

Mandate to the European Standards Bodies for a guidance document in the  
field of safety and usability of products by people with special needs  
(e.g. elderly and disabled)

**1 - Title**

Standards that promote barrier-free design, enabling the use of products by disabled and elderly people by applying the principles of design for all, adaptable design, and assistive technology.

**2 - Introduction**

This mandate is given under the framework standardisation mandate in the field of consumer safety.

The proportion of elderly people is increasing in the population of many European countries. In addition, people on average reach a higher age. This is a double ageing effect. Due to changes in health care systems and by their own choice, there is a distinct trend for elderly people and people with disabilities to live independently in their own homes as long as possible, with some assistance where necessary, rather than in special institutions. As currently about 120 million people in geographic Europe have disabilities or are elderly, this presents a huge challenge.

Living independently should be a right of everybody. This implies that people will have to perform at least part of the daily activities by themselves. However, the design of products and environments does not always take into account people with special needs. The effects of ageing are inevitable, and age related limitations may change the interaction with products considerably. For example, diminished hand force makes it more difficult to open all kinds of packaging and to operate folding products; diminished visual capacities make it difficult to read instructions or to see fine-tuning controls. People (of all age groups) with disabilities are facing similar problems; there is a large overlap in the two groups, since 70% of people with disabilities are aged 60 or over. Disabilities, just like the ageing process, affect certain functions. This will also change the interaction with products.

The effects of changing interactions are profound. First, personal autonomy is affected because people need help with many daily activities. Moreover, the risk of injury increases when the environment is not well adapted, and the possible consequences are more severe. Injury surveillance data clearly illustrate this risk.

In the European standards bodies, special needs are addressed in a number of committees for particular areas of assistive technology. However, there is no formal structure or procedure ensuring that the needs of all consumers of all ages, with or without disabilities or special abilities, are catered for in the entire standardisation process. Individual standardisation committees do not spontaneously take into account safety and usability for people with disabilities and for elderly people, except if they draft specific standards for assistive products. If general standards for consumer products do not meet the

requirements of these consumers with special needs, this means that many products and services cannot be used by a large part of the European population.

### **3 - Identification of hazards and risks**

Product related hazards are present in many products. A hazard is only a *potential* source of harm. Products should be made safe; this is the aim of most safety standards. A safe product means that the risk of injury is minimised; this is a combined measure of the *probability* and the *severity* of injury that may occur during person-product interactions. This is the key to safe design for people who grow older or have disabilities: due to their personal characteristics, or the technical aids they use, they may have different interactions with products than other people, which may result in higher probability of injury and more severe injuries.

An example which illustrates this: the design of mobile telephones does not adequately take into account the electromagnetic influence they may have on many technical aids such as electric wheelchairs.

The personal characteristics of people with special needs can generally be qualified as limitations in one or more functions: vision, hearing, cognitive functions, mental functions, movement, balance, sensory functions, stamina, or anthropometry.

The possible risk-generating interactions can be conveniently depicted in a matrix which has the limitations on one axis and product related hazards on the other axis. In the matrix cells the increased risk, if any, can be indicated. Such a matrix may stimulate designers and standardisation committees to look systematically at people with special needs in relation to safety. A similar approach, focusing on intended functions rather than hazards, yields a systematic overview of usability problems.

In order to maximise usability and minimise risk, the product side of the interaction can be influenced. This means that products have to be designed in such a way that the interaction is possible and safe for users who have limitations. It may be necessary to do additional product use studies in order to find out how people with special needs actually use a specific product.

### **4 - Evidence of risk**

Many products and environments are currently not designed in an ideal way to address the needs of ageing people and people with disabilities. For example, people of 55 years and over have a higher incidence of fatal and hospital-treated injuries than the younger population. Falling/slipping, bumping against obstacles in the home, falls from stairs or out of bed are frequent scenarios (CSI, 1998).

In a survey study performed in Vienna, it was shown that more than 27% of all persons over 60 suffer an accident each year. Most accidents happen at home or in public traffic areas (as pedestrians). Risk factors include low physical activity and the type of household equipment.

If analysed for the possible role of products, it is clear that the rate of injury to elderly people is higher than average for a large number of products (internal report CSI, 1996). The response to this data should not be denying the use of many products to this group, or relying on the development of stigmatising special designs. Instead, the products should be designed to be safe for all users.

