



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS K 6779 : 2016

(JPBPA/JPIF/JSA)

Polybutene (PB) pipe fittings

ICS 23.040.45 ; 83.140.30 ; 91.140.60

Reference number : JIS K 6779 : 2016 (E)

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Date of Establishment: 1990-06-01

Date of Revision: 2016-08-22

Date of Public Notice in Official Gazette: 2016-08-22

Investigated by: Japanese Industrial Standards Committee

Standards Board for ISO area

Technical Committee on Chemical Products and
Analytical Methods

JIS K 6779 : 2016, First English edition published in 2016-12

Translated and published by: Japanese Standards Association
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Printed in Japan

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Polybutene Pipe Association (JPBPA)/The Japan Plastics Industry Federation (JPIF)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS K 6779:2011** is replaced with this Standard.

However, **JIS K 6779: 2011** may be applied in the JIS mark certification based on the relevant provisions of Article 19 Clause 1, etc. of the Industrial Standardization Law until August 21, 2017.

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Polybutene (PB) pipe fittings

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of ISO 15876-3 published in 2003 with some modifications of the technical contents. The last revision was made in 2011 and the revision at this time is to incorporate the contents of JIS K 6793 and to follow the ordinance of the Ministry of Health, Labour and Welfare in describing the leaching criteria.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JC.

1 Scope

This Standard specifies pipe fittings (hereafter referred to as “fittings”) to be used for jointing with polybutene pipes (hereafter referred to as “pipes”) specified in JIS K 6778 mainly for the conveyance of water at 90 °C or lower.

The polybutene pipes, as well as the pipe fittings, are intended to be used for installations within buildings for the conveyance of water whose working pressure is 0.75 MPa or lower.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 15876-3 : 2003 *Plastics piping systems for hot and cold water installations — Polybutylene (PB) — Part 3 : Fittings* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0251 Limit gauges for metric screw threads

JIS B 0253 Gauges for taper pipe threads

JIS B 0254 Limit Gauges for Parallel Pipe Threads

JIS B 7502 Micrometers

JIS B 7507 Vernier dial and digital callipers

JIS K 6778 Polybutene (PB) pipes

JIS K 6900 Plastics — Vocabulary

JIS S 3200-1 Equipment for water supply service — Test methods of hydrostatic pressure

JIS S 3200-7 Equipment for water supply service — Test methods of effect to water quality

JIS Z 8102 Names of non-luminous object colours

JIS Z 8703 Standard atmospheric conditions for testing

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS K 6900**, and the following apply.

3.1 mechanical fitting

fittings whose water-tightness is secured either by tightening nuts, bands, sleeves and others after inserting pipes into fittings or by using O-rings

3.2 electrofusion fitting

insertable, fusion-bonded fitting which is equipped with heating elements such as electric heating wire

3.3 heat fusion fitting

insertable fitting which is fusion-bonded by heating the fitting and the pipe with a jointing tool such as heating plate

3.4 air-tightness test

the examination of a metallic material for leakage or other defects by sealing both ends of the material by a proper method and applying pressure to the inside

3.5 negative pressure resistance test

the examination for suction or other defects by jointing a pipe with a fitting and then reducing the pressure of the inside by a proper method

3.6 compression peeling test

the determination of the rate of peeling length to the length of fusion joint, by cutting into half the fitting fusion-bonded to the pipe and compressing it until the internal surfaces of the bonded pipe come into contact with each other

3.7 ordinary temperature

the temperature of $20\text{ }^{\circ}\text{C} \pm 15\text{ }^{\circ}\text{C}$, which is based on the standard temperature of $20\text{ }^{\circ}\text{C}$ specified in **JIS Z 8703** and the tolerance of grade 15 ($\pm 15\text{ }^{\circ}\text{C}$) specified in 3.1 of **JIS Z 8703**

4 Classification and symbols

Fittings and their symbols shall be classified by the connection type and be as given in Table 1.

Table 1 Classification and symbols of fittings

Classification of fitting	Symbol	
Mechanical fittings	Class M	
Electrofusion fitting (constant current type)	Class E ^{a)}	Type A
Electrofusion fitting (constant voltage type)		Type B
Heat fusion fitting	Class H	
Note ^{a)} Depending on the fusion method, there are two types of Class E fittings: Type A and Type B (see Annex JB). In order to prevent malfunctioning of both fittings, use the current-carrying terminal of outside diameter 2.0 mm for Type A or that of 2.5 mm for Type B.		

5 Performance

The performance of fittings shall be tested in accordance with 9.3 to 9.10, and comply with the requirements in Table 2.

