Standards for Welding

Specifications, procedures and tests for use by welders, quality controllers and manufacturers

Equipping business with knowledge
To provide a well-defined basis for planning welding operations and to ensure a system for quality control during welding, it is important that organizations issue the relevant welding procedure specifications, and ensure that welders are qualified and appropriately trained and tested to do the work safely and precisely. That's why, over the years, BSI Business Information has published standards, guidelines and specifications to help companies meet welding requirements.

BSI publishes standards on a wide range of welding disciplines and areas including welder qualification and procedures, welding equipment, consumables and much more!

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- The economic return from investment in standards makes sound business sense at both a macro and micro-economic level.

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General Welding, Brazing and Soldering including Quality Management, Acceptance Levels and Terminology

**BS 7910:2005 Guide to methods for assessing the acceptability of flaws in metallic structures**

This guide outlines methods for assessing the acceptability of flaws in all types of structures and components. Emphasis is placed on welded fabrications in ferritic and austenitic steels and aluminium alloys, however, the procedures developed can be used for analysing flaws in structures made from other metallic materials and in non-welded components or structures. The methods described can be applied at the design, fabrication and operational phases of a structure’s life.

As the number of application standards specifying requirements for weld flaw acceptance levels based on fitness for purpose increases, so it is necessary to update and extend BS 7910 to be used in co-ordinating and rationalizing those requirements.

This revision incorporates recent developments in fracture mechanics assessment methods. While arbitrary acceptance levels will continue to be used for quality control purposes, the complementary use of the methods described in this guide permits the acceptability of known or postulated flaws in particular situations to be evaluated in a rational manner. Applications standards that formerly referred to PD 6493 or BS 7910:1999 should, in future, refer to BS 7910:2005.

This guide has been revised to cover all failure modes that could be influenced by the presence of flaws. However, it should be noted that, whilst fracture, fatigue and creep are treated thoroughly, the treatment of other failure modes is less detailed.

ISBN 0 580 45965 9 Price £210*, £105 BSI Subscribing Members

**BS EN ISO 17659:2004 Welding. Multilingual terms for welded joints with illustrations**

This standard describes by pictorial representation most of the more common terms, in English, French and German, for types of joints, joint preparation and welds. BS EN ISO 17659:2004 supersedes BS EN 12345:1999.

ISBN 0 580 43994 1 Price £128*, £64 to BSI Subscribing Members

**BS EN ISO 5817:2003 Welding. Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded). Quality levels for imperfections**

This standard provides quality levels of imperfections on the above-mentioned materials that have a thickness above 0.5mm. The purpose of this standard is to define dimensions of typical imperfections, which might be expected in normal fabrication. It may be used within a quality system for the production of factory-welded joints. It provides three sets of dimensional values from which a selection can be made for a particular application. The quality levels necessary in each case should be defined by the application standard or responsible designer in conjunction with the manufacturer, user and/or other parties concerned, and shall be prescribed before the start of production.

BS EN ISO 5817:2003 provides useful reference data to help you set out levels of imperfections to save production time and money, avoid duplication of effort and costly mistakes; and achieve the quality standards so that customers know what to expect.

BS EN ISO 5817:2003 supersedes BS EN 25817:1992, which is withdrawn.

ISBN 0 580 42864 8 Price £106*, £53 BSI Subscribing Members

**BS EN 14717:2005 Welding and allied processes. Environmental check list**

Welding fabrication has many environmental aspects. This document provides a checklist, which may be used for identification of environmental aspects during welding fabrication of metallic materials including site and repair work. Provisions have to be restricted to a general guidance. Limit values are specified in national laws. Informative annexes indicate recommended actions for avoiding and reducing the possible environmental impacts outside the workshop.

ISBN 0 580 45981 0 Price £64*, £32 BSI Subscribing Members


This technical report provides a uniform system for grouping of materials for welding purposes. It may also apply for other purposes as heat treatment, forming, non-destructive testing and much more. This technical report covers grouping systems for the following standardized materials:

- Steel
- Nickel and its alloys
- Titanium and its alloys
- Cast iron
- Aluminium and its alloys
- Copper and its alloys
- Zirconium and its alloys

ISBN 0 580 34954 3 Price £52*, £26 BSI Subscribing Members

**BS 499-1:1991 Welding terms and symbols. Glossary for welding, brazing and thermal cutting**

This publication provides seven sections giving terms common to more than one process. Terms relating to welding with pressure, fusion welding, brazing, testing, weld imperfections and thermal cutting. Appendices give information on welding and cutting procedure sheets.

This standard is current although is partially replaced by BS EN 13622:2002 Gas welding equipment. Terminology. Terms used for gas welding equipment. See page 4 for details.

ISBN 0 580 19093 5 Price £140*, £70 BSI Subscribing Members

**BS 499-1 Supplement:1992 Welding terms and symbols. Supplement. Definitions for electric welding equipment**

This document gives definitions for electrical and thermal characteristics of welding equipment, for welding power sources, accessories and consumables and for safety equipment.

ISBN 0 580 21329 3 Price £92*, £46 BSI Subscribing Members

**BS 499-2C:1999 Welding terms and symbols. European arc welding symbols in chart form**

Provides in chart form, the type, position and method of presentation of European welding symbols with examples of their use. It is derived from BS EN 22553:1999.

ISBN 0 580 39164 7 Price £24*, £12 BSI Subscribing Members

*P&P applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.

www.bsi-global.com/welding
BS EN ISO 17662:2005 Welding. Calibration, verification and validation of equipment used for welding, including ancillary activities

This standard specifies requirements to calibration, verification and validation of equipment used for control of process variables during fabrication, or control of the properties of equipment used for welding or welding allied processes, where the resulting output cannot be readily or economically documented by subsequent monitoring, inspection and testing. This relates to process variables influencing the fitness-for-purpose and in particular the safety of the fabricated product.

The subject of the standard is limited to calibration, verification and validation of equipment after installation, as part of the workshops schemes for maintenance and/or operation.

ISBN 0 580 45806 7  Price £106*, £53 BSI Subscribing Members

BS EN 1792:2003 Welding. Multilingual list of terms for welding and related processes

This document provides a glossary of terms listed by process or classification.

Contents: Group 1: General welding terms; Group 2: Terms relating to welding with pressure; Sub-group 21: General terms for welding with pressure; Sub-group 22: Terms relating only to resistance welding; Sub-group 23: Terms relating only to friction welding; Group 3: Terms relating to fusion welding (welding without pressure); Sub-group 31: General terms for fusion welding; Sub-group 32: Terms relating only to arc welding; Sub-group 33: Terms relating only to gas welding; Sub-group 34 Terms relating only to electron beam welding; Sub-group 35: Terms relating only to light radiation welding; Group 4: Terms relating to brazing, brazing and soldering; Group 5: Terms relating to testing; Group 6: Terms relating to weld imperfections; Group 7: Terms relating to thermal cutting; Group 8: Terms relating to health and safety; English index; French index; German index

ISBN 0 580 41421 3  Price £140*, £70 BSI Subscribing Members


This standard collects and classifies the possible imperfections in welds made with pressure. A uniform designation is specified. Only the type, shape and dimensions of the different imperfections caused by welding with pressure are included.

