

Australian Standard™

**Methods for impact tests on metals**

**Part 5: Assessment of fracture surface  
appearance of steel**

This Australian Standard was prepared by Committee MT-006, Mechanical Testing of Metals. It was approved on behalf of the Council of Standards Australia on 15 August 2003 and published on 19 September 2003.

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Australasian Railway Association  
Australian Aluminium Council  
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STANDARDS AUSTRALIA

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RECONFIRMATION

OF

AS 1544.5—2003

Methods for impact tests on metals

Part 5: Assessment of fracture surface appearance of steel

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Technical Committee MT-009 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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Australian Standard™

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## PREFACE

This Standard was prepared by the Standards Australia Committee MT-006, Mechanical Testing of Metals to supersede AS 1544.5—1981, *Methods for impact tests on metals, Part 5: Assessment of fracture surface appearance of steel*.

The objective of this Standard is to specify a method for the assessment of the fracture appearance of notched bar test pieces for carbon and low alloy steels.

This Standard is Method 5 of a series of Standards on the methods for impact testing of metals. The series comprises the following methods:

## AS

1544	Methods for impact tests on metals
1544.1	Part 1: Izod
1544.2	Part 2: Charpy V-notch
1544.3	Part 3: Charpy U-notch and keyhole notch
1544.4	Part 4: Calibration of the testing machine
1544.5	Part 5: Assessment of fracture surface appearance of steel

In preparing this revision, cognizance was taken of the International Standard ISO/CD 148-1, *Metallic materials—Charpy pendulum impact test, Part 1: Test method*.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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## FOREWORD

Fracture surface appearance is one of the criteria for assessing the notch ductility of steel by means of notched bar impact tests.

The methods described in this Standard for assessing fracture surface appearance assume that a Charpy test piece or a square or rectangular section Izod test piece is to be examined after fracture. However, the provisions of this Standard may also be applied in the assessment of the fracture surface appearance of other types of notched bars. The Standard is not concerned with the interpretation or significance of the fracture surface appearance; these depend on such factors as the type of test, the metal under consideration, and the intended application.

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## STANDARDS AUSTRALIA

### Australian Standard Methods for impact tests on metals

#### Part 5: Assessment of fracture surface appearance of steel

### 1 SCOPE

This Standard sets out methods for the assessment of the fracture surface appearance of notched bar test pieces of carbon, carbon-manganese and low alloy steels, with particular reference to test pieces of the forms as specified in AS 1544, Parts 1 and 2.

### 2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

#### AS

- 1544 Methods for impact tests on metals
- 1544.1 Part 1: Izod
- 1544.2 Part 2: Charpy V-notch

#### ISO/CD

- 148 Metallic materials—Charpy pendulum impact test
- 148-1 Part 1: Test method

### 3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

#### 3.1 Assessment of fracture surface appearance

The determination of the areas of crystalline or fibrous fracture, expressed as a percentage of the original cross-sectional area below the notch.

#### 3.2 Crystallinity (crystalline fracture)

That portion of the fracture surface showing bright facets and characterized by a lack of visible plastic deformation.

#### 3.3 Fibrosity (fibrous fracture)

That portion of the fracture surface showing a dull grey silky appearance in which considerable deformation has occurred.

#### 3.4 Percentage crystallinity

The total of the areas of crystalline portions of the fracture surface, expressed as a percentage of the original cross-sectional area below the notch.

#### 3.5 Percentage fibrosity

The total of the areas of fibrous portions of the fracture surface, expressed as a percentage of the original cross-sectional area below the notch.

NOTE: The percentage fibrosity may be determined by subtracting the percentage crystallinity from 100 percent of the surface area.