Table 2 Performance of fittings

Performance item		Performance	Classification of fittings	Applicable subclause
Air-tightness ^{a)}		No leakage or other defects.	Class M	9.3
Water-tightness		No leakage or other defects.	Class E	9.4
Hydrostatic pressure resistance		No leakage or other defects.	Class H	9.5
Negative pressure resistance		No suction of air (or water) or other defects.		9.6
Hot internal-pressure creep resistance		No leakage or other defects.		9.7
Pull-out		No pull-out or other defects.		9.8
Compression peeling		Rate of peeling length of the fusion joint is not more than 15 %.	Class E	9.9
Leaching ^{b)}	Turbidity	As specified in Attached Table 1, "the criteria for leachate of water-supply implement installed anywhere except the end of water-supply facilities or leachate of water supply pipe" the Ordinance of the Ministry of Health and Welfare No. 14 of 1997.	Applied to moulded portion of polybutene.	9.10
	Chromaticity			
	Total organic carbon (TOC)			
	Odour			
	Taste			
	Loss of residual chlorine	0.7 mg/L max.		
Leaching specified in JA.4.2		As specified in Attached Table 1, "the criteria for leachate of water-supply implement installed anywhere except the end of water-supply facilities or leachate of water supply pipe" the Ordinance of the Ministry of Health and Welfare No. 14 of 1997.	Applied to moulded portions, excluding polybutene, which come into contact with water.	
Notes ^{a)} Air-tightness applies to fittings manufactured by other sand-mould castings than continuous casting.				
^{b)} The test temperature of leaching shall be 95 °C. For the loss of residual chlorine, however, it shall be the ordinary temperature. Obtain the difference from the blank test value to determine the leaching of performances except odour and taste.				

6 Appearance

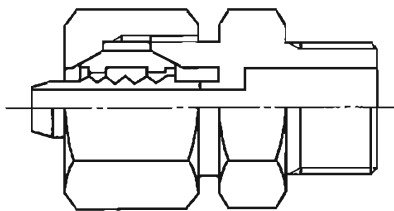
The appearance of fittings shall be as follows.

- a) When viewed without magnification, the internal and external surfaces of Class M fittings shall be smooth, and free from blowholes, flashes, flaws, fissures and other surface defects detrimental to use.
- b) When viewed without magnification, the internal and external surfaces of Class E fittings, except built-in heating wire, shall be smooth, and free from flaws, fissures and other surface defects detrimental to use.
- c) When viewed without magnification, the internal and external surfaces of Class H fittings shall be smooth, and free from flaws, fissures and other surface defects detrimental to use.
- d) The colour of resinous part for Class E and H fittings shall be light greyish reddish yellow (beige) specified in JIS Z 8102.

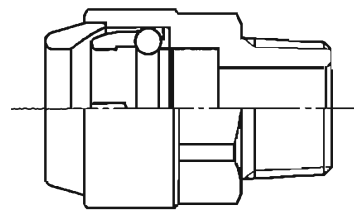
7 Structure and shape

The examples of structure and shape of fittings are shown in Figures 1 and 3.

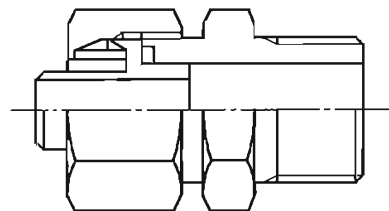
The structure and shape not specified in Figures 1 to 3 may be used when they satisfy the requirements in clauses 5 and 6.



a) Fitting used to secure water-tightness by tightening a nut and a ring



b) Fitting used to secure water-tightness with an O-ring by fixing a pipe with a holding ring



c) Fitting used to secure water-tightness with an O-ring by tightening a nut and a ring

Figure 1 Structure and shape of Class M fitting joint (example)

