

(資料1) 試験規則に基づいた工具メーカーの宣言値調査票

振 動 工 具 調 査 票

この調査票に記入された事項については、統計以外の目的に使ったり、他に漏らしたりすることはありませんから、ありのままに記入してください。

調査票作成年月日	平成 年 月 日
事業場名	
記入担当者	Tel: _____

※ 2枚目以降、省略可

※製造している振動工具のリスト（カタログ可）を添付願います。
 ※以下、このペーパーをコピーして、工具毎にご記入願います。

工具写真等(振動ピックアップの取付位置、測定軸を示してください。)	名称: _____ 型式: (カタログ添付可) 仕様: (カタログ添付可)
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振 動 測 定 値

	X軸 メイン(サイド)	Y軸 メイン(サイド)	Z軸 メイン(サイド)	3軸合成値 メイン(サイド)
周波数補正振動加速度実効値	() m/s ²	() m/s ²	() m/s ²	() m/s ²
工具振動レベル (ref=10 ⁻⁵ m/s ²)	() dB	() dB	() dB	() dB

測 定 方 法

(イ)準拠方法	(1) ISO8662-() (2) 労働省通達及びJIS B4900 (3)その他の測定方法※		
(ロ)測定装置	加速度ピックアップ (名称) (製造業者) (型式) (質量 g) メカニカルフィルター 有・無 (名称) (製造業者) (型式) 増幅器 (名称) (製造業者) (型式) 分析器 (名称) (製造業者) (型式) テープレコーダー (名称) (製造業者) (型式)		
(ハ)振動ピックアップの取付方法	(1) ネジ (2) ホースバンドで直接固定 (3) 取付ジグをホースバンドで固定 (4) その他		
(ニ)ハンドル部の状況	(1) 被覆されている。 イ. ゴム ロ. その他 () (2) 被覆されていない。		
(ホ)測定日時()	(ヘ)測定時の気温(°C)	(ト)測定時の湿度(%)	(チ)測定時の気圧()

裏面に続きます。

※(イ)測定準拠方法について(3)の場合は、裏面の特記事項の欄に測定値の根拠(例えば、数回測定の平均値、数回測定の80%上端値など)を記入ください。
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(リ)測定時の使用条件

(イ)測定準拠方法について(2),(3)の場合は、測定時の工具の使用条件を記入ください。

特記事項

(イ)測定準拠方法について(3)の場合は、この欄に測定値の根拠(例えば、数回測定の平均値、数回測定の上端値など)を記入ください。

(資料2) EU Directive (Machinery Safety Directive)

I

(Acts whose publication is obligatory)

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

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF
THE EUROPEAN UNION,

Having regard to the Treaty establishing the European
Community, and in particular Article 100a thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the Economic and Social
Committee⁽¹⁾,

Acting in accordance with the procedure laid down in
Article 189b of the Treaty⁽²⁾,

- (1) Whereas Council Directive 89/392/EEC of 14 June 1989 on the approximation of the laws of the Member States relating to machinery⁽³⁾ has been frequently and substantially amended; whereas for reasons of clarity and rationality the said Directive should be consolidated;
- (2) Whereas the internal market consists of an area without internal frontiers within which the free movement of goods, persons, services and capital is guaranteed;
- (3) Whereas the machinery sector is an important part of the engineering industry and is one of the industrial mainstays of the Community economy;
- (4) Whereas the social cost of the large number of accidents caused directly by the use of machinery can be reduced by inherently safe design and

construction of machinery and by proper
installations and maintenance;

- (5) Whereas Member States are responsible for ensuring the health and safety on their territory of persons and, where appropriate, of domestic animals and goods and, in particular, of workers, notably in relation to the risks arising out of the use of machinery;
- (6) Whereas, in the Member States, the legislative systems regarding accident prevention are very different; whereas the relevant compulsory provisions, frequently supplemented by *de facto* mandatory technical specifications and/or voluntary standards, do not necessarily lead to different levels of health and safety, but nevertheless, owing to their disparities, constitute barriers to trade within the Community; whereas, furthermore, conformity certification and national certification systems for machinery differ considerably;
- (7) Whereas existing national health and safety provisions providing protection against the risks caused by machinery must be approximated to ensure free movement on the market of machinery without lowering existing justified levels of protection in the Member States; whereas the provisions of this Directive concerning the design and construction of machinery, essential for a safer working environment, shall be accompanied by specific provisions concerning the prevention of certain risks to which workers can be exposed at work, as well as by provisions based on the organisation of safety of workers in the working environment;
- (8) Whereas Community law, in its present form, provides — by way of derogation from one of the fundamental rules of the Community, namely the free movement of goods — that obstacles to

⁽¹⁾ OJ C 133, 28.4.1997, p. 6.

⁽²⁾ Opinion of the European Parliament of 17 September 1997 (OJ C 304, 6.10.1997, p. 79), Council common position of 24 March 1998 (OJ C 161, 27.5.1998, p. 54) and Decision of the European Parliament of 30 April 1998 (OJ C 152, 18.5.1998), Council Decision of 25 May 1998.

