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## JIS A 5373 : 2010 (JPCC/JSA)

# Precast prestressed concrete products

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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 Precast Concrete Standard Committee (JPCC)/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 A 5373:2004 is replaced with this Standard.

However, **JIS A 5373**:2004 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 22nd September, 2010.

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Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

#### **Precast prestressed concrete products**

#### 1 Scope

This Japanese Industrial Standard specifies the precast prestressed concrete products (hereafter referred to as "PC products"). However, this Standard shall not be applied to individual concrete products for buildings which are specified in separate Japanese Industrial Standards.

This Standard shall not be applied to products which use the prestressing tendon etc. for the purpose of securing safety in construction without intending to use the prestressed concrete structure.

The comparison table between previous and current editions of this Standard on technically significant revisions is listed in Annex F.

#### **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 A 0203	Concrete terminology
JIS A 1108	Method of test for compressive strength of concrete
JIS A 1132	Method of making and curing concrete specimens
JIS A 1136	Method of test for compressive strength of spun concrete
JIS A 5361	Precast concrete products—General rules for classification, designation and marking
JIS A 5362	$\label{eq:precast} Precast\ concrete\ products  Required\ performance\ and\ methods\ of\ verification$
JIS A 5363	Precast concrete products—General rules for methods of performance test
JIS A 5364	$\label{eq:precast} Precast\ concrete\ products  General\ rules\ of\ materials\ and\ product\ methods$
JIS A 5365	Precast concrete products—General rules for method of inspection
JIS B 7505-1	Aneroid pressure gauges—Part 1: Bourdon tube pressure gauges
JIS B 7721	$Tension/compression\ testing\ machines \\Verification\ and\ calibration\ of\ the\ force-measuring\ system$
JIS Z 8401	Guide to the rounding of numbers

#### **3** Terms and definitions

For the purposes of this Standard, the terms and definitions given in **JIS A 0203** and the following terms and definitions apply.

#### 3.1 Group I

PC products whose conformity with the stated performance is confirmed by actual results, which are manufactured based on such specification, and whose recommended specifications are indicated in Annexes

#### 3.2 Group II

PC products whose performance and specifications are defined by the agreement between the parties concerned with delivery and which are manufactured based on such specifications

#### 4 Classification

PC products shall be classified as specified in table 1 by the application.

Products shall be classified into Group I and Group II according to the determination method of performance and specifications.

Classification	Applicable clause in Annex		
Poles	See <b>A.2</b> .		
Bridges	See <b>B.2</b> .		
Retaining walls	See <b>C.2</b> .		
Covered conduits	See <b>D.2</b> .		
Piles	See <b>E.2</b> .		
Other products Example: Disaster prevention facilities	Shall be subjected to the agreement between the parties concerned with delivery.		
NOTE : Group I is listed in the recommended specifications of Annexes; however, Group II has no recommended specifications.			

 Table 1
 Classification of PC products

#### 5 Quality

#### 5.1 Appearance

The appearance shall be tested as specified in **9.1** and it shall be free from any flaw, crack, chip, camber, torsion (in the case of a board-like product), etc. which are detrimental to use. Moreover, the water-contact surface of PC products for water-channel shall be as smooth as practically acceptable.

#### 5.2 Performance

The performance shall conform to the provisions of table 2 when tested as specified in clause  $\mathbf{9}$ .

Classification	Applicable clause in Annex
Poles	See <b>A.3</b> .
Bridges	See <b>B.3</b> .
Retaining walls	See C.3.
Covered conduits	See <b>D.3</b> .
Piles	See <b>E.3</b> .
Other products Example: Disaster prevention facilities	<ul> <li>a) Performance Specific items of performance shall be selected and designated according to the agreement between the parties concerned with delivery as specified in JIS A 5362.</li> <li>When performance is clearly correlated with product specifications (dimensions, materials, constructions, etc.), the agreement may be substituted by designation of product specifications indicated in b).</li> </ul>
	<ul> <li>b) Specification of alternative characteristics The specification of alternative characteristics shall be as follows.</li> <li>1) Dimensions</li> <li>2) Compressive strength of concrete</li> <li>3) Bar arrangement</li> <li>4) Effective prestress</li> </ul>

Table 2	Performance	of PC	products
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#### 6 Shape, dimensions and dimensional tolerances

The shape, dimensions and dimensional tolerances shall be as specified in table 3.

Classification	Applicable clause in Annex		
Poles	See <b>A.4</b> .		
Bridges	See <b>B.4</b> .		
Retaining walls	See <b>C.4</b> .		
Covered conduits	See <b>D.4</b> .		
Piles	See <b>E.4</b> .		
Other products Example: Disaster prevention facilities	Shall be subjected to the agreement between the parties concerned with delivery.		

