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Motorcycle tyres

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS K 6366 : 1994** is replaced with **JIS K 6366 : 1998**.

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Motorcycle tyres

Introduction This Japanese Industrial Standard has been prepared based on the second edition of ISO 10231, *Motorcycle tyres—Test methods for verifying tyre capabilities*, published in 1997, without changing the technical contents for the corresponding parts (scope, definitions, test equipment, testing method and performances) while the items (dimensions, appearance, marking) not specified in the corresponding International Standard have been supplemented. Enveloping curve for the contour of the tyres for the centrifugal growth test (Annex A), however, is adopted in advance based on the revision draft of ISO.

1 Scope This Japanese Industrial Standard specifies test methods for verifying the capabilities of newly manufactured tyres for motorcycles (hereafter referred to as “tyres”).

The capability test of tyres shall apply as follows according to the type of tyres.

The first test is the strength test for assessing the capability of the tyre structure with respect to breaking energy in the tread area.

The second test is the endurance test to assess the capability of the tyre with respect to service at full load over long distances.

The third test is the high-speed test to assess the capability of the tyre as related to service at the maximum speed capability of the tyre. It does not apply to tyres with a speed capability below 130 km/h.

Centrifugal growth test is the test for measuring the growth dimension of the tyre under the influence of centrifugal forces during the high-speed running, and it does not apply to tyres with a speed capability below 150 km/h.

Remarks: The International Standard corresponding to this Standard is shown below.

ISO 10231 *Motorcycle tyres—Test methods for verifying tyre capabilities*

2 Normative references The following standard contains provisions which, through reference in this text, constitute provisions of this Standard.

The following edition was effective when this Standard was issued, but every standard is subject to revision, so the most recent edition of the standard shall be applied.

JIS D 4203: 1998 *Motorcycle tyres—Designation and dimensions*

3 Definitions For the purpose of this Standard, the definitions in JIS D 4203 apply, and the rest of the terms are as follows.

- a) **bead separation** Peeling of bond between components in the bead area.
- b) **belt separation** Peeling between belt layers or between belts and plies.
- c) **chunking** Partly peeling found in the tread rubber.
- d) **cord separation** Peeling between the cord and adjacent rubber components.

- e) **cracking** Any cracking of rubber, extending to the cord, which occurs in the tread, sidewall, or innerliner.
- f) **innerliner separation** Peeling between the innerliner and carcass.
- g) **open splice** Parting at the connected part of tread, sidewall, and innerliner.
- h) **ply separation** Peeling between adjacent plies.
- i) **sidewall separation** Peeling between the sidewall rubber and cord.
- j) **tread separation** Peeling between the tread and carcass.
- k) **test rim** Specified rim that conforms to the nomination for the size of tire.
- l) **test drum speed** Speed of the outer surface of the steel drum.
- m) **tyre speed** Peripheral speed of the tire tread.
- n) **maximum load rating** The maximum mass chargeable on the tyre under the specified condition.

4 Test equipment

4.1 Test drum The steel drum, measuring $1.7 \text{ m} \pm 1 \%$ or $2.0 \text{ m} \pm 1 \%$ in diameter, which has smooth surface and width more than the overall width of the test tyre, shall give the load (mass or force) and speed necessary for the test.

The loading device may be a dead-weight cantilevered system with a hydraulic system or with any other equivalent system, with an accuracy within $\pm 1.5 \%$ of the full scale, and its speed has an accuracy within $\pm 3 \%$ of the full scale.

4.2 Plunger Cylindrical steel plunger of sufficient length with a hemispherical end measuring $8 \text{ mm} \pm 0.6 \text{ mm}$ in diameter.

The loading device shall be of hydraulic type or equivalent system with an accuracy within $\pm 1 \%$ of the full scale, and the speed of displacement shall be controlled with an accuracy within $\pm 3 \%$ of the full scale.

4.3 Air pressure gauge Capable of measuring at least 400 kPa with an accuracy within $\pm 10 \text{ kPa}$.

4.4 Apparatus for centrifugal growth test The bead part and fringe of the test rim, which has been fixed on a test axle, shall be controlled in order to ensure a radial run-out less than $\pm 0.5 \text{ mm}$ and a lateral run-out less than $\pm 0.5 \text{ mm}$.

The detecting device (projecting apparatus, a camera, etc.) is capable of reading the deformation shown by the tyre tread both when its being stopped and when at the maximum speed, and of decreasing the distortion as small as possible, and ensures a constant ratio between the plotted contour and the actual dimensions.

5 Testing method

5.1 Strength test

5.1.1 Preparation of tyre

5.1.1.1 Mount the tyre on a test rim and inflate it to the pressure specified in relation to the maximum load rating.

5.1.1.2 Maintain the assembly at test room temperature for at least 3 h.

5.1.2 Test procedure

5.1.2.1 Readjust the tyre pressure to that specified in **5.1.1.1** before or after the mounting of the assembly on the testing apparatus.

5.1.2.2 Position the plunger as near to the centreline as possible, avoiding penetration into the tread grooves, and force the plunger perpendicularly into the tread at a rate of 50 mm/min $\pm$ 2.5 mm/min.

5.1.2.3 Record the force for penetration and distance of penetration at each of five points approximately equally spaced around the circumference of the tyre. In case of tyres mounted on nominal rim diameter of 10 and smaller, test the tyre at three points.

5.1.2.4 If the tyre fails to break before the plunger is stopped on reaching the rim, then the tyre is deemed to have passed the test at that point.

5.1.2.5 Compute the breaking energy for each test point, except those considered by **5.1.2.4**, by means of the following formula.

$$W = \frac{F \times P}{2\,000}$$

where, W : breaking energy (J)

F : force for penetration (N)

P : distance of penetration (mm)

5.1.2.6 Determine the breaking energy value for the tyre by computing the average of the values obtained.

5.1.2.7 When an appropriate device which automatically evaluates the value of the energy is available, the penetration can be stopped shortly after having achieved the prescribed value.

5.1.2.8 In the case of tubeless tyres, means may be provided to ensure the retention of the inflation pressure for the duration of the test.

5.2 Endurance test

5.2.1 Preparation of tyre

5.2.1.1 Mount the tyre on a test rim and inflate it to the pressure specified in relation to the maximum load rating.

5.2.1.2 Maintain the assembly at 35 °C or a higher temperature for at least 3 h.