

JIS

JAPANESE INDUSTRIAL STANDARD

Traffic paint

 **JIS K 5665**—1992

Translated and Published

by

Japanese Standards Association

Printed in Japan

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.



1. Scope This Japanese Industrial Standard specifies the traffic paint to be used for partition lines, on-road signs and the like.

Remarks 1. The traffic paint is divided into two types, liquid and powder.

- (1) The liquid type is made by kneading the principal raw materials thoroughly, such as coloring pigments, body pigments and synthetic resin varnishes.
 - (2) The powdery type is made from the principal raw materials, such as coloring pigments, body pigments, glass beads, fillers and synthetic resins, which is subclassified into two types, one made by premixing the raw materials, and the other prepared at each time of use by melting and mixing the materials contained each in an independent bag.
2. The color shall be white and yellow, and yellow shall be expressed by 5.5 YR 6.5/12 specified in JIS Z 8721.
Glass beads shall be dispersed over the surface of the paint film when applied.
 3. The standards cited in this Standard are shown in the Attached Table 1.
 4. The units and numerical values given in { } in this Standard are based on the traditional units and are appended for informative reference.
 5. The terms used in this Standard shall comply with JIS K 5500.

2. Classification The traffic paint shall be classified as shown in Table 1.

Table 1. Classification

Classification		State of paint and condition for application
Class 1		Liquid state, glass beads are not contained in the paint, and are applied at ordinary temperature.
Class 2		Liquid state, glass beads are not contained in the paint, and are applied after the paint is heated.
Class 3	No. 1	Powdery state, glass beads are contained in the paint by 15 % to 18 % (mass %), and are applied after the paint is melted.
	No. 2	Powdery state, glass beads are contained in the paint by 20 % to 23 % (mass %), and are applied after the paint is melted.
	No. 3	Powdery state, glass beads are contained in the paint by not less than 25 % (mass %), and are applied after the paint is melted.

3. **Quality** When tested by the method specified in 6., the quality of traffic paint shall satisfy the requirements specified in Table 2 for Classes 1 and 2, and in Table 3 for Class 3, respectively.

Table 2. Quality of Classes 1 and 2

Item		Classification	
		Class 1	Class 2
State in containers		To be uniform and free from hard blocks when stirred.	
Density (20°C)	g/cm ³	1.3 min.	
Viscosity (KU value)		70 to 100	90 to 130
Heating stability		—	To satisfy the condition for "state in containers" and to be 141 or under in KU value.
Appearance of paint film		To show normal appearance on the paint film.	
Adhesiveness to tire		Not to adhere to a tire 15 min later.	Not to adhere to a tire 10 min later.
Contrast ratio	White	0.97 min.	
	Yellow	0.80 min.	
Visual reflectance (Diffuse reflectance) (Only for white)		80 min.	
Bleeding	White	Visual reflectance on painted surface of asphalt felt shall be 70 or over and the ratio of visual reflectance shall be 0.90 or over.	
	Yellow	Ratio of visual reflectance shall be 0.90 or over.	
Abrasion resistance (per 100 revs.)	mg	500 max.	
Water resistance		No abnormality shall be found after 24 h immersion in water.	
Alkali resistance		No abnormality shall be found after 18 h immersion in alkali.	
Residue on heating	%	60 min.	65 min.
Glass beads adhesiveness		Glass beads shall evenly adhere to the surface of paint film.	
Glass beads adhesion rate		90 min.	

Table 3. Quality of Class 3

Item	Classification		
	Class 3		
	No. 1	No. 2	No. 3
Density (20°C) g/cm^3	2.3 max.		
Softening point °C	80 min.		
Appearance of paint film	To show normal appearance on the paint film.		
Adhesiveness to tire	Not to adhere to a tire 3 min later.		
Visual reflectance (Diffuse reflectance) (only for white)	75 min.		
Yellowness (only for white)	0 to 0.1		
Abrasion resistance (per 100 revs.) mg	200 max.		
Compressive strength kN/cm^2 (kg/cm^2)	1.177{120} min.		
Alkali resistance	No abnormality shall be found after 18 h immersion in alkali.		
Amount of glass beads contained (mass %)	15^{+3}_0	20^{+3}_0	25 min.
Appearance and shapes of glass beads	Beads shall be spherical particles, and total ratio of those with defects of elliptical shape, acute angle shape, untransparency, foreign matters, fusion between particles shall be not greater than 20 % (particles number %).		
Weathering	When subjected to a 12-month test, cracks, peelings and changes in color shall not be remarkable compared with evaluation sample.		

4. Materials Glass beads to be used for traffic paint shall be of No. 1 specified in JIS R 3301.

5. Evaluation samples The evaluation samples shall conform to Table 4, according to the division specified in 3.6.1 (Evaluation sample) of JIS K 5400.

