

European Federation of Corrosion
Publications

NUMBER 17 Second Edition

A Working Party Report on

Corrosion Resistant Alloys for Oil
and Gas Production: Guidance on
General Requirements and
Test Methods for H₂S Service



M A N E Y

*Published for the European Federation of Corrosion
by Maney Publishing on behalf of The Institute of Materials*

Book Number B0767
Published in 2002 by Maney Publishing
on behalf of the Institute of Materials
1 Carlton House Terrace, London SW1Y 5DB

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British Library Cataloguing in Publication Data
Available on application

Library of Congress Cataloging in Publication Data
Available on application

ISBN 1-902653-55-6

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in this publication

Typeset in India by Emptek, Inc.
Printed and bound in the UK
at Charlesworth Group, Huddersfield

Contents

<i>Series Introduction</i>	ix
<i>Preface to the First Edition</i>	xii
<i>Preface to the Second Edition</i>	xiii
1. Terminology and Definitions	1
1.1 Generic and Oilfield Terms	1
1.2 Definitions and Abbreviations	2
2. Standards Referred to in this Document	7
3. Introduction	9
4. Scope	11
5. Objective	13
6. Overview of Requirements for Selection and Qualification of CRAs for Oil and Gasfield Use	15
6.1 Introduction	15
6.2 Resistance to Corrosion by Produced Fluids	15
6.2.1 Carbon Steels	15
6.2.2 CRAs	15
6.2.3 Testing CRAs for General and Localised Corrosion	16
6.2.4 Testing CRAs for Resistance To Environmental Cracking	17
6.3 Corrosion Resistance in Other Fluids	17
6.4 Qualification and Ranking of CRAs	19
6.5 Quality Assurance (QA), Quality Control (QC) Testing	19
7. General Principles and Limitations of Proposed SSC/SCC Tests	21
7.1 Background	21
7.2 Test Environments	21
7.3 Test Stresses and Loading of Specimens	21
7.4 Test Specimens	27
7.5 Test Duration and Strain Rate	28
7.6 Test Temperature	28
7.7 Test Materials	29

Contents

<i>Series Introduction</i>	ix
<i>Preface to the First Edition</i>	xii
<i>Preface to the Second Edition</i>	xiii
1. Terminology and Definitions	1
1.1 Generic and Oilfield Terms	1
1.2 Definitions and Abbreviations	2
2. Standards Referred to in this Document	7
3. Introduction	9
4. Scope	11
5. Objective	13
6. Overview of Requirements for Selection and Qualification of CRAs for Oil and Gasfield Use	15
6.1 Introduction	15
6.2 Resistance to Corrosion by Produced Fluids	15
6.2.1 Carbon Steels	15
6.2.2 CRAs	15
6.2.3 Testing CRAs for General and Localised Corrosion	16
6.2.4 Testing CRAs for Resistance To Environmental Cracking	17
6.3 Corrosion Resistance in Other Fluids	17
6.4 Qualification and Ranking of CRAs	19
6.5 Quality Assurance (QA), Quality Control (QC) Testing	19
7. General Principles and Limitations of Proposed SSC/SCC Tests	21
7.1 Background	21
7.2 Test Environments	21
7.3 Test Stresses and Loading of Specimens	21
7.4 Test Specimens	27
7.5 Test Duration and Strain Rate	28
7.6 Test Temperature	28
7.7 Test Materials	29

Contents

vii

A2.2.2 Oil Reservoirs	50
A2.2.3 High Pressure, Gas-Condensate Reservoirs	51
A2.2.4 Surface Production Facilities	51
A2.3 pH of Produced Waters	52
A2.4 Application to Material Testing and Selection	53
A2.5 Water Analysis	53
A2.5.1 Requirement	53
A2.5.2 Chloride and Non-Scaling Ions	54
A2.5.3 Scaling Ions	54
A2.5.4 Iron ($\text{Fe}^{2+}/\text{Fe}^{3+}$)	54
A2.5.5 pH Controlling Components	55
A2.5.6 Total Alkalinity and Bicarbonate (HCO_3^-)	56
A2.5.7 Ionic Strength	57
A2.5.8 Sampling	57
A2.5.9 Validation and Correction of Analyses	57
References for Appendix 2	58
APPENDIX 3:	
Titanium Alloys-Limitations of Use	59
A3.1 Scope	59
A3.2 Hydrofluoric Acid and Fluorides	59
A3.3 Methanol	59
A3.4 Hydrogen Uptake	59
Reference for Appendix 3	60
APPENDIX 4:	
Reference Environments for Comparative (or Ranking) SSC/SCC Testing that is not Application Specific	61
A4.1 Purpose	61
A4.2 Solution Chemistry	61
A4.3 Solution pH	61
A4.4 Reference Test Environments	61
A4.5 Test Temperature	62
Reference for Appendix 4	62
APPENDIX 5:	
Normalisation of Slow Strain Rate Test Ductility Measurements	63
A5.1 Use of Normalised Measurements	63
A5.2 Normalised Strain to Failure (ϵ_n)	63
A5.3 Normalised Reduction in Area (RA_n)	63

