

Code of practice for

Safe entry into silos

ICS 65.040.20

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee MHE/9, Continuous Mechanical Handling Equipment, upon which the following bodies were represented:

- Agricultural Engineers' Association
- Association of Consulting Engineers
- Automated Material Handling Systems Association
- British Aggregate Construction Materials Industries
- British Coal Corporation
- British Rubber Manufacturers' Association Ltd.
- Coke Oven Managers' Association
- Cranfield University
- Electrical, Electronic, Telecommunications and Plumbing Union
- Electricity Association
- Mechanical Handling Engineers' Association
- Solids Handling and Processing Association Ltd.

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Foreword

This British Standard has been prepared by Technical Committee MHE/9. It is intended to give guidance on the preparation of individual codes of practice relating to particular silos.

This British Standard provides guidance on preparation for entry into and the safety precautions necessary when working in a silo whether for maintenance or because of operational problems.

Some of the detailed recommendations contained in this British Standard may not be necessary for the safe operation of certain open silos (hoppers) of stout design (ratio of height to width less than 1.5). The decision not to follow details of the code of practice should only be made after a risk assessment has been carried out and appropriate procedures adopted.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

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1 Scope

This British Standard gives recommendations on operations prior to entry into a silo, bunker, bin or hopper; safety and access equipment for use therein; means of access; and safety precautions when working in, and affecting rescue from, a silo, bunker, bin or hopper.

NOTE 1. Statutory provisions covering safe means of access to elevated and confined working spaces are contained in the Mines and Quarries Act 1954 [1], the Factories Act 1961 [2] and regulations made under these. The Health and Safety at Work etc. Act 1974 [3] and regulations made under this have general requirements for safe systems of work including means of access and egress.

2 References

2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 8. For dated references, only the edition cited applies: any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Safety and access equipment

3.1 Fall arrest and work positioning systems, lanyards and full body harnesses

Work positioning systems should conform to BS EN 358, full body harnesses should conform to BS EN 361 and lanyards should conform to BS EN 354. They can be used in conjunction with fall-arrest devices to form a fall arrest system which should conform to BS EN 363. The use of other means of providing safe access is not precluded.

NOTE. General requirements for instructions for use and for markings are given in BS EN 365.

3.2 Anchorage lines

An anchorage line is used to provide attachment to the structure of the silo and a lanyard is then used between the anchorage line and the safety harness worn by the operator.

For anchorage lines, anti-static nylon rope, 16 mm in diameter, should be used as a prepared length. One end should be finished off with an eye splice formed around a nylon thimble, and the other end whipped and oversheathed with a ferrule.

The line should be long enough to allow the whole working area to be covered. In the event of a fall, to reduce the possibility of the operator swinging sideways into contact with the surrounding surfaces, the line should be fixed to an anchorage point as near as possible vertically above the working area. The anchorage point should also be high enough above the working area to allow completely unobstructed movement at all times to any safety device attached to the line.

The line should be fixed to the anchorage point using a terminal fitting through the eye splice.

WARNING. There is evidence that the failure of nylon ropes in fall-arrest situations relates directly to the tying-off of the rope to structural steel members. Therefore, no line should be looped around structural steel members as the sharp edges could damage the line. A shackle, karabiner chain sling, wire rope or girder clamp should be used.

In use, surplus line should not be allowed to rest on the material as this could cause damage to the line in the event of material fall.

3.3 Lanyards

A lanyard is used to connect the safety harness to the anchorage line. It provides an effective and authorized means of restricting the depth of a fall.

CAUTION. It is important to recognize that the length of the standard lanyards which connect the safety harness to safety lines is critical and should not be exceeded.

The following practices have the effect of increasing the potential fall distance to an unacceptable level and should be avoided:

- extending the length of lanyards to give increased mobility in the silo;
- using lanyards designed for other harnesses;
- failing to weight the free end of a static safety line which would allow it to be picked up by the personal mobile arrester when ascending, so leaving a loop of free line above the climber;
- withdrawing lengths of safety line to the top of the silo prior to descending.

Wherever possible lanyards should not be attached to points on the waist belt of safety harnesses for the following reasons:

- these attachment points are not certified to withstand arresting forces in a fall; and
- in a fall situation the arresting forces could cause serious injury.