



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS K 6353 : 2023

(JRMA/JSA)

**Rubber seals — Joint parts for water
supply, drainage and sewerage pipelines**

ICS 83.140.50;91.140.60;91.140.80

Reference number: JIS K 6353 : 2023 (E)

PROTECTED BY COPYRIGHT

K 6353 : 2023

Date of Establishment: 1953-03-28

Date of Revision: 2023-10-20

Date of Public Notice in Official Gazette: 2023-10-20

Investigated by: Japanese Industrial Standards Committee

Standards Board for ISO area

Technical Committee on Chemical Products and

Analytical Methods

JIS K 6353 : 2023, First English edition published in 2024-12

Translated and published by: Japanese Standards Association
Mita Avanti, 3-11-28, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2024

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

HN

PROTECTED BY COPYRIGHT

 **Documents**
Document Sharing Hub

Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification	2
5 Quality	3
6 Shape and dimensions	6
7 Material and processing	6
8 Test methods	6
8.1 Physical tests	6
8.2 Test of effect to water quality	9
9 Marking and labelling	10
10 Guidance on storage of rubber seals	11
Annex A (normative) Determination of splice strength	12
Annex B (informative) Guidance on storage of rubber seals	13
Annex JA (normative) Test method for effect to water quality of rubber seals for joint parts for water supply, drainage and sewer- age pipelines	14
Annex JB (informative) Comparison table between JIS and corresponding International Standard	16

Foreword

This Japanese Industrial Standard has been 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 The Japan Rubber Manufacturers Association (JRMA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS K 6353** : 2011), which has been technically revised.

However, **JIS K 6353** : 2011 may be applied in the **JIS** mark certification based on the relevant provisions of Article 30, paragraph (1), etc. of the Industrial Standardization Act until 19 October 2024.

This **JIS** document is protected by the Copyright Act.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, published patent application or utility model rights.

Rubber seals — Joint parts for water supply, drainage and sewerage pipelines

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 4633** : 2015, Edition 4, with some modifications of the technical contents to meet the local needs in Japan, including addition of physical test items and requirements for effect to water quality that are not provided in the said **ISO**. Note, however, that the requirements for effect to water quality added in this Standard do not apply to rubber seals used for water supply facilities; for these products, relevant criteria in related laws and regulations shall apply.

Annex JA is unique to **JIS** and not given in the corresponding International Standard. The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JB. Vertical lines and dotted underlines are not given for editorial changes from the corresponding International Standard regarding clause/subclause numbers as shown in Figure JB.1.

1 Scope

This Standard specifies requirements for rubber seals used for the joint parts of the pipes, fittings and valves of water pipelines (hereafter referred to as rubber seals). For the purpose of this Standard, the water pipelines include water supply pipelines, drainage and sewerage pipelines, and pipelines for industrial and agricultural water. This Standard is not applicable to rubber seals used for pipelines for heated water (drinking water above 50 °C for water supply rubber seals, and continuous flow above 45 °C and intermittent flow above 95 °C for other rubber seals).

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

ISO 4633 : 2015 *Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials* (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

Part or all of the provisions of the following standards, 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 K 6200 *Rubber — Vocabulary*

- JIS K 6250 *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*
- JIS K 6251 *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*
- JIS K 6253-2 *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2 : IRHD method (hardness between 10 IRHD and 100 IRHD)*
- ~~JIS K 6253-3 *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 3 : Durometer method*~~
- JIS K 6257 *Rubber, vulcanized or thermoplastic — Determination of heat ageing properties*
- JIS K 6258 *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*
- JIS K 6259-1 *Rubber, vulcanized or thermoplastic — Determination of ozone resistance — Part 1 : Static and dynamic strain testing*
- JIS K 6262 *Rubber, vulcanized or thermoplastic — Determination of compression set at ambient, elevated or low temperatures*
- JIS K 6263 *Rubber, vulcanized or thermoplastics — Determination of stress relaxation*
- ~~JIS K 6397 *Rubbers and latices — Nomenclature*~~
- ~~JIS S 3200-7 *Equipment for water supply service — Test methods of effect to water quality*~~
- ISO 3387 *Rubber — Determination of crystallization effects by hardness measurements*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions, and those given in **JIS K 6200** and Clause 3 of **JIS S 3200-7** apply.