Metallurgical deviations are not taken into account. Imperfections produced other than by the welding operation, for example additional stresses, loads or environmental factors are not covered by this standard. Information concerning the consequences of the mentioned imperfections and the use of particular structures is not given because this depends on the specific requirements of the joint.

ISBN 0 580 34907 1  Price £92*, £46 BSI Subscribing Members

BS EN 13622:2002 Gas welding equipment. Terminology. Terms used for gas welding equipment

This standard constitutes a compilation of technical terms and definitions specifically related to gas welding equipment. This document is intended to improve the understanding over the major language boundaries of the terms commonly used in the gas welding equipment industry. It is a compilation of the terms, with their respective definitions, most frequently encountered in the various published EN or ISO standards or in the professional, technical or commercial literature.

Some definitions are becoming more precise with time and some terms have been eliminated or have evolved through the daily practice. This document is intended to state the “official definition” in the standards as well as the recent evolution of the meaning of the technical terms used in the gas welding equipment industry. This compilation is aimed at easing the drafting or the revision of new or existing standards.

ISBN 0 580 39781 5  Price £64*, £32 BSI Subscribing Members


This technical report proposes quality requirements for heat treatment in air or controlled atmospheres carried out in workshops and on site in connection with welding and forming. It applies mainly to ferritic steels, but may be used for other materials, as appropriate.

The purpose of this report is to form as a guidance for manufacturers which perform heat treatment or produce heat treated products or components. This report may also be used as a basis for assessing the manufacturer in respect to its heat treatment capability.

The requirements contained within this report may be adopted in full or may be selectively deleted by the manufacturer if not applicable to the construction concerned. They provide a flexible framework for the control of heat treatment in the following cases:

• To provide specific requirements for heat treatment in contracts which require the manufacturer to produce heat treated products or components. This report may also be used as a basis for assessing the manufacturer in respect to its heat treatment capability.

ISBN 0 580 37676 1  Price £64*, £32 BSI Subscribing Members

BS EN 719:1994 Welding co-ordination. Tasks and responsibilities

Welding is a special process which requires the coordination of welding operations in order to establish confidence in welding fabrication and reliable performance in service. The tasks and responsibilities of personnel involved in welding related activities, e.g. planning, executing, supervising and inspection, should be clearly defined.

This standard identifies the quality related responsibilities and tasks included in the coordination of welding related activities. In any manufacturing organization welding coordination may be undertaken by one or a number of persons. Welding coordination requirements can be specified by a manufacturer, contract or an application standard.

ISBN 0 580 23100 3  Price £32*, £16 BSI Subscribing Members

*P&P applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.
BS EN 287-1:2004 Qualification test of welders. Fusion welding. Steels

Defines the qualification test of welders for the fusion welding of steels and provides a set of technical rules for the systematic qualification test. By following the guidelines in this standard you will be able to verify the skill of your welders and provide them with the relevant designation and qualification once they have passed the test.

This standard covers fusion welding processes which are designated as manual or partly mechanized welding. It does not cover fully mechanized and automated welding processes.

BS EN 287-1:2004 supersedes BS EN 287-1:1992, which is withdrawn.

ISBN 0 580 43545 8  Price £106*, £53 for BSI Subscribing Members

BS EN ISO 9606-2:2004 Qualification test of welders. Aluminium and aluminium alloys

This document specifies the requirements for qualification of welders for fusion welding of aluminium and aluminium alloys. It provides a set of technical rules for systematic qualification of welders that are independent of product type, location and examiner/examining body.

The welding processes referred to in this standard include those fusion-welding processes that are designated as manual or partly mechanized welding. It does not qualify fully mechanized and automated welding processes.

ISBN 0 580 45160 7  Price £106*, £53 for BSI Subscribing Members


This publication defines general rules for the specification and qualification of welding procedures for metallic materials. It is applicable to manual, mechanized and automatic welding.

Metallurgical deviations constitute a special problem, as the current levels of non-destructive technology makes it is near impossible to evaluate mechanical properties. Hence, the need to establish a set of rules for qualification of the welding procedure prior to the release of the specification to actual production. BS EN ISO 15607:2003 provides useful information on the standards you needed to refer to ensuring you use the correct format for welding procedure specifications. It states the process for development and qualification of welding procedures.

BS EN ISO 15607:2003 supersedes BS EN 288-1:1992, which is now withdrawn.

ISBN 0 580 43197 5  Price £64*, £32 BSI Subscribing Members


This document specifies the requirements for the content of welding procedure specifications for arc welding processes, BS EN ISO 15609-1:2004 forms part of the BS EN ISO 15609 series of standards. The variables listed in this standard are those influencing the quality of the welded joint.

BS EN ISO 15609-1:2004 replaces BS EN 288-2:1992, which has been withdrawn.

ISBN 0 580 44628 X  Price £52*, £26 BSI Subscribing Members


This standard specifies requirements for the content of welding procedure specifications for gas welding processes. Variables listed in this standard are those influencing the quality of the welded joint.

ISBN 0 580 37647 8  Price £52*, £26 BSI Subscribing Members


This standard specifies requirements for the content of welding procedure specifications for electron beam welding. Variables listed in this standard are those influencing the quality and properties of the welded joint.

ISBN 0 580 44250 0  Price £52*, £26 BSI Subscribing Members


This standard specifies requirements for the content of welding procedure specifications for laser beam welding processes. Variables listed in this standard are those influencing the quality and properties of the welded joint.

ISBN 0 580 44259 4  Price £64*, £32 BSI Subscribing Members


This standard specifies requirements for the content of welding procedure specifications for resistance spot, seam, butt and projection welding processes. The acceptability of applying the principles of the standard to other resistance and related welding processes should be established before any qualification is undertaken.

Variables listed in this standard are those influencing either weld dimensions (quality), weld nugget dimension, weld pattern positioning, mechanical properties or geometry of the welded joint.

ISBN 0 580 44258 6  Price £64*, £32 BSI Subscribing Members

专卖

www.bsi-global.com/welding
Welder Qualification and Welding Procedure Qualification


This document specifies how a preliminary welding procedure specification is qualified by welding procedure tests. It also defines the conditions for the execution of welding procedure tests and the range of qualification for welding procedures for all practical welding operations within a range of variables.

BS EN ISO 15614-1:2004 applies to the arc and gas welding of steels in all product forms and the arc welding of nickel and nickel alloys in all product forms. The principles of this standard may also be applied to other fusion welding processes.

This standard supersedes BS EN 288-3:1992, which is now withdrawn.

ISBN 0 580 43975 5 Price £106*, £53 to BSI Subscribing Members

BS EN ISO 15611:2003 Specification and qualification of welding procedures for metallic materials. Qualification based on previous welding experience

This standard gives the necessary information to explain the requirements referenced in BS EN ISO 15607 (see page 5) about the qualification of welding procedures based on previous welding experience. In addition it gives the range of qualification and the validity. The use of this European Standard may be restricted by an application standard or a specification.

