



## BUSINESS PLAN

CEN/TC 122  
Ergonomics

### EXECUTIVE SUMMARY

***Ergonomics is the scientific discipline concerned with the understanding of the interactions among human and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance***

#### **Business Environment**

The actual business environment of Ergonomics:

- The total market for products (including services, systems, facilities and environments) relevant for CEN/TC 122 cannot be quantified, because ergonomics is relevant to everything intended for human use or operation.
- The origin of ergonomics is related to work systems and product design. However, now ergonomic design is used for everyday products used in the home and leisure environment (for example, mobile phones and computers). Ergonomics design is not limited to systems and products, but can also be applied to organizations, services, facilities and environments.
- With the changes in the population the market needs for ergonomics are becoming more widely recognized.<sup>1</sup>

#### **Benefits**

The benefits of standardization of Ergonomics in the actual business environment are:

- to enhance health, safety and well-being of the consumers and users as well as the overall performance;
- to meet the requirements for ergonomic and efficient products under the conditions of free trade through the application of ergonomics standards;
- to improve the effectiveness and the efficiency of the design process;
- to support European Directives which are adopted in the frame of the New Approach with the aim of deregulation in legislation;
- to deliver a consistent set of ergonomic requirements as a reliable basis for world-wide product design (as EN ISO standards world-wide);
- to improve the effectiveness and the efficiency of the design process;
- to improve the accessibility and usability of products, systems, services, environments and facilities;

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<sup>1</sup> See mandates M/376 "Standardisation mandate to CEN, CENELEC AND ETSI in support of European Accessibility Requirements for Public Procurement of Products and Services in the ICT Domain", M/420 "Standardisation mandate to CEN, CENELEC and ETSI in support of European accessibility requirements for public procurement in the built environment", and M/473 "Standardisation mandate to CEN, CENELEC and ETSI to include "Design for All" in relevant standardisation initiatives".

- to make the world more accessible for elderly and disabled persons;
- to assist in promoting sustainability and social responsibility.

## **Priorities**

Strategies for the development of standardization of Ergonomics are:

- Modularization of type A-, B- and C-standards, with responsibility for the types A and B;
- Parallelization of work items and organisational measures at CEN and ISO, in order to support the consistency of European and International standards and easier trade across the EC;
- Ergonomics in the field of new technologies;
- Ergonomics across the borders of occupational work;
- Ergonomics for people with special requirements with the goal to improve accessibility.

## **1 BUSINESS ENVIRONMENT OF THE CEN/TC**

### **1.1 Description of the Business Environment**

The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this CEN/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

#### **1.1.1 Scope**

Standardization in the field of ergonomics, in particular, general ergonomics principles, anthropometry and biomechanics, ergonomics of human-system interaction and ergonomics of the physical environment, ergonomics of personal protective equipment addressing human characteristics and performance, and methods for specifying, designing and evaluating products, systems, services, environments and facilities.

**NOTE** Standardization in the field of ergonomics aims at optimizing system performance, effectiveness, efficiency, accessibility, reliability, availability and maintainability of the design outcome while safeguarding the safety, health and well-being of those involved or affected. It also assists in promoting sustainability and social responsibility.

Excluded:

Standardization of purely technical matters not related to human characteristics and abilities.

#### **1.1.2 Market, Environment and Objectives**

This section establishes a sequential development of thoughts regarding the Market for which the CEN/TC aims to fulfil the needs. This sequence of thoughts starts from a description of the current market situation relevant to the product or product grouping under consideration by the CEN/TC, continues on to an analysis of the different factors motivating/influencing the activities of the CEN/TC, to come to clear description of objectives for the CEN/TC, together with an accompanying strategy how to reach those objectives. Finally, a general 'risk analysis' is included highlighting issues that may delay or stop the CEN/TC achieving its set objectives.

#### **1.1.3 Market Situation**

CEN/TC 122 is preparing European Standards in the field of ergonomics, to meet the requirements of a free and fair European market. Standards are produced at all levels from standardisation of

ergonomics principles, standardisation of universal or widely applicable ergonomics information to standardisation for specific contexts and areas of application.

Standardisation in the field of ergonomics resulted from requirements to design work systems, work equipment, and products according to human characteristics in order to enhance the usability of these products and thus the productivity, health, safety and well-being of the operator or user. Target groups for ergonomics standards are in particular manufacturers, designers of products and workplaces, distributors, supervising authorities, testing and certification bodies, employers, employees, occupational health and safety experts and consumer organisations.