⁽³⁾ OJ L 183, 29.6.1989, p. 9. Directive as last amended by Directive 93/68/EEC (OJ L 220, 30.8.1993, p. 1).

movement within the Community resulting from disparities in national legislation relating to the marketing of products must be accepted in so far as the provisions concerned can be recognised as being necessary to satisfy imperative requirements;

(9) Whereas paragraphs 65 and 68 of the White Paper on the completion of the internal market, approved by the European Council in June 1985, provide for a new approach to legislative harmonisation; whereas, therefore, the harmonisation of laws in this case must be limited to those requirements necessary to satisfy the imperative and essential health and safety requirements relating to machinery; whereas these requirements must replace the relevant national provisions because they are essential;

(10) Whereas the maintenance or improvement of the level of safety attained by the Member States constitutes one of the essential aims of this Directive and of the principle of safety as defined by the essential requirements;

(11) Whereas the field of application of this Directive must be based on a general definition of the term 'machinery' so as to allow the technical development of products; whereas the development of complex installations and the risks they involve are of an equivalent nature and their express inclusion in the Directive is therefore justified;

(12) Whereas it is also necessary to deal with safety components which are placed on the market separately and the safety function of which is declared by the manufacturer or his authorised representative established in the Community;

(13) Whereas, for trade fairs, exhibitions, etc., it must be possible to exhibit machinery which does not conform to this Directive; whereas, however, interested parties should be properly informed that the machinery does not conform and cannot be purchased in that condition;

(14) Whereas the essential health and safety requirements must be observed in order to ensure that machinery is safe; whereas these requirements must be applied with discernment to take account of the state of the art at the time of construction and of technical and economic requirements;

(15) Whereas the putting into service of machinery within the meaning of this Directive can relate only to the use of the machinery itself as intended by the manufacturer; whereas this does not preclude the

laying-down of conditions of use external to the machinery, provided that it is not thereby modified in a way not specified in this Directive;

(16) Whereas it is necessary not only to ensure the free movement and putting into service of machinery bearing the 'CE' marking and having an EC conformity certificate but also to ensure free movement of machinery not bearing the 'CE' marking where it is to be incorporated into other machinery or assembled with other machinery to form a complex installation;

(17) Whereas, therefore, this Directive defines only the essential health and safety requirements of general application, supplemented by a number of more specific requirements for certain categories of machinery; whereas, in order to help manufacturers to prove conformity to these essential requirements and in order to allow inspection for conformity to the essential requirements, it is desirable to have standards harmonised at European level for the prevention of risks arising out of the design and construction of machinery; whereas these standards harmonised at European level are drawn up by private-law bodies and must retain their non-binding status; whereas for this purpose the European Committee for Standardisation (CEN) and the European Committee for Electrotechnical Standardisation (Cenelec) are the bodies recognised as competent to adopt harmonised standards in accordance with the general guidelines for cooperation between the Commission and these two bodies signed on 13 November 1984; whereas, within the meaning of this Directive, a harmonised standard is a technical specification (European standard or harmonisation document) adopted by either or both of these bodies, on the basis of a remit from the Commission in accordance with the provisions of Directive 83/189/EEC⁽¹⁾ and on the basis of general guidelines referred to above;

(18) Whereas it was found necessary to improve the legislative framework in order to ensure an effective and appropriate contribution by employers and employees to the standardisation process;

(19) Whereas the Member States' responsibility for safety, health and the other aspects covered by the essential requirements on their territory must be recognised in a safeguard clause providing for adequate Community protection procedures;

⁽¹⁾ Council Directive 83/189/EEC of 28 March 1983 laying down a procedure for the provision of information in the field of technical standards and regulations (OJ L 109, 26.4.1983, p. 8). Directive as last amended by Commission Decision 96/139/EC (OJ L 32, 10.2.1996, p. 31).

- (20) Whereas, as is currently the practice in Member States, manufacturers should retain the responsibility for certifying the conformity of their machinery to the relevant essential requirements; whereas conformity to harmonised standards creates a presumption of conformity to the relevant essential requirements; whereas it is left to the sole discretion of the manufacturer, where he feels the need, to have his products examined and certified by a third party;
- (21) Whereas, for certain types of machinery having a higher risk factor, a stricter certification procedure is desirable; whereas the EC type-examination procedure adopted may result in an EC declaration being given by the manufacturer without any stricter requirement such as a guarantee of quality, EC verification or EC supervision;
- (22) Whereas it is essential that, before issuing an EC declaration of conformity, the manufacturer or his authorised representative established in the Community should provide a technical construction file; whereas it is not, however, essential that all documentation be permanently available in a material manner, but it must be made available on demand; whereas it need not include detailed plans of the sub-assemblies used in manufacturing the machines, unless knowledge of these is indispensable in order to ascertain conformity with essential safety requirements;
- (23) Whereas, in its communication of 15 June 1989 on a global approach to certification and testing⁽¹⁾, the Commission proposed that common rules be drawn up concerning a 'CE' conformity marking with a single design; whereas, in its resolution of 21 December 1989 on a global approach to conformity assessment⁽²⁾, the Council approved as a guiding principle the adoption of a consistent approach such as this with regard to the use of the 'CE' marking; whereas the two basic elements of the new approach which must be applied are therefore the essential requirements and the conformity assessment procedures;
- (24) Whereas the addressees of any decision taken under this Directive must be informed of the reasons for such a decision and the legal remedies open to them;
- (25) Whereas this Directive must not affect the obligations of the Member States concerning the deadlines for transposition and application of the Directives set out in Annex VIII, part B,

⁽¹⁾ OJ C 231, 8.9.1989, p. 3, and OJ C 267, 19.10.1989, p. 3.

⁽²⁾ OJ C 10, 16.1.1990, p. 1.

HAVE ADOPTED THIS DIRECTIVE:

CHAPTER I

SCOPE, PLACING ON THE MARKET AND FREEDOM OF MOVEMENT

Article 1

1. This Directive applies to machinery and lays down the essential health and safety requirements therefor, as defined in Annex I.

