test results using the following equation:*

$$L_{pA} = 10 \lg \{0.3 \times 10^{0.1 L_{pA,0 \%}} + 0.7 \times 10^{0.1 L_{pA,100 \%}}\}$$

where:

$L_{pA,0 \%}$ is the sound pressure level determined with the fan set at zero speed,

$L_{pA,100 \%}$ is the sound pressure level determined with the fan set at maximum speed.

[...]

If the lowest of the distinct speeds is different from zero then this speed shall be substituted to the $L_{pA,0 \%}$ condition.

[...]

(c) *Fan drive with continuous variable speed*

If the fan can work at continuous variable speed, the test shall be carried out either according to 2.1 b or with the fan speed set by the manufacturer at no less than 70 % of the maximum speed.

2.2. Test of powered equipment free of load

For these measurements, the engine and hydraulic system of the equipment must be warmed up in accordance with the instructions, and safety requirements must be observed.

The test is carried out with the equipment in a stationary position without operating the working equipment or travelling mechanism. For the purpose of the test, the engine will idle at no less than the rated speed corresponding to the net power (¹⁸).

If the machine is powered by a generator or from the mains, the frequency of the supply current, specified for the motor by the manufacturer, shall be stable at ± 1 Hz if the machine is equipped with an induction motor, and the supply voltage at ± 1 % of the rated voltage if the machine is equipped with a commutator motor. The supply voltage is measured at the plug of a non-detachable cable or cord, or at the inlet of the machine if a detachable cable is provided. The waveform of the current supplied from the generator shall be similar to that obtained from the mains.

If the machine is powered by battery, the battery shall be fully charged.

The speed used and the corresponding net power are stated by the manufacturer of the equipment and must appear in the test report.

If the equipment is fitted with several engines, they must work simultaneously during the tests. If this is not possible, each possible combination of engine(s) is to be tested.

2.3. Test of powered equipment under load

For these measurements, the engine (driving device) and hydraulic system of the equipment must be warmed up in accordance with the instructions; and safety requirements must be observed. No signalling device such as a warning horn or reversing alarm is to be operated during the test.

⁽¹⁸⁾ *Net power means the power in 'EEC kW' obtained on the test bench at the end of the crankshaft, or its equivalent, measured in accordance with the EEC method of measuring the power of internal combustion engines for road vehicles, except that the power of the engine cooling fan is excluded.*

The speed or velocity of the equipment during the test must be recorded and appear in the test report.

If the equipment is fitted with several engines and/or aggregates they must work simultaneously during the tests. If this is not possible, each possible combination of engine(s) and/or aggregates is to be tested.

For each type of equipment that is to be tested under load, specific operating conditions must be laid down which shall, in principle, produce effects and stresses similar to those encountered under actual working conditions.

2.4. Test of hand-operated equipment

Conventional operating conditions for each type of hand-operated equipment shall be laid down that produce effects and stresses similar to those undergone under actual working conditions.

3. Calculation of surface sound pressure level

The surface sound pressure level shall be determined at least three times. If at least two of the determined values do not differ by more than 1 dB, further measurements will not be necessary; otherwise the measurements shall be continued until two values differing by no more than 1 dB are obtained. The A-weighted surface sound pressure level to be used calculating the sound power level is the arithmetic mean of the two highest values that do not differ by more than 1 dB.

4. Information to be reported

The A-weighted sound power level of the source under test shall be reported to the nearest whole number (less than 0,5 use lower number; greater than or equal to 0,5 use higher number).

The report shall contain the technical data necessary to identify the source under test as well as the noise test code and the acoustical data.

[...]

See also Annex III scope "Content of the test report".

[...]

5. Additional microphone positions on the hemispherical measurement surface (EN ISO 3744:1995)

In addition to clauses 7.2.1 and 7.2.2 of EN ISO 3744:1995 a set of 12 microphones on the hemispherical measurement surface may be used. The location of 12 microphone positions distributed on the surface of a hemisphere of radius r are listed in the form of Cartesian coordinates in the following table. The radius r of the hemisphere shall be equal to or greater than twice the largest dimension of the reference parallelepiped. The reference parallelepiped is defined as the smallest possible rectangular parallelepiped just enclosing the equipment (without attachments) and terminating on the reflecting plane. The radius of the hemisphere shall be rounded to the nearest higher of the following values: 4, 10, 16 m.

The number (12) of microphones may be reduced down to 6, but the microphone positions 2, 4, 6, 8, 10 and 12 following the requirements of Clause 7.4.2 of EN ISO 3744:1995 have to be used in any case.

Generally the arrangement with 6 microphone positions on a hemispherical measurement surface has to be used. If there are other specifications laid down in a noise test code in this directive for a specific equipment, these specifications shall be used.

TABLE
Coordinates of the 12 microphone positions

<i>Number of microphone</i>	<i>x/r</i>	<i>y/r</i>	<i>z</i>
1	1	0	1,5 m
2	0,7	0,7	1,5 m
3	0	1	1,5 m
4	-0,7	0,7	1,5 m
5	-1	0	1,5 m
6	-0,7	-0,7	1,5 m
7	0	-1	1,5 m
8	0,7	-0,7	1,5 m
9	0,65	0,27	0,71 r
10	-0,27	0,65	0,71 r
11	-0,65	-0,27	0,71 r
12	0,27	-0,65	0,71 r

[...]

Microphones Nos 1 to 8 are not exactly on the hemisphere but a little bit outside. For the determination of the measured sound power level:

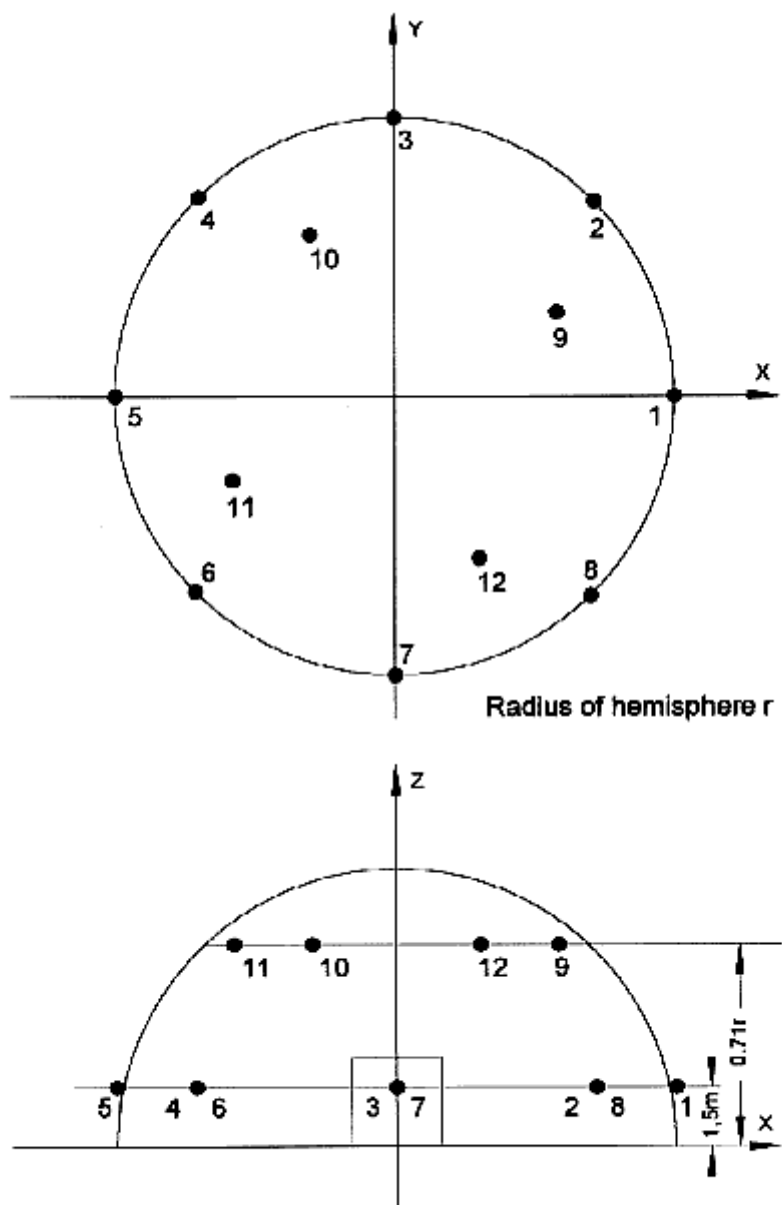
- microphones are set at the positions specified in the table;
- the area of the measurement surface to be taken into account for the calculations is that of the hemisphere with the value of the radius chosen according to the requirement of the first paragraph of point 5, thus assuming that all microphones are on this hemisphere.

[...]

6. Environmental correction K_{2A}

Equipment shall be measured on a reflecting surface of concrete or non-porous asphalt, then the environmental correction K_{2A} is set to $K_{2A} = 0$. If there are other specifications laid down in a noise test code of this directive for a specific equipment, these specifications shall be used.

Figure
 Additional microphone array on the hemisphere (12 microphone positions)



See also the comment under the table "Coordinates of the 12 microphone positions" above.

PART B
NOISE TEST CODES FOR SPECIFIC EQUIPMENT

In this part, the test codes without comments have been deleted to facilitate reading.

[...]

8. COMPACTION MACHINES

(i) NON-VIBRATING ROLLERS

See No 0.

(ii) VIBRATING ROLLERS FOR RIDE-ON OPERATORS

Basic noise emission standard

EN ISO 3744:1995

Operating conditions during test

Mounting of equipment

The vibrating roller shall be installed on one or more appropriate elastic material such as air-cushion(s). These air-cushions shall be made of a supple material (elastomer or similar) and shall be inflated to a pressure ensuring that the machine is elevated by at least 5 cm; resonance effects shall be avoided. The dimension of the cushion(s) shall be such that the stability of the machine under test is ensured.

Test under load:

The machine shall be tested in a stationary position with the engine at rated speed (stated by the manufacturer) and the moving mechanism(s) disconnected. The compacting mechanism shall be operated using the maximum compaction power corresponding to the combination of the highest frequency and the highest possible amplitude for that frequency as declared by the manufacturer.

Period of observation

The period of observation shall be at least 15 seconds.

(iii) VIBRATORY PLATES, VIBRATORY RAMMERS, EXPLOSIVE RAMMERS AND WALK-BEHIND VIBRATING ROLLERS

Basic noise emission standard

EN ISO 3744:1995

Test area

EN 500-4 rev. 1:1998, Annex C

[...]

This reference relates to a draft standard in discussion in CEN TC 151/WG 5 at that time. PrEN 500-4 submitted to the CEN enquiry during the second half of 2001 presents the same text.

[...]

Operating conditions during test

Test under load:

EN 500-4 rev. 1:1998, Annex C
[...]

This reference relates to a draft standard in discussion in CEN TC 151/WG5 at that time. PrEN 500-4, submitted to the CEN enquiry during the second half of 2001, presents the same text and is given hereafter. The previous Annex C became Annex E.

Annex E of PrEN 500-4:2001 (normative)

Determination of noise emission of rollers for ride-on operation

For the determination of the sound-power level, EN ISO 3744:1995 shall apply. For the determination of the sound pressure at the operator's position, EN ISO 11204:1996 shall apply.

