***भारतीय मानक***

***Indian Standard***

**IS 10202 : 2024**

खानों में प्रयुक्त खुरचनी — विशिष्टि

*( पहला पुनरीक्षण* )

**Scrapers Used in Mines — Specification**

( *First Revision* )

ICS 73.100.01

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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Mining Techniques and Equipment Sectional Committee, MED 08

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Mining Techniques and Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1982. This standard is being revised to keep pace with the latest technological developments and international practices. Also, in this revision, the standard has been brought into the latest style and format of Indian Standards, and references of Indian Standards, wherever applicable have been updated. BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act*, 2016.

The relevant SI units and corresponding conversion factors are given below for guidance:

1 kgf/cm2 = 98.066 5 kPa (kilopascal) = 10 m of water column (WC)

= 0.098 066 5 MPa (Megapascal)

= 0.980 665 bar

1 Pa = 1 N/m2

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a. test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded-off value should be the same as that of the specified value in this standard.

*Indian Standard*

SCRAPERS USED IN MINES — SPECIFICATION

*( First Revision )*

**1 SCOPE**

This standard covers the requirements for scrapers used in mines for loading loosened rock onto the conveyor system.

**2 REFERENCES**

The standard listed below contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards listed below.

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 1570 (Part 6) : 1996 | Schedules for wrought steels: Part 6 carbon and alloy tool steels (*first revision*) |

**3 GRADES**

**3.1 Light Grade**

Suitable for rock of bulk density less than 2 t/m3 and having ratio of 2.5 or more between the width of scraper and the maximum size of rock to be handled by the scraper.

**3.2 Heavy Grade**

Suitable for rock of bulk density more than 2 t/m3 and having a ratio of less than 2.5 between the width of scraper and maximum size of rock to be handled by the scraper.

**4 TYPES, MAIN PARAMETERS AND DIMENSIONS**

As specified in Table 1.

**5 DESIGNATION**

A light grade paddle type scraper of rigid, multi-sectional construction with a theoretical capacity of 1.00 m3 shall be designated as:

Scraper, Light/PRM 1.00 IS 10202

NOTE — Letters ‘*P*’ ‘*B*’ and ‘*S*’ shall be employed to indicate paddle, box and scoop-type scrapers and letters ‘*R*’ and ‘*A*' shall be used to indicate rigid and articulated construction. Letter ‘*M*’ shall be used only if multi-sectional construction is desired.

**6 GENERAL REQUIREMENTS**

**6.1** The design of the scraper shall ensure quick assembling or dismantling under actual mining conditions.

**6.2** The design of scraper shall permit rapid changing of the detachable cutting edges, if used, under actual mining conditions.

**6.3** The detachable cutting edges, if used, shall be manufactured from wear-resistant steel conforming to IS 1570 (Part 6).

**6.4** Before assembling, the seating surfaces of the components of the scrapers shall be cleaned.

**6.5** Scrapers shall be supplied in assembled conditions. Scrapers of capacity greater than 0.4 m3 may be supplied in dismantled condition, if required by purchaser.

**6.6** An instruction manual shall be supplied with each scraper which shall lay down the instructions for use, proper maintenance, spare parts list and other relevant information.

**7 MARKING**

**7.1** Each scraper shall be marked with manufacturer’s name or trademark or identification mark, year and month of manufacture and the designation of the scraper.

**7.2 BIS Certification Marking**.

The scrapers may also be marked with the Standard Mark.

**7.2.1** The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed there under, and the products may be marked with the Standard Mark.