It shall also apply to safety components placed on the market separately.

2. For the purposes of this Directive:

(a) 'machinery' means:

- an assembly of linked parts or components, at least one of which moves, with the appropriate actuators, control and power circuits, etc., joined together for a specific application, in particular for the processing, treatment, moving or packaging of a material,
- an assembly of machines which, in order to achieve the same end, are arranged and controlled so that they function as an integral whole,
- interchangeable equipment modifying the function of a machine, which is placed on the market for the purpose of being assembled with a machine or a series of different machines or with a tractor by the operator himself in so far as this equipment is not a spare part or a tool;

(b) 'safety components' means a component, provided that it is not interchangeable equipment, which the manufacturer or his authorised representative established in the Community places on the market to fulfil a safety function when in use and the failure or malfunctioning of which endangers the safety or health of exposed persons.

3. The following are excluded from the scope of this Directive:

- machinery whose only power source is directly applied manual effort, unless it is a machine used for lifting or lowering loads,
- machinery for medical use used in direct contact with patients,
- special equipment for use in fairgrounds and/or amusement parks,

- steam boilers, tanks and pressure vessels,
- machinery specially designed or put into service for nuclear purposes which, in the event of failure, may result in an emission of radioactivity,
- radioactive sources forming part of a machine,
- firearms,
- storage tanks and pipelines for petrol, diesel fuel, inflammable liquids and dangerous substances,
- means of transport, i.e. vehicles and their trailers intended solely for transporting passengers by air or on road, rail or water networks, as well as means of transport in so far as such means are designed for transporting goods by air, on public road or rail networks or on water. Vehicles used in the mineral extraction industry shall not be excluded,
- seagoing vessels and mobile offshore units together with equipment on board such vessels or units,
- cableways, including funicular railways, for the public or private transportation of persons,
- agricultural and forestry tractors, as defined in Article 1(1) of Directive 74/150/EEC⁽¹⁾,
- machines specially designed and constructed for military or police purposes,
- lifts which permanently serve specific levels of buildings and constructions, having a car moving between guides which are rigid and inclined at an angle of more than 15 degrees to the horizontal and designed for the transport of:
 - (i) persons;
 - (ii) persons and goods;
 - (iii) goods alone if the car is accessible, that is to say, a person may enter it without difficulty, and fitted with controls situated inside the car or within reach of a person inside,
- means of transport of persons using rack and pinion rail mounted vehicles,

- mine winding gear,
- theatre elevators,
- construction site hoists intended for lifting persons or persons and goods.

4. Where, for machinery or safety components, the risks referred to in this Directive are wholly or partly covered by specific Community Directives, this Directive shall not apply, or shall cease to apply, in the case of such machinery or safety components and of such risks on the implementation of these specific Directives.

5. Where, for machinery, the risks are mainly of electrical origin, such machinery shall be covered exclusively by Directive 73/23/EEC⁽²⁾.

Article 2

1. Member States shall take all appropriate measures to ensure that machinery or safety components covered by this Directive may be placed on the market and put into service only if they do not endanger the health or safety of persons and, where appropriate, domestic animals or property, when properly installed and maintained and used for their intended purpose.

2. This Directive shall not affect Member States' entitlement to lay down, in due observance of the Treaty, such requirements as they may deem necessary to ensure that persons and in particular workers are protected when using the machinery or safety components in question, provided that this does not mean that the machinery or safety components are modified in a way not specified in the Directive.

3. At trade fairs, exhibitions, demonstrations, etc., Member States shall not prevent the showing of machinery or safety components which do not conform to the provisions of this Directive, provided that a visible sign clearly indicates that such machinery or safety components do not conform and that they are not for sale until they have 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.

⁽¹⁾ Council Directive 74/150/EEC of 4 March 1974 on the approximation of the laws of the Member States relating to the type-approval of wheeled agricultural or forestry tractors (OJ L 84, 28.3.1974, p. 10). Directive as last amended by Decision 95/1/EC, Euratom, ECSC (OJ L 1.1.1995, p. 1).

⁽²⁾ Council Directive 73/23/EEC of 19 February 1973 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (OJ L 77, 26.3.1973, p. 29). Directive as last amended by Directive 93/68/EEC (OJ L 220, 30.8.1993, p. 1).

Article 3

Machinery and safety components covered by this Directive shall satisfy the essential health and safety requirements set out in Annex I.

Article 4

1. Member States shall not prohibit, restrict or impede the placing on the market and putting into service in their territory of machinery and safety components which comply with this Directive.

2. Member States shall not prohibit, restrict or impede the placing on the market of machinery where the manufacturer or his authorised representative established in the Community declares in accordance with point B of Annex II that it is intended to be incorporated into machinery or assembled with other machinery to constitute machinery covered by this Directive, except where it can function independently.

'Interchangeable equipment', as referred to in the third indent of Article 1(2)(a), must in all cases bear the CE marking and be accompanied by the EC declaration of conformity referred to in Annex II, point A.

3. Member States may not prohibit, restrict or impede the placing on the market of safety components as defined in Article 1(2) where they are accompanied by an EC declaration of conformity by the manufacturer or his authorised representative established in the Community as referred to in Annex II, point C.

Article 5

1. Member States shall regard the following as conforming to all the provisions of this Directive, including the procedures for checking the conformity provided for in Chapter II:

- machinery bearing the CE marking and accompanied by the EC declaration of conformity referred to in Annex II, point A,
- safety components accompanied by the EC declaration of conformity referred to in Annex II, point C.