ISBN 0 580 43199 1 Price £52*, £26 BSI Subscribing Members

BS EN ISO 15612:2004 Specification and qualification of welding procedures for metallic materials. Qualification by adoption of a standard welding procedure

This standard gives the necessary information to explain the requirements referenced in BS EN ISO 15607 (see page 5) about the qualification by adoption of a standard welding procedure, and establishes the conditions, limits and ranges of qualification necessary for the use of a standard welding procedure. This standard gives the manufacturer the possibility to use welding procedures based on welding procedure tests performed by other organizations. The use of this standard can be restricted by an application standard or a specification.

ISBN 0 580 44257 8 Price £52*, £26 BSI Subscribing Members

BS EN ISO 15613:2004 Specification and qualification of welding procedures for metallic materials. Qualification based on pre-production welding test

This standard specifies how a preliminary welding procedure specification is qualified based on pre-production welding tests. It is applicable to arc welding, gas welding, beam welding, resistance welding, stud welding and friction welding of metallic materials.


ISBN 0 580 43986 0 Price £52*, £26 to BSI Subscribing Members


This document specifies how a preliminary welding procedure specification is qualified by welding procedure tests. It defines the conditions for the execution of welding procedure tests and the range of qualifications for welding procedures for all practical welding operations within the range of variables. BS EN ISO 15614-2:2005 applies to the arc welding of wrought and cast aluminium and its alloys. This standard does not apply to finishing welding of aluminium castings.

ISBN 0 580 45973 X Price £106*, £53 to BSI Subscribing Members


This standard specifies how a preliminary welding procedure specification is qualified by welding procedure tests. It defines the conditions for the execution of welding procedure tests and the range of qualification for welding procedures for all practical welding operations within the range of variables.

ISBN 0 580 43641 1 Price £92*, £46 to BSI Subscribing Members


This standard specifies requirements for the qualification testing of welding procedures for the arc welding of tube to tube-plate joints in metallic materials by manual, partly mechanized, mechanized or automatic processes. Qualification by tube to tube-plate joint tests can be used for all joints even if they are fully loaded or only seal welded as required in application standards. In such cases, one or more special test pieces should be made to simulate the production joint in all essential features, e.g. dimensions, restraint, heat sink effects. The test should be carried out prior to and under the conditions to be used in production.

This standard applies to fusion welding of metallic materials for tube to tube-plate joints with gap. It does not apply to tube-sheets with forged end connections with welded tubes (external/internal bore welds). For welding of tube to tube-plate joints without gap welding procedure test should be defined in the specification. For other applications and/or requirements the standard can be used if required by the specification. Repair welding should be considered in the welding procedure test.

ISBN 0 580 37551 X Price £92*, £46 to BSI Subscribing Members


* P&P applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.
Recommendations for Welding on Metallic Materials


This document specifies how to qualify welding procedure specifications for welding in hyperbaric dry environments. It also specifies the minimum testing requirements necessary for qualification of welding procedures. BS EN ISO 15614-10 may be used to qualify welding procedures using mechanized and automated welding. It does not invalidate previously qualified welding procedures in accordance with other standards or specifications, providing the technical requirements are satisfied and the previous qualifications are relevant to the application and production work on which they are to be employed.

ISBN 0 580 45676 S Price £64*, £32 BSI Subscribing Members


This standard specifies how a welding procedure specification for electron or laser beam welding is qualified by a welding procedure test. It defines the conditions for the execution of welding procedure qualification tests and the limits of validity of a qualified welding procedure for all practical welding operations within the range of variables. Tests shall be carried out in accordance with this standard together with additional tests when specified. This standard applies to metallic materials, irrespective of the shape of the parts, their thicknesses, manufacturing method (rolling, forging, casting, sintering, etc.) and their heat treatment. It covers unlimitedly the production of new parts and repair work.

ISBN 0 580 37646 X Price £92*, £46 BSI Subscribing Members


This publication specifies the tests which may be used for qualification of welding procedure specifications for spot, seam and projection welding processes. It defines the conditions for carrying out tests and the limits of validity of a qualified welding procedure for all practical welding operations covered by this standard. The tests required to qualify the procedure for a particular component/assembly depend on the performance and quality requirements of the component/assembly and shall be established before any qualification is undertaken.

ISBN 0 580 44249 7 Price £64*, £32 to BSI Subscribing Members


This part of BS EN ISO 15614 specifies the tests which should be used for qualification of welding procedure specifications. It applies to resistance butt welding and flash welding of metallic materials, e.g. with solid, tubular, flat or circular cross-section and defines the conditions for carrying out tests and the limits of validity of a qualified welding procedure for all practical welding operations covered by this document.

ISBN 0 580 45687 0 Price £92*, £46 BSI Subscribing Members


This European Standard is being issued in several parts in order that it may be extended to cover the different types of metallic materials which will be produced to all European Standards for weldable metallic materials. This standard gives general guidance for the satisfactory production and control of welding and details some of the possible detrimental phenomena which may occur, with advice on methods by which they may be avoided. It is generally applicable to fusion welding of metallic materials and is appropriate regardless of the type of fabrication involved, although the application standard or design specification can have additional requirements.

ISBN 0 580 29659 8 Price £64*, £32 BSI Subscribing Members


This European Standard gives guidance for manual, semi-mechanized, mechanized and automatic arc welding of ferritic steels, excluding ferritic stainless steels, in all product forms. It supplements BS EN 1011-1. It is issued with several annexes in order that it can be extended to cover the different types of steel which are produced to all the European steel standards for ferritic steels. This standard gives general guidance for the satisfactory production and control of welds in ferritic steels. Details concerning the possible detrimental phenomena which can occur are given with advice on methods by which they can be avoided. This standard is generally applicable to all ferritic steels and is appropriate regardless of the type of fabrication involved, although the application standard can have additional requirements.

ISBN 0 580 36224 8 Price £128*, £64 BSI Subscribing Members


This European Standard gives general recommendations for the fusion welding of stainless steels. It is being issued with several annexes in order that it may be extended to cover the different types of steel which will be produced to all the European steel standards for stainless steels. When this standard is referenced for contractual purposes, the ordering authority should state the need for compliance with the standard and such other annexes as are appropriate. This standard gives general guidance for the satisfactory production and control of welding and details the possible detrimental phenomena which may occur with advice on methods by which they may be avoided. It is generally applicable to all stainless steels and is appropriate regardless of the type of fabrication involved, although the application standard may have additional requirements. Permissible design stresses in welds, methods of testing and acceptance levels are not included because they depend on the service conditions of the fabrication. These details should be obtained from the design specification.

This part of this European Standard contains additional details for fusion welding of stainless steels and should be read in conjunction with the general recommendations in BS EN 1011-1.

ISBN 0 580 36715 0 Price £92*, £46 BSI Subscribing Members

*P&P applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.

www.bsi-global.com/welding
Recommendations for Welding on Metallic Materials


This standard gives general recommendations for the manual, mechanized and automatic fusion welding of wrought and cast aluminium alloys and combinations thereof. It gives general guidance for the satisfactory design, production and control of welding and details the possible detrimental effects which may occur, together with advice on methods by which they may be avoided.