E.1 Mounting and operating conditions

For these measurements, the engine (driving device and, if installed, vibratory system) and hydraulic system of the equipment must be warmed up in accordance with the instructions of the manufacturer.

E.2 Test area

Flat reflecting surface of concrete or non-porous asphalt.

E.3 Mounting of equipment

The vibrating roller shall be installed on one more appropriate elastic materials such as air cushion(s). Those air-cushions shall be made of a supple material (elastomer or similar) and shall be inflated to a pressure insuring that the machine is elevated by at least 5 cm; resonance effects shall be avoided. The dimension of the cushion(s) shall be such that the stability of the machine under test is insured.

E.4 Test under load

The machine shall be tested in a stationary position with the engine at the rated speed (stated by the manufacturer) and the moving mechanism(s) disconnected. The compaction mechanisms shall be operated using the maximum compaction power corresponding to the combination of the highest frequency and the highest possible amplitude for the frequency as declared by the manufacturer.

E.5 Period of observation

The period of observation shall be at least 15 sec.

E.6 Calculation of the A-weighted sound-power level and of the emission sound-pressure level at the operator's position

According to Clause 8 of EN ISO 3744:1995, the sound-power level is registered in each of three measurements. The arithmetic mean is taken from the sound-power levels of the three measurements of the test-run. That mean value is the test-result for the sound-power level.

According to EN ISO 11204:1996, the arithmetic mean values of the three measurements of the sound-pressure levels at the operator's right and left ear shall be registered. The arithmetic mean value is taken for the test's result.

[...]

Period of observation

EN 500-4 rev. 1:1998, Annex C

18. DUMPERS

Basic noise emission standard

EN ISO 3744:1995

Test area

ISO 6395:1988

Measurement surface / number of microphone positions / measuring distance

ISO 6395:1988

Operating conditions during test

Test under load

Equivalent ISO 6395:1988 Annex C with the following amendment:

C.4.3, second paragraph is replaced by:

'The engine shall be operated at its maximum governed speed (high idle). The transmission control shall be set to neutral. Bring the bucket to the tipped position (emptying) up to about 75 % of its maximum movement and return it to its travelling position three times. This sequence of events is considered to be a single cycle for the stationary hydraulic mode.

[...]

"Bucket" means "dump body".

[...]

If no engine power is used to tip the bucket, the engine shall be operated at idling speed with the transmission in neutral. The measurement shall be performed without tipping the bucket, the period of observation shall be 15 seconds.'

Period(s) of observation / determination of resulting sound power level if more than one operating condition is used

ISO 6395:1988 Annex C

38. MOBILE CRANES

Basic noise emission standard

EN ISO 3744:1995

[...]

The position of the mobile crane in the measurement hemisphere is given in EN 13000.

[...]

Operating conditions during test

Mounting of equipment

If the crane is equipped with outriggers, they shall be fully extended and the crane shall be levelled on its pads in mid position of possible support height.

Test under load

The mobile crane to be tested shall be presented in its standard version as described by the manufacturer. The engine power considered for determination noise limit is the nominal power of the engine used for

crane motion. The crane shall be equipped with its maximum permitted counterweight mounted on the slewing structure.

Before carrying out any measurement, the engine and the hydraulic system of the mobile crane shall be brought to their normal working temperature following the instruction of the manufacturer and all relevant safety-related procedures given in the instruction handbook shall be carried out.

If the mobile crane is equipped with several engines, the engine used for the crane's function shall be run. The carrier engine shall be turned off.

If the engine of the mobile crane is fitted with a ventilator, it shall run during the test. If the ventilator can be operated at several speeds, the test shall be carried out with the ventilator running at the highest speed. [...]

The general statement for fan speed given in this annex Part A Clause 2.1 may be applied.

[...]

The mobile crane shall be measured under the following 3 (a - c) or 4 (a - d) conditions:

For all working conditions the following shall apply:

- *Engine speed at $\frac{3}{4}$ of maximum speed specified for crane operation mode with a tolerance of ± 2 %.*
- *Acceleration and deceleration at the maximum value without dangerous movements of the load or the hook block.*
- *Motions at maximum possible speed as given in the instruction manual under the conditions given.*

(a) Hoisting

The mobile crane shall be loaded with a load which creates 50 % of the maximum rope force. The test consists of hoisting of the load and the immediately following lowering to the starting position. The length of the boom shall be chosen so that the full test lasts 15 - 20 s.

(b) Slewing

With the boom adjusted to an angle of 40° - 50° to the horizontal and without load the upper carriage shall be slewed 90° to the left immediately followed by slewing back to the starting position. The jib shall be at its minimum length. The observation period shall be the time needed to carry out the working cycle.

(c) Derricking

The test starts with raising the short jib from the lowest working position immediately followed by the lowering of the jib to its original position. The movement shall be executed without load. The duration of the test shall be at least 20 s.

(d) Telescoping (if applicable)

With the jib adjusted to an angle of 40° - 50° to the horizontal without load and the jib fully retracted, the telescoping cylinder for the first section only shall be extended together with the first section to its full length and immediately retracted together with the first section.

Period(s) of observation / determination of resulting sound power level if more than one operating condition is used

The resulting sound power level is calculated by:

(i) if telescoping is applicable

$$L_{WA} = 10 \log (0,4x10^{0,1LWAa} + 0,25x10^{0,1LWAb} + 0,25x10^{0,1LWAc} + 0,1x10^{0,1LWAd})$$

(ii) if telescoping is not applicable

$$L_{WA} = 10 \log (0,4x10^{0,1LWAa} + 0,3x10^{0,1LWAb} + 0,3x10^{0,1LWAc})$$

where

L_{WAa} is the sound power level for the hoisting cycle

L_{WAb} is the sound power level for the slewing cycle

L_{WAc} is the sound power level for the derricking cycle

L_{WAd} is the sound power level for the telescoping cycle (if applicable)

45. POWER GENERATORS

Basic noise emission standard

EN ISO 3744:1995

Environmental correction K_{2A}

Measurement in the open air:

$$K_{2A} = 0$$

Measurement indoors

The value of the constant K_{2A} , determined without in accordance with Annex A of EN ISO 3744:1995, shall be ≤ 2.0 dB, in which case K_{2A} shall be disregarded.

Measurement surface / number of microphone positions /measuring distance

Hemisphere / 6 microphone positions according to part A paragraph 5 / according to part A paragraph 5;

If $l > 2m$: a parallelepiped according to EN ISO 3744:1995 may be used with measuring distance $d = 1m$.

Operating conditions during test

Mounting of equipment

The power generators shall be installed on the reflecting plane; skid-mounted power generators shall be placed on a support 0.40 m high, unless otherwise required by the manufacturer's conditions of installation.

Test under load

ISO 8528-10:1998, Clause 9

[...]

A more comprehensive definition of the load conditions is given in EN 12601 *Reciprocating internal combustion engine driven generating sets - Safety* that includes the correct power reference (PRP) given in the table of article 12 of this Directive.

This definition does not cause any conflict with either ISO 8528-10 or this Directive.

[...]

Period of observation

The period of observation shall at least be 15 seconds.

50. SHREDDERS/CHIPPERS

[...]

Following the decision of the Noise Committee mentioned in the comment to Article 13 above, this test cycle is thus divided into two parts, being the second one devoted to wood chippers:

SHREDDERS/CHIPPERS

[...]

Basic noise emission standard

EN ISO 3744:1995

Test area

ISO 11094:1991

[...]

The hemisphere radius shall be 4 m.

The machine shall be positioned with the main material intake on the vertical of the hemisphere centre and the main discharge direction along the x-axis.

[...]

Environmental correction K_{2A}

Measurement in the open air

$$K_{2A} = 0$$

Measurements indoors

The value of the constant K_{2A} , determined without artificial surface and in accordance with Annex A of EN ISO 3744:1995, shall be ≤ 2.0 dB, in which case K_{2A} shall be disregarded.

Measurement surface / number of microphone positions / measuring distance

ISO 11094:1991

Operating conditions during test

Test under load:

[...]

The shredder/chipper shall be tested using two pieces of dry pine 12 x 24 x 200 mm for each test cycle. The operator shall stand in the designated operating position and shall drop the test pieces simultaneously into the feed intake opening. The operator shall remain stationary while the tests are made. If there is more than one feed intake opening, each opening shall be tested separately. Measurements shall be only made while there are test pieces in the machine. All results except that from the intake opening giving the highest result shall be disregarded.

The engine/electrical motor shall be kept at nominal speed with the following conditions:

- Thermal engine: according to manufacturer's specifications.
- Electric motor fed by the mains: rated voltage/frequency within ± 2 % tolerance.

- Electric motor fed by a battery: battery voltage above 0,9, the nominal value for lead acid, and 0,8 of nominal value for all other types.

Period of observation / determination of resulting sound power level
[...]

The period of observation shall not be shorter than 10 seconds. If necessary additional pairs of test pieces shall be introduced to achieve a 10 seconds measurement period. The period of observation shall end when there is no more material in the chipping area. All results except that from the intake opening giving the highest result shall be disregarded.

WOOD CHIPPERS

Basic noise emission standard
EN ISO 3744:1995.

Test area
ISO 11094:1991.

Environmental correction K_{2A}
Measurement in the open air.

$$K_{2A} = 0$$

Measurement surface/number of microphone positions/measuring distance
ISO 11094:1991.

Operating conditions during test

Test under load

The measurements shall be made while chipping a 4 m long 50 x 50 mm air dried (moisture 18 ± 3 %) pinewood at maximum input speed of the machine.

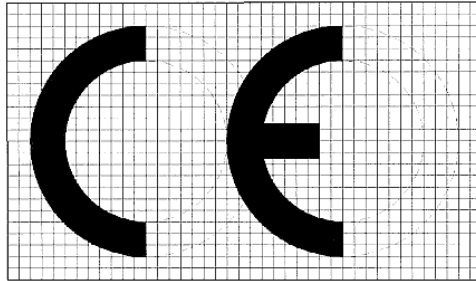
The thermal engine or electric motor shall operate at or within 10 % of its nominal speed.

Period of observation / determination of resulting sound power level

The work cycle begins when the wood meets the blades and ends when all the wood is chipped. The infeed has to be continuous in order to achieve a measuring period of at least 10 s.

