

THE ENGINEERING EQUIPMENT AND MATERIALS USERS ASSOCIATION

**EEMUA SUPPLEMENT TO BS 5500 : 1991
FOR THE OIL,
GAS AND CHEMICAL INDUSTRIES**

PUBLICATION No. 162 : 1991



THE ENGINEERING EQUIPMENT AND MATERIALS USERS ASSOCIATION

**EEMUA SUPPLEMENT TO BS 5500 : 1991
FOR THE OIL,
GAS AND CHEMICAL INDUSTRIES**

PUBLICATION No. 162 : 1991

Copyright © 1991 The Engineering Equipment and Materials Users Association

ISBN 0 85931 099 X

45 Beech Street
LONDON
EC2Y 8AD

Telephone: 0171-628 7878
Fax: 0171-628 7862



THE ENGINEERING EQUIPMENT AND MATERIALS USERS ASSOCIATION

The Engineering Equipment and Materials Users Association—EEMUA—was formed in 1983 by the Amalgamation of the Oil Companies Materials Association (OCMA) and the Engineering Equipment Users Association (EEUA). It is an organisation of substantial purchasers and users of engineering products, whose members include leading national and multi-national companies in the petroleum, gas, chemical and energy industries. A list of Full and Associate Members (the latter being limited to membership of three technical committees) is given below. EEMUA is concerned with the design, installation, operation and maintenance of the engineering plant used by members in pursuing their business activities.

The Association aims to reduce members' costs by providing the opportunity for them to share resources and expertise in order to keep abreast of technological developments and improve the effectiveness and efficiency of their engineering activities. EEMUA supports the British Standards Institution, works with other institutions, associations, government departments, regulatory authorities and the Confederation of British Industry, and is also actively involved with other standards-making bodies, both national and international, such as the American Petroleum Institute.

Work, which is carried out in-house by members alone or with the help of other organisations, may lead to the production of Association publications. These are prepared primarily for members' use, but are usually offered for sale and thus for more general use. Such publications may also be submitted, normally through the British Standards Institution, as bases for appropriate national, European or international standards.

A list of current EEMUA Publications which may be purchased from the Association is given at the end of this document.

Full Members

Associated Octel
BG
BP Amoco
Caltex Petroleum
Conoco
Dow Corning
Eastern Generation
Esso/ExxonMobil
Eutech
Foster Wheeler Energy
Lindsey Oil Refinery
National Power
PowerGen
Shell

Associate Members

AstraZeneca
BASF
D&C Engineering/MERCON [Netherlands]
Elf Exploration UK
Flexsys
Phillips Petroleum UK
Pilkington Technology
Royal Vopak (was Royal Pakhoed)
[Netherlands]
Texaco
UOP

ABOUT THIS PUBLICATION: LEGAL ASPECTS

In order to ensure that nothing in this publication can in any manner offend against or be affected by the provisions of the Restrictive Trade Practices Act 1976, the recommendations which it contains will not take effect until the day following that on which its particulars are furnished to the Office of Fair Trading.

As the subject dealt with seems likely to be of wide interest, this publication is also being made available for sale to non-members of the Association. Any person who encounters an inaccuracy or ambiguity when making use of this publication is asked to notify EEMUA without delay so that the matter may be investigated and appropriate action taken.

It has been assumed in the preparation of this publication that the user will ensure selection of those parts of its contents appropriate to the intended application and that such selection and application are correctly carried out by appropriately qualified and experienced people for whose guidance the publication has been prepared. EEMUA does not, and indeed cannot, make any representation or give any warranty or guarantee in connection with material contained in its publications, and expressly disclaims any liability or responsibility for damage or loss resulting from their use. Any recommendations contained herein are based on the most authoritative information available at the time of writing and on good engineering practice, but it is essential for the user to take account of pertinent subsequent developments or legislation.

All rights are reserved. No part of this Publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means: electronic, mechanical, photocopying, recording or other.

Infringing the copyright is not only breaking the law, but also, through reduction in Association's income, jeopardising the availability of future publications.

CONTENTS

	<u>Page Nos.</u>
FOREWORD	1
INTRODUCTION	2
DEFINITIONS	3
SCOPE	4
AMENDMENTS AND ADDITIONS	5 - 29
TABLE 1.5	6 - 11
TABLE 3.8.1.3	19

v

EEMUA SUPPLEMENT TO BS 5500 : 1991 BRITISH STANDARD
SPECIFICATION FOR UNFIRED FUSION WELDED PRESSURE VESSELS

FOREWORD

BS 5500 is an industry-wide pressure vessel standard which requires the experienced user to select options and provide details for particular applications. As a consequence many companies have developed supplementary specifications pertinent to their own businesses.

This supplement harmonises, as far as practicable, the supplementary pressure vessel specifications of seven major user companies in the oil, gas and chemicals industries. It is intended for use by the contributing companies and by other companies as a supplementary specification to BS 5500.

INTRODUCTION

This supplement provides amendments and additions to the text of BS 5500 together with pre-selection of some options and a variety of recommended practices relevant to equipment for the oil, gas and chemical industries.

For easy reference the clause numbering of BS-5500 has been used in this supplement. BS 5500 clauses not mentioned in this supplement shall be used without restriction. Where a requirement is not covered by BS 5500 an additional sequential clause number has been assigned in this supplement.