In the absence of harmonised standards, Member States shall take any steps they deem necessary to bring to the attention of the parties concerned the existing national technical standards and specifications which are regarded as important or relevant to the proper implementation of the essential safety and health requirements in Annex I.

2. Where a national standard transposing a harmonised standard, the reference for which has been published in the *Official Journal of the European Communities*, covers one or more of the essential safety requirements, machinery or safety components constructed in accordance with this standard shall be presumed to comply with the relevant essential requirements.

Member States shall publish the references of national standards transposing harmonised standards.

3. Member States shall ensure that appropriate measures are taken to enable the social partners to have an influence at national level on the process of preparing and monitoring the harmonised standards.

Article 6

1. Where a Member State or the Commission considers that the harmonised standards referred to in Article 5(2) do not entirely satisfy the essential requirements referred to in Article 3, the Commission or the Member State concerned shall bring the matter before the committee set up under Directive 83/189/EEC, giving the reasons therefor. The committee shall deliver an opinion without delay.

Upon receipt of the committee's opinion, the Commission shall inform the Member States whether or not it is necessary to withdraw those standards from the published information referred to in Article 5(2).

2. A standing committee shall be set up, consisting of representatives appointed by the Member States and chaired by a representative of the Commission.

The standing committee shall draw up its own rules of procedure.

Any matter relating to the implementation and practical application of this Directive may be brought before the standing committee, in accordance with the following procedure:

The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft, within a time limit which the chairman may lay down according to the urgency of the matter, if necessary by taking a vote.

The opinion shall be recorded in the minutes; in addition, each Member State shall have the right to ask to have its position recorded in the minutes.

The Commission shall take the utmost account of the opinion delivered by the committee. It shall inform the committee of the manner in which its opinion has been taken into account.

Article 7

1. Where a Member State ascertains that:

- machinery bearing the CE marking, or
- safety components accompanied by the EC declaration of conformity,

used in accordance with their intended purpose are liable to endanger the safety of persons, and, where appropriate, domestic animals or property, it shall take all appropriate measures to withdraw such machinery or safety components from the market, to prohibit the placing on the market, putting into service or use thereof, or to restrict free movement thereof.

Member States shall immediately inform the Commission of any such measure, indicating the reason for its decision and, in particular, whether non-conformity is due to:

- (a) failure to satisfy the essential requirements referred to in Article 3;
- (b) incorrect application of the standards referred to in Article 5(2);
- (c) shortcomings in the standards themselves referred to in Article 5(2).

2. The Commission shall enter into consultation with the parties concerned without delay. Where the Commission considers, after this consultation, that the measure is justified, it shall immediately so inform the Member State which took the initiative and the other Member States. Where the Commission considers, after this consultation, that the action is unjustified, it shall immediately so inform the Member State which took the initiative and the manufacturer or his authorised representative established within the Community. Where the decision referred to in paragraph 1 is based on a shortcoming in the standards, and where the Member State at the origin of the decision maintains its position, the Commission shall immediately inform the committee in order to initiate the procedures referred to in Article 6(1).

3. Where:

- machinery which does not comply bears the CE marking,
- a safety component which does not comply is accompanied by an EC declaration of conformity,

the competent Member State shall take appropriate action against whom so ever has affixed the marking or drawn up the declaration and shall so inform the Commission and other Member States.

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

CHAPTER II

CONFORMITY ASSESSMENT PROCEDURES

Article 8

1. The manufacturer or his authorised representative established in the Community must, in order to certify that machinery and safety components are in conformity with this Directive, draw up for all machinery or safety components manufactured an EC declaration of conformity based on the model given in Annex II, point A or C as appropriate.

In addition, for machinery alone, the manufacturer or his authorised representatives established in the Community must affix to the machine the CE marking.

2. Before placing on the market, the manufacturer, or his authorised representative established in the Community, shall:

- (a) if the machinery is not referred to in Annex IV, draw up the file provided for in Annex V;
- (b) if the machinery is referred to in Annex IV and its manufacturer does not comply, or only partly complies, with the standards referred to in Article 5(2) or if there are no such standards, submit an example of the machinery for the EC type-examination referred to in Annex VI;
- (c) if the machinery is referred to in Annex IV and is manufactured in accordance with the standards referred to in Article 5(2):
 - either draw up the file referred to in Annex VI and forward it to a notified body, which will acknowledge receipt of the file as soon as possible and keep it,
 - submit the file referred to in Annex VI to the notified body, which will simply verify that the standards referred to in Article 5(2) have been correctly applied and will draw up a certificate of adequacy for the file,
 - or submit the example of the machinery for the EC type-examination referred to in Annex VI.

3. Where the first indent of paragraph 2(c) of this Article applies, the provisions of the first sentence of paragraphs 5 and 7 of Annex VI shall also apply.

Where the second indent of paragraph 2(c) of this Article applies, the provisions of paragraphs 5, 6 and 7 of Annex VI shall also apply.

4. Where paragraph 2(a) and the first and second indents of paragraph 2(c) apply, the EC declaration of conformity shall solely state conformity with the essential requirements of the Directive.

Where paragraph 2(b) and the third indent of paragraph 2(c) apply, the EC declaration of conformity shall state conformity with the example that underwent EC type-examination.

5. Safety components shall be subject to the certification procedures applicable to machinery pursuant to paragraphs 2, 3 and 4. Furthermore, during EC type-examination, the notified body shall verify the suitability of the safety component for fulfilling the safety functions declared by the manufacturer.

