
रोड निर्माण एवं रखरखाव उपकरण — रोड
मिलिंग मशीनरी — शब्दावली एवं वाणिज्यिक
विशिष्टियाँ

Road Construction and Maintenance
Equipment — Road Milling
Machinery — Terminology and
Commercial Specifications

ICS 93.080.10

© BIS 2024

© ISO 2018



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002

www.bis.gov.in www.standardsbis.in

NATIONAL FOREWORD

This Indian Standard which is identical to ISO 15645 : 2018 'Road construction and maintenance equipment — Road milling machinery — Terminology and commercial specifications', issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on recommendation of the Construction Plant and Machinery Sectional Committee and approval of the Mechanical Engineering Division Council.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminologies and conventions are, however, not identical to those used in Indian Standard. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

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.

Contents

Page

Introduction	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Description of milling machine components	2
4.1 General.....	2
4.2 Design of milling machine types.....	2
4.2.1 Traction and transport system.....	2
4.2.2 Cutting and milling system.....	2
4.2.3 Rotor drive methods.....	2
4.2.4 Layout of tools.....	2
4.2.5 System for levelling and control of working depth.....	2
4.2.6 System to remove or windrow aggregate materials.....	3
5 Commercial specifications	3
5.1 Characteristics of the traction and transport vehicle.....	3
5.1.1 Dimensional characteristics.....	3
5.1.2 Shipping dimensions (overall).....	3
5.1.3 Mass characteristics.....	3
5.1.4 Engine characteristics.....	4
5.1.5 Transmission characteristics.....	4
5.1.6 Position of steering.....	4
5.1.7 Characteristics and type of tyres or tracks.....	4
5.1.8 Tank characteristics.....	5
5.2 Cutting and milling system characteristics.....	5
5.3 Drum sprinkler device.....	6
5.4 System to remove or windrow aggregate materials.....	6
Annex A (informative) Examples of road milling machine designs and their assemblies	7
Bibliography	12

Introduction

This document deals with road milling machinery used in the retread process, which is carried out in road maintenance.

It provides definitions of the milling machine itself and its components, and technical characteristics.

It includes figures showing milling machines with a loading device and the positioning of work tools in a rotor.

Indian Standard

ROAD CONSTRUCTION AND MAINTENANCE EQUIPMENT — ROAD MILLING MACHINERY — TERMINOLOGY AND COMMERCIAL SPECIFICATIONS

1 Scope

This document establishes the terminology, functions, types and characteristics of road milling machinery.

It is applicable to the planing of pavements made of concrete, asphalt and similar materials with a view to removing them.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/>

3.1

road milling machinery

mobile road construction machine used to remove materials from paved surfaces by a milling action

3.2

road milling carrier

machine carrying all the systems constituting the road milling machine and distributing the necessary power to operate the different devices and to ensure movement during work and transfer

3.3

cutting and milling system

power-driven cylindrical bodies on which the milling tools are fitted

Note 1 to entry: The cylindrical bodies rotate during the milling operation. The tools are mostly cooled by a water sprinkler device.

3.4

levelling system

automatic or manual system used to obtain and maintain the geometry of the bottom of the cut

Note 1 to entry: The geometry of the bottom refers to both the longitudinal and cross-sections. The geometrical reference is taken from the existing section or from a specific layout.

3.5

system to remove or windrow aggregate material

transport system for the removal and storage of loose material

Note 1 to entry: The material is removed by either a front-, rear- or side-loading system, or is deposited as a windrow at the side or the back of the road milling machine.

3.6 operating mass

mass of the base machine with all standard equipment, with or without the cab, with or without ROPS, etc., with the operator (75 kg) and full fuel tank, and all fluid systems at their rated capacities and, when applicable, with the sprinkler water tank half full

4 Description of milling machine components

4.1 General

The machine is usually equipped with all the following devices:

- a traction and transport system;
- a cutting and milling system;
- a levelling system;
- a system to remove or windrow aggregate material.

