

For BIS Use Only

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

(Not to be reproduced without the permission of BIS or used as an Indian Standard)

भारतीय मानक मसौदा

**लेड-ऑन टंगस्टन-कार्बाइड टिप्स सहित कोयले और चट्टान काटने के
उपकरणों के ब्रेज़ सामर्थ्य परीक्षण की पद्धति**

(आई एस 9910 का पहला पुनरीक्षण)

Draft Indian Standard

**METHOD FOR BRAZE STRENGTH TESTING OF COAL AND ROCK
CUTTING TOOLS WITH LAID-ON TUNGSTEN-CARBIDE TIPS**

(First Revision of IS 9910)

ICS 25.100.01

**Mining Techniques and Equipment
Sectional Committee, MED 08**

**Last date for receipt of
comments is 04 November 2022**

FOREWORD

(Formal clause to be added later)

This standard was first published in 1981. This standard is being revised again to keep pace with the latest technological developments and international practices. In this revision, the following major changes have been made:

1. A reference clause has been added mentioning the latest version of all the referred standards.
2. Editorial corrections have been done.

This standard lays down the method for testing braze strength of the coal and rock-cutting tools with laid-on tungsten-carbide tips. Although this method is an arbitrary method for testing the quality of the brazing but as the shear strength of the brazed joint is an important factor in the performance of the cutting tools, it is expected that the testing of the tools by this method will help in the assessment of the quality of the brazing in the tools.

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.

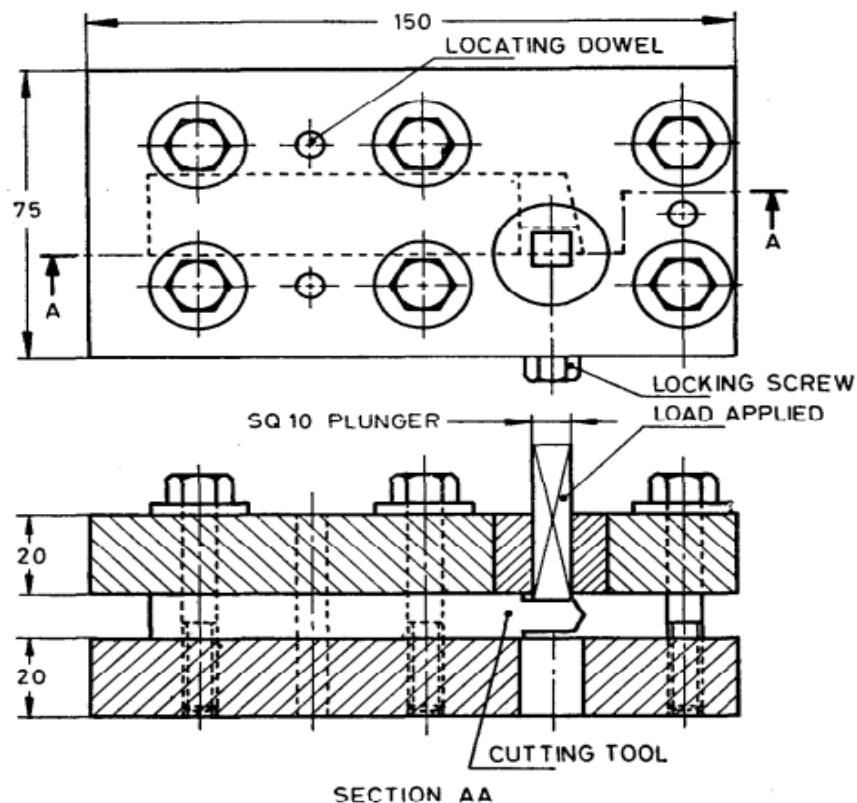
1 SCOPE

Lays down the method for testing and examination of the brazed surfaces on coal and rock-cutting tools with laid-on tungsten-carbide tips.

2 TESTING PROCEDURE

2.1 Apparatus

Apparatus for the test shall consist of jig (a typical design is shown in Fig. 1) and testing machine in which the tool to be tested may be held rigidly in such a way that a load is applied through a plunger to the side of the tip, adjacent to the braze.



All dimensions in millimeters.

FIG. 1 TYPICAL TEST JIG

2.1.1 During the test, appreciable deflection of the plunger shall not take place, and the plunger shall not contact the tool body during the test.

2.1.2 The apparatus shall be so constructed that the tool under test may be held rigidly so that:

- a) The tool does not deflect;
- b) The side of the tip on which the load is to be applied is normal to the direction of the load;
and
- c) The brazed faces are parallel with respect to the direction of the applied load.

2.1.3 The load shall be applied uniformly over all the area of the side of the tip. In case it is difficult to achieve this condition, it is permissible to apply the load along a line parallel to end immediately adjacent to the carbide/braze interface.

2.1.4 The plunger shall have an adequate bearing area on its guide bush so as to be free from any tendency to rock.

2.2 Preparation of Sample

The tools to be tested shall be ground on one or both sides so as to ensure that they will fit properly into the jig and that it will be possible to apply the load normally to the side of the tip in accordance with **2.1.1** to **2.1.4**. Care shall be taken during the preparation of the sample to prevent the generation of excessive heat which may affect the strength of the braze.

2.3 Method of Test

The tools shall be held normally in the jig and the load shall be applied on the tip of the tool through the plunger in accordance with **2.1**. The load shall be applied at a rate within the range of 20 kN/min and 100 kN/min. The rate of the loading shall be such that the tests take not less than 60 seconds from the application of the load. The load shall be applied at this rate till the fracture occurs.

3 ASSESSMENT OF RESULTS

Brazing shall be assumed to be of good quality if:

- a) The fracture takes place substantially through the braze alloy;
- b) After shearing, the surfaces show adequate wetting of the tungsten-carbide and the steel;
and
- c) The shear strength calculated on dividing applied load by the total area of the brazing between the tip and the tool body shall be not less than the strength specified for the individual standard.