6. (a) Where the machinery is subject to other Directives concerning other aspects and which also provide for the affixing of the CE marking, the latter shall indicate that the machinery is also presumed to conform to the provisions of those other Directives.

(b) However, where one or more of those Directives allow the manufacturer, during a transitional period, to choose which arrangements to apply, the CE marking shall indicate conformity only to the Directives applied by the manufacturer. In this case, particulars of the Directives applied, as published in the *Official Journal of the European Communities*, must be given in the documents, notices or instructions required by the directives and accompanying such machinery.

7. Where neither the manufacturer nor his authorised representative established in the Community fulfils the obligations of paragraphs 1 to 6, these obligations shall fall to any person placing the machinery or safety component on the market in the Community. The same obligations shall apply to any person assembling machinery or parts thereof or safety components of various origins or constructing machinery or safety components for his own use.

8. The obligations referred to in paragraph 7 shall not apply to persons who assemble with a machine or tractor interchangeable equipment as provided for in Article 1, provided that the parts are compatible and each of the constituent parts of the assembled machine bears the CE marking and is accompanied by the EC declaration of conformity.

Article 9

1. Member States shall notify the Commission and the other Member States of the approved bodies which they have appointed to carry out the procedures referred to in Article 8 together with the specific tasks which these bodies have been appointed to carry out and the identification numbers assigned to them beforehand by the Commission.

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

2. Member States shall apply the criteria laid down in Annex VII in assessing the bodies to be indicated in such notification. Bodies meeting the assessment criteria laid down in the relevant harmonised standards shall be presumed to fulfil those criteria.

3. A Member State which has approved a body must withdraw its notification if it finds that the body no longer meets the criteria referred to in Annex VII. It shall immediately inform the Commission and the other Member States accordingly.

CHAPTER III

CE MARKING

Article 10

1. The CE conformity marking shall consist of the initials 'CE'. The form of the marking to be used is shown in Annex III.

2. The CE marking shall be affixed to machinery distinctly and visibly in accordance with point 1.7.3 of Annex I.

3. The affixing of markings on the machinery which are likely to deceive third parties as to the meaning and form of the CE marking shall be prohibited. Any other marking may be affixed to the machinery provided that the visibility and legibility of the CE marking is not thereby reduced.

4. Without prejudice to Article 7:

- (a) where a Member State establishes that the CE marking has been affixed unduly, the manufacturer or his authorised representative established within the Community shall be obliged to make the product conform as regards the provisions concerning the CE marking and to end the infringement under the conditions imposed by the Member State;
- (b) where non-conformity continues, the Member State must take all appropriate measures to restrict or prohibit the placing on the market of the product in question or to ensure that it is withdrawn from the market in accordance with the procedure laid down in Article 7.

CHAPTER IV

FINAL PROVISIONS

Article 11

Any decision taken pursuant to this Directive which restricts the placing on the market and putting into service of machinery or a safety component shall state the exact grounds on which it is based. Such a decision 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 12

The Commission will take the necessary steps to have information on all the relevant decisions relating to the management of this Directive made available.

Article 13

1. 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.
2. The Commission shall, before 1 January 1994, examine the progress made in the standardisation work relating to this Directive and propose any appropriate measures.

Article 14

1. The Directives listed in Annex VIII, Part A, are hereby repealed, without prejudice to the obligations of the Member States concerning the deadlines for transposition and application of the said Directives, as set out in Annex VIII, Part B.
2. References to the repealed Directives shall be construed as references to this Directive and be read in accordance with the correlation table set out in Annex IX.

Article 15

This Directive shall enter into force on the 20th day following that of its publication in the *Official Journal of the European Communities*.

Article 16

This Directive is addressed to the Member States.

Done at Luxembourg, 22 June 1998.

For the European Parliament

The President

J. M. GIL-ROBLES

For the Council

The President

J. CUNNINGHAM

ANNEX I

ESSENTIAL HEALTH AND SAFETY REQUIREMENTS RELATING TO THE DESIGN AND CONSTRUCTION OF MACHINERY AND SAFETY COMPONENTS

For the purposes of this Annex 'machinery' means either 'machinery' or 'safety component' as defined in Article 1(2).

PRELIMINARY OBSERVATIONS

1. The obligations laid down by the essential health and safety requirements apply only when the corresponding hazard exists for the machinery in question when it is used under the conditions foreseen by the manufacturer. In any event, requirements 1.1.2, 1.7.3 and 1.7.4 apply to all machinery covered by this Directive.
2. The essential health and safety requirements laid down in this Directive are mandatory. However, taking into account the state of the art, it may not be possible to meet the objectives set by them. In this case, the machinery must as far as possible be designed and constructed with the purpose of approaching those objectives.
3. The essential health and safety requirements have been grouped according to the hazards which they cover.

Machinery presents a series of hazards which may be indicated under more than one heading in this Annex.

The manufacturer is under an obligation to assess the hazards in order to identify all of those which apply to his machine; he must then design and construct it taking account of his assessment.

1. ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

1.1. General remarks

1.1.1. Definitions

For the purpose of this Directive:

1. 'danger zone' means any zone within and/or around machinery in which an exposed person is subject to a risk to his health or safety;
2. 'exposed person' means any person wholly or partially in a danger zone;
3. 'operator' means the person or persons given the task of installing, operating, adjusting, maintaining, cleaning, repairing or transporting machinery.

1.2.2. Principles of safety integration

- (a) Machinery must be so constructed that it is fitted for its function, and can be adjusted and maintained without putting persons at risk when these operations are carried out under the conditions foreseen by the manufacturer.