<b>1</b>	Table 3	Shape.	dimensions	and	dimensional	tolerances	of PC	products
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### 7 Bar arrangement (reinforcing bar and prestressing tendon) and tolerances on bar arrangement

The bar arrangement and tolerances on bar arrangement shall be measured as specified in 9.3, and they shall conform to the provisions of the following  $\mathbf{a}$ ) and  $\mathbf{b}$ ).

a) **Bar arrangement** The bar arrangement (the minimum cover of reinforcing bar is included) shall be as specified in table 4. However, the bar arrangement other than that specified in table 4 may be adopted as far as it does not compromise the

performance of PC products (including provisions of **5.2**) subjected to the agreement between the parties concerned with delivery. Manufacturers shall prepare the bar arrangement drawing for each product and shall present it to purchasers upon request.

Classification	Applicable clause in Annex
Poles	See <b>A.5</b> .
Bridges	See <b>B.5</b> .
Retaining walls	See <b>C.5</b> .
Covered conduits	See <b>D.5</b> .
Piles	See <b>E.5</b> .
Other products Example: Disaster prevention facilities	Shall be subjected to the designation of the manufacturer.

Table 4 Bar arrangement of PC products

 $\label{eq:NOTE:General precautions for designing bar arrangement should preferably be as follows.$ 

 The minimum clearance of reinforcing bars and prestressing tendons is 5/4 of the maximum dimension of coarse aggregate or more.

- The necessary cross section of reinforcing bar and prestressing tendon is determined from structural calculation or structural details, and a combination of diameter and number of reinforcing bars and prestressing tendons that can satisfy the cross section is more than one. The diameter and number of reinforcing bars and prestressing tendons shall be selected and arranged in consideration of the thickness of component and the maximum dimension of coarse aggregate. They shall also be selected to ensure complete adhesion between reinforcing bar and concrete and good crack dispersion performance of concrete components.
- b) **Tolerances on bar arrangement** The tolerances on bar arrangement<sup>1)</sup> shall be specified by manufacturers, within the range where the dynamic characteristics and durability of components satisfy the predetermined performance, for each class of products.
  - Note <sup>1)</sup> The limits of deviation between the position of reinforcing bars and prestressing tendons indicated on the bar arrangement drawing and the position of reinforcing bars and prestressing tendons of products.

#### 8 Material and production method

The material used for PC products and the production method shall be as specified in **JIS A 5364**.

#### 9 Test method

#### 9.1 Appearance test

The appearance test shall be conducted by a visual observation to examine the existence of any flaw, crack, chip, camber, torsion (in the case of a board-like product), etc. which are detrimental to use.

#### 9.2 Performance test

The test method of performance shall be as specified in **JIS A 5363** and table 5.

Classification	Applicable clause in Annex
Poles	See <b>A.6</b> .
Bridges	See <b>B.6</b> .
Retaining walls	See <b>C.6</b> .
Covered conduits	See <b>D.6</b> .
Piles	See <b>E.6</b> .
Other products Example: Disaster prevention facilities	Shall be subjected to the agreement between the parties concerned with delivery.

Table 5 Performance test method of PC products

#### 9.3 Measurement of bar arrangement

Measurement of bar arrangement shall be conducted about the diameter, number and minimum cover of reinforcing bar and prestressing tendon. The method shall be either of the following.

- a) **Method by non-destructive test** The measurement by the non-destructive test shall use the electromagnetic induction method, the radar method, etc. According to the designated measurement manual, measurement shall be made on the diameter, number, and minimum cover of reinforcing bar and prestressing tendon.
- b) **Method by destructive sample** The measurement by the destructive sample shall be conducted after finishing performance tests, such as bending strength. The concrete part of the sample shall be chipped; reinforcing bar shall be exposed; and measurement shall be made on the diameter, number, and minimum cover of reinforcing bar and prestressing tendon.
- c) **Method by reinforcing bar before placing** If the position of reinforcing bar and prestressing tendon before and after placing of concrete is not affected by assembly method, fixing method to a formwork, and securing method of cover of reinforcing bar and prestressing tendon, then this position can be regarded as the position of finished product by measuring the diameter, number, and minimum cover of reinforcing bar and prestressing tendon before placing concrete.

#### **10 Inspections**

#### **10.1 Inspection items**

The inspection items of the final inspection conducted by the manufacturer and the delivery inspection conducted for confirmation at the time of acceptance shall be as follows.

- a) **Final inspection items** The final inspection items shall be as follows.
  - 1) Appearance
  - 2) Performance