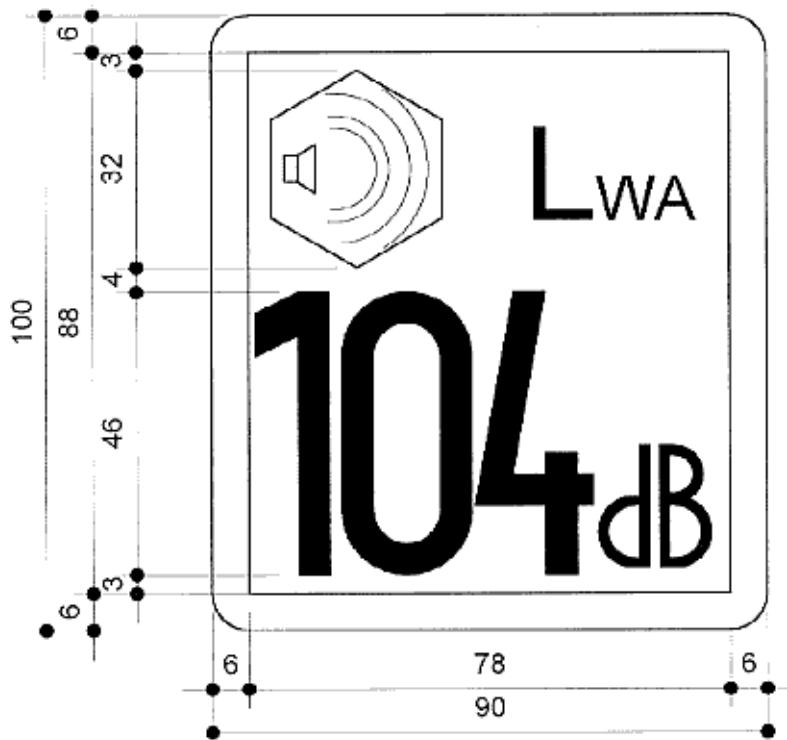
ANNEX IV
**MODELS OF THE CE MARKING OF CONFORMITY AND OF THE INDICATION OF THE
GUARANTEED SOUND POWER LEVEL**

The CE conformity marking must consist of the initials 'CE' taking the following form:



If the CE marking is reduced or enlarged according to the size of the equipment the proportions given in the above drawing must be respected. The various components of the CE marking must have substantially the same vertical dimension which may not be less than 5 mm.

The indication of the guaranteed sound power level must consist of the single-number of the guaranteed sound power in dB, the sign 'L_{WA}' and a pictogram taking the following form:



If the indication is reduced or enlarged according to the size of the equipment the proportions given in the above drawing must be respected. However, the vertical dimension of the indication should, if possible, not be less than 40 mm.

The marking may be embossed or on a label. There is no requirement for the colour of this marking. For equipment weighing less than 20 kg, the vertical dimension of the indication may be reduced to 20 mm.

ANNEX V
INTERNAL CONTROL OF PRODUCTION

This module is applicable for equipment listed in Article 13.
See the flow chart in Part 2 of these Guidelines.

1. *This annex describes the procedure whereby the manufacturer, or his authorised representative established within the Community, who carries out the obligations laid down in point 2, ensures and declares that the equipment concerned satisfies the requirements of this Directive. The manufacturer, or his authorised representative established in the Community, must affix the CE marking of conformity and the indication of the guaranteed sound power level as required in Article 11 to each equipment and draw up a written EC declaration of conformity as required in Article 8.*

[...]

To be able to place equipment on the market, the manufacturer:

- draws up a technical documentation including test results and determination of the guaranteed value (see Part 4 of these Guidelines on the determination of the uncertainties);
- draws up the EC declaration of conformity and affixes the CE marking and the guaranteed power level (L_{WA}).

The technical documentation:

- shall be drawn up in one of the official languages of the Union;
- shall be available on the premises of the manufacturer, though it is not necessary to put the technical documentation together physically;
- may be electronically stored, the manufacturer shall take care that the documentation remains accessible during the time prescribed;
- can be requested only by national authorities and submitted on reasoned request.

The language used for the technical documentation shall be one of the official languages of the Union.

If a manufacturer fails to present the technical documentation to the national authorities, non-conformity is presumed.

[...]

2. *The manufacturer, or his authorised representative established in the Community, must draw up the technical documentation described in point 3 and he must keep it for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities for inspection purposes. The manufacturer, or his authorised representative established in the Community, may entrust another person to keep the technical documentation. In this case he has to include the name and address of this person in the EC declaration of conformity.*
3. *The technical documentation must enable the conformity of the equipment with the requirements of this directive to be assessed. It must contain at least the following information:*
 - *name and address of the manufacturer or his authorised representative established in the Community*
 - *a description of the equipment*
 - *make*
 - *trade name*
 - *type, series and numbers*
 - *the technical data relevant for the identification of the equipment and the assessment of its noise emission, including, if appropriate, schematic drawings and any description and explanation necessary for their understanding*
 - *the reference to this Directive*

- *the technical report of noise measurements carried out in accordance with the provisions of this Directive*

[...]

See comment on Annex III scope.

[...]

- *the technical instruments applied and the results of the evaluation of the uncertainties due to production variation and their relation to the guaranteed sound power level.*

See Part 4 "Determination and maintenance of the guaranteed value".

The determination of the guaranteed value has to be detailed in the technical documentation. This shall include the way of determination of the uncertainty associated to production, as indicated here above, and the uncertainties due to measurements, not reminded here above, but necessary to be in line with the definition of the guaranteed sound power level given in Article 3.

To fulfil this requirement, the manufacturer needs to describe the methods used to ensure keeping the production variation within the limit he set when defining the guaranteed value. See also comments on Clause 4 in this annex.

When the equipment is fitted with a fan with several distinct speeds or with continuous variable speed, the technical documentation shall contain the relationship between fan speed and ambient temperature (see guidance in Annex III, point 2.1).

[...]

4. *The manufacturer must take all measures necessary in order that the manufacturing process ensures continuing compliance of the manufactured equipment with the technical documentation referred to in points 2 and 3 and with the requirements of this Directive.*

The manufacturer shall set up a process control procedure to maintain the noise performance of his equipment covering in particular the characteristics of the components, the surveillance of the production line and periodical tests (see Part 4).

ANNEX VI
***INTERNAL CONTROL OF PRODUCTION WITH ASSESSMENT OF TECHNICAL
DOCUMENTATION AND PERIODICAL CHECKING***

This module is applicable for equipment listed in Article 12.

See the flow chart in Part 2 of these Guidelines.

1. *This Annex describes the procedure whereby the manufacturer, or his authorised representative established in the Community, who carries out the obligations laid down in points 2, 5 and 6 ensures and declares that the equipment concerned satisfies the requirements of this directive. The manufacturer, or his authorised representative established in the Community, must affix the CE marking of conformity and the indication of the guaranteed sound power level as required in Article 11 to each equipment and draw up a written EC declaration of conformity as required in Article 8.*

[...]

To be able to put equipment on the market, the manufacturer must:

- draw up a technical documentation (including tests results and determination of the guaranteed value; see Part 4 of these Guidelines on the determination of the uncertainties);
- let it be evaluated by a notified body of his choice;
- draw up the EC declaration of conformity and affix the CE marking and the L_{WA} ;
- let the production process be checked by the notified body according to one of the following methods at the choice of the manufacturer:
 - the notified body shall carry out periodical checks in order to verify continuing compliance of the manufactured equipment with the technical documentation and with the requirements of this directive;
 - the notified body shall carry out or have carried out product checks at random intervals.

The technical documentation:

- shall be drawn up in one of the official languages of the Union;
- shall be available on the premises of the manufacturer, though it is not necessary to put the technical documentation together physically;
- may be electronically stored (the manufacturer shall take care that the documentation remains accessible during the time prescribed);
- can be requested only by national authorities and be submitted on reasoned request.

If a manufacturer fails to present the technical documentation to the national authorities, non-conformity is presumed.

[...]

2. *The manufacturer, or his authorised representative established in the Community, must draw up the technical documentation described in point 3 and he must keep it for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities for inspection purposes. The manufacturer, or his authorised representative established in the Community, may entrust another person to keep the technical documentation. In this case he has to include the name and address of this person in the EC declaration of conformity.*
3. *The technical documentation must enable the conformity of the equipment with the requirements of this Directive to be assessed. It must contain at least the following information:*
 - *name and address of the manufacturer or his authorised representative established in the Community*
 - *a description of the equipment*
 - *make*
 - *trade name*

- *type, series and numbers*
- *the technical data relevant for the identification of the equipment and the assessment of its noise emission, including, if appropriate, schematic drawings and any description and explanation necessary for their understanding*

[...]

Schematic drawings are intended to give enough information to identify the equipment. They are not the detailed construction drawing.

[...]

- *the reference to this Directive*
- *the technical report of noise measurements carried out in accordance with the provisions of this Directive*

[...]

See comment on Annex III scope.

When the equipment is fitted with a fan with several distinct speeds or with continuous variable speed, the technical documentation shall contain the relationship between fan speed and ambient temperature (see guidance in Annex III, point 2.1).

[...]

- *the technical instruments applied and the results of the evaluation of the uncertainties due to production variation and their relation to the guaranteed sound power level.*

[...]

The determination of the guaranteed value has to be detailed in the technical documentation. This shall include the way of determination of the uncertainty associated to production, as indicated here above, and the uncertainties due to measurements, not reminded here above, but necessary to be in line with the definition of the guaranteed sound power level given in Article 3.

To fulfil this requirement, the manufacturer needs to describe the methods used to ensure keeping the production variation within the limit he set when defining the guaranteed value. See also comments on Clause 4 in this Annex.

See also Part 4.

[...]

4. *The manufacturer must take all measures necessary in order that the manufacturing process ensures compliance of the manufactured equipment with the technical documentation referred to in points 2 and 3 and with the requirements of this Directive.*

[...]

The manufacturer shall set up a process control procedure to maintain the noise performance of his equipment covering in particular the characteristics of the components, the surveillance of the production line and periodical tests.

[...]

5. *Evaluation by the notified body prior to placing on the market*

[...]

The manufacturer shall choose a notified body from the list published in the NANDO database (see Article 15). The request for a specific model of equipment is submitted to a single notified body. The manufacturer may operate with more than one notified body at the same time for different models of equipment.

In the spirit of Directive 2000/14/EC, the notified body has to judge the soundness of the noise measurements and the following elaboration without forcing a pre-determined choice.

This is valid whichever method the manufacturer decides to adopt.

[...]

The manufacturer, or his authorised representative established in the Community, shall present a copy of his technical documentation to a notified body of his choice before the first item of equipment is placed on the market or put into service.

[...]

The language used for the technical documentation shall be one of the official languages of the Union and is determined by agreement between the manufacturer and the notified body.

The technical documentation may be in any format agreed between the manufacturer and the notified body.

As a general rule, the notified body may confirm the receipt of the technical documentation and gives a first reply within two to three weeks.

[...]

If there are doubts about the plausibility of the technical documentation the notified body shall inform accordingly the manufacturer or his authorised representative established in the Community, and, if need be, carry out, or have carried out, modifications of the technical documentation, or possibly, tests deemed necessary.

[...]

As a general rule, the notified body informs the manufacturer about his doubts, indicating the points of the technical documentation which give origin to the doubts. The manufacturer has to answer the questions and give more information which can be introduced in the technical documentation if necessary. If the doubts remain, the notified body may ask for tests (measurements) which he may carry out himself or which may be carried out under his control.

[...]

After the notified body has issued a report confirming that the technical documentation satisfies the provisions of this Directive, the manufacturer or his authorised representative established within the Community may affix the CE marking to the equipment and issue an EC declaration of conformity in accordance with Articles 11 and 8, for which he will bear complete responsibility.

[...]

The notified body shall issue a written report in any format legally valid in the country of the manufacturer or his authorised representative.

When the manufacturer has received this report, the equipment may be placed on the market with the necessary marking (CE and L_{WA}) and documentation (EC declaration of conformity).

[...]

