

Specification for Crosslinked Polyethylene (PEX) Line Pipe

API SPECIFICATION 15PX
FIRST EDITION, SEPTEMBER 2018



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 © 2018 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 patents.

The verbal forms used to express the provisions in this document are as follows.

Shall: As used in a standard, “shall” denotes a minimum requirement in order to conform to the standard.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required in order to conform to the standard.

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the director.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually and updated quarterly by API, 1220 L Street, NW, Washington, DC 20005.

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 Introduction	1
1.1 Purpose	1
1.2 Scope	1
1.3 Service Conditions	1
2 Normative References	2
2.1 General	2
2.2 Requirements	3
2.3 Equivalent Standards	3
3 Definitions and Abbreviations	4
3.1 Definitions	4
3.2 Abbreviations	5
4 Design	6
4.1 Long-term Strength	6
4.2 Fluid Service Factors	6
4.3 Determining the Maximum Working Pressure	7
4.4 External Service Environment	10
4.5 Dimensions and Tolerances	10
5 Process of Manufacture	15
5.1 General	15
5.2 Pipe Compound	15
5.3 Pipe Compound Requirements	15
5.4 Finish and Workmanship	17
6 Fittings	17
6.1 General	17
6.2 Electrofusion Fittings	17
6.3 Metallic Fittings	17
6.4 PEX Fittings	17
7 Quality Management Program	18
7.1 General	18
7.2 Quality Records Retention	18
7.3 Quality Control Tests	18
8 Product Marking	19
8.1 Manufactured Pipe	19
9 Handling, Storage, and Installation	20
9.1 Storage	20
9.2 Handling	20
9.3 Installation	20
10 Integrity Management	20
Annex A (informative) API Monogram Program—Use of the API Monogram by Licensees	21
Annex B (informative) External Pressure Rating (Collapse Pressure)	25
Annex C (informative) Interpolation of the HDB	26
Annex D (normative) Calculation of Pressure Ratings for Pipe Sizes Not Listed in this Standard	27

Contents

	Page
Annex E (informative) Purchasing Guidelines	29
Annex F (informative) Installation	30
Annex G (informative) Integrity Management	35
Bibliography	36
Tables	
1 Fluid Service Factors (FSF)	7
2 Standard Pressure Ratings (psi) of PEX Pipe Using the HDB Method of Design at Various Temperatures for Nonchemically Aggressive Fluids	7
3 Working Pressure (psi) of PEX Pipe Using the HDB Method of Design at Various Temperatures for Multiphase Fluids, Wet Natural Gas, and Liquid Hydrocarbons	8
4 Standard Pressure Ratings (psi) of PEX Pipe Using the DIN 16892/3 Method of Design at Various Temperatures for Most Fluids	9
5 Maximum Working Pressure (psi) of PEX Pipe Using the DIN 16892/3 Method of Design at Various Temperatures for Multiphase Fluids, Wet Natural Gas, and Liquid Hydrocarbons	9
6 Inch Dimensions and Tolerances Based on Outside Diameters	10
7 Metric Dimensions and Tolerances Based on Outside Diameters	14
8 Test Description and Frequency for PEX Pipe	19
E.1 Purchasing General Guidelines	29

Specification for Crosslinked Polyethylene (PEX) Line Pipe

1 Introduction

1.1 Purpose

The purpose of this specification is to provide standards for crosslinked polyethylene (PEX) line pipe suitable for use in conveying oil, gas, and nonpotable water in underground, aboveground, and repair applications for the oil and gas producing industries.

This specification does not propose to address all of the safety concerns associated with the design, installation, or use of products suggested herein. It is the responsibility of the user of the standard to utilize appropriate health and safety considerations.

All pipe produced under this standard utilizes pressure-rated materials used in pressurized, non-pressure, and negative pressure applications.

The technical content of this document provides requirements and guidelines for performance, design, materials inspection, dimensions and tolerances, marking, handling, testing, and shipping.

1.2 Scope

This specification covers PEX line pipe utilized for the production and transportation of oil, gas, and nonpotable water. The piping is intended for use in new construction, structural, pressure-rated liner, line extension, and repair of both aboveground and buried pipe applications. Specific equipment covered by this specification is listed as follows:

- a) PEX line pipe;
- b) fittings.

1.3 Service Conditions

The standard service conditions for the API 15PX standard pressure rating are as follows:

- a) Standard pressure ratings in non-chemically-aggressive fluids;
- b) Service temperature range: -50 °C (-58 °F) to 95 °C (203 °F);

NOTE Applications above 95 °C (203 °F) require special design consideration.

- c) The fluid environment is oil, gas, and nonpotable water and combinations thereof (see Table 1);
- d) Axial loads shall include end loads due to pressure only;
- e) Service conditions other than the standard API 15PX conditions are discussed in Section 5.