Some examples of problems and possible solutions:

- if domestic appliances have controls that are difficult to reach or require much effort to operate, some elderly people will have problems controlling these products. For example interaction with appliances such as electric kettles may have an increased risk. The same is true for gardening equipment, hedge trimmers, bicycles (brakes) etc.;
- in other cases, the product does not give adequate feedback about its status to people with poor sight or hearing. Clear, adaptable visual and audible signals are required to achieve a safer interaction.
- people having memory or concentration problems (e.g. due to medication) benefit from automatic shut-offs of cooker ranges etc.
- the huge problem of elderly people falling, resulting *inter alia* in hip fractures, cannot be solved by standardisation alone; health problems and medication contribute to this problem. But requirements for flooring, stairs, thresholds, etc. could be optimised with elderly people in mind.

For people with disabilities the level of functional limitation is often more severe, so that risks are even higher. In addition, they have a risk of accidents with products they have to depend on, such as falls out of a wheelchair. However, the current injury surveillance systems do not systematically register whether the injured person had disabilities.

### **5 - Principles of requirements for the safety of people with special needs: Design for all, adaptable design and assistive technology**

It is acknowledged that it will not be possible to design everything so that it can be used by everyone. There will always be consumers with a combination of severe physical, sensory and cognitive impairments who will not be able to use a product or service. However, it is not reasonable to refer consumers with special needs to special designs for each major product or service; this approach would exclude them from the advantages of economy of scale, and hence lead to *de facto* discrimination. A better approach is to apply the principle of design for all wherever possible, to strive for adaptable designs in most other cases, and to offer assistive technology where it is necessary.

*Design for all* implies that products are designed in such a way that people with the widest range of abilities have access to them and can use them in a safe and convenient way.

*Adaptable design* implies that a product can be adjusted to the needs of the user when putting into use, or each time when used. This should be achieved preferably by standard adjustment options or accessories; alternatives are compatibility with third-party assistive devices or facilitation of custom modifications.

*Assistive technology* means that technology is used to construct new products specifically targeted at elderly people or people with disabilities, to compensate for decrease or loss of function.

Requirements aimed at safety and usability of products should take into account all combinations of product characteristics (in particular hazardous properties) and person characteristics (including limitations). All foreseeable interactions should be systematically considered. In removing or minimising the risks, there is a preferred

hierarchy of safety measures: first remove or minimise hazards by design; second provide guards on the product or advise the use of protective equipment; and finally warn users about residual hazards.

The hazards to be considered are well known from the field of machine safety: products may present mechanical, electrical, chemical, radiation, thermal, fire/explosion and conceptual hazards.

Safety and usability information should be provided to instruct people about the safe use and to warn against residual hazards. The information should both identify the hazard and indicate the precautions to be taken. If necessary, information should be given about the usability by people with functional limitations; however, this should not take the form of an easy exclusion clause.

Safety and usability information comprises purchase information, instructions for use, markings and warnings. It should be designed to be easily readable and understandable.

## **6 - National and European regulations and standards**

European standards are currently critical for the safety level of many products in Europe. Therefore it is essential that the principles of *design for all*, adaptive design and assistive technology are applied throughout the standardisation process.

The European public authorities are committed to promoting social integration. The sheer numbers of elderly people necessitate maximum effort to optimise the quality of life and to integrate this group, even for economic reasons (otherwise the cost of care will continue to increase). The Amsterdam Treaty (Article 95 and annexed declaration) gives European institutions a moral obligation to take on board the needs of disabled people. In addition, the European Directive on General Product Safety (92/59/EEC) specifies that any product placed on the market should be safe. A safe product is defined as *Any product which, under normal or foreseeable conditions of use [...] does not present any risks or only the minimum risks compatible with the product's use [...]*. This requirement is clearly not limited to healthy young adults. It should take into account the categories of consumers at serious risk when using the product (see article 2c of the directive 92/59/CE). The challenge is to implement this Directive via horizontal standards and technical product specifications, in such a way that the risks are minimised also for people with special needs.

Within Europe, a number of programmes and activities have been initiated to achieve barrier free design of products.