6. Evaluation by the notified body during production

[...]

The evaluation during production is carried out by the same notified body that made the verification prior to placing on the market.

If the notification is withdrawn the manufacturer must choose another one.

[...]

The manufacturer, or his authorised representative established in the Community, shall further involve the notified body in the production phase according to one of the following procedures to be chosen by the manufacturer or his authorised representative established within the Community:

[...]

First procedure

[...]

- *The notified body shall carry out periodical checks in order to verify continuing compliance of the manufactured equipment with the technical documentation and with the requirements of this directive; in particular the notified body shall concentrate on:*
 - *the correct and complete marking of the equipment according to Article 11,*
 - *issuing of the EC declaration of conformity according to Article 8,*
 - *the technical instruments applied and the results of the evaluation of the uncertainties due to production variation and their relation to the guaranteed sound power level.*

[...]

The checks cover both a formal part concerning the compliance with the directive prescriptions on markings and the EC declaration of conformity and a practical one about the adherence by the manufacturer to the procedures he defined to maintain the noise performance during production.

[...]

The manufacturer, or his authorised representative established in the Community, shall give the notified body free access to all the internal documentation supporting these procedures, the actual results of the internal audits and the corrective actions which have been taken, if any.

Only if the above checks give unsatisfactory results the notified body shall carry out noise tests, which, upon its own judgment and experience, may be simplified or completely carried out according to the provisions laid down in Annex III for the relevant type of equipment.

[...]

When the result of the checks creates serious doubts about the conformity of production or shows lack of verification by the manufacturer, the notified body has to carry out tests (measurements) using any combination of his facilities and the manufacturer's ones. The tests shall be in proportion with the possible non-conformity.

The result of these checks is given by the notified body to the manufacturer in a written document in any format legally valid in the country of the manufacturer.

See also clause below "Frequency of verifications or tests".

Second procedure

[...]

- *the notified body shall carry out or have carried out product checks at random intervals. An adequate sample of the final equipment, chosen by the notified body, must be examined and appropriate noise tests as set out in Annex III, or equivalent tests, must be carried out to check the conformity of the product with the relevant requirements of the directive. The product checking must include the following aspects:*
 - *the correct and complete marking of the equipment according to Article 11,*
 - *issuing of the EC declaration of conformity according to Article 8.*

[...]

1. In this procedure, the notified body carries out tests (measurements) without verification of any documentation.

2. The notified body has to carry out tests (measurements) using any combination of his facilities and the manufacturer's ones.

For evaluation of the result, guidance is given in Part 4.

See also clause below "Frequency of verifications or tests".

Frequency of verifications or tests

[...]

In both procedures, the frequency of the checks shall be defined by the notified body according to the results of previous evaluations, the need to monitor corrective actions and further guidance for the frequency of the checks that may be given by the yearly production and the general reliability of the manufacturer to maintain the guaranteed values; however a check shall be carried out at least once every three years.

[...]

As a general rule, the first verification (for the first procedure) or tests (for the second procedure) take place within the first year after the verification prior to placing on the market.

Then the periodicity has to be determined taking into account:

- the result of previous check;
- the difference between the measured value and the guaranteed value;
- the manufacturer's procedures of production control.

Results of verifications and tests

[...]

If there are doubts about the plausibility of the technical documentation or the adherence during production the notified body shall inform accordingly the manufacturer, or his authorised representative established in the Community.

[...]

The result of these checks is given by the notified body to the manufacturer in a written document in any format legally valid in the country of the manufacturer.

The corrective actions shall be determined/discussed/agreed between the manufacturer and the notified body.

[...]

In those cases where equipment checked does not conform to the provisions of this Directive, the notified body must inform the notifying Member State.

[...]

Only the Member State may initiate measures to restrict or prohibit the placing on the market of the equipment in question (see Article 9).

ANNEX VII

UNIT VERIFICATION

This module is applicable for equipment listed in Article 12.

See the flow chart in Part 2 of these Guidelines.

This module is generally used for low-volume equipment and for second-hand equipment coming from outside the European Union that was not initially certified to this directive

This module is applied for each single item of equipment. It cannot be used as a test of a specimen representative of an envisaged production.

It shall not be confused with a type test examination.

The technical documentation described here after shall be prepared by the manufacturer or by the importer of second-hand equipment.

The technical documentation:

- shall be drawn up in one of the official languages of the Union;
- shall be available on the premises of the manufacturer, though it is not necessary to put the technical documentation together physically;
- may be electronically stored, the manufacturer shall take care that the documentation remains accessible during the time prescribed;
- can be requested only by national authorities and submitted on reasoned request.

If a manufacturer fails to present the technical documentation to the national authorities, non-conformity is presumed.

The language used for the technical documentation shall be one of the official languages of the Union and is determined by agreement between the manufacturer and the notified body.

- 1. This Annex describes the procedure whereby the manufacturer, or his authorised representative established in the Community, ensures and declares that the equipment which has been issued with the certificate referred to in point 4 conforms to the requirements of this directive. The manufacturer, or his authorised representative established in the Community, must affix the CE marking supplemented by the information as required in Article 11 to the equipment and draw up the EC declaration of conformity referred to in Article 8.*
- 2. The application for a unit verification must be lodged by the manufacturer or his authorised representative established in the Community with a notified body chosen by him.*

This application must include:

- *the name and address of the manufacturer and, if the application is lodged by the authorised representative, his name and address in addition*
- *a written declaration that the same application has not been lodged with any other notified body,*
- *a technical documentation conforming to the requirements set below:*
 - *a description of the equipment*
 - *trade name*
 - *type, series and numbers*
 - *the technical data relevant for the identification of the equipment and the assessment of its noise emission, including, if appropriate, schematic drawings and any description and explanation necessary for their understanding*

[...]

When the equipment is fitted with a fan with several distinct speeds or with continuous variable speed, the technical documentation shall contain the relationship between fan speed and ambient temperature (see guidance in Annex III, point 2.1).

[...]

— *the reference to this Directive.*

3. *The notified body must:*

- *examine whether the equipment has been manufactured in conformity with the technical documentation*
- *agree with the applicant the location where, in accordance with this directive, the noise tests will be carried out*

[...]

The notified body has to carry out tests using any combination of his facilities and the manufacturer's ones.

[...]

— *in accordance with this directive, carry out or have carried out the necessary noise tests.*

4. *Where the equipment meets the provisions of this directive, the notified body must issue a certificate of conformity to the applicant as described in Annex X.*

[...]

This certificate is valid only for the item of equipment which has been tested.

The guaranteed value to be affixed on the item of equipment is determined by the manufacturer considering the measured sound power level indicated in the certificate and the uncertainty associated to measurement.

This certificate shall be kept by the manufacturer and it is not necessary to attach it to the EC declaration of conformity.

[...]

If the notified body refuses to issue a certificate of conformity, it must state the detailed grounds for the refusal.

5. *The manufacturer, or his authorised representative established in the Community, must keep with the technical documentation copies of the certificate of conformity for a period of 10 years from the date on which the equipment is placed on the market.*

ANNEX VIII

FULL QUALITY ASSURANCE

This module is applicable for equipment listed in Article 12.
See the flow chart in Part 2 of these Guidelines.

General

In the module "full quality assurance" as a total quality approach, the notified body should only assess the QA system which has to prove the conformity of the products to this directive.

For this module, initial verification does not mean "verification of the product" but "verification of the quality assurance system". In other words, once the quality assurance system has been certified, special audit (verification of the technical documentation) in correspondence of the placing on the market of a new model is not necessary.

During the audits, the notified body has to check the smooth working of the system taking as basis existing products or new products. If the results are satisfactory, there is no need to check the correct application of the procedure for all the types of products.

The full quality assurance system is connected to one or more types of equipment as defined in Article 12. If a manufacturer starts producing a new type of equipment, he has to use the procedure described in Clause 3.4, second and third paragraphs of this annex.

- 1. This Annex describes the procedure whereby the manufacturer who satisfies the obligations of point 2 ensures and declares that the equipment concerned satisfies the requirements of this directive. The manufacturer, or his authorised representative established in the Community, must affix the CE marking supplemented by the information as required in Article 11 to each product and draw up the written EC declaration of conformity referred to in Article 8.*
- 2. The manufacturer must operate an approved quality assurance system for design, manufacture and final product inspection and testing as specified in point 3 and shall be subject to surveillance as specified in point 4.*

[...]

This module concentrates on the total quality system certification, rather than on the approval of the single model of equipment developed and produced by the manufacturer.

In order to apply this module, the manufacturer may be certified ISO 9001 or not. But the certification EN ISO 9001 is not enough for the application of this module.

[...]

3. Quality assurance system

[...]

1. Notified bodies

The notified body shall be chosen by the manufacturer in the list of this Directive published in the NANDO database (see Article 15).

Changing the notified body means substantially re-starting the whole procedure.

2. Obligation of the manufacturer and audit from notified body

The manufacturer shall:

- create or adapt to this directive the quality assurance system (written policies, procedures and instruction); this system must ensure compliance of the product with the requirements of the Directive;
- prepare the technical documentation for the models of equipment requiring certification including results of tests and the determination of the guaranteed value.

The technical documentation:

- shall be drawn up in one of the official languages of the Union;
- shall be available on the premises of the manufacturer, though it is not necessary to put the technical documentation together physically;
- may be electronically stored; the manufacturer shall take care that the documentation remains accessible during the time prescribed;
- can be requested only by national authorities and submitted on reasoned request.

The language used for the technical documentation shall be one of the official languages of the Union and is determined by agreement between the manufacturer and the notified body.

If a manufacturer fails to present the technical documentation to the national authorities, non-conformity is presumed.

The notified body shall assess the quality assurance system and check the conformity of equipment with the requirements of this Directive.

If the plant quality system is certified EN ISO 9001 the notified body:

- presumes conformity of the base EN ISO 9001 procedures;
- concentrates on the verification of the procedures necessary to ensure the compliance of the equipment with the requirements of Directive 2000/14/EC.

In the spirit of Directive 2000/14/EC, the notified body has to judge the soundness of the noise measurements and the following elaboration without forcing a pre-determined choice.

This is valid whichever method the manufacturer decides to adopt.

[...]

3.1. The manufacturer must lodge an application for assessment of his quality assurance system with a notified body of his choice.

The application must include:

- *all relevant information for the product category envisaged, including technical documentation of all equipment already in phase of design or production that must contain at least the following information:*
 - *name and address of the manufacturer or his authorised representative established in the Community*
 - *a description of the equipment*
 - *make*
 - *trade name*
 - *type, series and numbers*
 - *the technical data relevant for the identification of the equipment and the assessment of its noise emission, including, if appropriate, schematic drawings and any description and explanation necessary for their understanding*

[...]

When the equipment is fitted with a fan with several distinct speeds or with continuous variable speed, the technical documentation shall contain the relationship between fan speed and ambient temperature (see guidance in Annex III, point 2.1).

[...]

- *the reference to this Directive*

- *the technical report of noise measurements carried out in accordance with the provisions of this Directive*
- *the technical instruments applied and the results of the evaluation of the uncertainties due to production variation and their relation to the guaranteed sound power level.*

[...]