Table 4. Evaluation samples

Test item	Observing item	Division of evaluation samples		
		Type	Method of set up	Quality level
Appearance of paint film	Color	Paint film sample	Manufacturer's sample	Standard sample
Weathering	Cracks, peeling and color	Paint sample		Boundary sample

6. Test methods

6.1 Sampling method The sampling method shall follow that specified in 2. (Sampling method) of JIS K 5400. For Class 3, the amount of the sample to be taken shall be 1.5 kg to 2.0 kg, and it shall be reduced according to the prescription in 6.5.2 (Increment reducing method) of JIS M 8100.

For products which are, for each use, to be prepared by melting and mixing the raw materials contained each in an individual bag, heating shall be carried out in such a way that one bag of products reaches a temperature of 150°C to 170°C in 20 min to 40 min to be melted and mixed uniformly. The sample shall be taken from the middle part of the above.

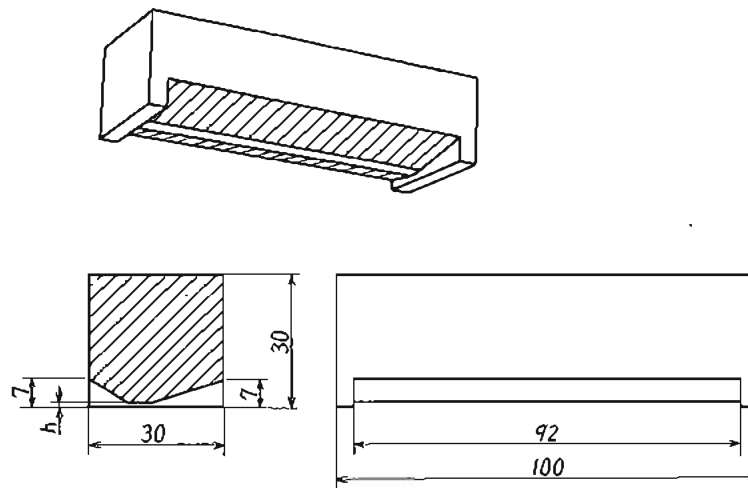
6.2 General conditions for tests The general condition for tests shall be as specified below, in addition to the requirements of 3. (General conditions for tests) of JIS K 5400, and 2. (1) (Common matters) of JIS K 5407.

- (1) **For Classes 1 and 2** Coating shall be made using a Type B film applicator ⁽¹⁾ or the like shown in Fig. 1, specified in 3.3 (Preparation of tests pieces) of JIS K 5400 to obtain the film $100 \pm 20 \mu\text{m}$ in thickness. For the test specified in 6.8, 6.12 and 6.14, coating shall be made to obtain the film of $200 \pm 40 \mu\text{m}$ in thickness.

Note ⁽¹⁾ The clearance of a film applicator shall be confirmed as necessary.

Fig. 1. Type B film applicator (an example)

Unit: mm



Dimensions of clearance (h) of the film applicator

Unit: mm

h	0.200±0.004
	0.250±0.005
	0.300±0.006
	0.400±0.008
	0.500±0.010
	0.600±0.012

Material: Alloy tool steel SKS 2 specified in JIS G 4404 or one equivalent or superior thereto in quality.

- (2) For Class 3 To prepare a test piece, add the sample little by little into a heat resistance container⁽²⁾, and heat in such a way that the temperature reaches $180 \pm 20^\circ\text{C}$ in 10 min to 20 min by stirring with care not to cause local overheating. When the contents become uniform, immediately pour quietly into the frames shown in Figs. 2, 3, 8 and 9 with care not to involve bubbles, or pour quietly into the applicator for Class 3 preheated at $180 \pm 20^\circ\text{C}$ shown in Fig. 5 to prepare the test pieces.

Note (2) When a sample is taken after melting and mixing the sample, crush the solidified sample after cooling and use it putting little by little into a heat resistance container.