The aim of measures taken must be to eliminate any risk of accident throughout the foreseeable lifetime of the machinery, including the phases of assembly and dismantling, even where risks of accident arise from foreseeable abnormal situations.

- (b) In selecting the most appropriate methods, the manufacturer must apply the following principles, in the order given:
 - eliminate or reduce risks as far as possible (inherently safe machinery design and construction),
 - take the necessary protection measures in relation to risks that cannot be eliminated,
 - inform users of the residual risks due to any shortcomings of the protection measures adopted, indicate whether any particular training is required and specify any need to provide personal protection equipment.

- (c) When designing and constructing machinery, and when drafting the instructions, the manufacturer must envisage not only the normal use of the machinery but also uses which could reasonably be expected.

The machinery must be designed to prevent abnormal use if such use would engender a risk. In other cases the instructions must draw the user's attention to ways — which experience has shown might occur — in which the machinery should not be used.

- (d) Under the intended conditions of use, the discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account.
- (e) When designing and constructing machinery, the manufacturer must take account of the constraints to which the operator is subject as a result of the necessary or foreseeable use of personal protection equipment (such as footwear, gloves, etc.).
- (f) Machinery must be supplied with all the essential special equipment and accessories to enable it to be adjusted, maintained and used without risk.

1.1.3. *Materials and products*

The materials used to construct machinery or products used and created during its use must not endanger exposed persons' safety or health.

In particular, where fluids are used, machinery must be designed and constructed for use without risks due to filling, use, recovery or draining.

1.1.4. *Lighting*

The manufacturer must supply integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity.

The manufacturer must ensure that there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects due to the lighting provided by the manufacturer.

Internal parts requiring frequent inspection, and adjustment and maintenance areas, must be provided with appropriate lighting.

1.1.5. *Design of machinery to facilitate its handling*

Machinery or each component part thereof must:

- be capable of being handled safely,
- be packaged or designed so that it can be stored safely and without damage (e.g. adequate stability, special supports, etc.).

Where the weight, size or shape of machinery or its various component parts prevents them from being moved by hand, the machinery or each component part must:

- either be fitted with attachments for lifting gear, or
- be designed so that it can be fitted with such attachments (e.g. threaded holes), or
- be shaped in such a way that standard lifting gear can easily be attached.

Where machinery or one of its component parts is to be moved by hand, it must:

- either be easily movable, or
- be equipped for picking up (e.g. hand-grips, etc.) and moving in complete safety.

Special arrangements must be made for the handling of tools and/or machinery parts, even if lightweight, which could be dangerous (shape, material, etc.).

1.2. Controls

1.2.1. *Safety and reliability of control systems*

Control systems must be designed and constructed so that they are safe and reliable, in a way that will prevent a dangerous situation arising. Above all they must be designed and constructed in such a way that:

- they can withstand the rigours of normal use and external factors,
- errors in logic do not lead to dangerous situations.

1.2.2. *Control devices*

Control devices must be:

- clearly visible and identifiable and appropriately marked where necessary,
- positioned for safe operation without hesitation or loss of time, and without ambiguity,
- designed so that the movement of the control is consistent with its effect,
- located outside the danger zones, except for certain controls where necessary, such as emergency stop, console for training of robots,
- positioned so that their operation cannot cause additional risk,
- designed or protected so that the desired effect, where a risk is involved, cannot occur without an intentional operation,
- made so as to withstand foreseeable strain; particular attention must be paid to emergency stop devices liable to be subjected to considerable strain.

Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence (e.g. keyboards, etc.), the action to be performed must be clearly displayed and subject to confirmation where necessary.

Controls must be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles. Constraints due to the necessary or foreseeable use of personal protection equipment (such as footwear, gloves, etc.) must be taken into account.

Machinery must be fitted with indicators (dials, signals, etc.) as required for safe operation. The operator must be able to read them from the control position.

From the main control position the operator must be able to ensure that there are no exposed persons in the danger zones.

If this is impossible, the control system must be designed and constructed so that an acoustic and/or visual warning signal is given whenever the machinery is about to start. The exposed person must have the time and the means to take rapid action to prevent the machinery starting up.

1.2.3. *Starting*

It must be possible to start machinery only by voluntary actuation of a control provided for the purpose.

The same requirement applies:

- when restarting the machinery after a stop-page, whatever the cause,
 - when effecting a significant change in the operating conditions (e.g. speed, pressure, etc.),
- unless such restarting or change in operating conditions is without risk to exposed persons.

This essential requirement does not apply to the restarting of the machinery or to the change in operating conditions resulting from the normal sequence of an automatic cycle.

Where machinery has several starting controls and the operators can therefore put each other in danger, additional devices (e.g. enabling devices or selectors allowing only one part of the starting mechanism to be actuated at any one time) must be fitted to rule out such risks.

It must be possible for automated plant functioning in automatic mode to be restarted easily after a stoppage once the safety conditions have been fulfilled.

1.2.4. *Stopping device*

Normal stopping

Each machine must be fitted with a control whereby the machine can be brought safely to a complete stop.

Each workstation must be fitted with a control to stop some or all of the moving parts of the machinery, depending on the type of hazard, so that the machinery is rendered safe. The machinery's stop control must have priority over the start controls.

Once the machinery or its dangerous parts have stopped, the energy supply to the actuators concerned must be cut off.