Generally it is applicable to all types of aluminium materials and is appropriate regardless of the type of fabrication involved, although the application standard/contract may have additional requirements.

This standard identifies the main factors that affect the welding of aluminium. This will be influenced by parent metal, consumables, design, welding procedure, welding equipment, joint preparation etc.

ISBN 0 580 36714 2 Price £92*, £46 BSI Subscribing Members


This standard gives general recommendations for welding of clad steels by means of appropriate arc welding processes and electroslag strip cladding. It is generally applicable to all clad steels and is appropriate regardless of the type of fabrication involved, although the application standard may have additional requirements. Non-ferrous claddings, such as titanium, tantalum, zirconium and their alloys are not covered by this standard.

This standard covers welding of cladding deposits as well as welding of the transition zone(s), when existing, between parent metal and cladding. These transition zones are metal combinations of non-alloyed ferrous parent metal with high alloyed stainless steels, nickel alloys or other non-ferrous metals. The mechanical and physical design of the joints is not covered by this standard. Methods of testing and acceptance levels are not included because they depend on the service conditions of the fabrication. These details should be obtained from the design specification. The corrosion resistance of the cladding depends on many factors and is not a part of this standard.

ISBN 0 580 41755 7 Price £52*, £26 to BSI Subscribing Members


This document may be used for the electron beam welding of weldable metallic materials according to PD CR ISO 15608 (see page 3). It does not contain data on permissible stresses on weld seams or on the testing and evaluation of weld seams. Such data can either be seen from the relevant application standards or should be separately agreed between the contracting parties. A requirement for the application of this document is that the recommendations should be used by appropriately trained and experienced personnel.

ISBN 0 580 44198 9 Price £106*, £53 BSI Subscribing Members


This is one of a series of European Standards for requirements for fusion welding of metallic materials. This document specifies the requirements for fusion welding of unalloyed and low-alloy cast iron castings.

BS EN 1011-8:2004 superseded BS 4570:1985 which is now withdrawn.

ISBN 0 580 44785 5 Price £92*, £46 BSI Subscribing Members


This British Standard specifies requirements for the welding of carbon, carbon manganese and low alloy steel pipelines with specified minimum yield strengths not exceeding 555 N/mm². It applies to pipes of outside diameter 21.0 mm and larger having a thickness of 3.0 mm or greater and is applicable to transmission pipelines for gases, liquids or slurries, both on land and offshore.

In addition to the definitive requirements, this standard also requires the documentation of items that include:

- Whether different batches of electrodes and filler materials are to be individually identifiable and completely separated
- The type and number of re-tests required in the event of failure during testing and qualification of welding procedures

This standard should be used in conjunction with BS EN 288-9:1999 although in reflecting current industry practice, this British Standard places duties on, and allocates powers of approval to, the employer. In this it differs from BS EN 288-9 (under which welding procedure approval is independent of the employer).

Contents: Information and requirements to be approved and documented; Equipment, welding processes, welding consumables, Testing, qualification and approval of welding procedures for butt welds; Testing, qualification and application of welding procedure for fillet welds; Testing, qualification and approval of welders; Production welding; Inspection and testing of welds, documentation of items that include:

ISBN 0 580 44622 0 Price £128*, £64 BSI Subscribing Member


This British Standard specifies requirements for the welding of solution annealed duplex austenitic ferritic stainless steel pipelines with specified minimum chromium contents in the range 21.0% to 26.0%.

This is applicable to transmission pipelines for gases, liquids or slurries, both on land and offshore, of outside diameter 21.0 mm and larger, having a thickness of 3.0 mm or greater.

In addition to the definitive requirements it also requires that the items detailed be documented. For compliance with this standard, both the definitive requirements and the documented items have to be satisfied.

ISBN 0 580 28272 4 Price £92*, £46 BSI Subscribing Member

BS EN 288-9:1999 Specification and approval of welding procedures for metallic materials. Welding procedure test for pipeline welding on land and offshore site butt welding of transmission pipelines

This standard specifies how a welding procedure specification is approved by welding procedure tests for on land and offshore site butt welding of transmission pipelines under normal atmospheric conditions.

This standard defines the conditions for the execution of welding procedure approval tests and the limits of validity of an approved welding procedure for all practical welding operations within the range of variables. The principles of this standard can be applied to other fusion welding processes subject to agreement between the contracting parties.

ISBN 0 580 32580 6 Price £64*, £32 BSI Subscribing Members

* P&P applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.
Welding Equipment

BS EN ISO 17662:2005 Welding. Calibration, verification and validation of equipment used for welding, including ancillary activities
This standard specifies requirements to calibration, verification and validation of equipment used for control of process variables during fabrication, or control of the properties of equipment used for welding or welding allied processes, where the resulting output cannot be readily or economically documented by subsequent monitoring, inspection and testing. This relates to process variables influencing the fitness-for-purpose and in particular the safety of the fabricated product.

ISBN 0 580 45806 7  Price £106*, £53 BSI Subscribing Members

BS EN 13705:2004 Welding of thermoplastics. Machines and equipment for hot gas welding (including extrusion welding)
This document specifies general performance requirements of the machines and equipment for welding by hot gas of semi-finished products made from thermoplastics, including hot gas extrusion welding.

ISBN 0 580 44208 X  Price £52*, £26 BSI Subscribing Members

This British Standard specifies requirements for two classes of flexible rubber hose for gas welding and allied processes for use up to a maximum working pressure of 20 bar1) over the temperature range -25 °C to +70 °C. There is no subdivision of the classes because only the high kink resistant hose is specified.

Type H hoses for gas welding, cutting and allied processes are mainly intended for use in long lengths in the construction and military sectors where the full length of hose might not be visible to the welding operator.

ISBN 0 580 43363 3  Price £64*, £32 BSI Subscribing Members

BS EN 559:2003 Gas welding equipment. Rubber hoses for welding, cutting and allied processes
This European Standard specifies requirements for rubber hoses, including twin hoses and fixed fuel gas hoses for welding, cutting and allied processes. The term “allied processes” means, in particular, heating, brazing and metallization. This standard specifies requirements for rubber hoses for normal duty up to 2 MPa (20 bar) and light duty [limited to hoses for maximum operating pressure up to 1 MPa (10 bar) and with nominal bore less than or equal to 6,3 mm]. This standard pertains to hoses operated at temperatures -20 °C to +60 °C.

ISBN 0 580 41686 0  Price £64*, £32 BSI Subscribing Members

BS EN 561:2002 Gas welding equipment. Quick-action coupling with shut-off valves for welding, cutting and allied processes
This European Standard defines the specifications and the type tests for quick-action couplings with shut-off valves. It applies to quick-action couplings used between the regulator and the torch in equipment for gas welding, cutting and allied processes. This standard applies to cases where these couplings are used with hoses according to BS EN 559 or thread unions according to BS EN 560.

