

## Miscellaneous

<b>DIN No</b>	TD5/043	<b>Issue Date</b>	2 May 2002
<b>Open Government Status</b>	Fully Open	<b>Review Date</b>	5 November 2002

### PROCESS SAFETY & PRESSURE SYSTEMS

#### Reading and Reference List

##### 1. GENERAL

Coward, HF, Jones, GW, "Limits of Flammability of Gases and Vapours", Bulletin 503, Bureau of Mines, Department of the Interior, Washington, USA, 1952.

Harris, RJ, "Gas Explosions in Buildings and Heating Plant", British Gas Corporation, E&FN Spon, London, 1983.

Rose, JW, Cooper, JR, "Technical Data of Fuel", Seventh Edition, The British National Committee, World Energy Conference, 34 St James Street, London, 1977.

UN 'orange book' - Recommendations of the transport of dangerous goods Test criteria.

In addition to the UN Orange Book there are published requirements for the International Transportation of dangerous goods by road, rail, sea and air under ADR, RID, IMDG Code, ICOA Instructions, etc.

ATEX 100A Directive. DTI Guidance Notes, Feb 1998.

##### 2. CHEMICAL REACTION HAZARDS

I Chem E. Chemical Reactions Hazards (Barton & Rogers) 2nd ed 1997.

HSE Contract Research Report 136/1998. Workbook for chemical reaction relief systems sizing (Etchells & Wilday).

HSE leaflet INDG 254. Chemical reaction hazards and the risk of thermal runaway.

ABPI Guidelines for chemical reaction hazard evaluation.

International Symposia on exothermic runaway reaction. Papers 1990, 1993, 1995, 1998.

FI NIGM 17/1990/11. Exothermic reactions.

##### 3. FIRE PRECAUTIONS

OC 217/2(rev): Fire legislation and liaison between HSE Inspectors and Fire Authorities.

OC 217/3: Civil proceedings following the fire at Bradford City Football Club.

BS 5588: Part 0: Fire precautions in the design, construction and use of buildings: Guide to fire safety codes of practice for particular premises/applications.

BS 5588: Part 11: Fire precautions in the design, construction and use of buildings: Code of Practice for shops, offices, industrial, storage and other similar buildings.

BS 5908: Code of Practice for Fire Precautions in the Chemical and Allied Industries.

Guidance Note EH 70: The control of fire-water run-off from CIMAH sites to prevent environmental damage.

HSG 168: Fire safety in construction work.

OC 404/23: General Fire Precautions at Temporary Accommodation Units on Construction sites.

OC 401/3: The enforcement of fire safety standards during construction work.

Sector Minute 02/1998/16: Fire Precautions in Tunnelling Work.

Printing Industry Advisory Committee: Fire safety in the printing industry.

Paper & Board Industry Advisory Committee: Fire safety in the paper and board industry.

#### **4. FLAMMABLE GASES AND OXYGEN**

##### **Compressed Gases**

BCGA GN2: Safe Practice for the Storage of Gases in Transportable Cylinders intended for industrial use.

BCGA CP4: Industrial gas cylinder manifolds & distribution pipework/pipelines (excluding acetylene).

BCGA CP16: Movement of static storage tanks for non-flammable, non-toxic gases by road.

BCGA CP21: Bulk liquid argon or nitrogen storage at users' premises.

BCGA CP22: Bulk liquid argon or nitrogen storage at production sites.

BCGA CP23: Application of the Pressure systems and Transportable Gas Containers Regs 1989 to industrial and medical pressure systems installed at consumer premises.

BCGA CP26: Bulk liquid carbon dioxide storage at users' premises.

BCGA leaflet: Carriage of gas cylinders by road in cars and vans - guidance for drivers at work.

BS 6959: Selection installation, use and maintenance of apparatus for the detection and measurement of combustible gases.

##### **Oxygen**

HSE 08 leaflet: "Fire and explosion hazards in the use and misuse of oxygen".

HSE guidance note: CS7 Odourisation of bulk oxygen supplies in shipyards.

