
INTERNATIONAL STANDARD



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Continuous mechanical handling equipment for loose bulk materials — Storage equipment : Storage bins and bunkers, silos and hoppers, bin gates — Safety code

Engins de manutention continue pour produits en vrac — Équipement de stockage : Trémies, silos, obturateurs — Code de sécurité

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 101 has reviewed ISO Recommendation R 1820 and found it technically suitable for transformation. International Standard ISO 1820 therefore replaces ISO Recommendation R 1820-1970 to which it is technically identical.

ISO Recommendation R 1820 was approved by the Member Bodies of the following countries :

Austria	Germany	Norway
Belgium	Greece	Peru
Canada	Israel	Poland
Czechoslovakia	Italy	South Africa, Rep. of
Egypt, Arab Rep. of	Japan	Sweden
Finland	Korea, Rep. of	United Kingdom
France	New Zealand	U.S.S.R.

No Member Body expressed disapproval of the Recommendation.

No Member Body disapproved the transformation of ISO/R 1820 into an International Standard.

Continuous mechanical handling equipment for loose bulk materials – Storage equipment : Storage bins and bunkers, silos and hoppers, bin gates – Safety code

1 SCOPE

This International Standard specifies, in addition to the general safety rules set out in ISO/R 1819, the special safety rules for the following continuous mechanical handling equipment for loose bulk materials: storage equipment such as storage bins and bunkers, silos and hoppers, bin gates.

2 FIELD OF APPLICATION

The safety rules laid down in this International Standard apply regardless of the use for which the equipment is intended.

These safety rules limit the supplier's responsibility to continuous mechanical handling equipment proper, excluding the structures to which such equipment is affixed.

3 REFERENCE

ISO/R 1819, *Continuous mechanical handling equipment – Safety code – General rules*.

4 SPECIAL SAFETY RULES

The construction and operation of storage equipment such as storage bins and bunkers, silos and hoppers, bin gates, shall meet

- the legal and local requirements relating to safety in general¹⁾;
- the principles laid down in clause 1 of ISO/R 1819;
- the general rules laid down in clause 2 of ISO/R 1819;
- the following special rules :

4.1 In the construction stage (design and manufacture)

4.1.1 Bins and bunkers, silos and hoppers

4.1.1.1 GENERAL

4.1.1.1.1 The components shall be designed to bear the stipulated loads : dead weights, material stored, ancillary

superstructures, occasional overloads and climatic overloads if any.

4.1.1.1.2 Stability under all load conditions shall be ensured.

4.1.1.1.3 If the material stored is reclaimed by vehicles or other moving equipment the following minimum free passages shall be left between the supporting structures and the vehicles or other moving equipment :

- 500 mm in the case of a stationary isolated obstacle (post, pile, column, angle of building, etc. less than 300 mm wide, as measured in the direction of movement of equipment);
- 700 mm in the case of a stationary continuous obstacle (wall, warehouse, platform or wharf, building etc.).

4.1.1.1.4 According to the nature of products, the design of bins and bunkers, silos and hoppers, particularly the slopes of the walls, the position and size of discharge openings, shall be such as to ensure satisfactory flow of the product by gravity with or without the help of ancillary means.

Interior struts, interior ladders and other internal fittings shall be avoided as far as possible.

4.1.1.1.5 Bins and bunkers, silos and hoppers intended for use with dry combustible materials shall be constructed of fireproof materials.

NOTE – The above-mentioned rules apply to all bins and bunkers, silos and hoppers. When the latter are more than 1 500 mm deep, risks of workers being buried under products or sinking into them shall be prevented and, in particular, the following complementary rules are to be applied :

4.1.1.2 CLOSED BINS AND BUNKERS, SILOS AND HOPPERS

4.1.1.2.1 Inspection doors and detachable parts of closed bins and bunkers, silos and hoppers shall be fitted with a device enabling them to be locked with a key.

1) See appendix Z of ISO/R 1819.