ISBN 0 580 40062 X  Price £64*, £32 BSI Subscribing Members

BS EN 730-1:2002 Gas welding equipment. Safety devices. Incorporating a flame (flashback) arrestor
BS EN 730-1 specifies the general requirements and tests for safety devices for fuel gases and oxygen or compressed air incorporating a flame (flashback) arrestor used downstream of manifold, cylinder and (or) pipeline outlet regulators, and upstream of blowpipes for welding, cutting and allied processes.

This standard does not specify the location of these devices in the gas system. Nor does it include requirements for safety devices which do not incorporate a flame arrestor which are covered by BS EN 730-2. This standard does not cover the use of safety devices incorporating flame arrestors for applications with premixed oxy/fuel or air/fuel gas supply systems, for example downstream of gas mixers or a generator to produce hydrogen/oxygen mixture by electrolytic decomposition of water.

ISBN 0 580 40732 2  Price £92*, £46 BSI Subscribing Members

BS EN 730-2:2002 Gas welding equipment. Safety devices. Not incorporating a flame (flashback) arrestor
This part of this European Standard specifies the general requirements and tests for safety devices for fuel gases and oxygen or compressed air which do not incorporate a flame (flashback) arrestor used downstream of manifold, cylinder and (or) pipeline outlet regulators, and upstream of blowpipes for welding, cutting and allied processes. This standard does not specify the location of these devices in the gas system. It does not include requirements for safety devices which incorporate a flame arrestor which are covered by BS EN 730-1.

ISBN 0 580 40733 0  Price £64*, £32 BSI Subscribing Members

BS EN ISO 15615:2002 Gas welding equipment. Acetylene manifold systems for welding, cutting and allied processes. Safety requirements in high-pressure devices
This standard lays down the general specifications, requirements and tests of devices located on the high-pressure side of acetylene manifold systems as defined in BS EN ISO 14114. The standard does not cover the high-pressure piping, flexible hoses and the regulator.

ISBN 0 580 39604 5  Price £92*, £46 BSI Subscribing Members

BS EN 50240:2004 Electromagnetic compatibility (EMC). Product standard for resistance welding equipment
This standard is applicable to equipment for resistance welding and allied processes intended for use in industrial and light industrial environments which are connected to mains supplies with rated voltages up to 1000 V a.c. rms. This standard does not define safety requirements.

Resistance welding equipment type tested in accordance with, and which has met the requirements of this standard, shall be deemed to be in compliance for all applications. The frequency range covered is from 0 Hz to 400 GHz. This product EMC standard for resistance welding equipment takes precedence over all aspects of the generic standards and no additional EMC tests are required or necessary.

ISBN 0 580 44934 3  Price £64*, £32 BSI Subscribing Members

DD CLC/TS 62081:2002 Arc welding equipment. Installation and use
This technical specification is applicable to the installation and industrial and professional use of welding power sources, equipment and accessories for arc welding and allied processes.

ISBN 0 580 40267 3  Price £52*, £26 BSI Subscribing Members

*PRP applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.
**BS EN 60974-2:2003** Arc welding equipment. Liquid cooling systems
This part of BS EN 60974 specifies safety and construction requirements for liquid cooling systems intended to cool torches. These liquid cooling systems can be internal or external to power sources for arc welding and allied processes. This standard is not applicable to refrigerated cooling systems.

ISBN 0 580 41245 8  Price £64*, £32 BSI Subscribing Members

**BS EN 60974-3:2003** Arc welding equipment. Arc striking and stabilizing devices
BS EN 60974-3 specifies safety requirements for arc striking and arc stabilizing devices used in arc welding and allied processes. Arc striking and arc stabilizing devices may be stand-alone units which may be connected to a separate welding power source or one where the welding power source and arc striking and arc stabilizing devices are housed in a single enclosure. This standard does not include electromagnetic compatibility (EMC) requirements.

ISBN 0 580 42894 X  Price £64*, £32 BSI Subscribing Members

**BS EN 60974-5:2002** Arc welding equipment. Wire feeders
This part of BS EN 60974 specifies safety and performance requirements for industrial and professional equipment used in arc welding and allied processes to feed filler wire. The wire feeder may be a stand-alone unit which may be connected to a separate welding power source or one where the welding power source and the wire feeder are housed in a single enclosure. The wire feeder may be suitable for manually or mechanically guided torches.

ISBN 0 580 39480 8  Price £92*, £46 BSI Subscribing Members

**BS EN 60974-8:2004** Arc welding equipment. Gas consoles for welding and plasma cutting systems
This part of BS EN 60974 specifies safety and performance requirements for gas consoles intended to be used with combustible gases or oxygen. These gas consoles are designed to supply gases for use in arc welding, plasma cutting, gouging and allied processes in non-explosive atmospheres. The gas console can be external or internal to the power source enclosure. In the latter case, this standard also applies to the power source.

ISBN 0 580 43615 2  Price £92*, £46 BSI Subscribing Members

**BS EN 60974-11:2004** Arc welding equipment. Electrode holders
This part of BS EN 60974 is applicable to electrode holders for manual metal arc welding with electrodes up to 10 mm in diameter. BS EN 60974-11 specifies safety and performance requirements of electrode holders. It is not applicable to electrode holders for underwater welding.

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*P&P applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.
Welding Consumables

BS EN 14640:2005 Welding consumables. Solid wires and rods for fusion welding of copper and copper alloys. Classification

For copper welding consumables there is no unique relationship between the product form (solid wire or rod) and the welding process used (e.g. gas shielded metal arc welding, gas tungsten arc welding, plasma arc or other welding processes). For this reason the solid wires or rods may be classified on the basis of any of the above product forms and can be used as appropriate, for more than one of the above processes.

This document specifies requirements for classification of solid wires and rods for fusion welding of copper and copper alloys. The classification of the solid wires and rods is based on their chemical composition.

ISBN 0 580 46036 3  Price £52*, £26 BSI Subscribing Members

BS EN 13479:2004 Welding consumables. General product standard for filler metals and fluxes for fusion welding of metallic materials

This document specifies general delivery conditions for filler metals and fluxes for fusion welding of metallic materials. This document does not apply to auxiliaries such as shielding gases. This document is intended for application in a number of situations:

• The manufacturer should use this document to establish the product’s characteristics.
• This document may be used for contractual purposes, as a reference document.
• This document should also be used as a reference document for product conformity assessment.

ISBN 0 580 45304 9  Price £64*, £32 BSI Subscribing Members

BS EN 14532-1:2004 Welding consumables. Test methods and quality requirements. Primary methods and conformity assessment of consumables for steel, nickel and nickel alloys

This document describes the basic verification tests, the testing methods, the amount of testing and the requirements for the qualification of welding consumables for steel, nickel and nickel alloys intended for all fields of application. It describes a wide range of tests, which are appropriate for the majority of applications. When supplementary tests are required (see BS EN 14532-2), these can be carried out at any time without the need to repeat the primary tests.