3.1

nominal size

designation of pipe determined by the type [e.g. reinforced concrete pipe, unplasticized poly(vinyl chloride) (PVC-U) pipe, ductile iron pipe] and dimensions of pipe

4 Classification

~~Quality classifications A and B of rubber seals are given in Tables 2 and 3, respectively. Classification A is further classified into class IA, class I B, class II, class III and class IV as given in Table 2, and classification B is further classified by hardness class as given in Table 1.~~

Table 1 Hardness class (classification B)

Range of hardness (IRHD)	36 to 45	46 to 55	56 to 65	66 to 75	76 to 85	86 to 95
Hardness class ^{a)}	40	50	60	70	80	90
Note ^{a)} Based on International Rubber Hardness Degrees (IRHD) agreed between the interested parties.						

5 Quality

The quality of the rubber seal shall be tested according to the methods specified in Clause 8 and satisfy the following.

- The appearance of the rubber seal shall be free from visible flaws, cracks, bubbles, cavities, inclusions of foreign matter and other defects detrimental to use.
- The physical properties of the rubber seal reflecting the raw material and formulation shall be in accordance with either Table 2 or Table 3.
- The effect to water quality of the rubber seal reflecting the type of raw material shall be in accordance with Table 4.

This requirement may be omitted for rubber seals used for applications where the sanitary impact of rubber on water quality need not be considered, such as drainage and sewerage pipelines, and pipelines for industrial and agricultural water.

NOTE For rubber seals used for water supply facilities, the criteria for effect to water quality provided in related laws and regulations are to be applied instead of requirements in this Standard.

Table 2 Quality (physical properties) (classification A)

Classification		Type A durometer hardness	Tolerance on Type A durometer hardness	Tensile test			Accelerated ageing test			Compression set Max.	Application examples
				Elongation at 7.0 MPa Max.	Tensile strength Min.	Elongation at break Min.	Tensile strength change Max.	Elongation change Max. Min.	Type A durometer hardness change Max. Min.		
Unit		—		%	MPa	%	%	%	—	%	
Test method		JIS K 6253-3		JIS K 6251			JIS K 6257			JIS K 6262	
Test sub-clause in this Standard		8.1.4 a)		8.1.5 a)			8.1.6 a)			8.1.7 a)	
Class I b)	A	A70	±5	200	18 ^{a)}	300	−20	+10 −20	+7 0	20	• Joint rubber ring for ductile iron pipe, steel pipe and unplasticized poly(vinyl chloride) (PVC-U) pipe • Rubber ring for reinforced concrete pipe • Rubber valve seat for butterfly valve
		A65	±5	250	18 ^{a)}	400	−20	+10 −30	+7 0	20	
		A60	±5	300	18 ^{a)}	400	−20	+10 −30	+7 0	20	
		A55	±5	350	18 ^{a)}	400	−20	+10 −30	+7 0	20	
		A50	±5	400	18 ^{a)}	400	−20	+10 −30	+7 0	20	
	B	A65	±5	—	18 ^{a)}	450	−40	+10 −40	+5 0	20	• Valve of rubber ring for ductile iron pipe push-on fitting
A50		±5	—	18 ^{a)}	450	−40	+10 −40	+5 0	20		
Class II		A70	±5	200	16 ^{a)}	300	−20	+10 −30	+7 0	30	• Rubber seal for gland of sluice valve
		A65	±5	250	16 ^{a)}	300	−20	+10 −30	+7 0	30	
		A60	±5	300	16 ^{a)}	300	−20	+10 −30	+7 0	30	
		A55	±5	350	16 ^{a)}	300	−20	+10 −30	+7 0	30	
		A50	±5	400	16 ^{a)}	300	−20	+10 −30	+7 0	30	
Class III		A80	±5	—	12	280	−25 ^{c)}	+10 ^{c)} −30	+5 0	30 ^{c)}	• Heel of rubber ring for ductile iron pipe push-on fitting
		A75	±5	—	12	300	−25	+10 ^{c)} −30	+7 ^{c)} 0	30 ^{c)}	
		A65	±5	250	12	300	−25	+10 −30	+7 0	30	
		A60	±5	300	12	300	−25	+10 ^{c)} −30	+7 ^{c)} 0	30 ^{c)}	
Class IV		A50	±5	—	9	400	−25	+10 −30	+7 0	30	• Rubber ring for reinforced concrete pipe
Note ^{a)} The tensile strength of ethylene propylene rubber (EPDM) shall be not less than 14 MPa for class I and not less than 12 MPa for class II.											
Note ^{b)} The tensile strength of class I acrylonitrile butadiene rubber (NBR) and chloroprene rubber (CR) shall be not less than 16 MPa.											
Note ^{c)} For some applications, these test items may be partially omitted upon agreement between the interested parties.											