Discipline Information Note 5025: Review of oxygen incidents 1990-1995.

BCGA CP14: The safe production of breathing gases used for breathing purposes.

BCGA CP19: Bulk liquid oxygen storage at production sites.

BCGA CP20: Bulk liquid oxygen storage at production sites.

BCGA GN5: The safe application of oxygen enriched atmospheres when packaging food.

BCGA R1 (LOX): A method of estimating the offsite risks from bulk storage of liquefied oxygen (LOX).

BS 4N 100 Part 2: Methods of testing the compatibility of materials in the presence of oxygen.

BS 4N 100 Part 6: Guidance and recommendations for the selection of materials for use with oxygen.

BS 4N 100 Part 7: Guidance on cleaning procedures, labelling and packaging systems.

BS 6869: Procedures for ensuring the cleanliness of industrial-process measurement control equipment in oxygen service.

ASTM Guides G94-88: Evaluating metals for oxygen service and G 63- 83a Evaluating non-metallic materials for oxygen service.

### **Pyrophoric Gases (silane)**

BCGA CP18: The safe storage, handling and use of special gases in the micro-electronics industry.

### **Welding, cutting and allied processes**

HSE HSG 139: The safe use of compressed gases in welding, cutting and allied processes.

BCGA CP7: The safe use of oxy-fuel equipment (individual portable or mobile cylinder supply).

Many British Standards including:

BS 6158: Safety devices for fuel gases and oxygen or compressed air for welding, cutting and related processes.

BS 5741: Pressure regulators used in welding, cutting and related processes.

### **Hydrogen**

BCGA CP8: The safe storage of gaseous hydrogen in seamless cylinders and similar containers.

HSE FIC 294/37: Catalytic hydrogen generators.

NFPA 50A Gaseous hydrogen systems at consumer sites.

NFPA 50B: Standard for liquefied hydrogen systems at consumer sites.

HSE FIC 498/11: Fire and explosion hazards at electrochlorination plant.

### **Special atmosphere furnaces**

HSE FIC 647/7: Fire and explosion hazards in special atmosphere furnaces used in heat treatment processes.

### **Landfill/naturally occurring gas**

HSE Discipline Information Note 5030: Review of Landfill Gas Incidents and Guidance.

Department of the Environment Waste Management Paper No 26A: Landfill Completion, 1994.

Department of the Environment Waste Management Paper No 26B: Landfill Design, Construction and Operational Practice, 1995.

Department of the Environment Waste Management Paper No 27: The control of landfill gas.

Department of the Environment Waste Management Paper No 4: The Licensing of Waste Facilities, 2nd Edition 1988.

Department of the Environment Circular 21/87: Development of Contaminated Land.

Methane: Its Occurrence and Hazards in Construction, CIRIA Report 130 1993.

Monitoring of Landfill Gas. Institute of Waste Management. June 1990.

HSE OC 847/4: Water boreholes: Risk of methane evolution.

HSE FIC 414/8 Diving operations: risk of methane explosion.

### **Ammonia**

HSE PM 81: Safe management of ammonia refrigeration systems.

HS(G)30: Storage of anhydrous ammonia under pressure in the UK.

### **Chlorine**

HSG 28: Safety advice for bulk chlorine installations.

HSG 40: Chlorine from drums and cylinders.

## **5. FLAMMABLE LIQUIDS**

Highly Flammable Liquids and LPG Regs 1972.

Safe work in confined spaces ACOP and guidance L101 HSE.

Safe use of work equipment ACOP and guidance L22 HSE.

## A guide to the Pipelines Safety Regulations 1966 L82.

BSEN 60079:Electrical apparatus for explosive gas atmospheres.  
Part 10 Hazardous area classification.  
Part 14 Electrical installations in hazardous areas.

Institute of Petroleum publications:

Model Code of Practice

Part 2 Marketing Safety Code

Part 11 Bitumen Safety Code

Part 15 Area Classification for Petroleum Installations

Part 16 Tank Cleaning Code

Part 19 Fire Precautions at Petrol Refineries & Bulk Storage Installations

Part 21 Guidelines for the control of Hazards arising from Static Electricity

Guidelines for the design and operation of gasoline vapour emission controls

Road Tank Vehicle Workshop Code

Leaded Gasoline Tank Cleaning and Disposal of Sludge - Associated Octel.

