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**Plastics — Unplasticized poly (vinyl
chloride) sheets**

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In the event of any doubts arising as to the contents,
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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 Japan Plastic Sheet Association (JPSA)/The Japan Plastics Industry Federation (JPIF)/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 6745 : 2015**), which has been technically revised.

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Plastics — Unplasticized poly (vinyl chloride) sheets

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 11833-1 : 2019**, Edition 4, with some modifications of the technical contents.

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 JC. Annex JA and Annex JB are unique to **JIS** and not given in the corresponding International Standard.

1 Scope

This Standard specifies the requirements for flat extruded sheets and pressed sheets of unplasticized poly (vinyl chloride) (hereafter referred to as sheets). It applies only to sheets of thickness not less than 1.0 mm. It does not cover biaxially stretched poly (vinyl chloride) sheets or embossed sheets.

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

ISO 11833-1 : 2019 *Plastics — Unplasticized poly (vinyl chloride) sheets — Part 1: Types, dimensions and characteristics for sheets of thickness not less than 1 mm* (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. 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 editions (including amendments) shall be applied.

JIS B 7502 *Micrometers*

JIS B 7503 *Mechanical dial gauges*

JIS B 7507 *Geometrical product specifications (GPS) — Dimensional measuring equipment — Vernier, dial and digital callipers*

JIS B 7512 *Steel tape measures*

JIS B 7516 *Metal rules*

JIS K 6740-1 *Plastics — Unplasticized poly (vinyl chloride) (PVC-U) moulding and*

extrusion materials — Part 1: Designation system and specifications

NOTE 1 Normative reference in the Corresponding International Standard: ISO 21306-1 : 2019 *Plastics — Unplasticized poly (vinyl chloride) (PVC-U) moulding and extrusion materials — Part 1: Designation system and basis for specifications*

NOTE 2 The **JIS** cited above is not a corresponding standard to but equivalent to the **ISO** Standard given in NOTE 1 in the contents relevant to this Standard.

JIS K 6900 *Plastics — Vocabulary*

NOTE Normative reference in the corresponding International Standard: ISO 472 *Plastics — Vocabulary*

JIS K 7100 *Plastics — Standard atmospheres for conditioning and testing*

NOTE Normative reference in the corresponding International Standard: ISO 291 *Plastics — Standard atmospheres for conditioning and testing*

JIS K 7111-1 *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test*

NOTE Normative reference in the corresponding International Standard: ISO 179-1 *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test*

JIS K 7114 *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals*

JIS K 7144 *Plastics — Preparation of test specimens by machining*

NOTE Normative reference in the corresponding International Standard: ISO 2818 *Plastics — Preparation of test specimens by machining*

JIS K 7161-2 *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

NOTE Normative reference in the corresponding International Standard: ISO 527-2 *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

JIS K 7206 : 2016 *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

NOTE Normative reference in the corresponding International Standard: ISO 306 : 2013 *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

JIS K 7361-1 *Plastics — Determination of the total luminous transmittance of transparent materials — Part 1: Single beam instrument*

NOTE Normative reference in the corresponding International Standard: ISO 13468-1 *Plastics — Determination of the total luminous transmittance of transparent materials — Part 1: Single-beam instrument*

3 Terms and definitions

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

4 Material

Sheets shall be fabricated from unplasticized poly (vinyl chloride) compounds as defined in Clause 1 of **JIS K 6740-1**. Compounds may contain additives such as stabilizers, lubricants, processing aids, impact modifiers, fillers, flame retardants and colourants. Compounds and additives of unknown identity and composition shall not be used for the processing of sheets.

5 Classification

Sheets are classified into extruded sheets (E) and pressed sheets (P) according to the moulding method, and also into non-critical applications (T₁) and critical applications (T₂) according to the thickness tolerance. Further, they are each classified into five groups characterized by the required properties, as given in Table 1. The tolerances on thickness of sheets shall be as specified in Table 4 and Table 5. The required properties of each group shall be as given in Table 6.

Table 1 Classification

Division according to the moulding method	Division according to the thickness tolerance	Division according to the required property
E: Extruded sheet P: Pressed sheet	T ₁ : Non-critical application T ₂ : Critical application	Group 1: General-purpose grade Group 2: Transparent grade Group 3: High-modulus grade Group 4: High-impact grade Group 5: Heat-resistant grade

6 Requirements

6.1 Appearance

The surface shall be free of noticeable flaws, cracks, mottling, voids, bubbles, impurities and colour unevenness (both within one sheet and between sheets) which are not acceptable for the application envisaged. The sheet shall have a smooth surface.

6.2 Nominal dimensions

6.2.1 Length and width

The nominal length and width of sheets shall be agreed between the interested parties. The tolerances on length and width of sheets shall be as specified in Table 2.

Table 2 Tolerances on length and width

Tolerance on nominal dimensions	
Length	Width
$\begin{smallmatrix} +1 \\ 0 \end{smallmatrix} \%$	$\begin{smallmatrix} +1 \\ 0 \end{smallmatrix} \%$

6.2.2 Rectangularity

The rectangularity of a sheet shall be expressed as the absolute value of the difference in length of the diagonals as shown in Figure 1. Tolerances on rectangularity for sheets with typical nominal dimensions shall be as given in Table 3.

