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EUROPEAN MACHINERY LEGISLATION

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1. INTRODUCTION

Since the introduction of a free Europe, member states have been obliged to accept legislation in the many forms issued as European Directives.

2. TYPES OF DIRECTIVES

The directive considered in this paper is a Product Standard Directives - produced to eliminate barriers to trade.

Initial Directives concerning Product Standards were issued under the Article 100 of the Treaty establishing the EEC (Treaty of Rome). A number of these relate to limiting noise emission, for example from construction plant and equipment; ie Directive 84/533/EEC "The permissible sound power level of compressors".

In May 1985 Community Ministers agreed on a "New Approach to Technical Harmonisation and Standards" to remove barriers to trade. This "New Approach" was based on a series of Directives (Community Laws) giving "Essential Safety Requirements" (ESRs) which had to be met before the product can be placed on the market. Products meetings these ESRs could carry the CE mark and be marketed anywhere in the Community.

The "New Approach" to directives also removed the power of veto by member states at the voting stage. This was replaced by Qualified Majority Voting which speeds up the Directive making process.

In 1987 the Single European Act added a new Article 118A to the Treaty of Rome; this was to deal specifically with health and safety at work. The principal Directive introduced under this new Article was the Framework Directive (89/391/EEC) which served as an introduction of the measures to encourage improvements in the health and safety of workers at work.

Another example of an Article 118A directive was the "Use of Personal Protective Equipment Directive" (89/656/EEC).

3. THE MACHINERY DIRECTIVE

The Machinery Directive 89/392/EEC was passed on the 1 June 1989, and became United Kingdom legislation on 1 January 1993 as The Supply of Machinery (Safety) Regulations 1992. To comply with these Regulations the following requirements must be met:-

(a) the relevant machinery must satisfy the relevant essential health and safety requirements;

(b) the appropriate conformity assessment procedure in respect of the relevant machinery must be carried out by the responsible person in accordance with one of the procedures described in the regulations;

(c) the responsible person, at his election, has issued either -

  (i) an EC declaration of conformity in accordance with regulations;
  (ii) in the case of relevant machinery to which regulation 23 applies (machinery which cannot function independently), a declaration of incorporation in accordance with that regulation.

(d) except in the case of relevant machinery to which regulation 23 applies, the EC mark has been properly affixed by the responsible person to the relevant machinery in accordance with the appropriate regulation;

(e) the relevant machinery is in fact safe.

The Essential Health and Safety Requirements (ESRs) are given in Schedule 3 of the Regulations and must be considered for all machines.

Schedule 3 is divided into the following parts:-

Part 1:preliminary observations, principles of safety integration and general safety aspects.

The essential health and safety requirements are mandatory as long as the hazard exists for the machinery in question when it is used under the conditions foreseen

by the manufacturer. All machinery must as far as possible be designed and constructed to meet the essential safety requirements.

Part 2: additional requirements for agri-foodstuffs machinery, portable hand-held machinery and machinery for woodworking and similar materials.

Part 3: particular requirements for the hazards arising from mobility.

Part 4: particular requirements for hazards associated with lifting - but not lifting people (this has been dealt with by a 2nd amending directive).

Part 5: requirements for underground working.

The requirements of the regulations in respect to **NOISE are found in Schedule 3 and are as follows:**

(a) **Schedule 3 - 1.1.2 - Principles of Safety Integration**

This section asks the manufacturer to identify the risks arising from the use of the machine and to take appropriate action to eliminate such risks that have been identified.

(b) **Annex 1 - 1.5.8 - Design and construction**

"Machinery must be so designed and constructed that risks resulting from the emission of airborne noise are reduced to the lowest level taking account of technical progress and the availability of means of reducing noise particularly at source".

(c) **Annex 1 - 1.7.2 - Warning of residual risks**

Where risks remain despite all the measures adopted, the manufacturer must **provide warnings** of such possible risks which may not be normally evident in the normal use of the machine.

(e) **Annex 1 - 1.7.4 - Instructions**

In sub paragraph (d): Any sales literature describing the machinery must not contradict the instructions as regards any safety: it must give information regarding the airborne noise emphasis referred to in sub paragraph (f) .....