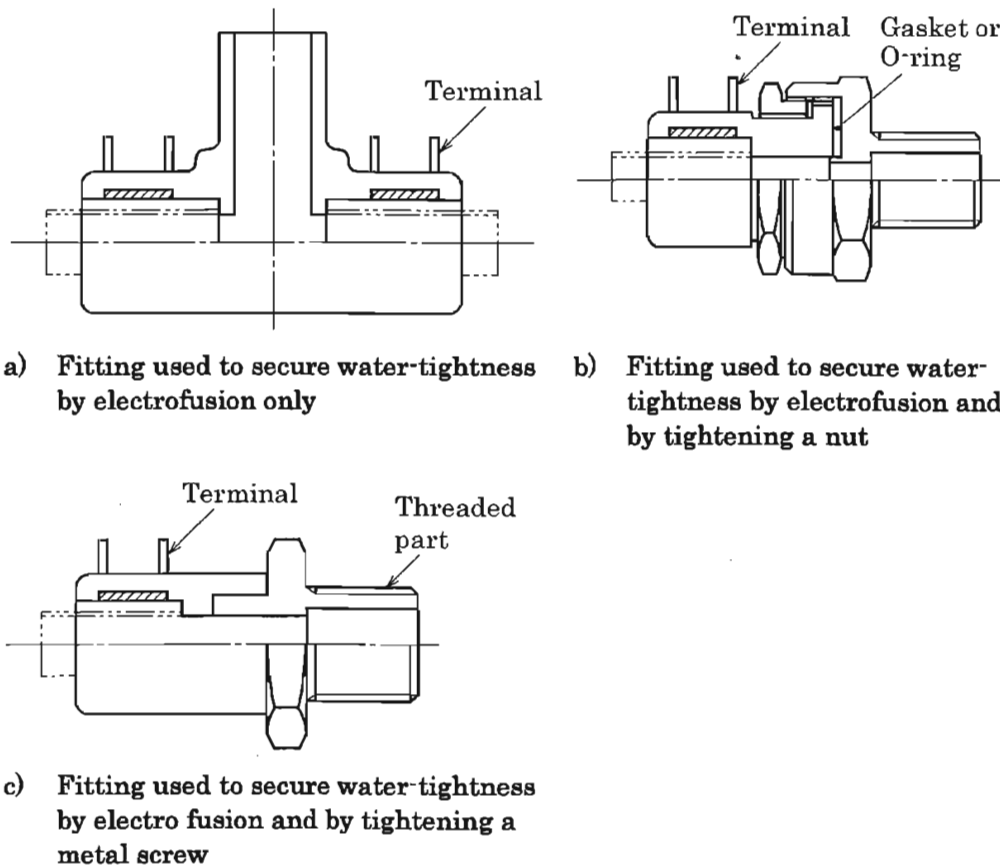


Figure 2 Structure and shape of Class E fitting joint (example)

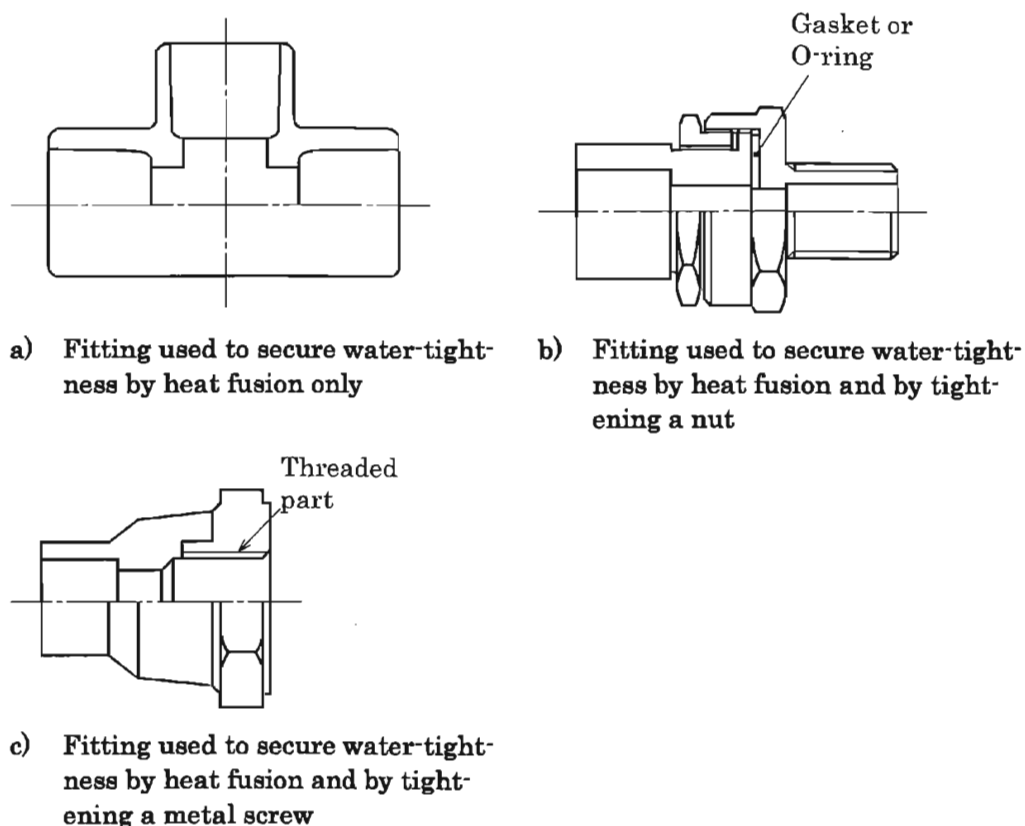


Figure 3 Structure and shape of Class H fitting joint (example)