STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 2205.7.3—2003

Methods for destructive testing of welds in metal

Method 7.3: Fracture mechanics toughness tests (K_{Ic}, critical CTOD and critical J values)

RECONFIRMATION NOTICE

Major stakeholders of this publication have 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.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

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NOTES

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Australian Standard™

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PREFACE

This Standard was prepared by the Standards Australia Committee WD-006, Testing of Welds, to supersede AS 2205.7.3—1997.

The objective of this edition is to update the Standard and include editorial changes in accordance with current Standards Australia editorial policy.

FOREWORD

Fracture toughness tests have been developed as a method of characterizing the toughness of ductile materials. The results of the tests may be used in conjunction with other information, such as stress and defect size, to provide quantitative predictions of fracture susceptibility. Although there still remain many areas of debate about test methods, interpretation of results and application to service situations, the test methods have been sufficiently well established and many practical examples exist where defect assessments based on fracture toughness data have been applied successfully to working structures.

In view of the above situation and the particular importance of defects and their influence on welded structures, it is appropriate that guidance be provided on the crack tip opening displacement (CTOD) testing of weld zones. This Standard has, therefore, been prepared to enable the use of the test with welds, while at the same time restricting the range of tests compared with that permitted by BS 7448.1, *Fracture mechanics toughness tests*, Part 1: *Method for determination of K_{Ic} critical CTOD and critical J values of metallic materials*. The less constrained subsidiary test specimens permitted by BS 7448.1 (with the agreement of the relevant parties) are not permitted when testing weld metal to this Standard. For the testing of a heat-affected zone (HAZ), the use of a standard test specimen necessitates the preparation of a double-bevel butt weld test plate. Although this is the recommended method, the subsidiary test is a permitted option, as it may not always be practicable to use the specific weld preparation.

The philosophy behind this rather restricted approach is the desire for a minimum of ambiguity in the interpretation of results. If it is considered necessary to go beyond the scope of this Standard to cover special circumstances, then this should only be done when the parties concerned are sufficiently well-informed on the subject to define the test conditions to suit the purpose. It is felt that it is in the best interests of standardization, particularly in view of the generally limited appreciation of the detailed theories behind the test, that excessive flexibility in the selection of the test method should not be incorporated or encouraged in the Standard.