Enhancing health and safety which has long been subject to legal requirements at national level, also became mandatory at European level as a result of European Directives aiming either to ensure free movement of products or to improve working environments and the health and safety of workers at the workplace.

The basic requirements of European Directives need to be supported by technical provisions in European Standards. As was previously the case for national and/or ISO standards, a national regulatory body can decide to implement a standard in order to support legal requirements.

As yet, no world-wide authority is entitled to impose an enforcement of health and safety specifications of International Standards despite recent recommendations of establishing ergonomic principles in safety standards (for example ISO/IEC Guide 51).

As a matter of fact, CEN standards, when dealing with health and safety aspects, mostly do so in order to improve products in a market oriented perspective. Nevertheless, items such as noise, vibrations, cold and heat stresses have been the subject matter of CEN standards aiming at health and safety benefits.

Starting from these origins and in view of the Single Market conditions, ergonomics standardisation has a very clear protective perspective, although in a preventive approach. Health, safety, and well-being of the operator or user are regarded as design objectives in the design of products, machinery or work systems, which the designer has to design into his products in the design process. Ergonomic design provides for these objectives by designing products, work equipment and work systems by taking due account of human characteristics, to which the design of machinery shall be adapted, and thus improves the usability of the design objects for human beings.

#### **1.1.4 Situation in Legislation**

It is an objective of CEN/TC 122 to successfully meet the requirements of CEN, particularly in support of European Directives under Articles 114 and 153 of the European Treaty (Treaty on the Functioning of the European Union – TFEU), for example:

- The Council Directive of 17 May 2006 on the approximation of the laws of the Member States relating to machinery (2006/42/EC).
- The Directive 89/270/EEC of 30 March 1989 concerning health protection for the work at displays.
- Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC.

It is generally considered desirable for ergonomics standards to be developed in order to support:

- The Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work.
- The Council Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace (first individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).
- Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by

workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

- The Council Directive 89/656/EEC of 30 November 1989 concerning the minimum safety and health requirements for the use by workers of personal protective equipment at the workplace (third individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).
- The Council Directive 90/269/EEC of 29 May 1990 on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers (fourth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).
- The Council Directive 90/270/EEC of 29 May 1990 on the minimum safety and health requirements for work with display screen equipment (fifth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).
- Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work (Sixth individual Directive within the meaning of Article 16(1) of Council Directive 89/391/EEC)
- Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC)
- The Council Directive 92/57/EEC of 24 June 1992 on the implementation of the minimum safety and health requirements at temporary or mobile construction sites (eighth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC).
- The Council Directive 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work (ninth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC).
- The Council Directive 92/85/EEC of 19 October 1992 on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding (10th individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC).
- The Council Directive 92/91/EEC of 3 November 1992 on the minimum requirements for improving the safety and health protection of workers engaged in drilling in the mineral-extracting industries (11th individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC).
- The Council Directive 92/104/EEC of 3 December 1992 on the minimum requirements for improving the safety and health protection of workers in surface and underground mineral-extracting industries (12th individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC).
- Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004

In the case of the Machinery Directive (2006/42/EC), a high level of safety is enshrined in the principle of incorporating safety into the design and manufacturing of machines. When choosing the most appropriate solutions, the manufacturer shall apply the following principles, in the following order:

- eliminate or reduce risks as far as possible,
- take the necessary protective measures against risks that cannot be eliminated,

- inform users of the residual risks due to any shortcomings in the protective measures adopted, indicate whether any particular training is required and specify any need to provide personal protective equipment.

These principles have to be applied during a machine's entire lifetime, including installing, operating, adjusting, maintaining, cleaning, assembling, dismantling, repairing or transporting, and even in foreseeable abnormal situations. The manufacturer shall also take into account the conditions of use and the constraints imposed by wearing personal protective equipment so as to minimize the operator's discomfort, fatigue and stress.

Machinery put on the European Market has to meet the essential health and safety requirements laid down in the Machinery Directive (2006/42/EC). The aim of this European legislation was to harmonize the health and safety regulations related to machinery in order to create an internal European market allowing the free movement and trade of machinery.

Machinery manufactured in conformity with specified published European standards which have also been published as identically worded national standards ('transposed harmonised standards'), will be presumed to comply with the essential health and safety requirements of the Machinery Directive covered by those standards.