The Printer's Guide to Health and Safety - HSE Books.

The Safe Isolation of Plant and Equipment - by OIAC HSE Books.

Selection criteria for remote isolation of hazardous inventories CRR 205 HSE Contract Research Report.

Guidance on the Control of Major Accident Hazards Regulations 1999, L111 HSE.

BS 5958: CoP Control of undesirable static electricity (note: soon to be replaced by CENELEC Standard - Safety of Machinery - Guidance and recommendations for the avoidance of hazards due to electricity).

BS 6656: Guide to prevention of inadvertent ignition of flammable atmospheres by radio frequency radiation.

Guidance on permit-to-work systems in the petroleum industry - by OIAC HSE Books.

Permit-to-work systems INDG98 HSE Books.

prEN 1539: Dryers & ovens in which flammable substances are released.

Bulk Storage and Handling of Potable Alcohol - HSE Drinks NIG.

APEA/IP Code of Practice for the design.

HS(G) 186: Bulk transfer of dangerous liquids and gases between ship and shore.

HS(G) 26: Transport of dangerous substances in tank containers.

NFPA 68: Guide for Explosion Venting.

FIC 803/11: Small-scale Paint Mixing Systems.

HS(G) 146: Dispensing Petrol: Assessing & Controlling the risk of fire and explosion at sites where petrol is stored and dispensed.

HS(G) 176: The Storage of Flammable Liquids in Fixed Tanks.

HS(G)51: The Storage of Flammable Liquids in Containers.

FISM 8/1985/4: Co-storage of Flammable and toxic materials in bulk.

CIA Booklet: Guidelines for Bulk Handling of Ethylene Oxide.

HSG 178: Spraying of Flammable Liquids.

HSE GN PM 25: Vehicle Finishing Units. (Out of print.)

HS(G) 113: Lift trucks in potentially flammable atmospheres.

HS(G) 158: Flame Arrestors.

HS(G) 16: Evaporating and Other Ovens (Out of print.)

HSE GN CS15: The cleaning and Gas Freeing of Tanks Containing Flammable Residues.

HS(G) 5: Hot Work. (Out of print.)

## **6. FLAMMABLE SOLIDS AND DUSTS**

HS(G) 103: Safe handling of combustible dusts (precautions against explosions).

DUST-EXPERT interactive software.

I Chem E: Guide to dust explosion prevention and protection  
Part 1 Venting  
Part 2 Ignition prevention, containment, inerting, suppression and isolation.  
Part 3 Venting of weak vessels and the effects of vent ducts.

I Chem E: Guide to fire and explosion hazards in drying particulate materials.

Milk Manufacturers' Assoc<sup>n</sup>: Prevention of fire and explosion in spray drying plant.

National Assoc<sup>n</sup> of British and Irish Millers: Prevention of fires and explosions in flour mills.

British Coating Federation: Code of Safe Practice for Powder Coating.

HS(G) 92: Safe Storage and Use of Cellular Plastics.

HS(G) 64 Home Office & HSE: Guidance on the assessment of fire hazards from solid materials and precautions for their safe storage and use.

HSW 22: Dust Explosions.

## **7. GAS SAFETY**

## **Legislation**

Gas Acts 1986 and 1995

Gas Safety (Management) Regs 1996

Gas Safety (Installation and Use) Regs 1998

Pipeline Safety Regs 1996

## **Codes of Practice**

Approved COP. Standards in Training in Safe Gas Installation.

Gas Service Technology Volumes 1, 2, 3

CORGI Installer Manual.

## **British Standards**

BS 5440: Flues and air supply for gas appliances of rated input not exceeding 70kW

Part 1 Flues

Part 2 Air Supply

BS 5446: Installation of gas hot water supplies for domestic purposes.

BS 5871: Installation of gas fires, convectors, and fires with back boilers.