4.2 Design of milling machine types

4.2.1 Traction and transport system

The description shall include the type of the ground drive system (wheels, tracks, etc.), the total number and position of wheels or tracks, the number and position of drive wheels or tracks, and the number and position of guiding wheels or tracks. The position of the rotor in relation to the wheels or tracks and the loading device is shown in [Figure A.1](#).

4.2.2 Cutting and milling system

The cutting and milling system comprises a rotor chamber and a drum sprinkler device (see [Figure A.3](#)).

4.2.3 Rotor drive methods

These may be

- hydraulic,
- hydromechanical, or
- mechanical (right and/or left),

or may depend on the direction of rotation of the rotor in relation to the direction of movement.

4.2.4 Layout of tools

The layout of tools on the rotor is application specific and is determined by the distance between two successive steps in the cross-section ([Figure A.2](#)).

4.2.5 System for levelling and control of working depth

The following characteristics shall be given:

- level reference (ground, machine element, cord or others);
- type of sensors (laser, ultrasound, electronic or hydraulic);
- adjustment;

- manual;
- automatic.

4.2.6 System to remove or windrow aggregate materials

The description shall include the types of conveyors, their drives and the methods of positioning.

5 Commercial specifications

5.1 Characteristics of the traction and transport vehicle

5.1.1 Dimensional characteristics

The dimensions shown in [Figure A.1](#) shall be specified:

- overall length with the removal system (mm);
- overall length without the removal system (mm);
- overall width in the working order (without the removal system) (mm);
- overall height (without the removal system) (mm);
- maximum front overhang (with the removal system) (mm);
- rear overhang (mm);
- inside turning radius (mm);
- outside turning radius (mm);
- distance between the rotor axis and the front wheels/tracks axis (mm);
- distance between the rotor axis and the rear wheels/tracks axis (mm);
- inside slewing radius of the rotor (mm);
- outside slewing radius of the rotor (mm);
- maximum loading height (mm);
- slewing angle of the removal system (degrees);
- side-shift of the rotor to the chassis (for machines with side-shifted rotor) (mm).

5.1.2 Shipping dimensions (overall)

The following dimensions shall be specified:

- length (mm);
- width (mm);
- height (mm).

5.1.3 Mass characteristics

The following characteristics shall be given:

- load shipping mass (kg);

- operating mass (kg) (see [3.6](#) for conditions);
- other masses (all in kg);
 - on the front axle;
 - on the rear axle;
 - cab;
 - protective structure;
 - pumping and liquid adding device.

5.1.4 Engine characteristics

The following characteristics shall be given:

- engine brand and type;
- rated power (kW);
 - NOTE See ISO 14396 for guidance.
- revolutions (r/min);
- cooling type.

5.1.5 Transmission characteristics

The following characteristics shall be given:

- number of tracks or wheels;
- number of driving axles;
- mechanical transmission;
- maximum working speed (km/h);
- maximum transfer speed (km/h).

5.1.6 Position of steering

This shall be specified as

- front,
- rear, or
- both.

5.1.7 Characteristics and type of tyres or tracks

This shall be specified as:

- front;
- rear.

5.1.8 Tank characteristics

The following characteristics shall be given:

- fuel tank capacity (dm³);
- hydraulic oil tank capacity (dm³);
- water tank capacity (dm³).

5.2 Cutting and milling system characteristics

The following characteristics shall be given (see [Figures A.2](#) and [A.3](#)):

- overall length (mm);
- working width of the rotor (mm);
- diameter of the rotor with tools (mm);
- number of tools;
- type of tools (with bits of sintered carbide):
 - tool in the form of a wand (for surfaces of cement and concrete);
 - tool in the form of a mushroom (for surfaces of asphalt and concrete);
- tool attachment method;
- direction of rotor rotation;
- revolutions of the rotor (min⁻¹);
- peripheral speeds at the end of tools (m/min);
- depth of cut in one pass (mm);
- permissible transverse tilt angle of the chassis (in relation to the horizontal) (degrees);
- maximum rotor tilt in the vertical plane (degrees);
- rotor drive method:
 - hydraulic;
 - hydromechanical;
 - mechanical;
- layout of tools:
 - step (mm);
- system of control of the working depth:
 - level reference (ground, machine element, cord or others);
 - type of sensors (laser, ultrasound, infrared or others);
 - adjustment of the working depth (manual, automatic).