ISBN 0 580 44964 5  Price £106*, £53 BSI Subscribing Members

BS EN 14532-2:2004 Welding consumables. Test methods and quality requirements. Supplementary methods and conformity assessment of consumables for steel, nickel and nickel alloys

This standard applies to welding consumables for which supplementary qualification is required. It contains the technical requirements to be fulfilled. These supplementary tests apply for welding consumables, where the primary qualification is available in accordance with BS EN 14532-1. The supplementary tests can be carried out at any time without the need to repeat the primary tests. This document describes the testing methods, the amount of testing and the requirements for supplementary qualification of welding consumables.

ISBN 0 580 44963 7  Price £92*, £46 BSI Subscribing Members

BS EN 14532-3:2004 Welding consumables. Test methods and quality requirements. Conformity assessment of wire electrodes, wires and rods for welding of aluminium alloys

ISBN 0 580 45359 6  Price £92*, £46 BSI Subscribing Members

BS EN 756:2004 Welding consumables. Solid wires, solid wire-flux and tubular cored electrode-flux combinations for submerged arc welding of non alloy and fine grain steels. Classification

This standard specifies requirements for classification of electrode-flux combinations and all-weld metal in the as-welded condition for submerged arc welding of non alloy and fine grain steels with a minimum yield strength of up to 500 MPa. Classification can be made with solid wire electrodes or tubular cored electrodes. One flux may be classified with different electrodes. The solid wire electrode is also classified separately based on its chemical composition. Fluxes for the single and two run techniques are classified on the basis of the two run technique.

ISBN 0 580 43546 6  Price £64*, £32 BSI Subscribing Members

BS EN ISO 544:2003 Welding consumables. Technical delivery conditions for welding filler metals. Type of product, dimensions, tolerances and markings

This European Standard specifies technical delivery conditions for filler materials for fusion welding. This European Standard does not apply to auxiliaries such as shielding gases.

ISBN 0 580 43006 5  Price £64*, £32 BSI Subscribing Members

BS EN ISO 1071:2003 Welding consumables. Covered electrodes, wires, rods and tubular cored electrodes for fusion welding of cast iron. Classification

This European Standard specifies requirements for classification of covered electrodes for manual metal arc welding, wire electrodes for metal arc welding, tubular cored electrodes for metal arc welding with and without a gas shield, rods for TIG-welding and rods for oxyfuel gas welding of unalloyed cast irons. Classification is based on the chemical composition of wires and rods and on the all-weld metal deposit for tubular cored and covered electrodes.

ISBN 0 580 42235 6  Price £106*, £53 BSI Subscribing Members

BS EN 14295:2003 Welding consumables. Wire and tubular cored electrodes and electrode-flux combinations for submerged arc welding of high strength steels. Classification

This standard specifies requirements for classification of electrode-flux combinations and all-weld metal in the as welded or stress relieved condition for submerged arc welding of steels with a minimum yield strength higher than 500 MPa. One flux may be classified with different electrodes. The wire electrode is also classified separately based on its chemical composition.

ISBN 0 580 42926 1  Price £64*, £32 BSI Subscribing Members

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BS EN ISO 18273:2004 **Welding consumables. Wire electrodes, wires and rods for welding aluminium and aluminium alloys. Classification**

This document specifies requirements for classification of solid wires and rods for fusion welding of aluminium and aluminium alloys. The classification of the solid wires and rods is based on their chemical composition.

For aluminium welding consumables there is no unique relationship between the product form (solid wire or rod) and the welding process used (e.g. gas shielded metal arc welding, gas tungsten arc welding, plasma arc welding, submerged arc welding, strip overlay welding, laser welding or other welding processes). For this reason the solid wire, strip or rod may be classified on the basis of any of the above product forms and can be used as appropriate, for more than one of the above processes.

ISBN 0 580 43553 9  Price £92*, €46 BSI Subscribing Members


This international standard prescribes requirements for the classification of nickel and nickel alloy covered electrodes for manual metal arc welding and overlaying. It includes those compositions in which the nickel content exceeds that of any other element.

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BS EN ISO 6847:2001 **Welding consumables. Deposition of a weld metal pad for chemical analysis**

This international standard specifies the procedure to be used for deposition of a weld metal pad for chemical analysis. It applies to deposition of a weld metal pad by use of covered electrodes, wire electrodes for gas shielded metal arc welding, tubular cored electrodes for gas shielded arc metal welding and for self-shielded metal arc welding, tubular cored rods for gas tungsten arc welding, and wire-flux combinations for submerged arc welding.

BS EN ISO 6847 is applicable to welding consumables for non-alloy and fine grain steels, high strength steels, creep-resistant steels, stainless and heat-resistant steels, nickel and nickel alloys, and copper and copper alloys.

ISBN 0 580 37898 5  Price £52*, €26 BSI Subscribing Members

BS EN 12073:2000 **Welding consumables. Tubular cored electrodes for metal arc welding with or without a gas shield of stainless and heat-resisting steels. Classification**

This European Standard specifies requirements for classification in order to designate tubular cored electrodes with or without a gas shield for metal arc welding of steels, such as stainless and heat-resisting steels in terms of the chemical composition of the all-weld metal. It is recognized that the operating characteristics of tubular cored electrodes can be modified by the use of pulsed current, but for the purposes of this standard, pulsed current is not used for determining the electrode classification.

ISBN 0 580 35223 4  Price £64*, €32 BSI Subscribing Members

BS EN 12074:2000 **Welding consumables. Quality requirements for manufacture, supply and distribution of consumables for welding and allied processes**

The requirements in this standard provide a framework for control of manufacture, supply and distribution of consumables in the following cases:

- To identify the requirements for manufacture, supply and distribution of consumables in contracts which require the manufacturer, the supplier or the distributor to have a quality system in accordance with BS EN ISO 9001 or BS EN ISO 9002.
- To provide specific requirements for manufacture, supply and distribution of consumables as a guidance to manufacturers, suppliers or distributors developing a quality system.
- To provide specific requirements for manufacture, supply and distribution of consumables in specifications, standards and regulations which require the manufacturer, the supplier or the distributor of consumables to have a quality systems as a condition for approval or certification of consumables.

ISBN 0 580 35224 2  Price £64*, €32 BSI Subscribing Members

BS EN 12535:2000 **Welding consumables. Tubular cored electrodes for gas shielded metal arc welding of high strength steels. Classification**

This standard specifies requirements for classification of tubular cored electrodes in the as-welded or stress relieved condition for gas shielded metal arc welding of high strength steels with a minimum specified yield strength higher than 500 N/mm². One tubular cored electrode may be tested and classified with different gases. It is recognized that the operating characteristics of tubular cored electrodes can be modified by the use of pulsed current, but for the purposes of this standard, pulsed current is not used for determining the electrode classification.

ISBN 0 580 34179 8  Price £64*, €32 BSI Subscribing Members

BS EN 12536:2000 **Welding consumables. Rods for gas welding of non alloy and creep-resisting steels. Classification**

This standard specifies a classification in order to designate rods for gas welding of non alloy and creep-resisting steels in terms of the chemical composition of the rod.

