



JAPANESE
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STANDARD

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(ISO 13852 : 1996)

**Safety of machinery—
Safety distances to prevent danger
zones being reached by the upper
limbs**

ICS 13.110; 13.180

Reference number : JIS B 9707 : 2002 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry, and the Minister of Health, Labour and Welfare through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Safety of machinery— Safety distances to prevent danger zones being reached by the upper limbs

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 13852** *Safety of machinery—Safety distances to prevent danger zones being reached by the upper limbs* published in 1996 without modifying the technical contents.

The foreword of the original International Standard has been excluded from this Standard because it is not part of the provisions. Also, the portion of introduction of the original International Standard which is described in another standard has been excluded from this Standard.

One method of eliminating or reducing risks caused by machinery is to make use of safety distances preventing danger zones from being reached by the upper limbs.

In specifying safety distances, a number of aspects have to be taken into consideration, such as:

- reach situation occurring when machinery is being used;
- reliable surveys of anthropometric data, taking into account ethnic groups likely to be found in the countries concerned;
- biomechanical facts, such as compression and stretching of parts of the body and limits of joint rotation;
- technical and practical aspects.

If the aspects were further developed, the current state of the art, reflected in this Standard, could be improved.

1 Scope This Standard establishes values for safety distances to prevent danger zones being reached by the upper limbs of persons of 3 years of age and above. The distances apply when adequate safety can be achieved by distances alone.

NOTE 1 These safety distances will not provide sufficient protection against certain hazards, for example radiation and emission of substances. For such hazards, additional or other measures need to be taken.

The safety distances protect those persons who try to reach danger zones without additional aid and under the conditions specified for the different reaching situations.

This Standard need not be applied to machinery which is covered by certain electrical standards in which specific testing procedures are laid down, for example using the test finger.

For certain applications there are justifiable reasons to deviate from these safety distances. Standards dealing with these applications indicate how an adequate level of safety can be achieved.

NOTE 2 The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 13852 : 1996 *Safety of machinery—Safety distances to prevent danger zones being reached by the upper limbs* (IDT)

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

ISO/DIS 12100-1 *Safety of machinery—Basic concepts and general principles for design—Part 1 : Basic terminology, methodology*

3 Definitions For the purposes of this Standard, the definitions given in **ISO/DIS 12100-1** and the following definitions apply.

3.1 protective structure Physical obstructing which restricts the movement of the body and/or a part of it.

NOTE : For example, a guard or part of a machine.

3.2 safety distances Minimum distance a protective structure shall be placed from a danger zone.

4 Values for safety distances

4.1 General

4.1.1 Assumptions The safety distances have been derived by making the following assumptions:

- the protective structures and any openings in them retain their shape and position;
- safety distances are measured from the surface restricting the body or the relevant part of the body;
- that persons may force parts of the body over protective structures or through openings in an attempt to reach the danger zone;
- the reference plane is a level at which persons would normally stand, but need not necessarily be the floor (e.g. a working platform could be the reference plane);
- no aids such as chairs or ladders are used to change the reference plane;
- no aids such as rods or tools are used to extend the natural reach of the upper limbs.

4.1.2 Risk assessment Selection of the appropriate safety distance for reaching upwards (see 4.2) or reaching over protective structures (see 4.3) shall be dependent on a risk assessment (for risk assessment see **ISO/DIS 12100-1**). The risk assessment shall be based on the probability of occurrence of an injury and the foreseeable severity