ASME PCC-1-2010

(Revision of ASME PCC-1-2000)

Guidelines for Pressure Boundary Bolted Flange Joint Assembly

AN AMERICAN NATIONAL STANDARD





ASME PCC-1-2010

(Revision of ASME PCC-1-2000)

Guidelines for Pressure Boundary Bolted Flange Joint Assembly

AN AMERICAN NATIONAL STANDARD





Date of Issuance: March 5, 2010

This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda issued to this edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this document. Interpretations are published on the ASME Web site under the Committee Pages at http://cstools.asme.org as they are issued.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assumes any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

No part of this document may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

The American Society of Mechanical Engineers Three Park Avenue, New York, NY 10016-5990

Copyright © 2010 by THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS All rights reserved Printed in U.S.A.

CONTENTS

	dee Roster	v vi
1	Scope	1
2	Introduction	1
3	Training, Qualification, and Certification of Joint Assembly Personnel	1
4	Cleaning and Examination of Flange and Fastener Contact Surfaces	1
5	Alignment of Flanged Joints	2
6	Installation of Gasket	2
7	Lubrication of "Working" Surfaces	5
8	Installation of Bolts	5
9	Numbering of Bolts When a Single Tool Is Used	6
10	Tightening of Bolts	6
11	Tightening Sequence When a Single Tool Is Used	10
12	Target Torque Determination	10
13	Joint Pressure and Tightness Testing	11
14	Records	11
15	Joint Disassembly	15
16	References	16
Figures		
1	Indicator-Type Bolting for Through-Bolted Joints	8
2	Indicator-Type Bolting for Studded Joints	9 14
4		15
Tables		
1M	Reference Values for Calculating Target Torque Values for Low-Alloy Steel	•
1	Bolting Based on Target Prestress of 345 MPa (Root Area) (SI Units)	3
_	Bolting Based on Target Prestress of 50 ksi (Root Area) (U.S. Customary Units)	4
2	Torque Increments for Legacy Cross-Pattern Tightening Using a Single Tool	7
3	Recommended Tool, Tightening Method, and Load-Control Technique Selection Based on Service Applications	11
4	Legacy Cross-Pattern Tightening Sequence and Bolt Numbering System	12
4.1	Alternative to Legacy Cross-Pattern Tightening Sequence and Bolt	13
Appendic	ces	
A	Notes Regarding Qualifying Flanged Joint Assemblers	19
В	Recommendations for Flanged Joint Assembly Procedure Qualification	20

C	Recommended Gasket Contact Surface Finish for Various Gasket Types	21
D	Guidelines for Allowable Gasket Contact Surface Flatness and Defect	
	Depth	22
E	Flange Joint Alignment Guidelines	27
F	Alternatives to Legacy Tightening Sequence/Pattern	30
G	Use of Contractors Specializing in Bolting Services	44
Н	Bolt Root and Tensile Stress Areas	45
I	Interaction During Tightening	46
J	Calculation of Target Torque	47
K	Nut Factor Calculation of Target Torque	48
L	ASME B16.5 Flange Bolting Information	49
M	Washer Usage Guidance and Purchase Specification for Through-Hardened	
	Washers	50
N	Definitions, Commentary, and Guidelines on the Reuse of Bolts	55
O	Assembly Bolt Stress Determination	57
P	Guidance on Troubleshooting Flanged Joint Leakage Incidents	69