ISBN 0 580 34180 1  Price £52*, €26 BSI Subscribing Members

*P&P applicable (see back cover for details). All prices, content and publishing dates may be subject to change. All information correct at time of printing.
Resistance Welding


This document recommends procedures for determining the generic weldability for resistance spot, seam and projection welding of metallic materials. This procedure is applicable for the assessment of the weldability of uncoated/coated steels, stainless steels and non-ferrous alloys such as aluminium, titanium, magnesium and nickel and their alloys of single thickness lower than or equal to 5 mm.

The weldability of metallic materials in resistance welding is defined in terms of:

• The ability to make the weld in the first place
• The ability to continue making welds
• The ability of the weld to withstand the imposed service stresses.

The procedures recommended in this standard can be used to:

• Compare the weldability of different metallic materials
• Compare the welding response of a particular welding equipment and allow comparisons between different equipment and determine the influence of the statisodynamic properties of different welding equipment
• Determine the weldability of a material when any welding configuration is changed e.g. electrode material and/or shape, water cooling requirements etc.
• Investigate the effect of welding parameters such as welding current, weld time, electrode force or complex welding schedules including pulse welding, current stepping etc. on weldability.

ISBN 0 580 44858 4 Price £52*, £66 BSI Subscribing Members


This document specifies a laboratory test procedure for the determination of the acceptable welding current range and the assessment of electrode life using a multi-spot test with specific conditions. This document is applicable for the assessment of the weldability of uncoated and coated sheet steels of thicknesses up to 3 mm. The test procedure specified in this document and the results obtained, apply only for the introduction of a new type or batch of material.

ISBN 0 580 44857 6 Price £92*, £46 BSI Subscribing Members

BS EN ISO 14327:2004 Resistance welding. Procedures for determining the weldability lobe for resistance spot, projection and seam welding

This European Standard specifies procedures for determining the weldability lobe for resistance spot, projection and seam welding. The tests are used in particular to determine the weldability lobe for coated/uncoated steels, stainless steels and aluminium and its alloys but may also be used for other metallic materials.

The aim of this procedure is to allow determination of the range of welding parameters which give rise to an acceptable weld quality as defined within precise limits. The procedure can be used to determine:

• The influence of electrode material, electrode shape and dimensions on the available welding range for a particular material and welding machine
• The influence of material type and thickness on the available welding range when using a particular combination of welding electrodes and welding machine
• The influence of welding machine type, or electrode cooling on the available welding range for a particular material using a particular electrode shape
• The available welding range in a production situation.

ISBN 0 580 43911 9 Price £64*, £32 BSI Subscribing Members

BS EN ISO 8166:2003 Resistance welding. Procedure for the evaluation of the life of spot welding electrodes using constant machine settings

This document specifies a laboratory test procedure for the determination of the acceptable welding current range and the assessment of electrode life using a multi-spot test with specific conditions. This document is applicable for the assessment of the weldability of uncoated and coated sheet steels of thicknesses up to 3 mm. The test procedure specified in this document and the results obtained, apply only for the introduction of a new type or batch of material.

ISBN 0 580 42044 2 Price £64*, £32 BSI Subscribing Members

BS EN ISO 14554-1:2001 Quality requirements for welding. Resistance welding of metallic materials. Comprehensive quality requirements

This standard has been prepared such that it is independent of the type of welded construction to be manufactured; it defines quality requirements for welding both in production plants and on site; it provides guidance for describing a manufacturer’s capability to produce welded constructions to meet specified requirements; it can also be used as a basis for assessing the manufacturer in respect to his welding capability.

This standard is appropriate when demonstration of a manufacturer’s or a sub-contractor’s capability to produce welded constructions, fulfilling specified quality requirements, are specified in one or more of the following:

• A contract between involved parties
• An application standard
• A regulatory requirement.

The requirements contained within this standard can be adopted in full or can be selectively deleted by the manufacturer if not applicable to the construction concerned. They provide a flexible framework for the control of welding in the following cases:

• To provide specific requirements for resistance welding in contracts which require the manufacturer or subcontractor to have a quality system in accordance with BS EN ISO 9001 or BS EN ISO 9002
• To provide specific requirements for resistance welding in contracts which require the manufacturer or subcontractor to have a quality system in accordance with BS EN ISO 9001 or BS EN ISO 9002
• To provide specific requirements for resistance welding as guidance to a manufacturer or sub-contractor developing a quality system.
• To provide specific requirements for references in application standards which uses resistance welding as part of its requirements or in a contract between relevant parties. It is however more appropriate for BS EN ISO 14554-2 to be used in such cases.

ISBN 0 580 34496 7 Price £64*, £32 BSI Subscribing Members


This standard has been prepared such that it is independent of the type of welded construction to be manufactured; it defines quality requirements for welding both in production plants and on site; it provides guidance for describing a manufacturer’s capability to produce welded constructions to meet specified requirements; it can also be used as a basis for assessing the manufacturer in respect to his welding capability.

The requirements contained within this standard can be adopted in full or can be selectively deleted by the manufacturer if not applicable to the construction concerned. They provide a flexible framework for the control of welding in similar cases described in BS EN ISO 14554-1:2001.

ISBN 0 580 34497 5 Price £52*, £26 BSI Subscribing Members

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www.bsi-global.com/welding
**Testing of Welds**  
Destructive and Non-destructive


This international standard specifies test specimens and procedures for fatigue testing spot welds, at ambient conditions, under repeated tensile loading to produce either shear or cross-tension loading of the spot weld, in steel of sheet thicknesses of 0.5 mm to 6 mm. The test results are not, in general, directly applicable to the fatigue behaviour of a spot-welded component or structure. This procedure can be used for other materials provided proper test conditions (e.g., heating) have been determined.

ISBN 0 580 42270 4  Price £64*, £32 BSI Subscribing Members

**BS EN ISO 14329:2003** Resistance welding. Destructive tests of welds. Failure types and geometric measurements for resistance spot, seam and projection welds

This international standard specifies the definitions of the geometric measurements and fracture types to be used in relation to the testing of resistance spot, projection and seam welds in which different loading configurations cause different stress distributions in the weld. The aim of these definitions is to give a base for all other related standards.

ISBN 0 580 42271 2  Price £64*, £32 BSI Subscribing Members

**BS EN ISO 17653:2003** Destructive tests on welds in metallic materials. Torsion test of resistance spot welds

This European Standard is applicable to spot welded test specimens with single sheet thicknesses ranging from 0.5 mm to 3.0 mm in steels. It may be used for non-ferrous materials in certain circumstances. The aim of this test is to determine the influence of different steel types, welding parameters and other factors on the deformation characteristics of a spot weld. Using this test, it is possible to determine the weld diameter and the fracture type from fractured specimens. Additionally, the maximum torsion moment (torque) and the corresponding torsion angle can be determined.

ISBN 0 580 41433 7  Price £52*, £26 BSI Subscribing Members


This European Standard specifies the pressure test method to be applied to resistance seam welded specimens of different types of material, e.g. uncoated and coated ferritic steels and uncoated austenitic steel sheet with single sheet thicknesses ranging from 0.3 mm to 3.2 mm. The purpose of this pressure test is to determine the suitability of the material, welding equipment, welding parameters and of other factors on a tank, a vessel or a container for liquids or gases, which are manufactured by resistance seam welding.