5.3 Drum sprinkler device

The following characteristics shall be given:

- water pump delivery (l/min);
- pressure in the water supply system (MPa);
- number of spray nozzles.

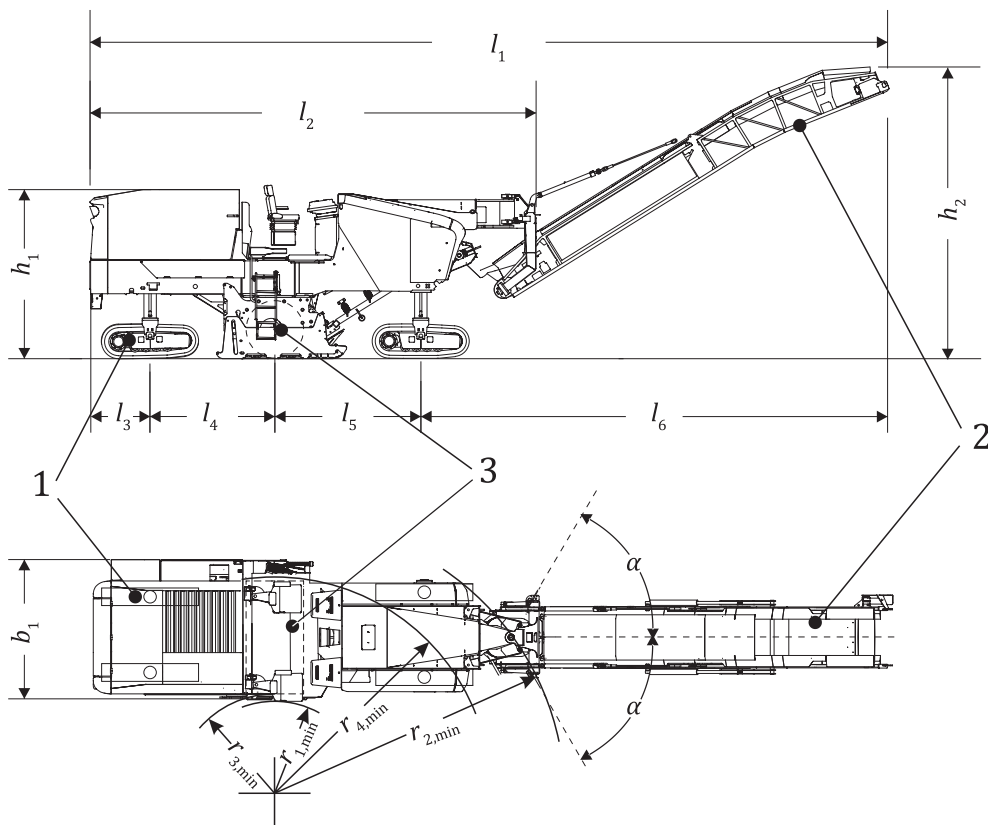
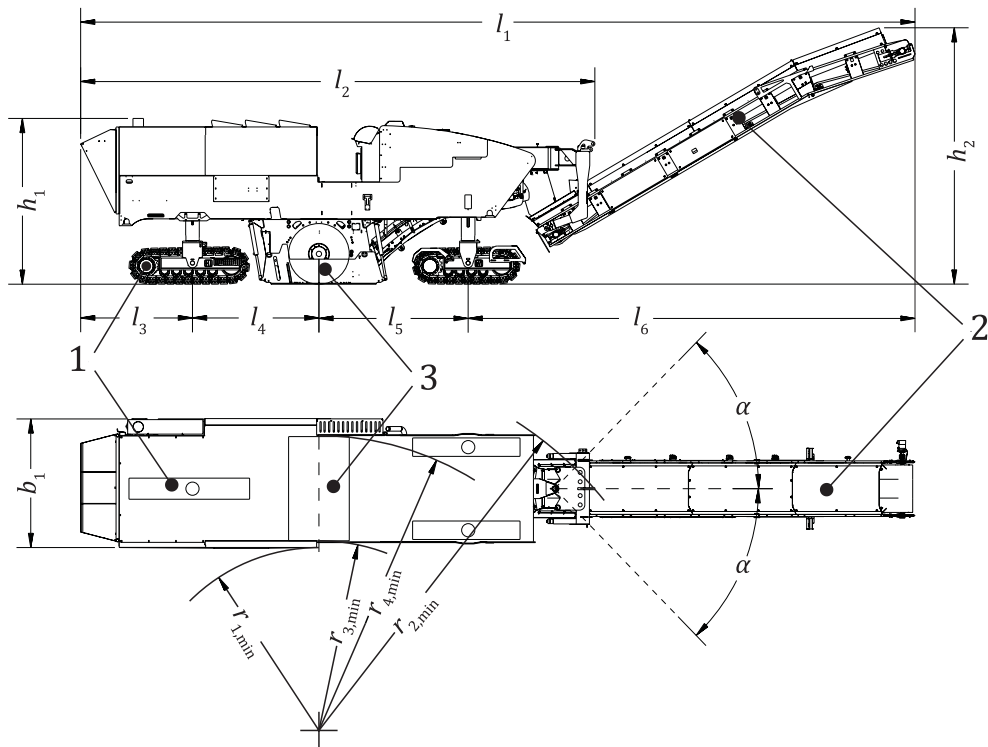
5.4 System to remove or windrow aggregate materials