The determination of the guaranteed value has to be detailed in the technical documentation. This shall include the way of determination of the uncertainties due production, as indicated here above, and the uncertainties due to measurements, not reminded here above, but necessary to be in line with the definition of the guaranteed sound power level given in Article 3.

To fulfil this requirement, the manufacturer needs to describe the methods used to ensure keeping the production variation within the limit he set defining the guaranteed value. See also comments on Clause 4 in this Annex.

See also Part 4.

[...]

- *a copy of the EC declaration of conformity.*
- *the documentation concerning the quality assurance system.*

3.2. The quality assurance system must ensure compliance of the product with the requirements of the directives that apply to it.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic and orderly manner in the form of written policies, procedures and instructions. The quality assurance system documentation must permit a common understanding of the quality policies and procedures such as quality programmes, plans, manuals and records.

3.3. It must contain in particular an adequate description of:

- *the quality objectives and the organisational structure, responsibilities and powers of the management with regard to design and product quality,*
- *the technical documentation to be drawn up for each product, containing at least the information indicated in point 3.1 for the technical documentation mentioned there,*
- *the design control and design verification techniques, processes and systematic actions that will be used when designing the products pertaining to the equipment category covered,*
- *the corresponding manufacturing, quality control and quality assurance techniques, processes and systematic actions that will be used,*
- *the examinations and test that will be carried out before, during and after manufacture, and the frequency with which they will be carried out,*
- *the quality records, such as inspection reports and test data, calibration data, qualification reports of the personnel concerned etc.,*
- *the means to monitor the achievement of the required design and product quality and the effective operation of the quality assurance system.*

The notified body must assess the quality assurance system to determine whether it satisfies the requirements referred to in point 3.2. It shall presume conformity with these requirements in respect of quality assurance systems that implement EN ISO 9001.

The auditing team must have at least one member with experience as an assessor in the equipment technology concerned. The assessment procedure must include an assessment visit to the manufacturer's premises.

The decision must be notified to the manufacturer. The notification must contain the conclusion of the examination and the reasoned assessment decision.

3.4. The manufacturer must undertake to fulfil the obligations arising out of the quality assurance system as approved and to maintain it in an adequate and efficient manner.

The manufacturer or his authorised representative established within the Community shall keep the notified body that has approved the quality assurance system informed of any intended updating of the quality assurance system.

The notified body must evaluate the modifications proposed and decide whether the modified quality assurance system will still satisfy the requirements referred to in point 3.2 or whether a re-assessment is required.

It must notify its decision to the manufacturer. The notification must contain the conclusions of the examination and the reasoned assessment decision.

4. Surveillance under the responsibility of the notified body [...]

The notified body shall carry out audits at the manufacturer premises which include at least:

- a verification of the adherence to the procedures included in the quality assurance system;
- a check of the updated technical documentation in particular the calibration of the measurement testing equipment, results of the tests and the calculation of uncertainties;
- a check of the marking of the equipment and the EC declaration of conformity.

As a general rule, the first audit takes place within one year after the initial certification of the quality system; then the following ones take place every year unless corrective actions have been decided.

When the result of the audit creates serious doubts about the conformity of production or shows lack of verification by the manufacturer, corrective actions shall be determined and it becomes necessary for the notified body to carry out tests using any combination of his facilities and the manufacturer's ones.

Furthermore, the notified body may pay unexpected visit to the manufacturer within six months to check that the corrective actions have been implemented (see Part 4.4).

If the non-conformity persists the notified body shall inform the notifying Member State.

Only the Member State may initiate measures to restrict or prohibit the placing on the market of the equipment in question (see Article 9).

[...]

4.1. The purpose of surveillance is to make sure that the manufacturer duly fulfils the obligations arising out of the approved quality assurance system.

4.2. The manufacturer must allow the notified body entrance for inspection purposes to the locations of design, manufacture, inspection and testing, and storage and must provide it with all necessary information, in particular:

- *the quality assurance system documentation*
- *the quality records as foreseen by the design part of the quality assurance system, such as results of analyses, calculations, tests, etc.,*
- *the quality records as foreseen by the manufacturing part of the quality assurance system, such as inspection reports and test data, calibration data, qualification reports of the personnel concerned etc.*

4.3. The notified body shall periodically carry out audits to make sure that the manufacturer maintains and applies the quality assurance system and must provide an audit report to the manufacturer.

- 4.4. Additionally the notified body may pay unexpected visits to the manufacturer. During such visits the notified body may carry out, or cause to be carried out, tests to verify that the quality assurance system is functioning correctly, if necessary. The notified body must provide the manufacturer with a visit report and, if a test has taken place, with a test report.*
- 5. The manufacturer must, for a period ending at least 10 years after the last equipment has been manufactured, keep at the disposal of the national authorities:*
- the documentation referred to in the second indent of point 3.1 of this annex,*
 - the updating referred to in the second paragraph of point 3.4,*
 - the decisions and reports from the notified body which are referred to in the final paragraph of point 3.4, points 4.3 and 4.4.*
- 6. Each notified body must give the other notified bodies the relevant information concerning the quality assurance system approvals issued and withdrawn.*

ANNEX IX
**MINIMUM CRITERIA TO BE TAKEN INTO ACCOUNT BY MEMBER STATES FOR THE
NOTIFICATION OF BODIES**

1. *The body, its director and its staff responsible for carrying out verification operations may be neither the designer, builder, supplier or installer of the equipment nor the authorised representative of any of those parties. They may become involved neither directly nor as authorised representatives in the design, construction, marketing or maintenance of such equipment nor represent the parties engaged in these activities. This does not preclude the possibility of exchange of technical information between the manufacturer and the body.*
2. *The body and its staff must carry out the assessments and verifications with the highest degree of professional integrity and technical competence and must be free from all pressures and inducements, particularly financial, which might influence their judgement or the results of their work, especially from persons or groups of persons with an interest in the results of verification.*
3. *The body must have at its disposal the necessary staff and possess the necessary facilities to enable it to perform properly the technical and administrative tasks connected with inspection and surveillance operations; it must also have access to the equipment required for any special verification.*
4. *The staff responsible for inspection must have:*
 - *sound technical and professional training*
 - *satisfactory knowledge of the requirements for the assessment of technical documentation*
 - *satisfactory knowledge of the requirements for the tests they carry out and adequate practical experience of such tests*
 - *the ability to draw up the certificates, records and reports required to authenticate the performance of the tests.*

[...]

The bodies notified for the conformity assessment procedures described in Annexes VI and VII need to show a capability on noise aspects as described above. The bodies notified for the conformity assessment procedure described in Annex VIII need to show capability on both aspects, noise and quality assurance. The resources dedicated to either capability may be subcontracted.

[...]

5. *The impartiality of inspection staff must be guaranteed. Their remuneration must not depend on the number of tests carried out or the results of such tests.*
6. *The body must take out liability insurance unless its liability is assumed by the State in accordance with national law, or the Member State itself is directly responsible for the tests.*
7. *The staff of the body must observe professional secrecy with regard to all information gained in carrying out its tests (except vis-à-vis the competent administrative authorities of the State in which its activities are carried out) under this directive or any provisions of national law giving effect to it.*

Annex to Part 3 of the Guidelines

This Annex is based on the agreement of the Standing Committee of the former Machinery Directive 98/37/EC, replaced by the Machinery Directive 2006/42/EC as by 29 December 2009, regarding the relation between that Directive and Directive 2000/14/EC on noise emission by equipment for use outdoors.

Article 3 of Directive 2006/42/EC lays down that "Where, for machinery, the hazards referred to in Annex I [of this Directive] are wholly or partly covered more specifically by other Community [EU] Directives, this Directive shall not apply, or shall cease to apply, to that machinery in respect of such hazards from the date of implementation of those other Directives".

As regards the sound power level emitted by machinery used outdoors and covered by Directive 2000/14/EC, it is clear that this Directive must be considered as a specific directive for Directive 2006/42/EC. This Directive stipulates in a very precise way how the sound power level of machinery must be measured and indicated on the machine.

With the view of avoiding useless procedures for manufacturers, it is important to agree on a methodology in order to avoid repetition of measurements.

Machinery not covered by Directive 2000/14/EC

Directive 2006/42/EC must be applied, it means sound pressure level at workstations must be measured. If this value is higher than 80 dB(A) (see Annex I, 1.7.4.2 (u)), the sound power level must also be measured.

Directive 2006/42/EC gives the free choice of the measurement method. The results of these measurements must be mentioned in the instructions of use accompanying the machine and in the technical documentation.

Machinery covered by Directive 2000/14/EC

Both Directives 2006/42/EC and 2000/14/EC must be applied. Directive 2006/42/EC for the measurement of the sound pressure level (Directive 2000/14/EC does not deal with this question) and Directive 2000/14/EC for the measurement of sound power level, whatever the value of the sound pressure level.

For the measurement of the sound power level, Directive 2000/14/EC lays down the measurement method and the operating conditions of the machinery during the test. On top of that, the manufacturer has to provide the value of the "guaranteed" sound power level, it means the result of the measurement of the sound power level increased with the value of the measurement uncertainty and a value taking into account the differences between the examined machine and the production of identical machines. This guaranteed sound power level must be indicated on the machine, the directive does not require any indications in the instructions for use.

Remarks

1. Harmonised standards

Where a machine is covered by Directive 2000/14/EC:

- the harmonised standards according to Directive 2006/42/EC and which relate to the measurement of sound power level can not be applied in order to comply with Directive 2000/14/EC;
- for the measurement of sound pressure level, in order to avoid redundant measurements for manufacturers, it would be advisable that harmonised standards according to Directive

2006/42/EC be modified, if needed, with a view of using the same operating conditions as those used during the measurement of sound power level.

2. Instructions for use

In order of having the same instructions for use as regards indications relating to noise, the following must be mentioned:

- in all cases, the sound pressure level at workstations;
- for machinery not covered by Directive 2000/14/EC, the **measured** sound power level if the sound pressure level is equal to or higher than 80 dB(A);
- for machinery covered by Directive 2000/14/EC, the **maximum guaranteed** sound power level (the indication of **measured** sound power level would lead to confusion since it would not be the same as the one indicated on the machine).

