

## **Guide for the inclusion of ergonomic aspects in standards (2001)**

European Standardization is mandated to contribute to the competitiveness of Europe and to support the European economy in international trade.

Manufacturers and importers of machinery (who have to construct or distribute their machinery in accordance with the EC Machinery Directive) as well as standards bodies developing product standards found that there is a certain lack of easily applicable generic standards in the field of ergonomics. As a result, specifications concerning ergonomic aspects are sometimes regulated several times in different standards and not necessarily in the same way. A clear structure for ergonomics standards and their contents will help to prevent possible uncertainties for the users.

The present guide is intended to effectively support the core activities of the ergonomics standards committees in this sense.

### Objectives:

- better adapt the standards to the structure of the market;
- facilitate the strategic orientation of the working programmes;
- enhance the development of target group oriented standards;
- harmonize ergonomic specifications in standards and avoid overlapping;
- make the requirements explicit to manufacturers;
- give better guidance to manufacturers when there is no ergonomics standard specifying the product area in question;
- improve the acceptance of ergonomics standards.

### Benefits:

- The standards structure becomes more transparent and standardization needs apparent.
- The classification of the standards is user-friendly, so that manufacturers and users can easily identify the standards they need to comply with.
- The manufacturer/user interface is better supported (communication is facilitated).
- Development times are reduced.
- The costs for the development of standards are reduced.

The structure of ergonomics standards shown in Figure 1 provides beneficiaries (product manufacturers and users, standards committees and public authorities or those responsible for occupational health and safety within companies) with a hierarchically structured overview which will facilitate their work.

Type of standard	Contents	
Basic standard  <b>(B)</b>	Human characteristics, stress/strain as well as methods to describe them (measuring and test methods, terminology), general principles (as guidelines) for the development of basic and group standards	
Group standard  <b>(G)</b>	<u>Product groups</u> <sup>1,2</sup> <b>(GP)</b>  Quantitative and qualitative ergonomic requirements, measuring and test methods, guidelines for the application of GP standards in product standards	<u>Work systems</u> <sup>3</sup> <b>(GW)</b>  Qualitative design information for work systems without setting limits, measuring methods
Product standard  <b>(P)</b>	<u>Products</u>  Integration of ergonomics data from B and GP into specific product standards;  drafting mostly not done in ergonomics TCs	

Fig. 1: Structure for the contents of ergonomics standards

It is not the aim of the structure to force existing standards into a bureaucratic pattern. During the revision of standards that constitute a mixture of several levels or columns of the concept, efforts should be made to separate the different kinds of contents in accordance with the structure.

The three levels of the concept structure – in particular in the field of product standardization – are similar to the levels used in machinery standardization (A, B and C standards). A standard can, however, have the character of a basic standard with regard to machinery standardization and at the same time be classified as a product group standard with regard to its ergonomic contents (a typical example is DIN EN 614 – Part 1).

**Basic standards (B)** on ergonomics should contain data and measuring methods which describe human beings without making reference to the design of a particular product group (or product) or the work environment. This includes anthropometric, biomechanical, physiological and psycho-mental data and their acquisition as well as terminological definitions and descriptions of general principles for the drafting of such standards. (A standard which, despite its group-related title “safety of machinery” is quite typical for this level is DIN EN 547,

<sup>1</sup> Products within the context of this concept are material as well as immaterial products (e.g. software)

<sup>2</sup> Product requirements (reference to art. 95 of the Amsterdam Treaty)

<sup>3</sup> Design of the work environment (reference to art. 137 of the Amsterdam Treaty); “work systems” is to be understood here in accordance with the definitions provided in ISO 6385 and DIN 33400.

Parts 1-3 which is above all a collection of anthropometric data independent of specific products). Since standardization is still incomplete in this category, it may well be a good idea at this point in time to integrate data from standards belonging to the second or third level into basic standards.

At the level of generic **group standards (G)** we must differentiate between product group standards (GP) and design standards for work systems (GW). Work systems serve the fulfilment of work tasks; people and work equipment act together in a working process at a workplace in a work environment under the conditions of the work system.

**Product group standards (GP)** should contain quantitative as well as qualitative ergonomic requirements for specific product groups. The repetition of parts of basic ergonomic data from the basic standards level can be useful in many cases. Measuring and test methods for ergonomic requirements regarding the product group concerned as well as guidelines for the application of GP standards should also form the contents of this type of standard. (A good example for a GP standard is DIN EN 1005, Parts 1-4).

**Group standards for work systems (GW)** on the other hand should contain only qualitative recommendations for work systems as well as relevant test and measuring methods. It is not useful to define limit values in standards within the field of the design of the work environment since this could lead to conflicts with national regulations<sup>4</sup> that often exist in this field (examples of GW standards are prEN 614, Part 2 and in the field of measuring methodology standards like DIN EN 27243).

**Product standards (P)** also contain ergonomic requirements which should be derived from the ergonomic data and requirements specified at the levels above. Specific product standards should, in contrast to the standards mentioned so far, not be developed by ergonomics committees but by the competent committees for the products in question. Ergonomics experts can play a role as service providers by producing ergonomics standards for the product groups concerned or through direct contributions when there is a lack of generic values or design principles. This does not exclude the drafting of product standards by standards committees for ergonomics in areas where product standards are not drafted by other bodies, but this would probably remain an exception.

The structure can be applied to standards and guidelines related to occupational health and safety; further fields (e.g. "environment") are not envisaged.

Generic standards which deal with ergonomics in individual paragraphs only (e.g. DIN EN 292, Parts 1-2) can also be assigned to the structure with respect to the relevant paragraphs.

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<sup>4</sup> *Within the European Union, the Member States were explicitly granted this freedom of regulation in art. 137 of the EC Treaty.*