BS 5864: Installation of gas fired ducted air heaters of rated input not exceeding 70kW.

BS 6172: Installation of domestic cooking appliances.

BS 6714: Installation of decorative gas log and other fuel effect appliances.

BS 6400: Installation of domestic gas meters.

BS 6798: Installation of gas fired hot water boilers of rated input not exceeding 70kW.

BS 6891: Installation of low pressure gas pipework up to 28mm in domestic premises.

## **8. HAZARDOUS AREA CLASSIFICATION**

BS 5345I Code of Practice for the Selection, Installation and Maintenance of Electrical Apparatus for use in Potentially Explosive Atmospheres.

Explosive Atmospheres - explosion prevention and protection. Part 1 Basic Concepts. BS EN 1127-1, 1998

Hazardous Area Classification, EN 6007910.

Institute of Petroleum: Code on Hazardous Area Classification.

Area Classification of Dusty Atmospheres CEC 61241-3.

## **9. LPG AND LNG**

LPGA Codes of Practice.

COP 1: Bulk LPG Storage at fixed installations (Parts 1-4)

COP 7: Storage of full and empty LPG cylinders and cartridges.

COP 25: LPG central storage and distribution systems for multiple consumers.

BAMA Codes - A guide to safety in aerosol manufacture.

## **10. STORAGE AND WAREHOUSING**

HS(G) 71: Storage and packaged dangerous.

CIA Guidelines for safe warehousing.

GN CS 3: Storage and use of sodium chlorate and similar strong oxidants.

GN CS 18: Storage and handling of ammonium nitrate.

GN CS 21: Storage and handling of organic peroxides.

HS(G) 135: Industrial Nitrocellulose.

FMA Code of Practice on AN fertilisers.

## **11. PRESSURE SYSTEMS AND TRANSPORTABLE PRESSURE RECEPTACLES**

### **Regulations**

The Pressure Equipment Regulations 1999.

The Pressure Systems Safety Regulations 2000

Simple Pressure Vessels (Safety) Regulations 1991 (as amended).

Carriage of Dangerous Goods (Classification, Packaging & Labelling) and use of Transportable Pressure Receptacles Regs 1996. (CDGCPL2)

The Transportable Pressure Vessel Regulations 2001

Carriage of Dangerous Goods by Road Regs 1996.

Carriage of Dangerous Goods (amending) Regs 1998, 1999.

Carriage of Dangerous Goods (Driver Training) Regs 1996.

Carriage of Dangerous Goods (Safety Adviser) Regs 1999.

### **Codes of Practice**

British Compressed Gases Association (BCGA): Codes of Practice for Gas Cylinders.

Transport of Compressed Gases in Tube Trainers and Tankers (CoP33).

Pressure Systems Safety Regulations 2000: Safety of Pressure Systems (Approved CoP L122).

LP Gas Association (LPGA) Codes of Practice for LPG.

## **Guidance**

The European Commission website for the Pressure Equipment Directive -  
<http://ped.eurodyn.com/>

The European Commission website for the Transportable Pressure Equipment Directive –  
<http://www.europa.eu.int/comm/transport/tpe/>

British Compressed Air Society (BCAS): Guide to the selection and installation of compressed air services(see also

<http://www.britishcompressedair.co.uk/>.

The British Fluid Power Association (BFPA): Guidelines to The Pressure Systems Safety Regulations 2000 and their application to gas loaded accumulators (see also  
<http://www.bfpa.co.uk/>.

Guidance note GS4: Safety in pressure testing. (2nd edition).

OC 289/18: Transportable Pressure Receptacles.

OC 308/13 on Pressure Systems and Transportable Gas Containers

Regulations (also contains interpretations relevant for The Pressure Systems Safety Regulations 2000).

An Open Learning Course on The Pressure Systems and Transportable Gas Containers Regulations 1989 (also contains interpretations relevant for The Pressure Systems Safety Regulations 2000).

Best Practice for the Procurement and Conduct of Non-Destructive Testing - Part 1: Manual Ultrasonic Inspection (see <http://www.hse.gov.uk/dst/ndt.pdf>)

Guidance note PM4 (2nd edition): High temperature dyeing machines.

