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**Unplasticized poly(vinyl chloride)
(PVC-U) pipes for water supply**

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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 Japan PVC Pipe and Fittings Association (JPPFA)/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 6742:2007** is replaced with this Standard.

However, **JIS K 6742:2007** 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 October 19, 2017.

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Unplasticized poly(vinyl chloride) (PVC-U) pipes for water supply

Introduction

This Japanese Industrial Standard has been prepared based on the first editions of **ISO 1452-1** and **ISO 1452-2** published in 2009 with some modifications of the technical contents including addition of requirements concerning product dimensions and performance, and their test methods that are widely used in Japan.

Sidelines or dotted underlines indicate changes from the corresponding International Standards. A list of modifications with explanations is given in Annex JC.

1 Scope

This Standard specifies unplasticized poly(vinyl chloride) (PVC-U) pipes and impact-resistant unplasticized poly(vinyl chloride) (PVC-U) pipes (hereafter referred to as pipes) to be used for piping of water works under working pressure of 0.75 MPa or lower.

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

ISO 1452-1:2009 *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure—Unplasticized poly(vinyl chloride) (PVC-U)—Part 1: General*

ISO 1452-2:2009 *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure—Unplasticized poly(vinyl chloride) (PVC-U)—Part 2: Pipes* (overall evaluation: MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards 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. For standards with the year indication, only the editions of the indicated year shall be applied and the revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent edition (including amendments) shall be applied.

JIS B 7502 *Micrometers*

JIS B 7507 *Vernier, dial and digital callipers*

JIS K 6814 *Thermoplastics pipes—Thermal reversion test method*

NOTE : Corresponding International Standard: ISO 2505:2005 *Thermoplastics pipes—Longitudinal reversion—Test method and parameters* (MOD)

JIS K 6815-1:2002 *Thermoplastics pipes—Determination of tensile properties—Part 1: General test method*

NOTE : Corresponding International Standard: ISO 6259-1:1997 *Thermoplastics pipes—Determination of tensile properties—Part 1: General test method* (IDT)

JIS K 6815-2:2002 *Thermoplastics pipes—Determination of tensile properties—Part 2: Pipes made of unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C) and high-impact poly(vinyl chloride) (PVC-HI)*

NOTE : Corresponding International Standard: ISO 6259-2:1997 *Thermoplastics pipes—Determination of tensile properties—Part 2: Pipes made of unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C) and high-impact poly(vinyl chloride) (PVC-HI)* (IDT)

JIS K 6816 *Thermoplastics pipes and fittings—Test method for Vicat softening temperature*

NOTE : Corresponding International Standard: ISO 2507-1:1995 *Thermoplastics pipes and fittings—Vicat softening temperature—Part 1: General test method* (MOD)

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 8401 *Guide to the rounding of numbers*

JIS Z 8703 *Standard atmospheric conditions for testing*

ISO 1167-1 *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids—Determination of the resistance to internal pressure—Part 1: General method*

ISO 1167-2 *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids—Determination of the resistance to internal pressure—Part 2: Preparation of pipe test pieces*

ISO 7686 *Plastics pipes and fittings—Determination of opacity*

ISO 9852 *Unplasticized poly(vinyl chloride) (PVC-U) pipes—Dichloromethane resistance at specified temperature (DCMT)—Test method*

ISO 18373-1 *Rigid PVC pipes—Differential scanning calorimetry (DSC) method—Part 1: Measurement of the processing temperature*

EN 744:1995 *Plastics piping and ducting systems—Thermoplastics pipes—Test method for resistance to external blows by the round-the-clock method*

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 working pressure

maximum water pressure (hydrostatic pressure) to which a pipe is subjected under normal service condition

3.2 type inspection

an inspection to judge whether the quality of a product satisfies all the characteristics stated in the design

3.3 delivery inspection

an inspection performed at the delivery of a product to judge whether the quality of the product satisfies all the required characteristics

4 Classification and symbols

The classification and symbols of pipes are shown in Table 1.

Table 1 Classification and symbols

Classification	Symbols
Unplasticized poly(vinyl chloride) (PVC-U) pipes	VP
Impact-resistant unplasticized poly(vinyl chloride) (PVC-U) pipes	HIVP
Unplasticized poly(vinyl chloride) (PVC-U) pipes for water supply and for drainage and sewerage under pressure ^{a)}	IWVP
Note ^{a)} Types of pipe specified in the corresponding International Standards.	