The following characteristics shall be given:

- type of the conveyor (belt, drag slat or other);
- output of the conveyor (kg/h);
- width of the conveyor (mm);
- conveyor drive method (hydraulic, hydromechanical, mechanical);
- system of conveyor positioning (hydraulic, hydromechanical, mechanical);
- overall length with the removal system folded (mm).

Annex A
(informative)

Examples of road milling machine designs and their assemblies

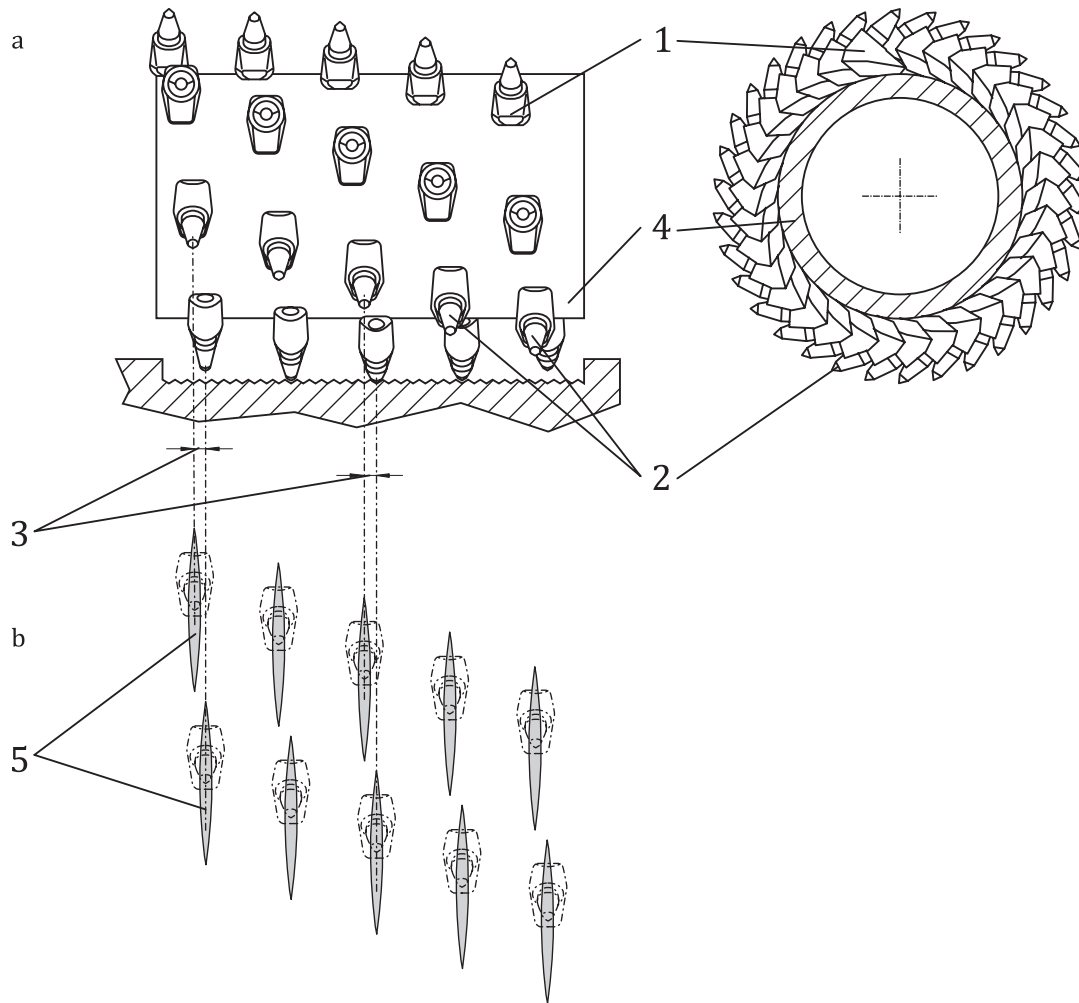


Key

- | | | | |
|-------|--|-------|---|
| 1 | tracks | h_1 | overall height (without the removal system) |
| 2 | removal system | h_2 | maximum loading height |
| 3 | rotor | b_1 | overall width (without the removal system) |
| l_1 | overall length (with the removal system) | r_1 | inside turning radius |

l_2	overall length (without the removal system)	r_2	outside turning radius
l_3	rear overhang	r_3	inside slewing radius of the rotor
l_4	distance between the rotor axis and the rear wheels/tracks axis	r_4	outside slewing radius of the rotor
l_5	distance between the rotor axis and the front wheels/tracks axis	α	slewing angle of the removal system
l_6	maximum front overhang (with the removal system)		

Figure A.1 — Dimensional characteristics of road milling machines (3 or 4 tracks) with a removal system