Guidance note PM5: Automatically controlled steam and water boilers.

Guidance note PM60: (2nd edition): Steam boiler blowdown systems.

Guidance note PM73 (2nd edition): Safety at autoclaves.

SIR No 5: Avoiding waterhammer in steam systems.

SIR No 47: Accidents on steam plant hot water systems 1988 to 1992.

SAFed: Guidelines for the examination of boiler shell-to-endplate and furnace-to-endplate welded joints. (replaces Guidance Note PM36).

SAFed: Guidelines for the examination of longitudinal seams of shell boilers

SAFed: Guidelines on periodicity of examinations

HS(G) 29: Locomotive boilers.

HS(G) 39: Compressed air safety.

HS(G) 55: Health & Safety kitchens and food preparation areas.

HS(G) 160 to HS(G) 164: Carriage of dangerous goods explained. (series of four guidance booklets.)

The Boiler Operators Handbook. NIFES, Publishers - Graham and Trotman Ltd.

Industrial Boilers - Longman by Gunn and Horton.

Boiler Efficiency and Safety - A guide to managers, engineers and operators responsible for small steam boilers. ESSO The Macmillan Press Ltd.

Pressure Vessel Design, E&F N Spon by Spence and Tooth (1994)

Relief Systems Handbook, IchemE, by Cyril F. Parry (1992)

### **Standards (European and British)**

BS 5045: Transportable gas containers. Part 1: 1982; Part 2: 1989; Part 3: 1984; Part 5: 1986; Part 6: 1987., Part 7: 2000; Part 8: 2000

BS 5430: Periodic inspection testing and maintenance of transportable gas containers. Part 1-3: 1990; Part 6: 1994.

PD 5500: 2000: Unfired fusion welded pressure vessels.

BS 4994: 1987: Construction of vessels and tanks in reinforced plastics.

BS 2790: 1992: Shell boilers of welded construction. (Shortly to be published as PD 2790).

BS 1113: 1998: Water-tube steam generating plant. (Including Superheaters, Reheaters and steel tube economizers). (Shortly to be published as PD 1113)

BS 806: 1993: Ferrous piping installations for and in connection with land boilers.

BS 759: 1984: Valves, gauges and other safety fittings for application to boilers, and to piping installations for and in connection with boilers.

BS 2461: 1983: Gas washing bottles.

BS 6759: 1984: Part 1, 2, 3 safety valves.

BS 2915: 1990: Bursting discs and bursting disc devices.

BS 779: 1989: Cast iron boilers for central heating and indirect hot water supply (44KW up to 3MW).

BS 799: Parts 1 to 6. Oil burning equipment. Part 2: 1991; Part 3: 1981; Part 4: 1991; Part 5: 1987; Part 6: withdrawn; Part 7: 1988; Part 8: 1988.

BS 5885: Automatic gas burners. Part 1: 1988; Part 2: 1987.

BS 855: 1990: Welded steel boilers for central heating and indirect hot water supply (44KW up to 3MW).

BS 1894: 1952: Electrode boilers of riveted, seamless, welded and cast iron construction for water heating and steam generation.

BS 5169 1992: Specification for fusion welded steel air receivers.

BS 2486: 1997: Recommendations for treatment of water for steam boilers and water heaters.

BS 853: 1990: Calorifiers and storage vessels for central heating and hot water supply.

BS EN 286: Part 1: Simple unfired pressure vessels designed to contain Air or Nitrogen.

BS 1123: 1987: Safety valves, gauges and fusible plugs for compressed air or inert gas installations.

BS 3970: 1990: Steam sterilisers.

BS 2646: Autoclaves for sterilisation in laboratories. Part 1: 1983; Part 2: 1990; Part 3: 1993; Part 4: 1991; Part 5: 1993.

BS 1723: Brazing.

Part 1: 1986: Specification for brazing.

Part 2: 1986: Guide to brazing.

Part 3: 1988: Methods for non-destructive and destructive testing.

