ISO 20064:2019 (E)

Metallic materials — Steel — Method of test for the determination of brittle crack arrest toughness, Kca

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Symbols

5 Test equipment

5.1 General
5.2 Testing machine
5.2.1 Force implementation
5.2.2 Calibration of the load cell
5.2.3 Force measurement
5.2.4 Method for force transfer to integrated test piece
5.2.5 Loading direction
5.2.6 Distance between the loading pins
5.3 Impact equipment
5.3.1 Impact methods
5.3.2 Impact energy calculation
5.3.3 Reaction force receivers

6 Test pieces

6.1 Test piece configurations
6.2 Configurations of extension plates and tab plates
6.2.1 General
6.2.2 Extension plates
6.2.3 Tab plates
6.3 Welding of test piece and extension plates

7 Test methods

7.1 Temperature control method
7.1.1 Determination of temperature gradient
7.1.2 Method of temperature control and monitoring
7.2 Crack initiation methods

8 Test procedures

8.1 Pretest procedures
8.2 Impacting procedures
8.3 Post-test operations
8.4 Observation of fracture surfaces

9 Determination of arrest toughness

9.1 Validation of arrested crack
9.2 Assessment of impact energy
9.3 Calculation of arrest toughness

10 Reporting

Annex A (informative) Devices and method for controlling and monitoring the temperature of test pieces

- **A.1 General**
- **A.2 Devices and method**

Annex B (normative) Method for obtaining Kca at a specific temperature

- **B.1 General**
- **B.2 Method**

Annex C (normative) Calculation of stress intensity factors for a curved crack

- **C.1 General**
- **C.2 Method**

Annex D (informative) Double tension type arrest test

- **D.1 General**
- **D.2 Test piece configurations**
- **D.3 Temperature conditions and temperature control methods**
- **D.4 Secondary loading method**
- **D.4.1 General**
- **D.4.2 Holding methods of secondary loading device**
- **D.4.3 Loading system**
- **D.4.4 Loading method**

Annex E (informative) Duplex type arrest test

- **E.1 General**
- **E.2 Test piece configuration**
- **E.3 Welds**
- **E.4 Definition of crack arrest**

Annex F (informative) Dynamic measurement methods

- **F.1 General**
- **F.2 Measurement method**
- **F.2.1 General**
- **F.2.2 Measurement of crack propagation velocity**
- **F.2.3 Dynamic strain measurement**

Page count: 45