

ASTM 產業標準資源

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ASTM 組織介紹

組織介紹

- ASTM International 國際標準組織
- 前身為美國材料暨測試協會

American Society For Testing and Materials



Charles Benjamin Dudley

組織介紹

- 成立於1898年，是世界上最早、最大的非營利性標準制定組織；2001年改名為ASTM International
- 任務是制訂材料、產品、系統和檢測服務的標準及促進有關知識的發展。

組織介紹

- 主要制定140多個專業領域的標準
- 有34000名會員，來自136個國家的生產者、消費者、政府機關和學術代表
- 經常組織學術討論會，舉辦實驗室專題活動，召開標準編制會議等

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ASTM標準在台灣

- 台灣經濟部標準檢驗局於2005年與ASTM簽署協議備忘錄
- 台灣省土木技師公會 → ASTM A6，A673，A709，A992
- 榮科實業(CyberTek) → ASTM F1856，ASTM F2036
- 佳世達(Qisda) → ASTM D7386，ASTM D996
- 長榮航太科技 → ASTM D429，ASTM D95
- 華航 → ASTM B117-09，B244-09，D4052-09
- 全國公證(Intertek Testing Services) → ASTM E2149-10

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- 鋼鐵產品
- 有色金屬
- 金屬材料試驗方法及分析程式
- 建設材料
- 石油產品、潤滑劑及礦物燃料
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- 紡織品及材料

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- 電氣絕緣體和電子產品
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- 核能，太陽能
- 醫療設備和服務
- 儀器儀錶及一般試驗方法
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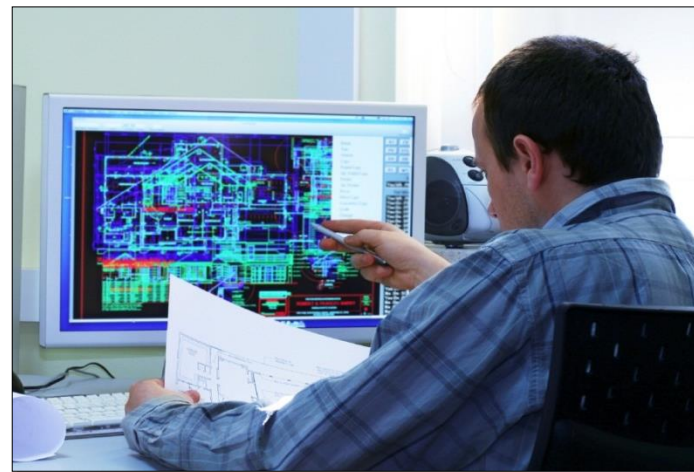
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標 準 介 紹

標準介紹

- 標準是公開的文件，通過認可的機構，制定了規範和程序。
- 目的是確保材料、產品、方法或者服務符合其預期目標的宗旨並一貫的執行。
- 標準化的過程，是包含標準文件的開創、發展和應用。
- 標準是一種共同的語言，確定和建立質量安全標準。如果程序標準化，成本將降低。

標準型式

- 技術規範(Technical Specification)
- 指南(Guidance)
- 試驗方法與報告(Test Method & Report)
- 分類法(Classification)
- 標準慣例(Standard Practice)
- 術語(Terminology)

標準編號

■ 標準代號+字母分類代碼+標準序號+制定年份

■ 示例：

ASTM A34-2001

ASTM C685/C685M-2001

ASTM D4595-86 (2001) ASTM F2090-01a

■ 說明：

1. 標準序號後帶字母M的為公制單位標準，不帶字母M的為英制單位標準；
2. 制定年限後面括弧內的年代為標準重新審定的年代；
3. a.b.c.....表示修訂版次。
4. 字母分類代碼見「標準分類」

標準編號

- A: 黑色金屬 Ferrous Metals (鐵，錳，鉻，合金鋼，鋼鐵等)
- B: 有色金屬 Non-ferrous Metals (銅，鋁，粉末冶金材料，導線等)
- C: 水泥，陶瓷，混凝土與磚石材料 Cementitious, Ceramic, Concrete and Masonry Materials
- D: 其他各種材料 Miscellaneous Materials (石油產品，燃料，低強塑膠等)
- E: 雜類 Miscellaneous Subjects (金屬化學分析，耐火試驗，無損試驗，統計方法等)
- F: 特殊用途材料 Materials for Specific Applications (電子材料，防震材料，外科用材料等)
- G: 材料的腐蝕，變質與降級 Corrosion, Deterioration, and Degradation of Materials

ASTM 標準資料庫

- 超過13,000份現行(Active)的技術標準
- 38,000份歷史(Historical)標準,
3,300份廢止(Withdrawn)標準
- 約有35%的標準文件每年會進行修改
- 強大的關鍵字或編號搜索
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新增功能

- 於2012年，免費新增超過100部標準檢測影片，給PLUS版本用戶。幫助同學更了解檢測過程所涉及的程序。
- 新增XML及E-Pub瀏覽模式，支援智慧型手機與平板產品。



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- ASTM 數位圖書館（Digital Library）收錄 ASTM 國際標準組織所出版的刊物，包含專業技術報告、期刊、手冊與專書，內容均可進行電子版本下載。
- 所有文章都經過嚴格的同行評議流程，確保良好學術性內容及技術準確度。

專業技術報告

- 收錄ASTM技術委員會主辦的研討會內容，反應全球最新研究結果，並提供制訂新標準的技術及見解。
- 累積超過13,000份文獻
- 以書本格式出版1,517冊，每年新增10~12冊
- 最早可回溯至1931年