The European Committee for Standardisation (CEN) is working to produce a complex of European standards at three levels in support of the Machinery Directive:

- The first (A) level comprises general principles for the design of machinery.
- The second (B) level covers specific safety devices and ergonomic aspects.
- The third (C) level deals with specific classes of machinery by calling up the appropriate standards from the first two levels and addressing requirements specific to the class.

In the case of the Council Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment (which has been replaced by Regulation (EU) 2016/425 on personal protective equipment), a survey of the drafts prepared by the PPE Technical Committees identified insufficient consideration of ergonomics aspects concerning human body dimensions, interference with work performance, thermal properties, potentially harmful properties of PPE materials and sensory acceptance.

In the case of the Council Directive 89/391/EEC concerning the introduction of measures to encourage improvements in the safety and health of workers at work, aimed at comprehensive coverage of workers' health and safety, minimum requirements are laid down on the basis of a survey of current legislation on health and safety in Member States of the European Union.

According to the Council Directive 89/391/EEC the employers have the duties to adapt work to the individual, especially regarding the design of workplaces, the choice of work equipment, working and protection methods, with a view to all evicting monotonous work and work at predetermined work-rates.

The above mentioned European Directives give the legal environment for TC 122.

## **1.2 Quantitative Indicators of the Business Environment**

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the CEN/TC:

It is impossible to quantify the total market served by the products of CEN/TC 122 because of the wide range of applicability of these mainly general horizontal documents. Very important areas for the application of CEN ergonomic standards are

- the machinery sector,
- personal protective equipment;
- office and industrial work places.

The increased use of machinery and equipment (e.g. visual display terminals) is important for the economical growth of any country and there is now a wide spectrum of use from the mature

societies in the developed world to those in the emerging nations. Today machines/equipment are used for both professional use in such key sectors as metal and wood working, plastics and paper, construction, agriculture and forestry as well as non-professional use in the home and garden. Indeed, a growing trend is the migration of machines/equipment intended for professional use into the non-professional sector.

Ergonomics are essential requirements for personal protective equipment to deliver the targeted level of safety and well-being in intended operating conditions.

Office and industrial work places represent a big quantity of work places and are therefore a very important field of application for ergonomic standards.

The trade in both new and used machinery and equipment can be described as truly global with an increasing trend for multinational companies to manufacture in one continent for use around the world. In contrast, there is also a continuing growth in the manufacture and repair of machines in small and medium enterprises (SMEs) and it has been estimated that 90 % of employed persons work in SMEs.

It is impossible to quantify in any accurate way the total value of the global trade in machinery/equipment because the products of CEN/TC 122 influence the design and the usage of machinery produced for both professional and non-professional use including domestic and leisure purposes. These quantifications should be left to the various machinery sectors.

## **2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC**

The benefits of standardization of Ergonomics expected from the work of CEN/TC 122 are:

- to enhance health, safety and well-being of the users as well as the overall performance;
- to prepare standards in the field of ergonomics, in order to meet the requirements for ergonomic and efficient products under the conditions of free trade;
- to support European Directives which are adopted in the frame of the New Approach with the aim of deregulation in legislation;
- to support product TC's which draft product standards;
- to deliver a consistent set of ergonomic requirements as a reliable basis for world-wide product design (as EN ISO standards world-wide);
- to improve the accessibility and usability of products, systems, services, environments and facilities.

## **3 PARTICIPATION IN THE CEN/TC**

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

Except the CEN national members the following parties are interested in the standardisation process:

- European Commission,
- Industry (manufacturer of work equipment and personal protective equipment, visual display terminals, machinery, control centres etc.),
- ETUI-REHS The European Trade Union Institute for Research, Education and Health and Safety,
- ANEC European Association for the Co-ordination of Consumer Representation in Standardization,

- CEN/BT/WG 213 Strategic Advisory Group on Accessibility (SAGA)
- Health and Safety Government Bodies,
- National Boards of Occupational Health and Safety,
- National Working Environment Services,
- Public authorities,
- National Trade Union Confederations,
- National Employer's Associations,
- ECMA European Computer Manufacturers Association,
- FEES Federation of European Ergonomics Societies
- ILO International Labour Organization,
- WHO World Health Organization,
- CIB International Council for Building Research, Studies and Documentation,
- ICSID International Council of Societies of Industrial Design
- ICTA International Commission of Technology and Accessibility,
- ISSA International Social Security Association.

## **4 OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT**

### **4.1 Defined objectives of the CEN/TC**

CEN/TC 122, through standardisation and co-ordination of related activities, promotes the creation of working and living conditions which fit the anatomical, physiological and psychological characteristics of human beings taking into account the physical, social and technical environment.