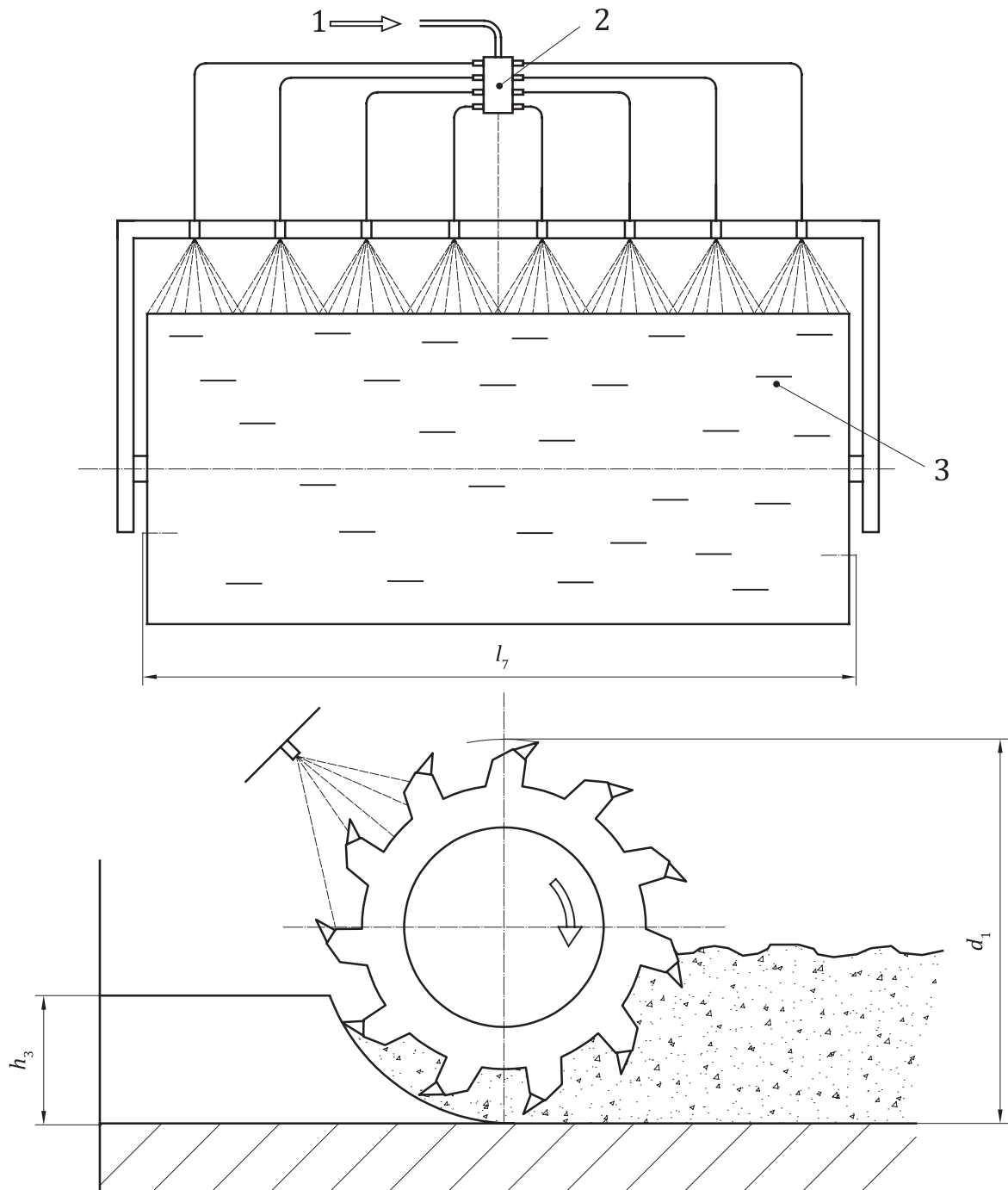


Key

- 1 tool holder
- 2 cutting tools
- 3 step
- 4 rotor
- 5 tool tracks
- a Pavement cross-section and tool attachment.
- b Top view of tool tracks.

NOTE The length of the tool tracks depends on the rotating speed of the rotor and the speed of the road milling machine.

Figure A.2 — Positioning of the working tools in a rotor



Key

- 1 water supply
- 2 distribution block
- 3 rotor
- l_7 working width of the rotor
- d_1 diameter of the rotor with tools
- h_3 depth of cut in one pass

Figure A.3 — Example of the rotor chamber and the drum sprinkler device

Bibliography

- [1] ISO 14396, *Reciprocating internal combustion engines — Determination and method for the measurement of engine power — Additional requirements for exhaust emission tests in accordance with ISO 8178*

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 2016* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Head (Publication & Sales), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: MED 18 (24233).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002

Telephones: 2323 0131, 2323 3375, 2323 9402

Website: www.bis.gov.in

Regional Offices:

Central : 601/A, Konnectus Tower -1, 6th Floor,
DMRC Building, Bhavbhuti Marg, New
Delhi 110002

Telephones

{ 2323 7617

Eastern : 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V,
Salt Lake, Kolkata, West Bengal 700091

{ 2367 0012
2320 9474

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg,
Chandigarh 160019

{ 265 9930

Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113

{ 2254 1442
2254 1216

Western : Manakalya, 4th Floor, NTH Complex (W Sector), F-10, MIDC, Andheri
(East), Mumbai 400093

{ 283 25838

Branches : AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HARYNA, HUBLI, HYDERABAD, JAIPUR, JAMMU & KASHMIR, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PARWANOO, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VIJAYAWADA.