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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 19426-3

Structures for mine shafts — Part 3: Sinking stages

*Structures de puits de mine —
Partie 3: Plates-formes de fonçage*

ICS: 73.020

ISO/TC 82

Secretariat: **DIN**

Voting begins on:
2025-10-09

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2026-01-01

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 82, *Mining*.

A list of all parts in the ISO 19426 series can be found on the ISO website.

Introduction

Many mining companies, and many of the engineering companies which provide designs for mines, operate globally so ISO 19426 was developed in response to a desire for a unified global approach to the safe and robust design of structures for mine shafts. The characteristics of ore bodies, such as their depth and shape, vary in different areas so different design approaches have been developed and proven with use over time in different countries. Bringing these approaches together in ISO 19426 will facilitate improved safety and operational reliability.

The majority of the material in ISO 19426 deals with the loads to be applied in the design of structures for mine shafts. Some principles for structural design are given, but for the most part it is assumed that local standards will be used for the structural design. It is also recognized that typical equipment varies from country to country, so the clauses in ISO 19426 do not specify application of the principles to specific equipment. However, in some cases examples demonstrating the application of the principles to specific equipment are provided in informative Annexes.

Structures for mine shafts —

Part 3: Sinking stages

1 Scope

This document specifies the design loads and the design procedures for the structural design of stages and components of stages.

The loads specified in this document are not applicable for the design of stage ropes or sheaves. Rope sizes are determined in accordance with other standards.

This document does not cover matters of operational safety, or layout of the sinking stage and other mechanised methods of shaft sinking that shall be addressed using a rational method.

This document adopts a limit states design philosophy.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 10721-1, *Steel structures — Part 1: Materials and design*

ISO 10721-2, *Steel structures — Part 2: Fabrication and erection*

ISO 19426-1, *Structures for mine shafts — Part 1: Vocabulary*

ISO 22111, *Bases for design of structures — General requirements*

ISO 2394, *General principles on reliability for structures*

EN 1999-1-1, *Eurocode 9 — Part 1: Design of aluminium structures — Part 1: General structural rules*

EN 1999-1-3, *Eurocode 9 — Part 1: Design of aluminium structures — Part 3: Structures susceptible to fatigue*

EN 1999-1-4, *Eurocode 9 — Part 1: Design of aluminium structures — Part 4: Cold-formed structural sheeting*

CEN/TS 13001-3-1, *Cranes — General design — Part 3-1: Limit states and proof competence of steel structures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19426-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org>

4 Symbols

C	lashing unit grab capacity (m^3)
E	emergency load, or load effect (N, Nm)
e_G	stage load eccentricity factor
E_a	emergency impact load (N)
E_p	emergency impact load on a protective platform (N)
E_R	emergency rope load (N)
F	design load, or load effect (N, Nm)
G	permanent load, or load effect (N, Nm)
G_D	jumbo unit self-weight (N)
G_L	lashing unit self-weight (N)
K	weight of the kibble and full load (N)
L	span of an element or floor beam (m)
L_1	lashing unit lever arm or the VSM lashing unit grab lever arm (m)
L_2	stage jack lever arm horizontal (m)
L_3	stage jack lever arm vertical (m)
L_4	jumbo unit centre of gravity lever arm or the VSM lashing unit centre of gravity lever arm (m)
L_{5i}	hydraulic cylinder horizontal lever arm to the boom pivot point (m)
L_{6i}	hydraulic cylinder vertical lever arm to the boom pivot point (m)
M_D	jumbo unit moment about the boom pivot point (Nm)
M_L	lashing unit moment about the boom pivot point (Nm)
N_L	total number of lashing unit cycles
P	payload used during doubling-down (N)
p_D	uniformly distributed load on stage decks (N/m^2)
P_A	canopy load (N)
P_B	blast load (N)
P_C	concentrated load on stage decks (N)
P_D	total uniformly distributed imposed load on stage decks (N)
P_G	stage skid load (N)
P_H	kibble cross-head support load (N)
P_J	stage jack load (N)