Summary

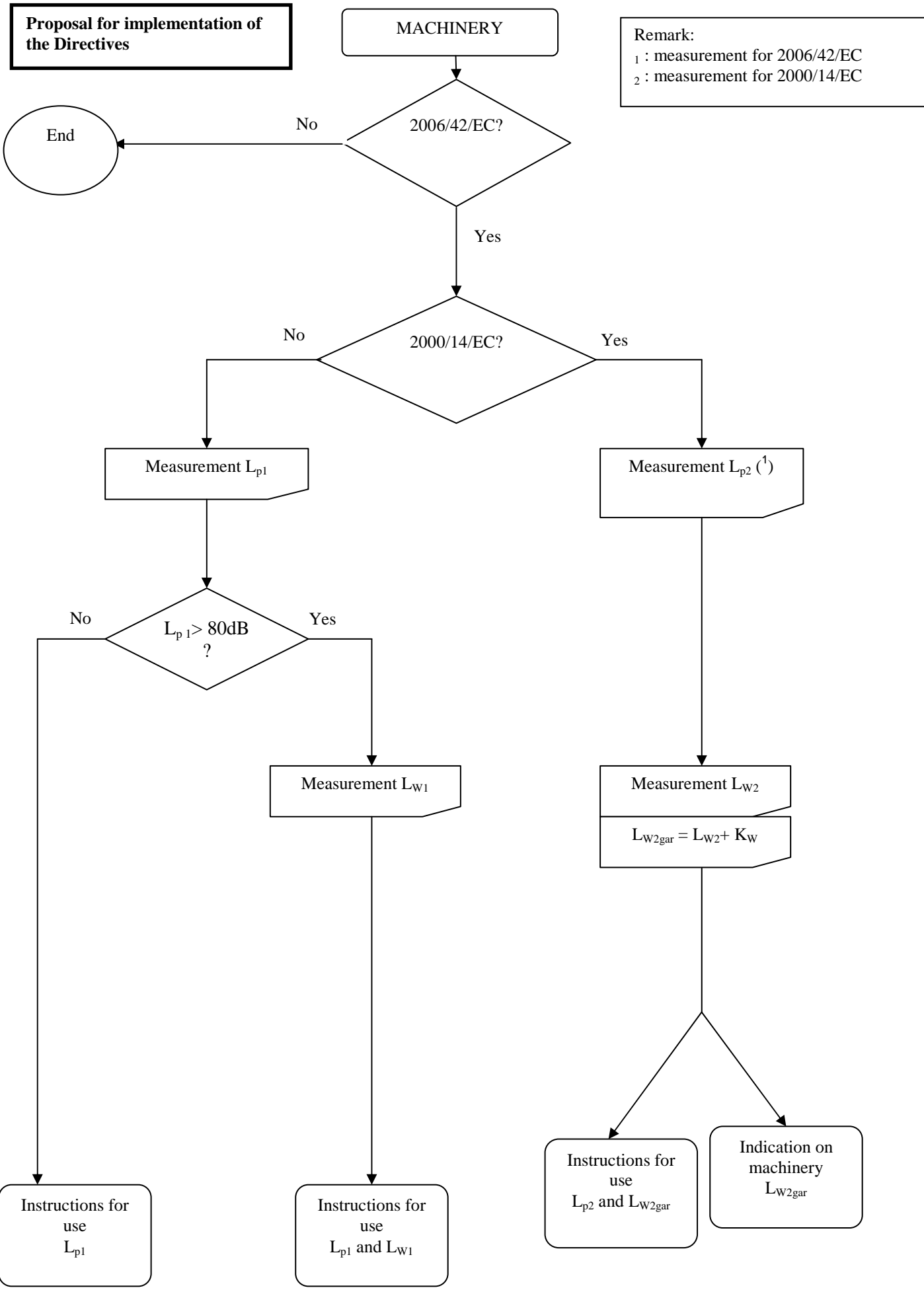
Measurement method of noise emission	
Product covered only by Directive 2006/42/EC	Product covered by both Directives 2006/42/EC and 2000/14/EC
1. Measurement of <u>sound pressure level</u> (L_p)	1. Measurement of <u>sound pressure level</u> (L_p)
2. When $L_{p\text{measured}} > 80$ dB(A): measurement of <u>sound power level</u> (L_W) according to the provisions of Directive 2006/42/EC	2. Measurement of <u>sound power level</u> (L_W) according to the provisions of Directive 2000/14/EC

Remarks

- The measurement of the sound power level for Directive 2006/42/EC must be done according to the provisions of this directive. When both directives have to be applied, the measurement method is given by Directive 2000/14/EC.
- The measurement of sound pressure level for Directive 2006/42/EC must be done according to the provisions of this directive. When both directives have to be applied, it is advisable to carry out the measurement of sound power level by using the operating conditions of the machine as given by Directive 2000/14/EC. Indeed, it is not recommendable to use two different operating conditions for the same product.

Indication of the results of noise emission measurement	
Product covered only by Directive 2006/42/EC	Product covered by both Directives 2006/42/EC and 2000/14/EC
On the machine: nothing	On the machine: $L_{W\text{guaranteed}} = L_{W\text{measured}} + \text{uncertainty value}$
In the instructions for use: — $L_{p\text{measured}}$ — $L_{W\text{measured}}$ when $L_{p\text{measured}} > 80$ dB(A)	In the instructions for use: — $L_{p\text{measured}}$ — $L_{W\text{guaranteed}}$

Note: When, for a machine covered only by Directive 2006/42/EC, a standard harmonised under that directive is used to measure L_p and/or L_W , provisions of this standard relative to the content of the instructions for use must be followed. Harmonised standards under Directive 2006/42/EC foresee that the instructions for use give both the measured value and the associated uncertainty.



⁽¹⁾ L_{p2} is identical to L_{p1} if the operating conditions of the machine are the same in both cases.

Part 4 - Determination and maintenance of the guaranteed sound power level

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- 3. Definitions**
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 - 3.3.2. *Confidence level*
 - 3.3.3. *Coverage factor*
 - 3.3.4. *Uncertainty K*
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 - 4.2.1. *ISO 4871*
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1. INTRODUCTION

Directive 2000/14/EC requires manufacturers to mark every item of equipment placed on the market with the guaranteed value of the sound power level. It also requires that both the measurement uncertainty and the production uncertainty be considered when determining the guaranteed value.

The determination and maintenance of a guaranteed value is therefore a key issue that must be dealt with great care.

This applies on an equal basis to both equipment for which only marking with the guaranteed value is required and equipment for which the manufacturer additionally has to observe stated noise emission limits.

When deciding on the value of the uncertainty to be taken into account in order to obtain the guaranteed value, a manufacturer should also bear in mind the risk he is running of a piece of equipment failing a possible verification due to an inaccurate determination of the guaranteed value.

Declaration and verification of noise emission values are tightly connected. It would be better that the manufacturer declaring the noise emission value of a product (a piece of equipment) knows which checking procedure is used for the verification of this value by a supervising third party. For the time being, this information does not exist. It is up to each Member State to define its own procedure.

This lack of harmonisation may be source of disturbance in the verification process.

In the spirit of Directive 2000/14/EC, the notified body has to judge the soundness of the **noise measurements** and the following **elaboration**.

It is not the task of the notified body to choose the method to be used to determine the guaranteed value; it is the manufacturer's decision.

For equipment covered in Article 12, it is also the task of the manufacturer to choose the certification procedure to be used.

Part 4 is divided into five clauses:

- to restate some general definitions;
- to identify existing statistical methods;
- **to give guidance on how to determine the guaranteed value;**
- to maintain the guaranteed value;
- verification of the guaranteed value by a third party.

2. SCOPE

This part of the Guidelines is intended to restate some basic concepts about uncertainties and to give guidance to:

- determine the guaranteed sound power level of a model of equipment prior to placing on the market
- maintain this value during production by adequate sampling of machines (see Clause 5).

It also gives guidance for the consideration of the uncertainties in the verification process.

Annex A to Part 4 gives basic statistical instruments.

Annex B to Part 4 gives definitions from international standards.

3. DEFINITIONS

3.1. Definition given in the Directive

'guaranteed sound power level' means a sound power level determined in accordance with the requirements laid down in Annex III which includes the uncertainties due to production variation and measurement procedures and where the manufacturer, or his authorised representative established in the Community, confirms that according to the technical instruments applied and referred to in the technical documentation it is not 'exceeded'.

Note: A measured value of a physical quantity has little sense if it is not accompanied by some information about the associated uncertainty. Whenever a measurement is carried out strictly according to the requirements of a particular method, the true value lies within a given interval with a stated confidence level.

The sources of uncertainty can be split analytically into different types which are normally addressed separately.

- The **first one** belongs intrinsically to the actual measurement method used. When a measurement is carried out according to a given test method, the associated **measurement uncertainty** is an intrinsic characteristic of the method. The measurement uncertainty associated with a measured value incorporates all sources of uncertainty that are attached to the method.

- In the case of the determination of sound power levels according to the method given in EN ISO 3744:1995 (or EN ISO 3746:1995), sources of uncertainty are:
 - the instrumentation used (within the class of instruments authorised by the method);
 - the atmospheric conditions during the test (within the ranges of temperature, humidity and wind speed authorised by the method);
 - background noise conditions during the test (within the limits of the procedure to account for background noise as specified by the method);
 - environmental conditions (within the limits specified by the method regarding the nature of the ground surface and the presence of obstacles in the vicinity of the measurement area);
 - the operator carrying out the test (within the relevant specifications in the method);
 - the positioning of microphones at the coordinates specified in 2000/14/EC;
 - the finite number of microphone positions on the measurement surface.

- The **second source** of uncertainty is connected to the noise source under test, and relates to the **setting of the mounting and operating conditions** of the item of machinery tested (when meeting the requirements of the noise test code as specified in Annex III of 2000/14/EC). This source of uncertainty is strongly dependent on the type of machinery considered and on the quality of the noise test code.

Note: This type of uncertainty is mainly relevant when, for checking production, simplified methods are used. See Clause 5, first paragraph.

- The **last source** to be considered is the variation of noise emission from one item of machinery to another in a given production. This is called **production uncertainty** and is present every time tests are carried out on different pieces of ‘identical’ items of machinery taken from the manufacturer’s production.

3.2. General definitions

3.2.1. Uncertainties due to measurement procedure

The uncertainty due to measurement is the quantification of the measurement result in connection with the true value.

Some basic definitions are given in Annex B to Part 4.

The uncertainty due to measurement results from changes in sound power level due to the condition of measurement which include different weather condition, different measurement sites, different operator or apparatus.

Note: In general, it is important to remind that a series of measurements carried out on one item of equipment strictly according to the requirements of the measurement method chosen will provide a series of measured values. These values will all be (more or less) different because, from one test to another, the contribution of the various sources of uncertainty listed above will be different. This does not mean that someone has done something wrong. It only reflects the intrinsic behaviour of the measurement method used and of the type of equipment concerned.

In order to analyse the effects of measurement uncertainties to their full extent, two basic concepts may be used: repeatability and reproducibility.

The definitions given in Annex B are taken from existing standards and are based on theoretical analysis of the uncertainty of measurement. The uncertainty in repeatability conditions may be determined by the manufacturer; the determination of the uncertainty in reproducibility conditions for a given type of equipment requires round robin tests. Maximum values of the uncertainty in reproducibility conditions are given in EN ISO 3744:1995 and EN ISO 3746:1995.

In practice, for the application of the directive, the manufacturer has difficulties to separate the uncertainties due to measurement and due to production; with the data he collects in time with his measurements, he has a knowledge of a standard deviation which includes both types of uncertainty (see Annex A to Part 4).

3.2.2. Uncertainties due to production

The uncertainties due to production result from changes in sound power levels due to the combination of tolerances in the production process.

In practice, for the application of the Directive, the manufacturer has difficulties to separate the uncertainties due to measurement and due to production; with the data he collects in time with his measurements, he has a knowledge of a standard deviation which includes both types of uncertainty (see Annex A to Part 4).

3.3. Particular definitions for statistical approach

3.3.1. Standard deviation

The standard deviation of a population of values expresses the dispersion of these values around their average.

3.3.2. Confidence level

It is an indication in percentage of the likelihood that a sound power level determination of a particular machine does not exceed the guaranteed sound power level.

