
Ergonomics — Manual handling —
Part 1:
Lifting and carrying

Ergonomie — Manutention manuelle —

Partie 1: Manutention verticale et manutention horizontale



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11228-1 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 3, *Anthropometry and biomechanics*.

ISO 11228 consists of the following parts, under the general title *Ergonomics — Manual handling*:

- *Part 1: Lifting and carrying*
- *Part 2: Pushing and pulling*
- *Part 3: Handling of low loads at high frequency*

Introduction

The three parts of ISO 11228 establish ergonomic recommendations for different manual handling tasks. All the parts apply to such vocational and non-occupational activities. The standards will provide information for designers, employers, employees and others involved in work, job and product design. It is connected with ISO 11226.

This part of ISO 11228 is the first International Standard on manual handling.

Disorders of the musculoskeletal system are common worldwide and one of the most frequent disorders in occupational health.

Factors such as the size and mass of the object being handled, working posture, and the frequency and duration of manual handling, can alone, or in combination, lead to a hazardous handling activity and correspond to the risk of musculoskeletal disorders.

It is desirable to specify the recommended limits for the mass of objects in combination with working postures, and frequency and duration of manual handling which persons may be reasonably expected to exert when carrying out activities associated with manual handling.

An ergonomic approach has a significant impact on reducing the risks of lifting and carrying. Of particular relevance is a good design of the work, especially the tasks and the workplace, which may include the use of appropriate aids.

This part of ISO 11228 provides a step-by-step approach to estimating the health risks of manual lifting and carrying; at each step, recommended limits are proposed. In addition, practical guidance for ergonomic organization of manual handling is given in Annexes, A, B and C.

The risk-assessment model presented allows the estimation of the risk associated with a manual material-handling task. It takes into consideration the hazards (unfavourable conditions) related to the manual lifting and the time spent with manual-handling activities. Unfavourable conditions could be high masses to be manipulated or awkward postures required during the lifting process such as twisted or bent trunks or far reaches. This part of ISO 11228 provides information on both repetitive and non-repetitive lifting.

The recommended limits provided are based on the integration of data derived from four major research approaches, namely the epidemiological, the biomechanical, the physiological and the psychophysical approach.

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Ergonomics — Manual handling —

Part 1: Lifting and carrying

1 Scope

This part of ISO 11228 specifies recommended limits for manual lifting and carrying while taking into account, respectively, the intensity, the frequency and the duration of the task. This part of ISO 11228 is designed to provide guidance on the assessment of several task variables, allowing the health risks for the working population to be evaluated.

This part of ISO 11228 applies to manual handling of objects with a mass of 3 kg or more.

This part of ISO 11228 applies to moderate walking speed, i.e. 0,5 m/s to 1,0 m/s on a horizontal level surface.

This part of ISO 11228 does not include holding of objects (without walking), pushing or pulling of objects, lifting with one hand, manual handling while seated, and lifting by two or more people. Holding, pushing and pulling of objects will be included in other parts of ISO 11228.

This part of ISO 11228 is based on an 8 h working day. It does not concern analysis of combined tasks in a shift during a day.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC Guide 51, *Safety aspects — Guidelines for their inclusion in standards*

ISO 7250:1996, *Basic human body measurements for technological design*

ISO 14121, *Safety of machinery — Principles of risk assessment*

EN 1005-2, *Safety of machinery — Human physical performance — Part 2: Manual handling of machinery and component parts of machinery*¹⁾

1) To be published.