The main objectives are to enhance safety, health, and well-being of the users as well as overall system performance. This work includes:

- basic standards related to fundamental characteristics of humans;
- functional standards related to ergonomics in the operation or use of equipment, processes, products or systems;
- environmental standards related to the effects of physical factors of the environment on humans;
- standards for ergonomic test procedures and for processing ergonomic data;
- co-ordination with CEN and ISO technical committees and co-operation with other organisations (IEA or other relevant professional organisations), stakeholders and users in the field of ergonomics.
- It is an objective of CEN/TC 122 to successfully meet the requirements of CEN, particularly in support of European Directives under the European Treaty (Treaty on the Functioning of the European Union – TFEU),
  - Articles 114 (e.g. the Machine Directive (2006/42/EC)) and
  - Article 153 (e.g. Directive concerning work with display screen equipment (90/270/EEC)).
- To support the requirements of CEN/CENELEC Guide 6.

## 4.2 Identified strategies to achieve the CEN/TCs defined objectives.

Accordingly, CEN/TC 122's strategy is to:

- adjust the extent of the work programme to the available resources, for example to the number and competencies of the experts available;
- establish/maintain a joint planning function of ISO/TC 159 and CEN/TC 122 Ergonomics in accordance with the Vienna Agreement;
- ensure, among experts, a balance between those of scientific competence and those experienced in practice to ensure that the contents of its standards are valid and usable;
- identify those branches of industry, services and trade where ergonomics needs will expand or arise;
- be aware of the consequences of ergonomics standards for existing laws, regulations and codes of practice;
- anticipate the specific needs of the social partners;
- offer assistance to CEN member bodies producing standards that pertain to the work of CEN/TC 122;
- seek out sufficient resources to fulfil the work programme;
- consider the strategic issues needed for improving the adoption, acceptance and use of ergonomics standards.

## 4.3 Environmental aspects

Ergonomics and environmental aspects go often hand in hand since ergonomics targets on the efficiency of the human-system interaction. E. g. a workplace designed according to ergonomics principles may increase the efficiency of the overall system. This leads to a lower energy and resource consumption.

But ergonomics requires inherently the consideration of human characteristics, capabilities and needs, which may go contrary to the requirements of environmental protection. For example may it be required to install more powerful illumination at a workplace which is not well equipped with it. This is often the case for elderly employees. Another example is the accessible house which has – due to the ramps – a higher consumption of space and resources.

CEN/TC 122 addresses environmental issues in the following way:

- a) CEN/TC 122 requests its working groups to consider the environmental side effects quantitatively while developing the ergonomics requirements, in order to
  - use environmental advantages as a further argument for the ergonomic solution, in case that ergonomics and environment go hand in hand;
  - find the most efficient balance between energy and resource consumption in the ergonomic solution.
- b) CEN/TC 122 requests its working groups to consider CEN Guide 4 for each work item, in order to document,
  - any relevant environmental aspects; and
  - how they will be addressed.

Furthermore CEN/TC 122 tries to operate in a resource-saving manner:

- physical meeting will be arranged at places that are easy to be accessed by train;
- co-located meetings with conferences and congresses may reduce the travelling of our participants;
- smaller meetings may be substituted by electronic conference calls or ballots;



- paper hand-outs will be avoided.

## **5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME**

Factors affecting the completion and implementation of these objectives:

- to collect and critically review ergonomics data relevant to standardisation pertinent to the design and manufacturing of machinery, the design and organisation of work processes and the layout of equipment as well as the control of the physical environment in the work premises;
- to consider the take up and use of CEN/TC 122 standards;
- to support the use of CEN/CENELEC Guide 6 while drafting and revising ergonomics standards.
- to identify those branches of industry, services and trade where ergonomics needs will expand or arise;
- to recognise the unavoidable time lags in producing and implementing standards;
- to set up and to implement an appropriate structure of operation for standardisation in ergonomics and its application;
- to make effective use of liaisons with other committees through which standards with ergonomic specifications have been or are being produced, sometimes with insufficient consideration of accepted ergonomics data and/or principles;
- to create within CEN/TC 122 a strategy planning function in charge of implementing and updating the present strategic policy statements;
- to co-ordinate a joint development in CEN/TC 122 and ISO/TC 159 in accordance with the Vienna Agreement.;
- to improve the co-ordination of the interested partners of the standards in conjunction with FEES and other relevant organizations.