



GS 118-3

GENERAL SPECIFICATION FOR WELDED FABRICATION AND CONSTRUCTION

December 1996

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BP GROUP RECOMMENDED PRACTICES AND SPECIFICATIONS FOR ENGINEERING											
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Document Title GENERAL SPECIFICATION FOR WELDED FABRICATION AND CONSTRUCTION (Replaces BP Std 164)											
APPLICABILITY Regional Applicability: International											
SCOPE AND PURPOSE This Guidance for Specification covers the application of welding in the design and fabrication of vessels, tankage, piping, structural steelwork and other welded construction used in BP activities in the oil and petrochemical industries											
AMENDMENTS <table border="1"> <thead> <tr> <th>Amd</th> <th>Date</th> <th>Page(s)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td colspan="4"> </td> </tr> </tbody> </table>				Amd	Date	Page(s)	Description				
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CUSTODIAN (See Quarterly Status List for Contact) Welding											
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FOREWORD

Introduction to BP Group Recommended Practices and Specifications for Engineering

The Introductory Volume contains a series of documents that provide an introduction to the BP Group Recommended Practices and Specifications for Engineering (RPSEs). In particular, the 'General Foreword' sets out the philosophy of the RPSEs. Other documents in the Introductory Volume provide general guidance on using the RPSEs and background information to Engineering Standards in BP. There are also recommendations for specific definitions and requirements.

Value of this Guidance for Specification

The value of this Guidance for Specification is in bringing together BP requirements for welded fabrication and construction to ensure that all activities are covered by direct specification or reference to appropriate documents.

Application

This Guidance for Specification is intended to guide the purchaser in the use or creation of a fit-for-purpose specification for enquiry or purchasing activity.

Text in *italics* is Commentary. Commentary provides background information which supports the requirements of the Recommended Practice, and may discuss alternative options. It also gives guidance on the implementation of any "Specification" or "Approval" actions; specific actions are indicated by an asterisk (*) preceding a paragraph number.

This document may refer to local, national or international regulations but the responsibility to ensure compliance with legislation and any other statutory requirement lies with the user. The user should adapt or supplement this document to ensure compliance for the specific application.

Feedback and Further Information

This Guidance for specification is a general update of BP Std. 164 incorporating reference to latest documents.

Feedback and Further Information

Users are invited to feed back any comments and to detail experiences in the application of BP RPSE's to assist in the process of their continuous improvement.

For feedback and further information, please contact Engineering Practices Group, Engineering Shared Service at Sunbury, or the Custodian. See Quarterly Status List for contacts.



1. SCOPE

- 1.1 This Specification covers the application of welding in the design and fabrication of vessels, tankage, piping, structural steelwork and other welded construction used in BP activities in the oil and gas industry.

2. WAIVERS

- 2.1 It is not the intention of this Specification to restrict the Contractor in the use of any processes, procedures and techniques that may not be covered by this Specification. However all applications for approval to use such alternative processes, procedures and techniques, and all applications for waivers to any requirement, or requirements, in this Specification must be made before work is commenced and before any materials are purchased or processed.

This is to ensure that the Company is not committed by consideration of delivery, or for any other reason, to approve the practice proposed by the Contractor.

3. DEFINITIONS

- 3.1 All terms relating to welds, welding and cutting have the meaning assigned to them in [BS 499](#) or [AWS A3.0](#) or agreed alternative.

4. DRAWINGS

- 4.1 The Company's approval of drawings must be obtained before the work is commenced or the materials are processed. The drawings must provide the following information with regard to welding and weld joint details:-

- (i) the location, sizes, lengths and types of all welds.

The type of weld may be indicated by reference to [BS 5135](#) or [BS EN 24063](#) or [AWS A2.4](#) as appropriate. Alternatively the detail must be clearly shown and dimensioned on the drawing. Fillet welds may be indicated by a statement of their size i.e. leg length, only.

- (ii) the welding procedure to be used and whether the welds are to be made in the shop or during erection.

- (iii) the specification of the parent metal.



5. PROCEDURES

- 5.1 All welding procedures employed shall be qualified in accordance with the contractual requirements.

Where pre-qualified welding procedures are to be considered for approval by BP the Welding Procedure Specification (WPS), as defined herein, and all supporting Weld Procedure Qualification Record (WPQR) data shall be submitted before the commencement of fabrication.

The WPS documents for all new welding procedures or those requiring re-qualification within the contract terms shall be submitted for BP review and acceptance prior to the fabrication of any test pieces required.

The term "welding procedure specification" shall be deemed to include reference to the following on which information must be provided.

- (i) The specification or composition of the parent metal.
- (ii) The welding process e.g. SMAW, GMAW, GTAW, etc.
- (iii) The type of electrode or filler rod to be employed together with any flux, shielding gas or backing gas.
- (iv) WPQR reference number and specification used for qualification
- (v) The thickness range qualified and weld preparation dimensions, with tolerances.
- (vi) The preheat and any postweld heat treatment to be applied.
- (vii) The number and disposition of runs in multi-run welds.