5 Performance

The pipes shall satisfy the performance requirements given in Table 2.

Table 2 Performance

Performance item		Requirement	Symbol of applicable pipe	Applicable test subclause
Tensile strength at yield	MPa	45 min.	VP	9.1.1
		40 min.	HIVP	
Pressure resistance		No damages.	VP, HIVP, IWVP	9.1.2
Flattening resistance		No fissures or cracks.	VP, HIVP	9.1.3
Impact resistance		"No abnormalities" ^{a)}	HIVP	9.1.4
Opacity	%	0.2 max. in transparency of visible ray.	VP, IWVP	9.1.5
Vicat softening temperature	°C	76 min.	VP, HIVP	9.1.6
		80 min.	IWVP	
Effect to water quality	Lead and its compounds	mg/L	VP, HIVP, IWVP	9.1.7
	Zinc and its compounds	mg/L		
	Organic matters [amount of total organic carbon (TOC)]	mg/L		
	Taste			
	Odour			
	Chromaticity	degrees		
	Turbidity	degrees		
	Loss of residual chlorine	mg/L		
Hot internal pressure creep property		No damages.	IWVP	9.1.8
Resistance to external blows (rotation method)	%	True impact rate (TIR) at 0 °C: 10 max.	IWVP	9.1.9
Thermal longitudinal reversion	%	Extension and contraction in axial direction: 5 max	IWVP	9.1.10
Dichloromethane resistance ^{b)}		No corrosion.	IWVP	9.1.11
Differential scanning calorimetry (DSC) ^{b)}	°C	B-onset (maximum processing temperature): 185 min.	IWVP	9.1.12
Notes ^{a)} To be judged according to the criteria given in JA.4 . ^{b)} For IWVP, either dichloromethane resistance or differential scanning calorimetry (DSC), whichever is selected, shall be tested.				

6 Appearance and shape

6.1 Appearance

The pipes shall be smooth in outer and inner surfaces and free from defects detrimental to use such as flaws and fissures.

6.2 Shape

The pipe shall have a practically right-circular cross-section and be straight, and its end surfaces shall be square to its axis.

7 Dimensions and tolerances

The dimensions and tolerances of pipes shall be in accordance with Table 3 for VP and HIVP, and Table 4 for IWVP. Pipe length may be other than that specified in the said tables if agreed between the purchaser and the manufacturer.

Table 3 Dimensions and tolerances VP and HIVP

Unit: mm

Nominal diameter	Outside diameter			Wall thickness		Length		Informative [Mass per metre (kg) ^{e)}]	
	Basic dimension	Tolerance on max. and min. outside diameter ^{a)}	Tolerance on mean outside diameter ^{b)}	Basic dimension	Tolerance	Basic dimension	Tolerance	VP	HIVP
13	18.0	± 0.2	± 0.2	2.5	± 0.2	4 000	+ 30 − 10	0.174	0.170
16	22.0			3.0	± 0.3			0.256	0.251
20	26.0			3.5				0.310	0.303
25	32.0							0.448	0.439
30	38.0	± 0.3	± 0.3	4.0	± 0.4	4 000 or 5 000		0.542	0.531
40	48.0			4.5				0.791	0.774
50	60.0	± 0.4		1.122				1.098	
65	76.0	± 0.5		5.9	1.445			1.415	
75	89.0				2.202			2.156	
100	114.0	± 0.6		7.1	± 0.5			3.409	3.338
125	140.0	± 0.8		7.5				4.464	4.371
150	165.0	± 1.0		9.6	± 0.6			6.701	6.561

- Notes ^{a)} Tolerance on the maximum or minimum outside diameter is the permitted deviation of the measured maximum or minimum value of the outside diameter at any cross-section of the pipe (maximum or minimum outside diameter) from the basic dimension.
- ^{b)} Tolerance on mean outside diameter is the permitted deviation of either of the following from the basic dimension: the measurement of pipe circumference at any cross-section divided by the circular constant, 3.142; or the mean of the measurements of the outside diameter (mean outside diameter) obtained in two directions at an equal interval at any cross-section.
- ^{c)} Mass per metre is calculated by assuming the density of VP to be 1.43 g/cm³, and that of HIVP to be 1.40 g/cm³, with the pipe dimension as the basic dimension.