Part 4: 1988: Methods for specifying brazing procedure and operator approval testing.

BS 1724 1990: Specification for bronze welding by gas.

BS1821: 1982: Specification for class I oxy-acetylene welding of ferritic steel pipework for carrying fluids.

BS 2633: 1987: Specification for class I arc welding of ferritic steel pipework for carrying fluids.

BS 2640: 1982: Specification for class II oxy-acetylene welding of carbon steel pipework for carrying fluids.

BS 2971: 1991: Specification for class II arc welding of carbon steel pipework for carrying fluids.

BS 2996: 1958: Specification for the projection welding of low carbon wrought steel studs, bolt nuts and annular rings.

BS 3019: MIG Welding. Part 1: 1984: Specification for TIG welding of aluminium, magnesium and their alloys.

BS 3571: MIG Welding. Part 1: 1985: Specification for MIG welding of aluminium and aluminium alloys.

BS 4204: 1989: Specification for flash welding of steel tubes for pressure applications.

BS 4515: 1984: Specification for welding of steel pipelines on land and offshore.

BS 4570: 1985: Specification for fusion welding of steel castings.

BS 4677: 1984: Specification for arc welding of austenitic stainless steel pipework for carrying fluids.

BS 5135: 1984: Specification for arc welding of carbon and carbon manganese steel.

BS 6223: 1990: Specification for friction welding of joints in metal.

BS 6990: 1989: Code of Practice for welding on steel pipes containing process fluids or their residuals.

BS 6244: 1982: Code of Practice for stationary air compressors.

BS EN 303 (Parts 1 and 2): Heating boilers with forced draught burners.

BS EN 61010: Safety Requirements for electrical equipment for measurement control and laboratory use (see 61010 2-041, 2-042, 2-043).

BS 7475: 1991: Specification for fusion welding of austenitic stainless steels.

BSEN 1964: 1999: Seamless steel gas cylinders.

BSEN1975: 1999: Seamless aluminium gas cylinders

BSEN 12872:2000 Welded aluminium gas cylinders

BSEN 1251:2000: Cryogenic gas cylinders

BSENISO 11120:1999: Large seamless steel tubes

BSEN 1442: 1988: Transportable, fillable, welded steel cylinders for LPG.

BSEN 1800:1999: Acetylene cylinders

BS EN 285: 1997: Sterilisation, steam sterilisers large sterilisers.

BS 1389: 1986: Specification for hose connections and hose assemblies for equipment for gas welding, cutting and related processes.

BS 5120: 1987: Specification for rubber hoses for gas welding and allied processes.

BS 5741: 1979: Specification for pressure regulators used in welding, cutting and related processes.

BS 6158: 1982: Specification for safety devices for fuel gases and oxygen or compressed air for welding, cutting and related processes.

BS 6572: 1986: Specification for Bourdon tube pressure gauges used in welding, cutting and related processes.

BS 6942: Design and construction of small kits for oxy-fuel gas welding and allied processes.

Part 1: Withdrawn: Specification for kits using one or more non-refillable gas containers for oxygen and fuel gas.

Part 2: 1989: Specification for kits using refillable gas containers for oxygen fuel gas.

BS 7278: 1990: Specification for gas tightness of equipment for gas welding and allied processes.

BS 709: 1983: Methods of destructive testing fusion welded joints and weld metal in steel.

BS 1295: 1987: Code of Practice for training in arc welding skills.

BS 2600: Radiographic examination of fusion welded butt joints in steel.

Part 1: 1983: Methods for steel 2mm up to and including 50mm thick.

Part 2: 1973 (1983): Methods for steel over 50mm up to and including 200mm thick.

BS 2704: 1978 (1983): Specification for calibration blocks for use in ultrasonic flaw detection.

BS 2910: 1986: Methods for radiographic examination of fusion welded circumferential butt joints in steel pipes.

BS 3451: 1973 (1981): Methods of testing fusion welds in aluminium and aluminium alloys.

BS 3923: Methods for ultrasonic examination of welds.

Part 1: 1986: Methods for manual examination of fusion welds in ferritic steels.