Table 3 Tolerances on rectangularity ^{a)}

Nominal dimensions (length × width)	Unit: mm	
	Difference between diagonals	
	Extruded sheet (E)	Pressed sheet (P)
1 820 × 910	7 max.	5 max.
2 000 × 1 000	7 max.	5 max.
2 424 × 1 212	9 max.	7 max.
3 000 × 1 500	11 max.	8 max.
4 000 × 2 500	17 max.	13 max.
Note ^{a)} The tolerances specified in Table 3 assume that the length and width of the sheet comply with Table 2.		

Tolerances on sheets of other nominal dimensions shall be calculated, in millimetres, using the following formulae and rounded to the nearest integer.

Extruded sheet (E):

$$|\overline{AC} - \overline{BD}| \leq \sqrt{(\overline{AB} + 4\overline{BC} / 1\,000)^2 + \overline{BC}^2} - \sqrt{(\overline{AB} - 4\overline{BC} / 1\,000)^2 + \overline{BC}^2}$$

Pressed sheet (P):

$$|\overline{AC} - \overline{BD}| \leq \sqrt{(\overline{AB} + 3\overline{BC} / 1\,000)^2 + \overline{BC}^2} - \sqrt{(\overline{AB} - 3\overline{BC} / 1\,000)^2 + \overline{BC}^2}$$

where, $|\overline{AC} - \overline{BD}|$: Difference in length of diagonals

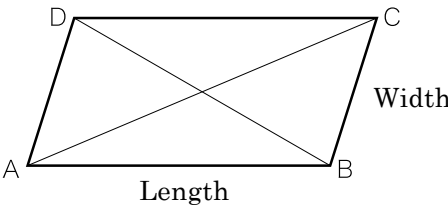


Figure 1 Measurement positions for determination of rectangularity

The tolerance on the thickness of sheets shall be as specified in Table 4 for non-critical applications (T₁) and in Table 5 for critical applications (T₂).

Nominal thickness d mm	Tolerance %	
	Extruded sheet (E)	Pressed sheet (P)
$1.0 \leq d \leq 5.0$	± 13	± 15
$5.0 < d \leq 20$	± 10	± 10
$20 < d$	± 7	± 7

	Tolerance mm
Extruded sheet (E)	$\pm(0.1 + 0.03 \times \text{nominal thickness } d)$
Pressed sheet (P)	$\pm(0.1 + 0.05 \times \text{nominal thickness } d)$

The basic mechanical, thermal, optical and chemical properties of sheets of each group shall be as specified in Table 6.

NOTE Other properties that can be additionally selected are shown in Annex JB.

Table 6 Required properties

Properties	Requirements										Test method
	Extruded sheet (E)					Pressed sheet (P)					
	Group 1 General purpose	Group 2 Trans-parent	Group 3 High modulus	Group 4 High impact	Group 5 Heat re-sistant	Group 1 General purpose	Group 2 Trans-parent	Group 3 High modulus	Group 4 High impact	Group 5 Heat re-sistant	
Tensile stress at yield MPa	≥50	≥45	≥60	≥45	≥50	≥50	≥45	≥60	≥45	≥50	7.4.1
Nominal strain at break %	≥8	≥5	≥3	≥8	≥10	≥5	≥5	≥8	≥10	≥8	7.4.1
Modulus of elasticity in tension MPa	≥2 500	≥2 000	≥3 200	≥2 300	≥2 500	≥2 500	≥2 500	≥3 000	≥2 000	≥2 500	7.4.2
Charpy impact strength of notched specimens kJ/m ²	≥2	≥1	≥2	≥5	≥2	≥2	≥1	≥2	≥10	≥2	7.4.3
Vicat softening temperature °C	≥70	≥60	≥70	≥70	≥85	≥75	≥65	≥78	≥70	≥90	7.5.1
Dimensional change on heating %	Nominal thickness 1.0 mm ≤ d ≤ 2.0 mm : ±10 Nominal thickness 2.0 mm < d ≤ 5.0 mm : ± 5 Nominal thickness 5.0 mm < d ≤ 10 mm : ± 4 Nominal thickness 10 mm < d : ± 4					Nominal thickness 1.0 mm ≤ d : ±3					7.5.2.2
Delamination of composite layers	—					No blisters, cracks or flaking (delamination)					7.5.2.3
Total luminous transmittance ^{a)} %	Nominal thickness 1.0 mm ≤ d ≤ 2.0 mm : ≥82 Nominal thickness 2.0 mm ≤ d ≤ 6.0 mm : ≥78 Nominal thickness 6.0 mm ≤ d ≤ 10 mm : ≥75 Nominal thickness 10 mm < d : —										7.6
Chemical resistance ^{b)}	Pass the test	—	—	—	—	Pass the test	—	—	—	—	Annex JA
“—” : not applicable											
Note ^{a)} Applicable only to extruded sheets of Group 2 and pressed sheets of Group 2.											
Note ^{b)} Applicable only to extruded sheets of Group 1 and pressed sheets of Group 1.											