
Ergonomics — Manual handling —

**Part 3:
Handling of low loads at high frequency**

Ergonomie — Manutention manuelle —

Partie 3: Manipulation de charges faibles à fréquence de répétition élevée



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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 11228-3 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

Handling of low loads at high frequency (repetitive work) can cause pain and fatigue, which could lead to musculoskeletal disorders, reduced productivity, and deteriorated posture and movement co-ordination. The latter can increase the risk of errors and may result in reduced quality and hazardous situations. Good ergonomic design and proper organization of work are basic requirements for the avoidance of the adverse effects mentioned.

Risk factors in repetitive work include the frequency of actions, exposure duration, postures and movement of body segments, forces associated with the work, work organization, job control, demands on work output (e.g. quality, task precision) and level of training/skill. Additional factors can include environmental factors, such as climate, noise, vibration and illumination.

The recommendations provided by this part of ISO 11228 are based on available scientific evidence concerning the physiology and epidemiology of manual work. The knowledge is, however, limited, and the suggested guidelines are subject to change according to future research.

Ergonomics — Manual handling —

Part 3: Handling of low loads at high frequency

1 Scope

This part of ISO 11228 establishes ergonomic recommendations for repetitive work tasks involving the manual handling of low loads at high frequency. It provides guidance on the identification and assessment of risk factors commonly associated with handling low loads at high frequency, thereby allowing evaluation of the related health risks to the working population. The recommendations apply to the adult working population and are intended to give reasonable protection for nearly all healthy adults. Those recommendations concerning health risks and control measures are mainly based on experimental studies regarding musculoskeletal loading, discomfort/pain and endurance/fatigue related to methods of working. For the evaluation of working postures, refer to ISO 11226.

This part of ISO 11228 is intended to provide information for all those involved in the design or redesign of work, jobs and products.

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 6385, *Ergonomic principles in the design of work systems*

ISO 11226, *Ergonomics — Evaluation of static working postures*

ISO 11228-1, *Ergonomics — Manual handling — Part 1: Lifting and carrying*

ISO 11228-2, *Ergonomics — Manual handling — Part 2: Pushing and pulling*

ISO 14738, *Safety of machinery — Anthropometric requirements for the design of workstations at machinery*

ISO 15534 (all parts), *Ergonomic design for the safety of machinery*



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