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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18717.1-2002

**Ergonomic design for the safety of machinery -- Part 1:
Principles for determining the dimensions required for
openings for whole-body access into machinery
(English Translation)**

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Foreword

GB/T 18717 Ergonomic Design for the Safety of Machinery is divided into three parts.

---Part 1. Principles for Determining the Dimensions Required for Openings for Whole-body Access into Machinery;

---Part 2. Principles for Determining the Dimensions Required for Openings for Access of Parts of the Body into Machinery;

---Part 3. Anthropometric Data.

This Part is the first part of GB/T 18717; it is corresponding to ISO 15534-1. 2000 Ergonomic Design for the Safety of Machinery - Part 1. Principles for Determining the Dimensions Required for Openings for Whole-body Access into Machinery (English version). The degree of consistency between this Part and Part 1 in ISO 15534-1. Ergonomic Design for the Safety of Machinery is non-equivalent. Please see the main differences below.

---The Introduction part and the involved Bibliography [2] in the previous international standard are deleted;

---Three reference standards in the previous international standard are modified into corresponding national standards;

---GB/T 12985-1991 General Rules of Using Percentiles of the Body Dimensions for Products Design is added to the Bibliography part in the previous international standard;

---On the premise of the same conditions for the measurement of human body dimension, GB/T 5703-1999 Basic Human Body Measurements for Technological Design (please refer to Bibliography [1]) shall prevail in terms of human body measurement.

In this Part, Appendix A is normative; Appendix B is informative.

This Part was proposed by General Administration of Quality Supervision, Inspection and Quarantine.

This Part shall be under the jurisdiction of National Technical Committee on Mechanical Safety of Standardization Administration of China (CSBTS/TC 208).

The responsible drafting organizations of this Part. China National Institute of Standardization, China Academy of Machinery Science and Technology Group Co., Ltd., Jilin Institute of Science and Technology on Safety.

1 Scope

This Part specifies five dimensions required for openings (minimum opening dimensions, please refer to Bibliography [2]) for whole-body access into machinery (please refer to 3.1 in GB/T 15706.1-1995), and eleven formulas for the calculation of opening dimension which combine anthropometric data (human body dimension) and additional space (allowances).

Please refer to Table 1 in GB/T 18717.3-2002 for anthropometric data. Please refer to Appendix A in this Part for the numerical value of additional space.

Dimensions for passages are based on the values for either the 95th or the 99th percentiles of the expected user population (please refer to 3.1 in Bibliography [2]).

Values for the 99th percentile apply to emergency egress routes.

The anthropometric data given in GB/T 18717.3-2002 originates from static measurements of nude persons, and do not take into account body movements, clothing, equipment, machinery-operating conditions or environmental conditions.

This Part is applicable to non-mobile machinery. In terms of mobile machinery, there may be additional specific requirements.

Situations where people are to be prevented from reaching a hazard are elaborated in GB 12265.1.

2 Normative References

Through the quotation in this Part of GB/T 18717, clauses in the following documents become clauses in this Part. In terms of references with a specific date, all the subsequent modification sheets (excluding corrected content) or revised versions are not applicable to this Standard. However, all parties that reach an agreement in accordance with this Standard are encouraged to explore the possibility of adopting the latest versions of these documents. In terms of references without a specific date, the latest versions are applicable to this Standard.

GB 12265.1 Safety of Machinery - Safety Distances to Prevent Danger Zones Being Reached by the Upper Limbs (eqv EN 294)

GB/T 15706.1-1995 Safety of Machinery - Basic Concept, General Principles for Design - Part 1. Basic Terminology, Methodology (eqv ISO/TR 12100-1. 1992)

GB/T 18717.3-2002 Ergonomic Design for the Safety of Machinery - Part 3. Anthropometric Data (neq ISO 15534-2. 2000)

3 General Requirements

This Part specifies the dimensions required for openings for human body's ingress and egress of machinery in five positions. Other than basic anthropometric data, the numerical value of these dimensions shall also consider specific details regarding the operator and the operating conditions. It is necessary to add allowances to permit unhindered and safe entry and working.

In this aspect, the following criteria of are particular significance.

a) Factors that influence convenient access.

- 1) The type of clothing, for example, light or heavy clothing;
- 2) Whether tools are being carried, for example, for maintenance or repair purposes;
- 3) Whether there is additional equipment, for example, personal protective

equipment (including protective clothing), or portable lighting is being carried or worn;

- 4) The demands of the task, for example, posture, nature and speed of movement, lines of sight, application of force;
- 5) Frequency and duration of task;
- 6) Length of passage, for example, through a relatively thin wall (wall of a tank or a groove) where there is space for movement at the exit, or through a channel-type passage;
- 7) The amount of space available to allow for the dynamic nature of movement to escape from danger;
- 8) The position and size of supports for the body, such as foot support, and hand holds;
- b) Environmental conditions (such as darkness, heat, moisture and noise);
- c) Level of risk during the task.

The allowances needed in the above-mentioned items depend on the particular

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