Also the sizes of electrodes or filler wires to be deposited.
- (viii) The welding current, arc voltage and welding speed and the limits of the heat input for each weld run. For manual welding the run out length for each electrode shall be given.
- (ix) The sequence of welding.

6. FABRICATION STANDARDS

- 6.1 Where no specific requirements are set out in the contract, further guidance on the requirements for fabrication by welding of pressure



vessels, tankage, piping , and other equipment is given in the following BP documents:-

(a) Offshore Structures

[GS118-1](#) Fabrication of Fixed Offshore Steel Structures

[GS118-2](#) Welded Cladding of Risers for Fixed Offshore Steel Structures

(b) Fabricated Pipework

[GS118-5](#) The Fabrication, Assembly, Erection and Inspection of Carbon, Carbon Manganese and Low Alloy Ferritic Steel Pipework to [ANSI/ASME B31.3](#).

[GS118-7](#) Fabrication of Pipework to [ANSI B31.3](#) Part 3:

(c) Heat Exchanger Bundles.

[GS118-8](#) Tube End Welding of Heat Exchanger Tubes.

(d) Transmission Pipelines

[GS118-9](#) Welding of Transmission Pipelines: Supplementary to [API 1104](#).

[GS118-10](#) Welding of Transmission Pipelines Supplementary to [BS 4515](#).

(e) Unfired Pressure Vessels

[GS146-2](#) Unfired Pressure Vessels: Vessels to [BS 5500](#)

[GS146-3](#) Unfired Pressure Vessels: Vessels to Codes other than [BS 5500](#)

[GS146-4](#) Unfired Pressure Vessels: Vessels not exceeding 20mm thick

[GS146-5](#) Unfired Pressure Vessels : Vessels operating close to Atmospheric Pressure



(f) Storage Tanks

[GS158-2](#) Vertical Tanks for Non-Refrigerated Fluids:
Tanks to [BS 2654](#).

For items not covered by these documents all fabrication shall be in accordance with the appropriate national or international standards e.g. BS, ANSI/ASME, API, ISO, etc.



DEFINITIONS AND ABBREVIATIONS

Definitions

Standardised definitions may be found in the BP Group RPSEs Introductory volume.

Inspector	The person appointed by the supplier or the purchaser to carry out engineering inspection in the suppliers works.
Certifying Authority:	The body whose function is to ensure compliance with statutory requirements in the country of usage of the equipment and whose approval is acceptable to the government of that country.
Competent Person:	A person having such practical and theoretical knowledge and actual experience of the type of equipment to be examined as will enable him to detect defects or weaknesses which it is the purpose of the examination to discover and to assess their importance in relation to the strength and functions of the particular equipment.
Inspection:	Activities such as measuring, examining, testing, gauging one or more characteristics of a product or service and comparing these with specified requirements to determine conformity.

Abbreviations

ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
GMAW	Gas Metal Arc Welding
GTAW	Gas Tungsten Arc Welding
SMAW	Shielded Metal Arc Welding
WPQR	Weld Procedure Qualification Record
WPS	Welding Procedure Specification



LIST OF REFERENCED DOCUMENTS

A reference invokes the latest published issue or amendment unless stated otherwise.

Referenced standards may be replaced by equivalent standards that are internationally or otherwise recognised provided that it can be shown to the satisfaction of the purchaser's professional engineer that they meet or exceed the requirements of the referenced standards.

American Standards/Codes

- [AWS A2.4](#) Symbols for Welding, Brazing and Non-destructive Examination
- [AWS A3.0](#) Welding Terms and Definitions

British Standards

- [BS 499](#) Welding terms and symbols
- [BS 5135](#) Specification for arc welding carbon and carbon manganese steels
- [BS EN 24063](#) Welding, brazing, soldering and braze welding of metals.

BP Group Documents

- [GS 118-1](#) Fabrication of Fixed Offshore Steel Structures
- [GS118-2](#) Welded Cladding of Risers for Fixed Offshore Steel Structures
- [GS118-5](#) The Fabrication, Assembly, Erection and Inspection of Carbon, Carbon Manganese and Low Alloy Ferritic Steel Pipework to [ANSI/ASME B31.3](#)
- [GS118-7](#) Fabrication of Pipework to [ANSI B31.3](#) Part 3
- [GS118-8](#) Tube End Welding of Heat Exchanger Tubes
- [GS118-9](#) Welding of Transmission Pipelines:
Supplementary to [API 1104](#)
- [GS118-10](#) Welding of Transmission Pipelines:
Supplementary to [BS 4515](#)
- [GS146-2](#) Unfired Pressure Vessels:
Vessels to [BS 5500](#)



- GS146-4 Unfired Pressure Vessels:
Vessels not exceeding 20mm thick
- GS146-5 Unfired Pressure Vessels:
Vessels operating close to Atmospheric Pressure
- GS158-2 Vertical Tanks for Non-Refrigerated Fluids:
Tanks to [BS 2654](#)