This supplement covers only technical matters. Contractual issues shall be addressed in the purchaser's enquiry/order documents.

Where use of this supplement is intended, the contractual documents shall state that the equipment shall comply with BS 5500 and EEMUA PUBLICATION NO 162.

DEFINITIONS

In this supplement the following definitions apply:

SHALL: the word 'shall' means that the requirement is mandatory.

SHOULD: the word 'should' means that the requirement is strongly recommended.

Other terminology used in this supplement shall be taken to have the same meaning as in BS 5500.

SCOPE OF THIS SUPPLEMENT

This supplement may be used in conjunction with BS 5500 to provide minimum additional requirements for equipment constructed in carbon, carbon manganese, low alloy and austenitic stainless steels.

Further specification may be needed in exceptional circumstances for equipment constructed in the above materials, for example when thicknesses are unusually high or when there are particular environmental requirements.

For other materials, such as those listed below, the general requirements of this supplement apply but further material-related specification should be considered:

- Integrally clad steels
- Quenched and tempered steels
- 3½% and higher nickel materials

This supplement does not cover all matters required by BS 5500 to be agreed between manufacturer and purchaser.

Section One. General**1.2 Add to this clause**

Enquiry cases published by BSI shall not be used without the approval of the Purchaser except as otherwise specified in this specification.

1.5 Add to this clause

Table 1.5 of this supplement modifies and is additional to the requirements of Table 1.5 of BS 5500.

1.5.1. Add to this clause.

The design specification/data sheet furnished by the purchaser shall give the following details, where applicable.

- a) Coincident static design pressures and temperatures
- b) Transient and/or cyclic pressures and temperatures
- c) Life of vessel if relevant to creep or fatigue design
- d) Corrosion allowance of pressure parts and internals, if applicable
- e) Type of material and any special requirements
- f) Nature of contents (if relevant to manufacturers responsibility)
- g) Environmental conditions - temperature including possible minimum ambient, wind, snow, etc.
- h) Construction category
- i) Support interface details
- j) Nozzle and appurtenance location, orientations and details
- k) External loads including piping loads, platform, ladder and insulation weights.
- l) Emergency loads such as earthquake, explosion and impact of projectiles.

The purchase order shall define the optional documentation listed in Appendix S that shall be mandatory for the contract.

1.5.2 Add to this clause

Chemical analysis and mechanical property test certificates shall be supplied for all materials comprising and welded to the pressure shell.

**Table 1.5 : Purchaser Options and Features Requiring Approval
by the Purchaser (See 1.5.1, 1.5.2)**

Purchaser option or feature requiring approval by Purchaser (BS 5500 Clause References)	EEMUA SUPPLEMENTARY REQUIREMENTS CLAUSE REFERENCES	NOTES
Use of BSI Enquiry Cases	1.2	1
Requirements for additional records; documentation additional to that specified in 1.5.2(1.5.1)	1.5.2 5.1	
Any special requirements governing the selection, heat treatment or testing of materials (2.1.1, 3.4.2., 5.6.2)	1.2.4(i) 5.6.2	
Use of castings and appropriate inspection procedure (2.1.2)	-	1
Use of materials other than those covered by listed British Standards (2.1.2)	2.1.2.5	1
Design strength values for materials qualified by Notes (b), 1(d), (f), 8, 17 to Table 2.3	-	1
Use of increased design stresses for certain alloy steels as per Notes 5 and 6 to Table 2.3	-	1
Use of steels with carbon content greater than 0.25% (2.3.2)	-	1
Use of design methods other than detailed in Section Three (3.2.2, 3.5.4., 3.8.1., 3.9, 3.9.3, 3.9.4)	-	1
Any relaxation of the design pressure for protected vacuum vessels (3.2.3)	-	1
The design lifetime for high temperature applications (3.2.4)	-	1
The service lifetime for applications where fatigue strength is a potential life-limiting factor (3.2.4)	-	1

Table 1.5 : (Continued)

Purchaser option or feature requiring approval by Purchaser (BS 5500 Clause References)	EEMUA SUPPLEMENTARY REQUIREMENTS CLAUSE REFERENCES	NOTES
The provisions for corrosion (3.3)	3.3.2	
The construction category for vessel or component parts (3.4.1)	1.5.1	
Properties of alloy steels used for design purposes when post-weld heat treatment exceeds time and temperature limits given in Table 4.4.3.1 (3.4.2)	-	2
Use of set on nozzles	3.5.4.7	1
Use of partial penetration nozzle welds	3.5.4.7	1
Use of threads of pitch coarser than 3mm or bolt stresses in excess of values given in Table 3.8.1.4, (3.8.1)	-	1
Use of plate material for flanged hubs (3.8.1)	-	1
Use of socket weld, single fillet welded or screwed connections	3.5.4.8	2
Use of fillet welds with throat thickness less than thickness of thinner adjacent Section (3.10.3)	3.10.3	1
Commencement of manufacture before approval of all information specified in 4.1.1.	3.6.2.2	1
Any modification to information supplied in accordance with 4.1.1.	-	1
Distance between welds	3.10.1.2	1