

Australian Standard[®]

**METHOD FOR SAMPLING OF
MOLTEN STEEL AND
PREPARATION OF SAMPLES
FOR DETERMINATION OF
HYDROGEN CONTENT**

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Aluminium Development Council
Australasian Institute of Mining and Metallurgy
Australian Lead Development Association
Australian Mineral Development Laboratories
Australian Tin Information Centre
Australian Zinc Development Association
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Copper Producers Association of Australia
Department of Defence
Electricity Supply Association of Australia
Metal Trades Industry Association of Australia
National Association of Testing Authorities
Railways of Australia Committee
Royal Australian Chemical Institute

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PREFACE

This standard was prepared by the Association's Committee on Analysis of Metals, under the direction of the Chemical Standards Board. It is intended for use in conjunction with a proposed method for the determination of hydrogen in steel. It is based on a submission from the Broken Hill Pty Co Ltd and includes a procedure for preparation of test pieces from the sample.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

**METHOD FOR THE
SAMPLING OF MOLTEN STEEL AND PREPARATION
OF SAMPLES FOR DETERMINATION OF HYDROGEN
CONTENT**

1 SCOPE. This standard describes a method for the sampling of molten alloyed or unalloyed steel and for the preparation of samples and the test pieces therefrom for the determination of hydrogen content.

2 APPLICATION. The method is applicable to steels that contain more than 92 percent iron.

3 REAGENTS AND MATERIALS.

3.1 Freezing Mixture. The freezing mixture shall be prepared as follows:

- (a) Place 1 L of acetone (or alcohol) in the insulated container (4(e)).
- (b) Add small pieces (approximately 20 mm in diameter) of solid carbon dioxide to the liquid in the insulated container until effervescence ceases. Add acetone (or alcohol) and solid carbon dioxide alternately until the required volume of freezing mixture is obtained.
- (c) Maintain the temperature of the freezing mixture by maintaining an excess of solid carbon dioxide.

CAUTION: The flammable and cryogenic nature of the materials used in the freezing mixture should be considered.

3.2 Aluminium Wire. Aluminium wire of 4 mm to 6 mm diameter and sufficient to provide not less than 2 g per kilogram of the steel to be sampled.

NOTE: The wire is not required for the analysis of killed steels

4 APPARATUS. The following apparatus is required:

- (a) *Mould.* A split-pencil mould (see Note 1), the design and dimensions of which shall be as shown in Fig. 1 (see Note 2).

NOTES:

1. The mould may be made from copper, steel or cast iron. Steel and copper moulds give a smoother surface to the sample than do cast iron moulds but no advantage is gained from the higher thermal conductivity of copper over that of steel or cast iron. Cast iron moulds have the advantage that they last longer than copper moulds.
2. Moulds may be rectangular and closed by means of a clamp. It is essential that the mould can be easily and quickly opened.