

Torque-Position Assembly Guidelines for API Casing and Tubing Connections

API TECHNICAL REPORT 5TP
FIRST EDITION, DECEMBER 2013



AMERICAN PETROLEUM INSTITUTE

Special Notes

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed.

Neither API nor any of API's employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. Neither API nor any of API's employees, subcontractors, consultants, or other assignees represent that use of this publication would not infringe upon privately owned rights.

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to assure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

API publications are published to facilitate the broad availability of proven, sound engineering and operating practices. These publications are not intended to obviate the need for applying sound engineering judgment regarding when and where these publications should be utilized. The formulation and publication of API publications is not intended in any way to inhibit anyone from using any other practices.

Any manufacturer marking equipment or materials in conformance with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard. API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard.

All rights reserved. No part of this work may be reproduced, translated, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher. Contact the Publisher, API Publishing Services, 1220 L Street, NW, Washington, DC 20005.

Copyright © 2013 American Petroleum Institute

Foreword

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

Contents

Page

1	Scope	1
2	Normative References.....	1
3	Terms and Definitions.....	1
4	Background	2
4.1	Torque-Position Application	2
4.2	API Connection Sealing Mechanism.....	2
4.3	Thread Compound.....	3
4.4	Coupling Coating or Plating.....	3
4.5	Thread Features, Measurements, and Inspection	4
4.6	Torque Control and Monitoring	5
5	Procedure.....	5
5.1	General	5
5.2	Torque-Position Tables.....	6
5.3	Position Control-Templates	6
5.4	Thread Compound Application	7
5.5	Make-up Speed	9
5.6	Mill-end Axial Position Stripe.....	9
	Annex A (informative) Implementation Aids	11
	Annex B (normative) Torque-Position Tables	16
	Bibliography	30
Figures		
1	Torque-Position Assembly Schematic	3
2	Connection Assembly Acceptance Criteria for Torque-Position.....	6
3	Example Reference Sheet for Torque-Position	7
4	Dimensional Example for Torque-Position Template	8
5	An Example of Axial Position Stripe Applied Across Interface	10
Tables		
1	Converted 5B Tolerances for Average Crest Diameter.....	4
2	Suggested Target Range for Average Crest Diameter for Torque-Position	4
3	Tolerances on Thread Ovality for Torque-Position	5
4	Suggested Template Slot Width.....	9
B.1	Torque-Position Tubing	17
B.2	Torque-Position Casing	18
B.3	Torque-Position Buttress	23
B.4	Torque-Position Buttress 4T	26

Torque-Position Assembly Guidelines for API Casing and Tubing Connections

1 Scope

This document provides alternative connection assembly procedures to those found in API 5B (power turns) and those found in API 5C1 (optimum torque). The procedures set forth are referred to as “torque-position” because the make-up torque and final position are used as acceptance criteria for the assembly operation. The connections are threaded in accordance with API 5B. The torque-position assembly parameters have been developed for most SC (short round thread casing), LC (long round thread casing), BC (buttress thread casing), and EU (external upset tubing) connections.

Torque-position is a precision assembly method that relies on a controlled process for successful implementation. When defined threading and assembly procedures are followed, the performance of the resulting assembled connection is optimized.

2 Normative References

This document contains no normative references. For a list of documents and articles associated with API TR 5TP and torque-position assembly guidelines, please see the Bibliography.

3 Terms and Definitions

For the purposes of this document, the following definitions apply.

3.1 addendum

The distance from the crest cone to the pitch cone.

3.2 connection

A connection is defined as a single pin assembled into one side of a coupling.

3.3 crest diameter

A measurement of the diameter of the crests of the pin or coupling threads at a specified axial position measured from the pin nose or coupling face.

3.4 field-end make-up

The side or end of the coupling that is assembled at the rig floor as the pipe is being run into the well.

3.5 mill-end make-up

The side of the coupling that is assembled (bucked on) before the pipe is shipped to the field location. This connection assembly operation is typically performed at the facility where the pin end is threaded (mill or thread processor). See Figure 1.

3.6 position band

A stenciled color mark applied at a specific axial distance from the nose of the pin that serves as an external reference point for the position of the pin within the coupling during assembly (see Figure 3). In addition, the position of the coupling face can be compared visually to judge for acceptance or rejection of the final assembly (see Figure 2).