期刊

- ASTM國際期刊(JAI) 2004~至今
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- 岩土技術測試雜誌(GTJ) 1978~至今
- 複合材料技術與研究雜誌(JCTR) 1978~2003
- 水泥、混泥土與混合物(JCCA) 1979~2004
- 法醫學雜誌(JFS) 1972-2005
- ➡ 土木工程材料發展(ACEM) **New!**
- ➡ 材料的性能及特徵(MPC) **New!**



手冊與專書

- 書籍會整備受推崇的專家，在各自領域的實踐技術與先進資訊。
- 累積114冊，超過 25,000頁，並每年新增 6~10冊文獻。
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ASTM Redline 產業標準

- ASTM 紅線是 PDF 文檔，提供變更標記，在現行 ASTM 標準和先前版本之間對比增加、刪除或其他變化。



Designation:~~A31-04~~ Designation: A 31 - 04^{ε1}

Standard Specification for Steel Rivets and Bars for Rivets, Pressure Vessels¹

This standard is issued under the fixed designation A 31; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

ε¹ NOTE—Sections 2.2 and 3.1.9 were editorially revised in October 2006.

1. Scope*

1.1 This specification² covers steel rivets for use in boilers and pressure vessels and steel bars for use in the manufacture of rivets.

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縮小搜尋範圍

ASTM D3872-05(2011) Standard Test Method for Ferrous Iron in Iron Oxides

1.1 This test method covers the quantitative determination of ferrous oxide (FeO) by oxidation of ferrous iron (Fe++) in an acid solution to potassium dichromate using diphenylamine as the indicator. 1.2 This test method is applicable to synthetic black iron oxide, natural black iron oxide, and iron ore. More

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1.1 This test method covers the quantitative determination of ferrous oxide (FeO) by oxidation of ferrous iron (Fe ++) in an acid solution to the ferric state (Fe +++) and titration with potassium dichromate using diphenylamine as the indicator. 1.2 This test method is applicable to synthetic black iron oxide, natural black iron oxide, magnetite or brown iron oxide where part of the iron ... More

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ASTM D3872 - 05(2011) ⓘ

D3872-05(2011) Standard Test Method for Ferrous Iron in Iron Oxides


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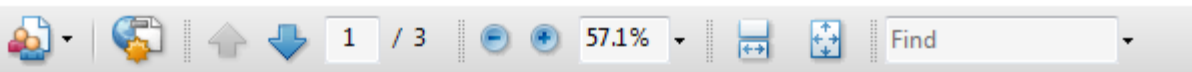
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Designation: D3872 - 05 (Reapproved 2011)

Standard Test Method for Ferrous Iron in Iron Oxides¹

This standard is issued under the fixed designation D3872; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the quantitative determination of ferrous oxide (FeO) by oxidation of ferrous iron (Fe²⁺) in an acid solution to the ferric state (Fe³⁺) and titration with potassium dichromate using diphenylamine as the indicator.

1.2 This test method is applicable to synthetic black iron oxide, natural black iron oxide, magnetite or brown iron oxide where part of the iron content is present in the ferrous state (Note 1). It is applicable to iron oxides where the ferrous iron content ranges from 50 to 0.20 %.

Note 1—Natural iron oxides and magnetite may contain traces of metallic iron that will be combined with and analyzed as FeO.

1.3 *This standard does not purport to address the safety concerns if any, problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

- 2.1 *ASTM Standards:*²
- D50 Test Methods for Chemical Analysis of Yellow, Orange, Red, and Brown Pigments Containing Iron and Manganese
 - D280 Test Methods for Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments
 - D769 Specification for Black Synthetic Iron Oxide
 - D1193 Specification for Reagent Water
 - D3722 Specification for Natural Red and Brown Iron Oxide Pigments

3. Significance and Use

3.1 This test method may be used for production quality control or specification acceptance.

4. Apparatus

4.1 The digestion apparatus consists of a standard 500-mL Erlenmeyer flask fitted with a two-hole rubber stopper and glass tubing, as shown in Fig. 1, to provide for the introduction of the inert gas and vent for gas and digestion fumes.

5. Reagents

5.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.³ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean Type II of Specification D1193.

5.3 *Diphenylamine Indicator*—Dissolve 1 g of diphenylamine in 100 mL of concentrated (H₂SO₄) (sp gr 1.84).

5.4 *Hydrochloric Acid (1+1)*—Dilute concentrated hydrochloric acid (HCl, sp gr 1.19) with an equal volume of reagent water.

5.5 *Iron Ore, Standard, Sibley No. 27-f.*⁴

5.6 *Potassium Dichromate, Standard Solution (0.1 N)*—Dissolve 4.904 g of K₂Cr₂O₇ in water and dilute to 1 L.



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Wei T., Cao D., Li H., Smith K., Harrison R.

Abstract

Zircaloy-4 (Zr-4) is a zirconium alloy that has been used extensively within the nuclear industry in both power generation and research reactors. The potential for welded reactor core components to undergo embrittlement during neutron irradiation is an important material issue throughout the service life of the reactor. Of particular interest is the behavior of the weld heat-affected zone (HAZ) which depend on the properties of both the weld heat-affected zone and the base metal. In this work Zr-4 HAZ was simulated using a Gleeble weld simulator. The small punch test (SP) was used to study the variation in fracture behavior of these narrow zones of the metal. A finite element analysis (FEA) model of the SP test was used to study the deformation and fracture behavior of Zr-4 welds and is compared with the experimental data obtained.

Keywords:

fracture, weld, small punch test, Zircaloy-4, finite element analysis

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