3.3.3. Coverage factor

The coverage factor is a factor that depends on the number of measurements constituting the statistical evaluation base, normally the number of machines tested and the confidence level. It is used to evaluate uncertainty K.

3.3.4. Uncertainty K

This value is calculated taking into account the standard deviation, the confidence level and the coverage factor. This uncertainty is added to the measured sound power level value to establish the guaranteed value.

4. DETERMINATION OF THE GUARANTEED VALUE

The Directive does not impose a method of calculation of the guaranteed sound power level, but through the definitions given and the indications offered by the conformity assessment modules, it is clear that the spirit of the directive concentrates on:

- the acquisition of adequate data on the sound power level emitted by the equipment through measurement
- estimating uncertainties through measurements
- the determination of the uncertainties through a statistical method reported in the technical documentation
- keeping noise emission under control through production controls.

4.1. Tests

The manufacturer, in order to define the guaranteed value, has to collect noise emission data of one or more items of equipment before placing the first one on the market.

Further tests will be necessary throughout production to check the maintenance of compliance.

The tests carried out for the determination of the guaranteed sound power value shall:

- be carried out in accordance with the relevant machine-specific noise test code as described in Annex III of the Directive;
- follow the requirements laid down in ISO 3744 / ISO 3746, with the mounting and operating conditions laid down in the relevant equipment specific noise test code as described in Annex III of this Directive 2000/14/EC;
- be carried out by specifically trained staff.

The manufacturer, when choosing his basic method for the determination of the sound power level, should always consider the implications of the choice between ISO 3744 and ISO 3746 in terms of uncertainties. The second standard may appear simpler to use and requiring lower investment for the apparatus, but it leads to higher uncertainty values and a higher guaranteed sound power level value.

The tests carried out for checking production may be based on simplified methods provided the correlation with the **reference** methods has been determined. See comments in Annex III scope.

4.2. Statistical methods

Statistical methods are described in the literature. Among the available documents, the manufacturer may use at his choice:

- the international standards like EN ISO 4871 or the ISO 7574 series;
- Annex A to Part 4.

It is important to stress that, whichever method the manufacturer chooses, he should never get the false impression that his work is complete. The control of production and the analysis of its results, in particular their correlation with the uncertainty K, the manufacturer has initially determined, are the best tool to confirm or to re-address the guaranteed value.

4.2.1. EN ISO 4871

Among the standards, EN ISO 4871:2009 *Acoustics - Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*, harmonised for the Machinery Directive 2006/42/EC, offers, in an informative annex, a method on how to declare the noise power level based on the consideration of the uncertainties indicated in this Directive 2000/14/EC.

A manufacturer lacking experience in obtaining experimental noise data may need to provide a noise declaration using standard parameters reported in this international standard bearing in mind the following considerations.

The standard indicates that various parameters necessary to determine uncertainty K may be defined by the manufacturer himself or through values given in standards providing noise test codes for particular types of equipment.

EN ISO 4871 also offers standard values for these parameters (s_M ; σ_R) so that, in the absence of reliable information either from noise test codes or from direct manufacturer experience, a value can be declared.

These values are derived from generic experience on vast populations of equipment, but experience shows that such values when used for a specific type of equipment often overestimate uncertainties and **this leads to higher declared values** and the false impression of a very poor measurement quality.

The standard deviation of reproducibility, or its estimate based on results from a limited batch of measurements, is linked to the type of equipment, test method, operating cycle, etc., but not to the

particular manufacturer or model. In practice, it can be elaborated from noise tests on a single item of equipment in different laboratories (round robin tests).

This allows values to be offered for this parameter in the literature, be it international standards or other sources, and manufacturers are free to share among themselves this value for a given type of equipment. It would be very convenient to have systematically equipment-specific standards indicating these values, which is not presently the case.

The standard itself encourages its user to get machine/test cycle specific values for a more accurate evaluation. However, it does not offer in explicit terms to the manufacturer that has carried out a sufficient number of tests a method to determine some of the key parameters used. In that case, other standards like the ISO 7574 series may be used.

Note: ISO 7574:1985 *Acoustics - Statistical methods for determining and verifying stated noise emission values of machinery and equipment:*

- *Part 1: General consideration and definitions*
- *Part 2: Methods for stated values for individual machines*
- *Part 3: Simple (transition) method for stated values for batches of machines*
- *Part 4: Methods for stated values for batches of machines*

4.2.2. Method described in Annex A to Part 4

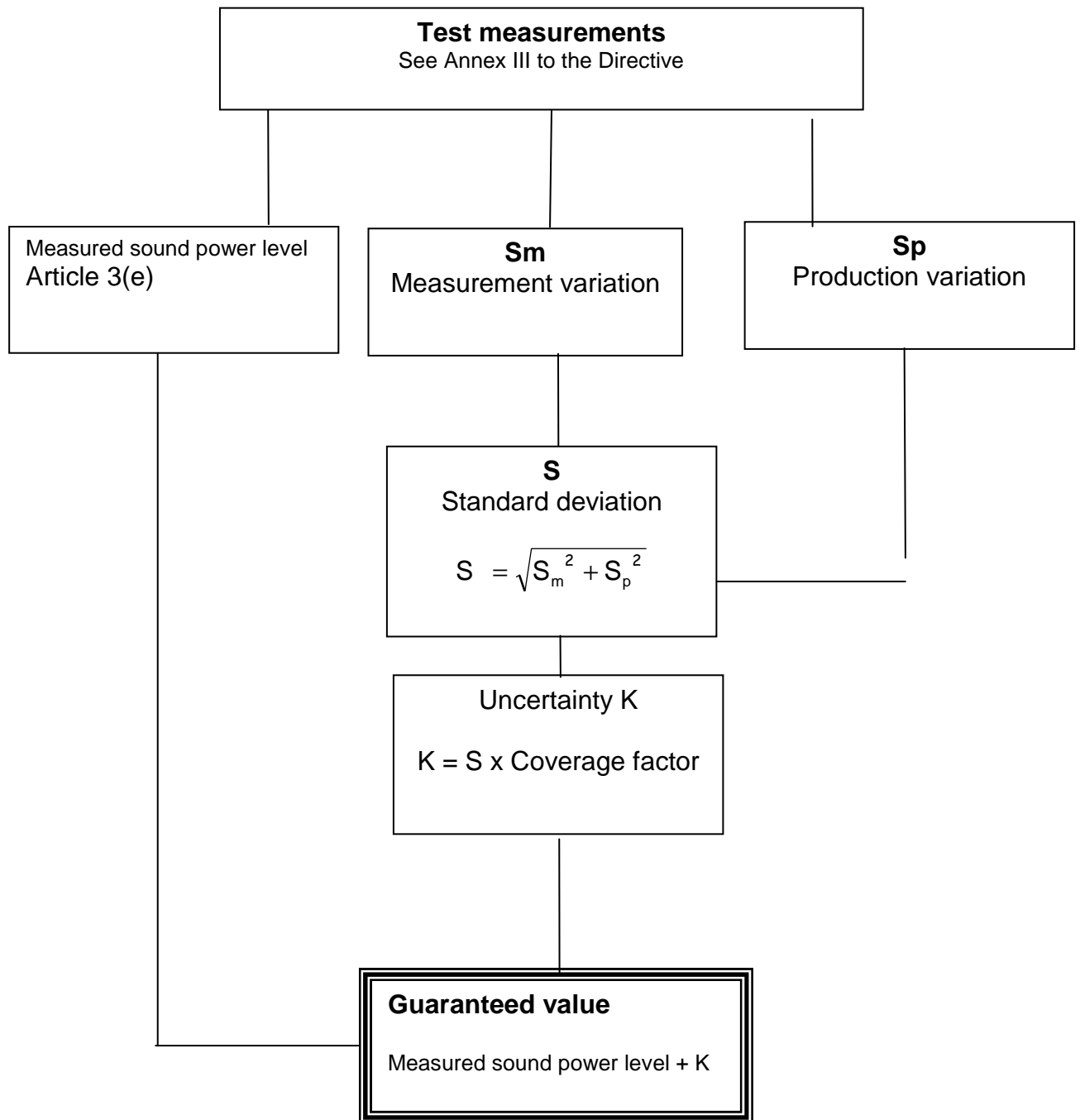
The statistical approach offered in Annex A to this part describes a method for the determination of the guaranteed sound power level starting from an adequate number of measurements using general measurement uncertainty concepts.

Figure 1 gives an outline of the various steps relevant for this method.

For the determination of the measured sound power level, the directive does not give any guidance on how the uncertainties should be determined. The manufacturer shall decide on the basis of the definition given in the directive, Article 3(e).

The symbol s_m indicates the standard deviation of measurement, the symbol is purposely different from the ones given in the standards (like EN ISO 4871) so as not to create any confusion. If the approach to this parameter coincides with one of those given in the literature, then the relevant symbol may be used.

Figure 1



4.3. Practical procedure to determine the guaranteed sound power level

Whatever the statistical method used by the manufacturer he has:

- to use all his experience and data coming from the measurements made, possibly also those carried out for the Machinery Directive purposes or for the previous noise directives;
- to report in the technical documentation requested by the annexes of the directive the **noise measurements** carried out and the **explanation** of the method used to determine the uncertainties.

Considering the uncertainties due to the measurement procedure, the manufacturer is faced with one of the following situations:

- He already approached these uncertainties due to previous measurements. In this case, the various sources of uncertainties (see note in the definition 3.2.1) for his own test site(s), instrument, operator, weather condition, environment entered into play. So the determined value may be used directly.
- He subcontracts the measurements to a laboratory. In this case, the latter should be able to indicate the uncertainties due to the measurement taking into account his various sources of uncertainties.
- He has no experience in measurement. In this case, he has to evaluate the uncertainties in repeatability condition (see definition 3.2.1) and to modify or confirm them with the results of the measurements conducted during production.

Considering the uncertainties due to production, the manufacturer may use his data collected for other models of the same type of equipment.

Coverage factor

The coverage factor is a function of the confidence level, and the size of the sample.

Confidence level

For the purposes of this directive, **the confidence level has to be chosen by the manufacturer.**

The literature normally refers to a confidence level of 95 %. A confidence level of 95 % means that 5 % of the items of equipment produced may have a measured sound power level higher than the guaranteed value.

Lower confidence levels might be considered at the beginning of the application of this directive while adequate data are being collected by the manufacturer, however being aware of the increased risks of failure in case of verification particularly if this procedure assumes a higher confidence level.

5. MAINTENANCE OF THE GUARANTEED VALUE

The tests carried out for checking production may be based on simplified methods provided the correlation with the reference methods has been determined. See comments in Annex III scope and Clause 4 of this part.

When using the conformity assessment procedures as described in Annex V or Annex VI with the first procedure for the control of production or Annex VIII, the manufacturer shall carry out periodical tests during the full production period to check that the guaranteed sound power level is not being exceeded statistically.

These tests are not required by the directive when the manufacturer has chosen the second procedure for the control of production of Annex VI (the notified body conducts product noise tests at random intervals).

The manufacturer must have these production confirmation tests completed on an adequate sample size spread out through the production period to be able to statistically support continued use of the guaranteed label value. The basic statistical terms and principles given in Part 4, Clause 4 of these Guidelines may be used.