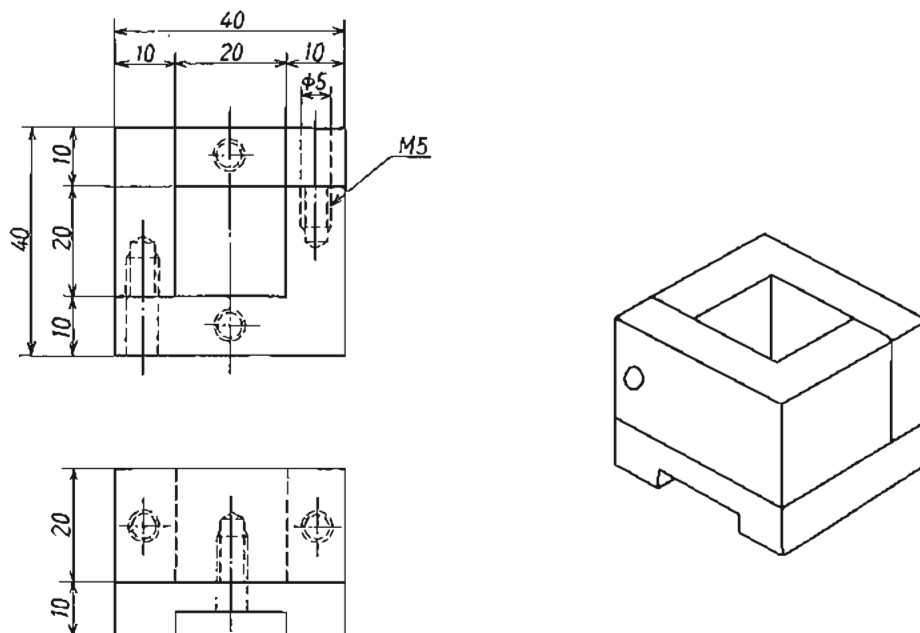
6.3 State in container Test for the state in container shall follow the method specified in 4.1 (2) (a) (In the case of liquid paint) of JIS K 5400.

6.4 Density Test for the density shall be carried out as follows:

- (1) For Classes 1 and 2 Measurement shall be made by the method specified in 4.6.2 (Specific gravity cup method) of JIS K 5400.
- (2) For Class 3
- (2.1) Preparation of test pieces Fill the melted sample in the frame shown in Fig. 2, and cool it down to room temperature. Then, cut the swell off the upper edges with a heated knife, take out the sample from the frame, and finish each surface flat by means of No. 100 abrasive paper specified in JIS R 6252.

Fig. 2. Frame (an example)

Unit: mm



Material: SUS 304 specified in JIS G 4304 or one equivalent or superior thereto in quality.

- (2.2) Procedure Measure the length, the width and the height of the test piece to the nearest 0.1 mm by means of vernier callipers (readable to 0.02 mm min.) specified in JIS B 7507, then measure the mass of the test piece to the nearest 10 mg.
- (2.3) Calculation The density shall be calculated from the following formula, and the results shall be rounded off to the first decimal place in accordance with JIS Z 8401.

$$S = \frac{m}{V}$$

where, S : density

m : mass of the test piece (g)

V : volume of the test piece (cm³)

6.5 Viscosity Test for viscosity shall be made in accordance with 4.5.2 (Stomer viscometer method) of JIS K 5400.

6.6 Heating stability Test for heating stability shall be made by the method below:

- (1) Use the sample which has been hermetically sealed after the test of 6.5.
- (2) Place the sample in a thermostatic chamber kept at $60 \pm 1^\circ\text{C}$ for 3 h, and cool it down to room temperature.
- (3) Examine the state in the container in conformity to 6.3, and obtain KU value by the method specified in 6.5.

6.7 Softening point Test for softening point shall follow the method given below:

(1) Preparation of test pieces

- (1.1) Place the ring for enclosing sample shown in Fig. 3 on the metallic plate laid horizontally, fill it with the molten paint with care not to cause bubbles, and allow it to cool down to room temperature.
- (1.2) Cut off the swell the upper edge of the ring with a heated knife.

(2) Procedure

- (2.1) Place the measuring apparatus for softening points⁽³⁾ into which a No. 34 (SP-34) mercury thermometer specified in JIS B 7410 is inserted in advance in a glass container (85 mm or over in diameter and 127 mm or over in height) as shown in Fig. 4, and pour the refined glycerine No. 1 specified in JIS K 3351 to a depth of 90 mm or over.

Note ⁽³⁾ The measuring apparatus for softening point shall be of such construction that rings for enclosing the sample are held horizontally and that the distance between the center of the ring and the thermometer is 17 mm or under.

- (2.2) Use a Grade 60 steel ball specified in JIS B 1501 whose nominal size is $\frac{3}{8}$ and nominal diameter 9.525 mm.
- (2.3) After keeping the temperature of glycerine at 15°C to 35°C for 15 min, insert the ring for enclosing sample into the hole of the sample shelf using suitable tongs, and then place the steel ball on the center of the upper surface of the ring.
- (2.4) Adjust the distance between the upper edge of the ring and upper surface of glycerine to approx. 50 mm.
- (2.5) Make the center of the mercury bulb of the thermometer to align with the height of the upper edge of the sample shelf.
- (2.6) Heat the whole bottom of the glass container uniformly.
- (2.7) When the temperature of glycerine reaches 50°C , raise the temperature at a rate of $5.0 \pm 0.5^\circ\text{C}$ per minute.
- (2.8) The sample softens gradually and it allows the specimen or the ball to fall from the ring, read the temperature when the sample or the ball contacts with the bottom plate.