Part 2: 1972: Automatic examination of fusion welded butt joints in ferritic steels.

BS 3971: 1980 (1985): Specification for image quality indicators for industrial radiography (including guidance on their use).

BS 4069: 1982: Specification for magnetic flaw detection inks and powders.

BS 4129: 1990: Specification for welding primers and welds-through sealants, adhesives and waxes for resistance welding of sheet steel.

BS 4206: 1967: Methods of testing fusion welds in copper and copper alloys.

BS 4331: Methods for assessing the performance characteristics of ultrasonic flaw detection equipment.

Part 1: 1978 (1989): Overall performance: on-site methods.

Part 2: 1972 (1987): Electrical performance.

Part 3: 1974 (1987): Guidance on the in-service monitoring of probes (excluding immersion probes).

EN 287: Specification for approval testing of welding procedures.

**Part 1: 1981: Fusion welding of steel.**

Part 2: 1982: TIG and NIG welding of aluminium and its alloys.

Part 3: 1985: Arc welding of tube to tube-plate joints in metallic materials

Part 4: 1988: Specification for automatic fusion welding of metallic materials, including welding operator approval.

EN 288: Specification for approval testing of welders working to approved welding procedures.

**Part 1: 1982: Fusion welding of steel.**

Part 2: 1982: TIG and MIG welding of aluminium and its alloys.

Part 3: 1985: Arc welding of tube to tube-plate joints in metallic materials

BS 4872: Specification for approval testing of welders when welding procedure approval is not required.

**Part 1: 1982: Fusion welding of steel.**

Part 2: 1976: TIG or MIG welding of aluminium and its alloys.

BS 5044: 1973 (1987): Specification for contrast aid paints used in magnetic particle flaw detection.

BS 5289: 1976 (1983): Code of Practice for visual inspection of fusion welded joints.

BS 6072: 1981 (1986): Method of magnetic particle flaw detection.

BS 6084: 1981: Method of test for comparison of prefabrication primers by porosity rating in arc welding.

BS 6443: 1984: Method for penetrant flaw detection.

BS 6691: Fume from welding and allied processes.

Part 1: 1986: Guide to methods for the sampling and analysis of particulate matter.

Part 2: 1986: Guide to methods for the sampling and analysis of gases.

BS 7009: 1988: Guide to the application of real-time radiography to weld inspection.

BS 7257: 1989: Methods for radiographic examination of fusion welded branch and nozzle joints in steel.

BS 7363: 1990: Methods for controlled thermal severity (CTS) test and bead-on-plate (BOP) test for welds.

M42: 1972 (1983): Methods for non-destructive testing of fusion and resistance welds in thin gauge materials.

PD 6493: 1991: Guidance on methods for assessing the acceptability of flaws in fusion welded structures.

BS 470: 1984: Inspection, access and entry openings for pressure vessels.

BS EN 473 1993: General principles for qualification and certification of NDT personnel.

BS 7910: 1999: Guide on methods for assessing the acceptability of flaws in structures (to reflect PD 6493 and PD 6539).

EN 25817: Arc-welded joints in steel. Guidance on quality levels for inspections.

EN 12062: Non destructive examination of welds - General rules for metallic materials.

EN 970: Visual examination.

EN 1435: Non destructive examination of welds - Radiographic examination of welded joints.

EN 12517: Non destructive examination of welds - Radiographic examination of welded joints - Acceptance levels.

EN 1714: Ultrasonic examination of welded joints in steel - Method.

EN 1713: Characterisation of defects in welds: planar or non planar defects.

EN 1712: Ultrasonic examination of welded joints in steel - Acceptance criteria.

EN 571-1: Non destructive testing - Penetrant testing - Part 1: General principles for the examination.

EN 1289: Non destructive examination of welds - Penetrant testing of welds –  
Acceptances levels and criteria.

EN 1290: Non destructive examination of welds - Magnetic particle testing of welds - Method.

EN 1291: Non destructive examination of welds - Magnetic particle testing of welds -  
Acceptance levels and criteria.