Further to an adequate check of conformity, repeated tests in production will also provide an ongoing refinement of the evaluation of uncertainties.

The quantity of items of equipment that must be tested has to be determined considering the quantity of production, the production standard deviation and the confidence level.

The results of the confirmation tests may indicate that the guaranteed value initially determined is no longer correct.

If a model exceeds the guaranteed value, the manufacturer should determine the cause. If it can be corrected, then the manufacturer takes the necessary action to bring the model back into conformity. In this case, the guaranteed value remains the same. If the equipment cannot be corrected, the guaranteed value can be modified. For equipment listed in Article 12, the revised guaranteed value must remain below the limit values.

If over time a model's levels, when corrected by the K-factor, consistently fall below the guaranteed value, then the guaranteed value may be revised downward.

Particular cases of manufacturing changes for product/process improvement

These production checks may be used to ensure that the design and manufacturing process changes after the production start up, which have been introduced on the equipment, do not cause a significant change in the guaranteed sound power level.

6. VERIFICATION OF THE GUARANTEED VALUE

When, for the purpose of verification, an item of equipment is tested by a third party, the guaranteed value of the sound power level is verified if the following criterion is met:

$$L'_{WA} \leq L_{WA,g}$$

where L'_{WA} is the value measured during verification

and $L_{WA,g}$ is the value guaranteed by the manufacturer.

If L'_{WA} is larger than $L_{WA,g}$ the guaranteed value is not verified.

Further investigation for the whole batch of the equipment is recommended using statistical methods since for these tests if the sound power level measured for one item is exceeded, it may not lead to the consequence that the whole batch of equipment has failed the verification process.

The technical documentation of the manufacturer, in particular the part concerning the determination of the guaranteed value (uncertainties, statistical method, coverage factor, etc.), may also be used.

Annex A to Part 4 - Basic statistical instruments

This Annex intends to provide some basic statistical instruments useful for the determination of the guaranteed sound power level.

General statistical literature (as the standards, mentioned Clause 4.2.1 of Part 4 of these Guidelines) may offer more comprehensive approaches to the problem, but this annex aims at indicating a simple statistical method based on the definitions given in Part 4.

No numerical example is provided as it might be too easily misinterpreted as giving quantitative indications.

A.1. Average value and standard deviation of a set of measured values

A set of n measured values x_i of a physical quantity can be characterised by:

- the average value, $\bar{x} = \sum x_i / n$
- the standard deviation σ of the distribution of the values, that expresses the dispersion of the measured values around the average value.

The true value of σ can only be found from a very large (infinite) set of measured values. However, statistics enable an estimate s of σ to be calculated from a small number n of measured values. The quantity measured here is the sound power level, the estimate for the standard deviation s of which is obtained using the expression:

$$s = \sqrt{\frac{\sum_{i=1}^{i=n} (x_i - \bar{x})^2}{n - 1}} \quad (\text{A.1})$$

where n is the number of sound power level determinations (sample size):

- x_i is the value provided by the i^{th} sound power level determination;
- \bar{x} is the arithmetic mean of the n determinations.

The larger n is, the better the estimate s of σ will be. However, the measurement effort grows in proportion to the number n of determinations made, with diminishing returns. It is up to the manufacturer to choose the number of times that a phenomenon has to be measured to determine s . The following approach to the confidence level and standard deviation offers guidance for this choice.

s is the basic quantity to be determined from the samples of measurements to obtain uncertainty K .

This calculation method applies to the relevant measurement samples to cover both measurement and production uncertainties as defined in paragraph 3.2 of Part 4.

A.2. Combination of the standard deviations

Estimates of standard deviations of measurement S_m and of production S_p combine using the following equation:

$$S = \sqrt{S_m^2 + S_p^2} \quad (\text{A.2})$$

Particular consideration for the determination of the standard deviation during production surveillance

A particular case will be met, typically during production surveillance, when data are collected from different machines tested under different measurement conditions.

The collection of measurement data normally reflects a situation where:

- the item of equipment under test varies;
- the site and measurement apparatus are the same;
- the operator may change;
- the weather conditions will change.

The data do not reflect the same kind of analytical situation (production variation, repeatability or reproducibility) normally used in standards like EN ISO 4871 to determine uncertainty K.

As a consequence, the manufacturer has to verify, using formula (A.1), his initial estimate of the standard deviation, especially when he has a limited statistical basis, most of all in the early stage of application of this Directive.

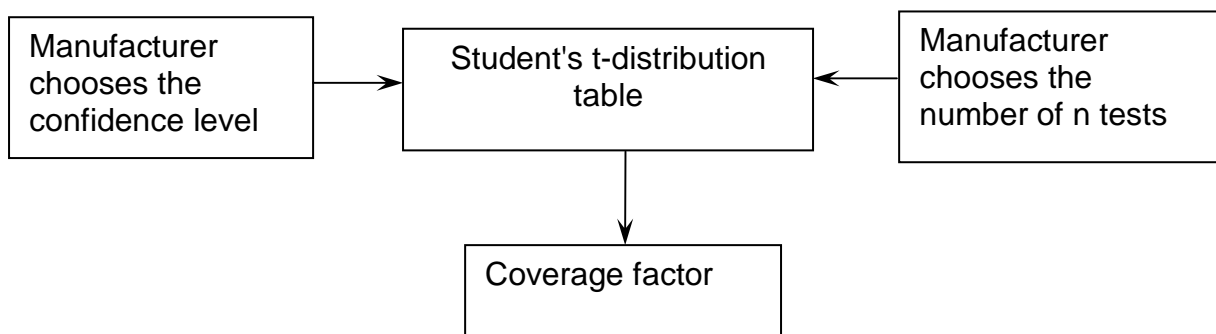
To approach the total standard deviation, the manufacturer should use data derived from his own experience and/or from the literature and/or data shared between manufacturers.

A.3. Determination of uncertainty K

Having carried out the necessary tests and basic statistical processing of the result samples it is necessary to consider how to calculate uncertainty K. This uncertainty will be added to the measured sound power level to determine the guaranteed level.

To determine uncertainty K, the coverage factor needs to be determined (K = S multiplied by the coverage factor).

It is possible, using a set of tables associated with a statistical distribution known as student's t, and once a **confidence level** is chosen, based on the **number of tests n** (size of the sample), to derive the **coverage factor**.



Number of items of equipment tested

The estimated value of a standard deviation will become closer to the 'true' value as the number, n, of repeated measurements carried out or the number of items of equipment used is increased. To assess a practical value for n, the magnitude of the coverage factor should be considered.

Coverage factor

The value of the coverage factor obtained from the table associated with the student's t distribution depends on the confidence level and the number of the items of equipment.

An extract **for a 90 % and 95 % confidence level**, presented in a form suitable for these Guidelines, is given in Table A.1 below.

Coverage factor		
Sample size	95 % confidence level	90 % confidence level
2	6.314	3.078
3	2.920	1.886
4	2.353	1.638
5	2.132	1.533
6	2.015	1.476
7	1.943	1.440
8	1.895	1.415
9	1.860	1.397
10	1.833	1.383
15	1.761	1.345
20	1.729	1.328
100	1.660	1.290
∞	1.645	1.280

Table A.1: Coverage factor as a function of the number n of measurements for 90 % and 95 % confidence level

It can be seen that for values of n greater than about 5 the change in the value of the coverage factor is relatively small. It is therefore recommended that for practical purposes a minimum of five repeat measurements or five machines may be used.

See also Clause 4 of this part.

Determination of uncertainty K

The estimate of the standard deviation obtained from (A.2) is multiplied by the coverage factor to obtain uncertainty K.

A.4. Determination of the guaranteed value

The **uncertainty K** is added to the **measured value** to obtain the **guaranteed value of the sound power level**.

Note: For the calculation of the guaranteed value, the measured value may be rounded or not rounded.

Annex B to Part 4 - Basic definitions for uncertainty due to measurement procedure

The basic definitions for the uncertainty due to measurement procedure are determined in the JCGM 200:2012 *International Vocabulary of Metrology - Basic and General Concepts and Associated Terms* (VIM 3rd edition) and in the JCGM 100:2008 (GUM 1995 with minor corrections) *Evaluation of measurement data - Guide to the expression of uncertainty in measurement* (known as the "GUM") and its accompanying documents, issued by Bureau International des Poids et Mesures (BIPM).

Those definitions are reproduced hereafter.

Repeatability (of results of measurements)	<p>Closeness of the agreement between the results of successive measurements of the same measurand [the quantity to be measured] carried out under the same conditions of measurement.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. These conditions are called repeatability conditions. 2. Repeatability conditions include: <ul style="list-style-type: none"> - the same measurement procedure - the same observer - the same measuring instrument, used under the same conditions - the same location - repetition over a short period of time. 2. Repeatability may be expressed quantitatively in terms of the dispersion characteristics of the results.
Reproducibility (of results of measurements)	<p>Closeness of the agreement between the results of measurements of the same measurand [the quantity to be measured] carried out under changed conditions of measurement.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. A valid statement of reproducibility requires specification of the conditions changed. 2. The changed conditions may include: <ul style="list-style-type: none"> - principle of measurement - method of measurement - observer - measuring instrument - reference standard - location - conditions of use - time. 3. Reproducibility may be expressed quantitatively in terms of the dispersion characteristics of the results. 4. Results are here usually understood to be corrected results [result of a measurement after correction for systematic error].

The same kind of definitions are also given in the noise standards EN ISO 4871 and 7574:

Standard deviation of repeatability σ_r	Standard deviation of noise emission values obtained under repeatability conditions; that is the repeated application of the same noise emission method on the same noise source within a short interval of time and under the same conditions (same laboratory, same operator, same apparatus).
Standard deviation of reproducibility σ_R	Standard deviation of noise emission values obtained under reproducibility conditions; that is the repeated application of the same noise emission method on the same noise source at different times and under different conditions (different laboratory, different operator, different apparatus). The standard deviation of reproducibility, therefore, includes the standard deviation of repeatability.

Useful references

- Directive 2000/14/EC (consolidated, multi-lingual texts): <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02000L0014-20090420>
- European Commission's website on Noise Emissions by Outdoor Equipment: <http://ec.europa.eu/growth/sectors/mechanical-engineering/noise-emissions/>
- New Legislative Framework: <http://ec.europa.eu/growth/single-market/goods/new-legislative-framework/>
- The 'Blue Guide' on the implementation of EU product rules 2016: <http://ec.europa.eu/DocsRoom/documents/16210>
- CE marking: <http://ec.europa.eu/growth/single-market/ce-marking/>
- European Committee for Standardization (CEN): <https://www.cen.eu/>
- CIRCABC Interest Groups:
 - "Noise Emissions" (Committee and Working Group): <https://circabc.europa.eu/w/browse/073fa6a8-b0c5-461a-9c17-4e35ebed694d>
 - "Noise emissions - Adco" (Administrative Co-operation): <https://circabc.europa.eu/w/browse/661eebbc-18de-4b80-872f-3cb40efbc853>
 - "Noise Emission NB" (Notified Bodies): <https://circabc.europa.eu/w/browse/c00d2e19-20dc-4ea1-ade6-e85f3ad30415>