In sub paragraph (e): Where necessary, the instructions must give the requirements relating to installation and assembly for reducing noise and vibration .....

In sub paragraph (f): The instructions must give the following information concerning airborne noise emissions by the machinery, either the actual value or a value established on the basis of measurements made on identical machinery.

- Equivalent continuous A-weighted sound pressure level at the workstations, where this exceeds 70dB(A); where this level does not exceed 70dB(A), this fact must be stated (ie measurements **must** be made)
- peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 Pa).

- sound power level emitted by the machinery where the equivalent continuous A-weighted sound pressure level at the workstations exceeds 85dB(A).

- In the case of very large machinery, instead of sound power level, the equivalent continuous sound pressure levels at specified positions around the machine may be indicated.
- Where the harmonised standards are not applied, sound levels must be measured using the most appropriate method for the machinery.

- The manufacturers **must** indicate the operating conditions of the machinery during measurements and what methods have been used for the measurement.

- Where the workstations are undefined or cannot be defined, sound pressure levels **must** be measured at a distance of 1 metre from the surface of the machinery and at a height of 1.60 metres from the floor or access platform. **The position and value of the maximum sound pressure must be indicated.**

4. STANDARDS

To assist in compliance of the Supply of Machinery (Safety) Regulations a hierarchy of standards have either been produced or updated by CEN (Comite Europeen de Normalisation). These are:-

(a) **Type A** standards **(fundamental safety standards)** giving basic concepts, principles for design and general aspects that can be applied to all machinery.

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(b) **Type B** standards (group safety standards) dealing with **one safety aspect** or one type of safety related device that can be used across a wide range of machinery.
- **Type B1** standards on **particular safety aspects** eg safety distances, surface temperatures, **noise**.
- **Type B2** standards on safety related devices eg two-hand controls interlocking devices, pressure sensitive devices, guards.

(c) **Type C** standards (machine safety standards) giving **detailed safety requirements for a particular machine or group of machines**.

In relation to Noise CEN has mandated ISO (International Organisation for Standardisation) to revise many of the existing measurement standards with a view to harmonising them to bring them in line with the requirements of the European Community.

This harmonisation programme deals with standards for the measurement of sound power, sound pressure and sound intensity. These are 'B' type standards and are as follows:-

- **Sound pressure** ISO 6081 series revised as ISO 11200 series - to be EN 31200 series, (In parts 31200-31204).

- **Sound power** ISO 3740 series revised as ISO 3740 series - to be EN 23740 series. (In parts 23740-23747).

- **Sound Intensity** being drafted as ISO 9614-1 and ISO 9614-2 will be EN 29614-1 and EN 29614-2.

These revisions are being carried out by a CEN Technical Committee (CEN TC 211) which is overseen in the United Kingdom by a BSI committee (EPC 1/4).

To assist the 'C' standard makers in dealing with the noise aspects of the regulations TC 211 have also prepared two other documents which are 'B' type standards:-

(a) Safety of Machinery-Guidance for the Drafting of the **Noise Clauses of Safety Standards..**

(b) ACOUSTICS - Noise Emitted by Machinery and Equipment - Rules for the Drafting and Presentation of a **NOISE TEST CODE.** This was numbered ISO 12001 and will become EN 32001 as a European standard.

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Working groups within ISO on behalf of CEN are also preparing are a number of standards as follows:-

- Design of Low Noise Machines
- Design of Low Nose Workshops

- Design of Noise Control Devices

These standards will assist the 'C' standard makers and those involved in design/manufacture and measurement of machines to be sold within the Common Market.

The work in drafting "C" type standards is being carried out by many organisations especially those directly related to the type of machinery being addressed and it is hoped that the relevant industries will have a large input into their formulation.

A "C" standard should address the noise clauses in the safety standards and also include a harmonised test procedure or a Noise Test Code which should indicate:-

(a) How the machine is to be tested.

(b) What grade of "B" standard to use.

(c) The operating and mounting conditions to use during the test.

(d) It should also indicate how the measured results are to be declared and verified.