**Table 1 Type, Main Parameters and Dimensions of Scrapers**

(*Clause* 4)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl No.** | **Type** | **Construction** | **Theoretical Capacity, *Min***  m3 | **No. of Section** | **Overall Dimensions, *Max***  mm | | | | **Mass, *Max***  kg | | **Angle of Introduction**  Degrees |
| Length | Width | Height | | Light  Grade | Heavy  Grade |
|  |  | Under Operating Condition | Under No Load |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|  | Paddle | Single section, rigid | 0.10 | 1 | 950 | 710 | 400 | 400 | 85 | 160 | 45°, 60° |
| 0.16 | 1 | 1 250 | 850 | 500 | 500 | 160 | 265 |
| 0.25 | 1 | 1 400 | 950 | 560 | 560 | 265 | 400 |
| 0.40 | 1 | 1 700 | 1 120 | 670 | 670 | 400 | 500 |
| 0.60 | 1 | 2 000 | 1 250 | 800 | 800 | 500 | 800 |
| 1.00 | 1 | 2 360 | 1 500 | 900 | 900 | 800 | 1 180 |
| 1.60 | 1 | 2 650 | 1 700 | 1 060 | 1 060 | 1 180 | 1 600 |
| 2.50 | 1 | 3 000 | 1 900 | 1 250 | 1 250 | 1 600 | 2 120 |
| 4.00 | 1 | 3 550 | 2 240 | 2 120 | 1 500 | 2 120 | 3 000 |
| Single section, articulated collapsible | 0.25 | 1 | 1 700 | 950 | 500 | 265 | 400 | 560 |
| 0.40 | 1 | 2 000 | 1 120 | 670 | 360 | 560 | 800 |
| 0.60 | 1 | 2 360 | 1 250 | 800 | 450 | 800 | 1 180 |
| 1.00 | 1 | 2 650 | 1 500 | 900 | 500 | 1 180 | 1 600 |
| 1.60 | 1 | 3 000 | 1 700 | 1 060 | 670 | 1 600 | 2 120 |
| 2.50 | 1 | 3 550 | 1 800 | 1 250 | 800 | 2 120 | 3 000 |
| Multi- sectional, rigid | 0.60 | 2 | 2 650 | 950 | 500 | 500 | 800 | — | 30°, 45° |
| 1.00 | 2 | 4 500 | 1 120 | 670 | 670 | 1 180 | — |
| 1.60 | 3 | 5 600 | 1 120 | 670 | 670 | 1 600 | — |
|  | Box | Single section, rigid | 0.16 | 1 | 800 | 710 | 360 | 360 | 85 | 160 | 30°, 45° |
| 0.25 | 1 | 950 | 850 | 400 | 400 | 160 | 265 |
| 0.40 | 1 | 1 120 | 950 | 450 | 450 | 265 | 400 |
| 0.60 | 1 | 1 400 | 1 120 | 500 | 500 | 400 | 560 |
| 1.00 | 1 | 1 700 | 1 250 | 500 | 500 | 560 | 800 |
| 1.60 | 1 | 2 000 | 1 500 | 630 | 630 | 830 | 1 180 |
| 2.50 | 1 | 2 360 | 1 700 | 710 | 710 | 1 180 | 1 600 |
|  | Scoop1) | Single section, rigid | 0.16 | 1 | — | — | — | — | — | — | — |
| 0.25 | 1 | — | — | — | — | — | — |
| 0.40 | 1 | — | — | — | — | — | — |
| 1.00 | 1 | — | — | — | — | — | — |
| 1) The dimensions, mass and angle of introduction for scoop-type scrapers will be included at a later date. | | | | | | | | | | | |

**ANNEX A**

(*Foreword*)

**COMMITTEE COMPOSITION**

Mining Techniques and Equipment Sectional Committee, MED 08

|  |  |
| --- | --- |
| *Organization* | *Representative(s)* |
| Directorate General of Mines Safety, Dhanbad | Shri Saifullah Ansari **(*Chairperson*)** |
| Automotive Research Association of India, Pune | Shri Milind Kandalkar  Shri Dhondiram Mole (*Alternate*) |
| BEML Limited, Bengaluru | Shri V. R. S. Prasad Rao  Shri H. G. Suresh (*Alternate*) |
| CSIR-Central Institute for Mining and Fuel Research, Dhanbad | Dr Manoj Kumar Singh  Shri Surajit Dey (*Alternate* I)  Prof S. K. Kashyap (*Alternate* II) |
| Directorate General of Mines Safety, Dhanbad | Shri M. Arumugam |
| Eastern Coalfields Limited, Dishergarh | Shri Sarvesh Kumar  Shri Ajay Bhowmik (*Alternate*) |
| Eimco Elecon (India) Limited, Vallabh Vidyanagar | Shri Ram Ramesh Kale  Shri Vinay Jaynarayan Sharma (*Alternate*) |
| Hutti Gold Mines Company Limited, Bengaluru | Dr Prabhakar Sangoormath  Shri Mallikarjun Sarapur (*Alternate* I)  Ms Mega Hiremath (*Alternate* II) |
| Indian Institute of Technology (ISM), Dhanbad | Shri L. A. Kumaraswamidhas |
| Manganese Ore Limited, Nagpur | Shri Rakesh Kumar Verma  Shri Atul Sharma (*Alternate* I)  Shri Ashwini Baghele (*Alternate* II) |
| Metso Outotec India Private Limited, Vadodara | Shri Sandeep Deokisan Bhattad |
| Nanda Millar Company, Kolkata | Shri J. P. Goenka  Shri Madhur Goenka (*Alternate*) |
| Tata Steel Limited, Dhanbad | Shri Soumendhu Manjhi  Shri Abinash Jha (*Alternate*) |
| BIS Directorate General | Shri K. Venkateswara Rao, Scientist ‘F’/ Senior Director and Head (Mechanical) [Representing Director General (*Ex-officio*)] |

*Member Secretary*

Shri Shubham Tiwari

Scientist ‘D’/Joint Director

(Mechanical), BIS