Emergency stop

Each machine must be fitted with one or more emergency stop devices to enable actual or impending danger to be averted. The following exceptions apply:

- machines in which an emergency stop device would not lessen the risk, either because it would not reduce the stopping time or because it would not enable the special measures required to deal with the risk to be taken,
- hand-held portable machines and hand-guided machines.

This device must:

- have clearly identifiable, clearly visible and quickly accessible controls,
- stop the dangerous process as quickly as possible, without creating additional hazards,
- where necessary, trigger or permit the triggering of certain safeguard movements.

Once active operation of the emergency stop control has ceased following a stop command, that command must be sustained by engagement of the emergency stop device until that engagement is specifically overridden; it must not be possible to engage the device without triggering a stop command; it must be possible to disengage the device only by an appropriate operation, and disengaging the device must not restart the machinery but only permit restarting.

Complex installations

In the case of machinery or parts of machinery designed to work together, the manufacturer must so design and construct the machinery that the stop controls, including the emergency stop, can stop not only the machinery itself but also all equipment upstream and/or downstream if its continued operation can be dangerous.

1.2.5. *Mode selection*

The control mode selected must override all other control systems with the exception of the emergency stop.

If machinery has been designed and built to allow for its use in several control or operating modes presenting different safety levels (e.g. to allow for adjustment, maintenance, inspection, etc.), it must be fitted with a mode selector which can be locked in each position. Each position of the selector must correspond to a single operating or control mode.

The selector may be replaced by another selection method which restricts the use of certain functions of the machinery to certain categories of operator (e.g. access codes for certain numerically controlled functions, etc.).

If, for certain operations, the machinery must be able to operate with its protection devices neutralised, the mode selector must simultaneously:

- disable the automatic control mode,
- permit movements only by controls requiring sustained action,
- permit the operation of dangerous moving parts only in enhanced safety conditions (e.g. reduced speed, reduced power, step-by-step, or other adequate provision) while preventing hazards from linked sequences,
- prevent any movement liable to pose a danger by acting voluntarily or involuntarily on the machine's internal sensors.

In addition, the operator must be able to control operation of the parts he is working on at the adjustment point.

1.2.6. *Failure of the power supply*

The interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply to the machinery must not lead to a dangerous situation.

In particular:

- the machinery must not start unexpectedly,
- the machinery must not be prevented from stopping if the command has already been given,
- no moving part of the machinery or piece held by the machinery must fall or be ejected,
- automatic or manual stopping of the moving parts whatever they may be must be unimpeded,
- the protection devices must remain fully effective.

1.2.7. *Failure of the control circuit*

A fault in the control circuit logic, or failure of or damage to the control circuit must not lead to dangerous situations.

In particular:

- the machinery must not start unexpectedly,
- the machinery must not be prevented from stopping if the command has already been given,
- no moving part of the machinery or piece held by the machinery must fall or be ejected,
- automatic or manual stopping of the moving parts whatever they may be must be unimpeded,
- the protection devices must remain fully effective.

1.2.8. *Software*

Interactive software between the operator and the command or control system of a machine must be user-friendly.

1.3. **Protection against mechanical hazards**

1.3.1. *Stability*

Machinery, components and fittings thereof must be so designed and constructed that they are stable enough, under the foreseen operating conditions (if necessary taking climatic conditions into account) for use without risk of overturning, falling or unexpected movement.

If the shape of the machinery itself or its intended installation does not offer sufficient stability, appropriate means of anchorage must be incorporated and indicated in the instructions.

1.3.2. *Risk of break-up during operation*

The various parts of machinery and their linkages must be able to withstand the stresses to which they are subject when used as foreseen by the manufacturer.

The durability of the materials used must be adequate for the nature of the work place foreseen by the manufacturer, in particular as regards the phenomena of fatigue, ageing, corrosion and abrasion.

The manufacturer must indicate in the instructions the type and frequency of inspection and maintenance required for safety reasons. He must, where appropriate, indicate the parts subject to wear and the criteria for replacement.

Where a risk of rupture or disintegration remains despite the measures taken (e.g. as with grinding wheels) the moving parts must be mounted and positioned in such a way that in case of rupture their fragments will be contained.

Both rigid and flexible pipes carrying fluids, particularly those under high pressure, must be able to withstand the foreseen internal and external stresses and must be firmly attached and/or protected against all manner of external stresses and strains; precautions must be taken to ensure that no risk is posed by a rupture (sudden movement, high-pressure jets, etc.).

Where the material to be processed is fed to the tool automatically, the following conditions must be fulfilled to avoid risks to the persons exposed (e.g. tool breakage):

- when the workpiece comes into contact with the tool the latter must have attained its normal working conditions,
- when the tool starts and/or stops (intentionally or accidentally) the feed movement and the tool movement must be coordinated.

1.3.3. *Risks due to falling or ejected objects*

Precautions must be taken to prevent risks from falling or ejected objects (e.g. workpieces, tools, cuttings, fragments, waste, etc.).

1.3.4. *Risks due to surfaces, edges or angles*

In so far as their purpose allows, accessible parts of the machinery must have no sharp edges, no sharp angles, and no rough surfaces likely to cause injury.

1.3.5. *Risks related to combined machinery*

Where the machinery is intended to carry out several different operations with the manual removal of the piece between each operation (combined machinery), it must be designed and constructed in such a way as to enable each element to be used separately without the other elements constituting a danger or risk for the exposed person.

For this purpose, it must be possible to start and stop separately any elements that are not protected.

1.3.6. *Risks relating to variations in the rotational speed of tools*

When the machine is designed to perform operations under different conditions of use (e.g. different speeds or energy supply), it must be designed and constructed in such a way that selection and adjustment of these conditions can be carried out safely and reliably.

