

December 2023

For Comments only

भारतीय मानक का मसौदा
कटर सॅक्शन ड्रेज संघटक – विशिष्टि
भाग 1 कटर
[IS 10854 (Part 1) का प्रथम पुनरीक्षण]

DRAFT *INDIAN STANDARD*

CUTTER SUCTION DREDGE COMPONENT — SPECIFICATION
PART 1 CUTTER
[First Revision of IS 10854 (Part 1)]
(ICS no 47.060)

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**Last date for receipt
of comments is 01 02 2024**

Inland Harbour Crafts and Fishing Vessels Sectional Committee, TED 18

FOREWORD

This draft Indian Standard (Part 1) (First Revision) will be adopted by the Bureau of Indian Standards after the draft finalized by the Inland Harbour Crafts and Fishing Vessels Sectional Committee is approved by the Transport Engineering Division Council.

This Indian standard was first published in 1984. This first revision of the standard is being undertaken to update the standard and to incorporate latest technological advancement/ statutory requirements that have been specified. The salient features of this first revision are:

- a) Reference of latest Indian Standard has been given
- b) The Indian Standard has been drafted as per latest grafting guidelines.

This standard is to be published in several parts. Other parts in this series are:

- Part 2 : Suction Pipe
Part 3 : Ladder

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- Part 4 : Spuds
- Part 5 : Cast Spud Point
- Part 6 : Cast Spud Cylinder

The composition of the Committee responsible for the formulation of this standard is given at Annex A (Will be added later).

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.

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1 SCOPE

This standard covers the types and other requirements of the cutter used as a dredge component for cutter suction dredgers.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication the editions 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 editions of the standards indicated below:

<i>IS No</i>	<i>Title</i>
IS 1570 (Part 4) : 1988	Schedules for wrought steels: Part 4 alloy steels (Alloy Constructional And Spring Steels) with specified chemical composition and mechanical properties (First Revision)
IS 2500 (Part 1) : 2000	Sampling inspection procedures : Part 1 : Attribute sampling plans indexed by acceptable quality limit (AQL) for lot-by-lot inspection (Third Revision)

3 DEFINATION

For the purpose of this standard, the following definition(s) shall apply;

3.1 Cone Angle — The angle formed by the profile of the cutter-this angle is approximately twice angle between the bottom of the cut and the centre line of the inclined ladder.

3.2 Face Angle — One half the cone angle.

3.3 Rake Angle — The angle made by the tangent to the cutter's peripheral motion at the point of contact with the material being cut and the slope of the line of the blade or tooth face (see Fig. 1).

3.4 Sweep — The angular displacement of the cutter blades - the included angle along the periphery) of the cutter of one complete blade. A three blade cutter has a sweep angle of 120 degrees.

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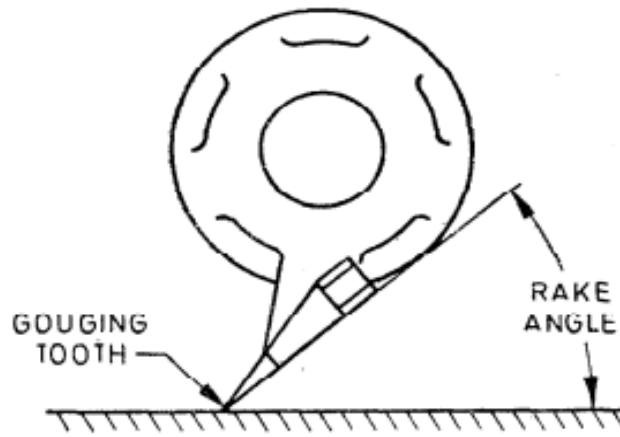


Fig 1 Cutter Rake Angle

4 TYPES

4.1 The cutter shall be of the following types:

- a) Basket Type — Having a front hub, a back wearing ring and several spiral shaped blades integral with the hub and ring and suitable for operation in soft material.
- b) Straight Arm Type — Having blades extended beyond the hub and attached with bolts to a spider and suitable for operation in hard clay.

5 REQUIREMENTS

5.1 Design

The cone angle, the face angle and its sweep and the rake angle form the physical factors to determine the cutter configuration.

5.1.1 The cutter's sweep angle shall be chosen to optimize the vibration encountered and the materials to be dredged.

5.1.2 The rake angle is the most important characteristic of the cutter and important to its operation. The angle best suited for obtaining maximum force shall be the angle which allows penetration of the material at the lowest torque.

5.2 RATING

The power applied to the cutter varies with the job and size of the dredge. The rating shall vary from 300 kW to 3 000 kW. The speed at which the cutter is turned shall vary between 10 to 30 rpm.

5.3 MATERIAL

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5.3.1 The cutter shall be made of wear resistant steel. Steels of following designation as per IS 1570 (Part 4) are recommended:

- a) 40Ni6Cr4Mo3
- b) 31Ni10Cr3Mo6
- c) 40Ni10Cr3Mo6

5.3.2 The leading edge of the cutter blade shall have a hardness of 500 Brinell (HBS) and a yield strength of 1240 MPa *Min.*

5.4 CONSTRUCTION

The cutters shall be assembled in sections by casting each part separately and then suitably fitting them together.

6 MARKING

The cutter shall be marked with indelible printing or embossed with the following information:

- a) Name, initials or recognized trade-mark of the manufacturer; and
- b) Type of cutter.

7 BIS CERTIFICATION MARKING

7.1 The cutter may also be marked with the Standard Mark.

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

8 SAMPLING

Unless otherwise agreed upon between a supplier and purchaser, the inspection sampling shall be as per IS 2500 (Part 1).