APPENDIX 6:

Autoclave testing of CRAs	65
A6.1 Scope	65
A6.2 Principles	65
A6.3 Safety	66
A6.4 Test Vessels	66
A6.5 Test Specimens, Loading Grips and Jigs	67
A6.6 Applied Load - Corrections for Pull-Through Autoclaves	67
A6.7 Test Solutions	67
A6.8 Test Gases	68
A6.9 Test Monitoring	69
A6.10 Reporting	70

APPENDIX 7:

Stressing of Bent Beam Specimens and C-Rings	71
A7.1 Scope	71
A7.2 Studding, Nuts and Jigs	71
A7.3 Loading: General	72
A7.4 Loading: Bent Beams	72
A7.5 Loading: C-Rings	73
A7.6 Welded Specimens	73
A7.7 Strain Gauging	74
A7.8 Reporting	75
References for Appendix 7	75

SUPPLEMENTARY APPENDIX S1:

Test Methods for the Evaluation of the Corrosion Performance of Steels and Non-Ferrous Alloys in the System: Water-Hydrogen Sulphide- Elemental Sulphur	77
Editorial Note	77
S1.1 General	78
S1.2 Description of the Test Methods	78
S1.2.1 Environmental Parameters	78
S1.2.2 Test Parameters/Type of Corrosion	80
S1.2.3 Test Procedures	81
S1.3 Evaluation of Results	82
References for Supplementary Appendix S1	82

Preface to the First Edition

This Working Party Report is the companion to EFC 16 *Guidelines on Materials Requirements for Carbon and Low Alloy Steels for H₂S-Containing Environments in Oil and Gas Production*. These reports have been produced by Work Groups in the Working Party on Corrosion in Oil and Gas Production since it was formed in 1992.

The driving force for the preparation of this report has been the long standing, unsatisfactory inconsistency in testing and qualifying corrosion resistant alloys (CRAs) for H₂S service. The primary problem was considered to be that there was no standard methodology for establishing the environmental cracking resistance of CRAs in H₂S service. Improving this situation became the CRA Work Group's initial aim.

The report therefore proposes test methods for assessing the environmental cracking resistance of CRAs. In order to document the basis for these proposals, extensive background information has been included along with further information related to the use of CRAs in oil and gas production.

However, to produce the report in a reasonable time it has been necessary to limit its scope. Thus, it has not been possible to include detailed test methods for pitting and crevice corrosion or develop guidance on the service limits of individual CRAs. These important tasks, among others, remain for consideration in future revisions or reports.

The CRA Work Group has been well supported by all sections of the industry that have an interest in the use of CRAs. As chairmen of the EFC Working Party and Work Group that have produced this report, we wish to thank all who have supported the work. This includes sponsorship of Work Group members by employers, provision of meeting facilities by host organisations and contributions from individuals. Unfortunately, the contributors are too numerous to name individually, though NiDI's essential organisational and secretarial sponsorship warrants particular mention. Working with the group, whose membership has been drawn from Europe and beyond, has been very rewarding for us. We hope readers find value in the product of this labour.

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Preface to the Second Edition

The work group consider this revision of EFC 17 necessary to incorporate developments, in the testing of CRAs, made since publication of the first edition in 1995. In particular:

1. Experience with weldable super-martensitic stainless steels has identified that artificially buffered test solutions used for SSC testing require modification for these steels
2. More general improvements in the definition of test solutions have been made in co-operation with ISO/TC 67/WG 7 during the preparation of ISO 15156.

The above have been incorporated as changes to Section 8 and Appendix 4. Elsewhere, minor changes have been made to update and correct editorial errors and omissions in the original text.

In addition to the changes now made to this document, the reader's attention is drawn to:

1. Continuing development of ISO 15156 by ISO/TC67/WG 7.
2. Extensive proposed changes to the CRA content of NACE MR0175 and the intended carry-over of these changes into ISO 15156.
3. Incorporation of SCC testing requirements in the 1996 revision of NACE TM0177 and changes to test solutions now in preparation for the next edition. The latter are expected to be largely consistent with this document.
4. Publication of ISO 13680:2000 that defines 'technical delivery conditions' for CRA OCTG not previously covered by API 5CT (ISO 11960).

We wish to acknowledge the essential contributions of Work Group members to this revision and the following who have assisted with the editorial preparation of the revision: J.-L. Crolet, E. Wade, B. Kermani.

As foreseen in the first edition, developments in the testing of CRAs continue. Readers are encouraged to monitor these to ensure their use of best practice.

Phil Jackman
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