ISBN 0 580 41432 9  Price £52*, £26 BSI Subscribing Members

**BS EN 12799:2000** Brazing. Non-destructive examination of brazed joints

This European Standard describes non-destructive examination procedures and test piece types necessary to perform the tests on brazed joints. The non-destructive examination methods include visual examination; ultrasonic examination; radiographic examination; penetrant examination; lead testing; proof testing; and thermography.

ISBN 0 580 36226 4  Price £106*, £53 BSI Subscribing Members

**BS EN 14324:2004** Brazing. Guidance on the application of brazed joints

This standard gives guidance on the application of brazing and the manufacture of brazed joints, providing an introduction to brazing and a basis for the understanding and use of brazing in different applications. BS EN 14324:2004 has been written to cover joint design and assembly; material aspects for both parent material and filler materials; brazing process and process variables; pre- and post-braze treatment and inspection.

ISBN 0 580 44516 X  Price £128*, £64 for BSI Subscribing Members

**BS EN 14224-3:2003** Solder wire, solid and flux cored. Specification and test methods. Wetting balance test method for flux core solder wire efficacy

ISBN 0 580 41967 3  Price £64*, £32 BSI Subscribing Members

**BS EN ISO 18279:2003** Brazing. Imperfections in brazed joints

This document details a classification of imperfections that can occur in brazing joints; guidance on quality levels; and suggested limits for imperfections. BS EN ISO 18279:2003 covers only imperfections that can occur in connection with brazing without the effect of any additional service loads. Only the type, shape and position of such imperfections are covered; no indication is given of the conditions of occurrence or causes.

ISBN 0 580 43238 6  Price £92*, £46 BSI Subscribing Members

**BS EN ISO 9454-2:2001** Soft soldering fluxes. Classification and requirements. Performance requirements

This part of BS EN ISO 9454 specifies the performance requirements for fluxes in solid, liquid and paste forms intended for use with soft solders.

ISBN 0 580 34682 X  Price £64*, £32 BSI Subscribing Members

**BS EN ISO 9455-10:2001** Soft soldering fluxes. Test methods. Flux efficacy test, solder spread method

This part of BS EN ISO 9455 specifies a method for the determination of the efficacy of a soft soldering flux. The method is known as the solder spread method and is applicable to all flux classes defined in BS ISO 9454-1. This part of ISO 9455 is only applicable for liquid fluxes > 10 % (m/m).

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**BS ISO 9455-17:2002** Soft soldering fluxes. Test methods. Surface insulation resistance comb test and electrochemical migration test of flux residues

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**BS EN 12797:2000** Brazing. Destructive tests of brazed joints

This European Standard describes destructive test procedures and test piece types necessary to perform the tests on brazed joints. The destructive test methods described are shear tests; tensile tests; metallographic examination; hardness tests; peel test; and bend tests.

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Occupational Health & Safety Management

BS 8800:2004 Occupational health and safety management systems. Guide
Written with the help of industry, safety practitioners and the Health and Safety Executive (HSE), this British Standard will help organizations develop a framework for managing OH&S so employees and others, whose health and safety might be affected by the organization's activities, are adequately protected.

BS 8800:2004 will:
• Minimize risk to employees and others by developing good working practices to prevent accidents and work-related ill health
• Improve business performance and assist organizations to establish a responsible image within the market place
• Assist organizations in continually improving their performance beyond legal compliance
• Help organizations to achieve compliance with its OH&S policies and objectives.
The guidelines in BS 8800:2004 are based on general principles of good management and are designed to enable the integration of OH&S management within an overall management system.

ISBN 0 580 43987 9 Price £140*, £70 BSI Subscribing Members

OHSAS 18001:1999 Occupational health and safety management systems. Specification
This Occupational Health and Safety Assessment Series (OHSAS) specification gives requirements for an occupational health and safety management system, to enable an organization to control its OH&S risks and improve its performance. It does not state specific OH&S performance criteria, nor does it give detailed specifications for the design of a management system (this can be found in BS 8800:2004). All the requirements in this OHSAS specification are intended to be incorporated into any OH&S management system.

ISBN 0 580 28298 8 Price £35*

OHSAS 18002:2000 Occupational health and safety management systems. Guidelines for the implementation of OHSAS 18001
This publication provides generic advice on the application of OHSAS 18001. It explains the underlying principles of OHSAS 18001 and describes the intent, typical inputs, processes and typical outputs, against each requirement of OHSAS 18001. This is to aid the understanding and implementation of OHSAS 18001.

ISBN 0 580 33123 7 Price £50*

Managing Safety the Systems Way
David Smith, Geoff Hunt and Clive Green
This newly revised book explains how the various elements in developing an OH&S management system can be tackled, and how the system can be maintained as OH&S evolves, responding to internal and external influences.


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Environmental Management

BS EN ISO 14001:2004 Environmental management systems. Requirements with guidance for use
The newly revised BS EN ISO 14001:2004 specifies the requirements for an environmental management system (EMS), which provides a framework for an organization to control the environmental impacts of its activities, products and services, and to continually improve its environmental performance. It applies to those environmental aspects which the organization can control and over which it can be expected to have an influence. It does not itself state specific environmental performance criteria.

ISBN 0 580 44771 5 Price £96*, £48 BSI Subscribing Members

BS EN ISO 14001:2004 is now available in a laminated AS spiral-bound format making for extra durability.
A5 laminated and spiral-bound, 52 pages, 2005
ISBN 0 580 45406 1 BSI order ref BIP 2075 Price £130*, £65 BSI Subscribing Members

BS ISO 14004:2004 Environmental management systems. General guidelines on principles, systems and support techniques
BS ISO 14004:2004 provides guidelines on the elements of an EMS, its implementation and the principles involved. It also gives advice on how to effectively initiate, improve or sustain an environmental management system. An EMS is an essential element to an organization’s ability to anticipate and meet its environmental objectives and to ensure ongoing compliance with national and/or international requirements.

ISBN 0 580 44772 3 Price £116*, £58 BSI Subscribing Members

BS 8555:2003 Environmental management systems. Guide to the phased implementation of an environmental management system including the use of environmental performance evaluation
Building on BS EN ISO 14001 and the EU Eco-Management and Audit Scheme (EMAS), this British Standard provides guidance to all organizations on the phased implementation, maintenance and improvement of a formal EMS. BS 8555 makes particular reference to small and medium-sized enterprises but is applicable to any organization. It outlines an implementation process that can be undertaken in up to six separate phases and allows for phased acknowledgement of progress towards full EMS implementation.

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Managing the Environment the 14001 Way
David Smith and Clive Green
This book is for organizations seeking user-friendly help in developing a cost-effective EMS based on BS EN ISO 14001 and 14004. It builds on the basic framework and principles of the standards by providing practical advice, examples and sources of further information.

A5 paperback, 160 pages (approx), 2005
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