1.3.7. *Prevention of risks related to moving parts*

The moving parts of machinery must be designed, built and laid out to avoid hazards or, where hazards persist, fixed with guards or protective devices in such a way as to prevent all risk of contact which could lead to accidents.

All necessary steps must be taken to prevent accidental blockage of moving parts involved in the work. In cases where, despite the precautions taken, a blockage is likely to occur, specific protection devices or tools, the instruction handbook and possibly a sign on the machinery should be provided by the manufacturer to enable the equipment to be safely unblocked.

1.3.8. *Choice of protection against risks related to moving parts*

Guards or protection devices used to protect against the risks related to moving parts must be selected on the basis of the type of risk. The following guidelines must be used to help make the choice.

A. Moving transmission parts

Guards designed to protect exposed persons against the risks associated with moving transmission parts (such as pulleys, belts, gears, rack and pinions, shafts, etc.) must be:

- either fixed, complying with requirements 1.4.1 and 1.4.2.1, or
- movable, complying with requirements 1.4.1 and 1.4.2.2.A.

Movable guards should be used where frequent access is foreseen.

B. Moving parts directly involved in the process

Guards or protection devices designed to protect exposed persons against the risks associated with moving parts contributing to the work (such as cutting tools, moving parts of presses, cylinders, parts in the process of being machined, etc.) must be:

- wherever possible fixed guards complying with requirements 1.4.1 and 1.4.2.1,
- otherwise, movable guards complying with requirements 1.4.1 and 1.4.2.2.B or protection devices such as sensing devices (e.g. non-material barriers, sensor mats), remote-hold protection devices (e.g. two-hand controls), or protection devices intended automatically to prevent all or part of the operator's body from encroaching on the danger zone in accordance with requirements 1.4.1 and 1.4.3.

However, when certain moving parts directly involved in the process cannot be made completely or partially inaccessible during operation owing to operations requiring nearby operator intervention, where technically possible such parts must be fitted with:

- fixed guards, complying with requirements 1.4.1 and 1.4.2.1 preventing access to those sections of the parts that are not used in the work,
- adjustable guards, complying with requirements 1.4.1 and 1.4.2.3 restricting access to those sections of the moving parts that are strictly for the work.

1.4. Required characteristics of guards and protection devices

1.4.1. General requirements

Guards and protection devices must:

- be of robust construction,
- not give rise to any additional risk,
- not be easy to by-pass or render non-operational,
- be located at an adequate distance from the danger zone,
- cause minimum obstruction to the view of the production process,
- enable essential work to be carried out on installation and/or replacement of tools and also for maintenance by restricting access only to the area where the work has to be done, if possible without the guard or protection device having to be dismantled.

1.4.2. Special requirements for guards

1.4.2.1. Fixed guards

Fixed guards must be securely held in place.

They must be fixed by systems that can be opened only with tools.

Where possible, guards must be unable to remain in place without their fixings.

1.4.2.2. Movable guards

A. Type A movable guards must:

- as far as possible remain fixed to the machinery when open,
- be associated with a locking device to prevent moving parts starting up as long as these parts can be accessed and to give a stop command whenever they are no longer closed.

- B. Type B movable guards must be designed and incorporated into the control system so that:
- moving parts cannot start up while they are within the operator's reach,
 - the exposed person cannot reach moving parts once they have started up,
 - they can be adjusted only by means of an intentional action, such as the use of a tool, key, etc.,
 - the absence or failure of one of their components prevents starting or stops the moving parts,
 - protection against any risk of ejection is proved by means of an appropriate barrier.

1.4.2.3. Adjustable guards restricting access

Adjustable guards restricting access to those areas of the moving parts strictly necessary for the work must:

- be adjustable manually or automatically according to the type of work involved,
- be readily adjustable without the use of tools,
- reduce as far as possible the risk of ejection.

1.4.3. *Special requirements for protection devices*

Protection devices must be designed and incorporated into the control system so that:

- moving parts cannot start up while they are within the operator's reach,
- the exposed person cannot reach moving parts once they have started up,
- they can be adjusted only by means of an intentional action, such as the use of a tool, key, etc.,
- the absence or failure of one of their components prevents starting or stops the moving parts.

1.5. Protection against other hazards

1.5.1. *Electricity supply*

Where machinery has an electricity supply it must be designed, constructed and equipped so that all hazards of an electrical nature are or can be prevented.

The specific rules in force relating to electrical equipment designed for use within certain voltage limits must apply to machinery which is subject to those limits.

1.5.2. *Static electricity*

Machinery must be so designed and constructed as to prevent or limit the build-up of potentially dangerous electrostatic charges and/or be fitted with a discharging system.

1.5.3. *Energy supply other than electricity*

Where machinery is powered by an energy other than electricity (e.g. hydraulic, pneumatic or thermal energy, etc.), it must be so designed, constructed and equipped as to avoid all potential hazards associated with these types of energy.

1.5.4. *Errors of fitting*

Errors, likely to be made when fitting or refitting certain parts which could be a source of risk must be made impossible by the design of such parts or, failing this, by information given on the parts themselves and/or the housings. The same information must be given on moving parts and/or their housings where the direction of movement must be known to avoid a risk. Any further information that may be necessary must be given in the instructions.

Where a faulty connection can be the source of risk, incorrect fluid connections, including electrical conductors, must be made impossible by the design or, failing this, by information given on the pipes, cables, etc. and/or connector blocks.