The Technology Initiative for Disabled and Elderly People (TIDE), a research and development programme of the European Commission (DG XIII), amongst other things resulted in the HEART study (rehabilitation technology standardisation).

COST 219 is a project within the context of the European organisation for Co-operation in the field of Scientific and Technical Research. It dealt with future telecommunication and teleinformatics facilities for disabled people.

Other relevant COST actions include: A5, Ageing and technology; COST 322, Buses; COST 335, Accessibility of railway traffic.

In the field of telecommunications, ETSI organised a workshop on ICT Standardisation and Disability.

Within European standardisation, specific committees are addressing elderly and disability issues in various ways:

- CEN/TC 293 Technical aids for disabled persons (for example walking aids and wheel chairs);
- CEN/TC 224 Machine readable cards, pays considerable attention to special requirements of many consumers;
- CEN/TC 251 Medical informatics;
- CEN/TC10/WG 7 is drafting standards to make new lifts and escalators accessible to disabled people.

Whereas these are very useful activities, they have a limited scope. Standardisation of consumer products and environments should routinely address the needs of ageing people and people with disabilities. In Europe there is currently no general approach to satisfying this aim, in contrast to the USA where the Americans with Disabilities Act provides a legislative framework which is complemented by standards activities.<sup>1</sup>

In order to make sure that all relevant committees address the needs of ageing people and people with disabilities, it is necessary to give them guidance on both the nature and extent of the problems and to provide strategies for solving them. Therefore, an inventory should be made of relevant limitations and of the general principles to be applied in designing, taking these limitations into account. This has to be done in close co-operation with organisations of elderly and disabled people, consumer organisations in general and designers specialised in Design for all.

The work should result in practical guidelines that can be applied by all relevant standardisation committees. In addition, these committees should be made aware of the existence of the guidelines, and be stimulated to use them. Any experience with the use should be systematically collected in order to get feedback and to improve the guidelines continuously.

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<sup>1</sup> The Americans with Disabilities Act of 1990 prohibits discrimination on the basis of disability in employment, programs and services provided by state and local governments, goods and services provided by private companies, and in commercial facilities. It explicitly makes reference to standards as one of the means to achieve this aim.

## **7 – Mandate.**

Given that:

users with special needs may be excluded from using many products in a safe and comfortable way, unless specific requirements are included in standards that take their limitations into account; the standards work for people with special needs is currently mainly focused on assistive technology;

standardisation committees need to be made aware of elderly people and those with special needs as potential users or contact groups of the products they are dealing with;

standardisation committees need clear and detailed information about the nature and extent of limitations people may have due to ageing or disability, and guidance in using this information to produce more adequate requirements,

the European bodies responsible for standardisation, being CEN, CENELEC and ETSI are requested to accept a mandate to:

**AS A FIRST STEP.**

- draft a guidance document which explains how to address the needs of elderly and disabled people in product standards. The document should explain the principles of design for all and adaptable design, and provide information about the limitations that should be taken into account. Documents from other sources, especially the USA, should be taken into account. In addition, the document should describe an approach to use this information systematically in producing requirements, so that the needs of people with special needs are taken into account.
- set up a mechanism to make sure that the guidance document is actually used and continuously improved: distribute the document to all relevant technical bodies; promote ways of ensuring that the information is accessible at the right time; request committees to report on use and experiences at regular intervals; evaluate the use and report to the Commission;

**AS A SECOND STEP, AFTER PUBLICATION OF THE GUIDANCE DOCUMENT.**

- possibly review specific existing standards in view of possible amendment in the context of the guidance document.

The European bodies shall take into account the work done in the framework of the mandate to CEN, CENELEC and ETSI in the field of information and communications technologies (ICT) for disabled and elderly people.

## **8 - Execution of the mandate.**

CEN, CENELEC and ETSI shall present to the Commission, within 3 months of the date of acceptance of this mandate, a report setting out the arrangements they have made for execution of this mandate.

The report shall include target dates for the presentation of the guidance document and for the proposition of the list of standards, which should be revised as a second step after publication of the guidance document.

Relevant interested parties, such as representatives of consumers, shall have the possibility to participate to the process.

Following the execution of this mandate and depending on its result, a possible further mandate for the production of revised standards can be envisaged.

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