

Test Standard for Painting Performance of Top coat Coating Material(1C1B)

KES S S603B

(EST.) 1987 - 08 - 01

(REV.) 1988 - 10 - 01

(REV.) 1990 - 03 - 01

Contents

1. Scope of Application
2. Performance of the Film
3. Test Items
4. General Condition of Evaluating Test
5. Report of the Test Result
6. Generating Limit of Pinhole
7. Sagging Generating Limit
8. Smoothing Limit
9. Sensitivity of Crater
10. Air Blow Resistance
11. Quality of Recoat Crater
12. Sanding Cover up Efficiency
13. Stability of Dilution
14. Stability of Circulation
15. Different Dust Resistance
16. Discoloration to Yellow
17. Adhesiveness
18. Solubility of Cleaning Thinner
19. Blurriness]
20. Generating Limit of Sanding Mark Flowing
21. Polishing Performance
22. Two-tone Performance
23. Durability According to Metal Contact

1. Scope of application

This standard is specified for 1 coat 1 bake type of 2 coat and 3 coat coating material used in this company and is applied also to the case in which the same type coating material is used in 2-tone painting.

2. Performance of the film

The film of coating material to be tested shall meet the film performance standard of KES B-R001(film of automobile) through the test and evaluation of separately specified KES T M010(Condition testing method of the film).

3. Test items

The following table 1 shows the test items for each 2 coat and 3 coat, common test items for 2 and 3 coat.

But, for common test items of 2 and 3 coat, use test piece for 3 coat.

Table 1

NO	Testing items	2 coat	3 coat	Common	Test method
1	Generating limit of pinhole	○	○	-	
2	Sagging generating limit	○	○	-	
3	Smoothing limit	○	○	-	
4	Sensitivity of crater	-	-	○	
5	Air flow resistance	-	-	○	
6	Performance of recoat crater	-	-	○	
7	Sanding cover up efficiency	○	○	-	
8	Stability of dilution	-	-	○	
9	Stability of circulation	-	-	○	
10	Different dust resistance(1)	-	-	○	

NO	Testing items	2 coat	3 coat	Common	Test method
11	Discoloration to yellow	○	○	-	
12	Adhesiveness	○	○	-	
13	Solubility of cleaning thinner	-	-	○	
14	Blurriness	○	○	-	
15	Solid line generating limit	○	○	-	
16	Polishing quality	-	-	○	
17	Two-tone performance	-	-	○	
18	Color changefulness due to metal contact	-	-	○	

Remark

Table 1.1

2 coat	Pre-painting + top coat solid
3 coat	Electrodeposit + surface coat + top coat solid

Note (1) Different dust means dust of existing coating material which is being used in the line to which test coating material will be applied.

4. General Condition of Evaluating Test

(1) Basic idea of test condition setting

Experiment shall be performed in the laboratory with the same painting condition as that of mass production line.

(2) Selection of painting color

Color of coating material used in test shall be discussed and determined between the parties to meet the purpose.

(3) Adjustment of test piece

Table 2

Material of test piece	Material quality of test piece	Painting	
		For 2 coat use	For 3 coat use
Steel plate	First-SPC cold rolled steel plate specified by this company	After treating surface, pre-painting	Surface coat on the test piece for 2 coat use
	Galvanized steel plate which is being used in the body		

Remark For the common test items of 2 and 3 coat, use coat for 3, as a rule, use the test plate with hole of 10-15mm on the steel plate of 100x 300mm. For testing item 4, 5 and 10, test plate of large size(400x400mm) shall be used.

For surface treatment material and pre-painting coating material of test piece, use the same material as that of mass production line.

For surface coat, if there is no special instruction, paint according to the test condition specified in KES S C 002(test standard when working with surface coating material).

(4) Selection of testing material

Adjust to the painting condition under which you want to test, and dilute with thinner specified in yearly thinner system.

(5) Adjustment of painting instrument

Use the instruments used in mass production procedure or instruments equivalent to it.

The following shows the example of use and standard use condition by painting instrument type.

Table 3

Type of painting instrument	Example of use	Amount of discharge (cc/min)	Air pressure (kg/min)	Distance of gun (cm)	Approved voltage (KV)	LH wind velocity in the booth (m/sec)
Electrostatic revolving atomization type	Mini Bell	80~250	2.0	30	-90, -80	0.2~0.3
Electrostatic air atomization type	Auto Rea	200~240	2.0~4.0	30	-60	0.3~0.4
Air atomization force type	Iwata W-70 Graco-700	350~400	4.0	30	-	0.4~0.5

Remark Setting value of standard use condition can be reset by the agreement between the parties. Set air pressure of electrostatic revolving atomization type to shaping air pressure.

(6) Adjustment of setting value of painting 소부 condition (laboratory)

Table 4 shows standard setting value of painting and 소부 condition. In other words, setting value can be adjusted by the agreement between the parties according to the testing items.(For each items, the fixed experiment for painting, 소부 condition will be performed.)

Table 4

Film thickness	Setting time(1)	Temperature and time of 소부
30 ~ 40 μ	- Top coat - top coat : 4-5 minutes - Top coat- 소부 : 8 minutes	Temperature of material to be coated : 140C time : 20 minutes

Note Setting means leaving as the test piece stands at the temperature of booth after coating of coating material.

5. Report of Test Results

For the test, see each testing items.

As a rule, testing standard shall be equal to the performance of existing top coat coating material or better. .

But if the standard of measure etc. needs to be changed, discuss it between the parties and revise the testing method and standard, fix it newly.

6. Generating Limit of Pinhole

6.1 Purpose

Measure the pinhole generating limit of top coat coating material.

6.2 Test instrument

Measuring instrument of film thickness, drying furnace, masking tape

6.3 Test method

- (1) Attach the two sheets of masking tape to the two test pieces.
- (2) By using the appropriate instrument to top coat coating material, Paint to be distributed equally and paint to the masking tape attached direction. (See Fig. 1)
- (3) Set a sheet of tape on the test piece for 1 minute, another 1 tape for 3 minutes.
(During it, remove a sheet of each masking tape.)
- (4) Paint to be distributed equally like the method of 6.3(2)
- (5) Set for the fixed time. (During it, remove another masking tape.)
- (6) 소부 according to the fixed 소부 temperature condition in the drying furnace. But, as a rule, when 소부 of painting, the test piece shall be in a horizontal position.

6.4 Test

By using magnifying glass etc or naked eye., check the pinhole generated on the surface of painting, and then with measuring instrument of film thickness, measure the film thickness of pinhole generated part and below body painting film thickness on the test piece and indicate it as a top coat single film thickness.

6.1.5 Standard

For each painting condition, the pinhole limit shall be equal to that of existing coating material or better.

- Remark 1. Equally distributed painting means to change the film thickness gradually from the thin condition to the thick one.
2. Under the testing condition equivalent to the mass production line, thicken the film by the post-compensation hand spray (or pre-compensation hand spray, if necessary), and check limit film thickness of pinhole.

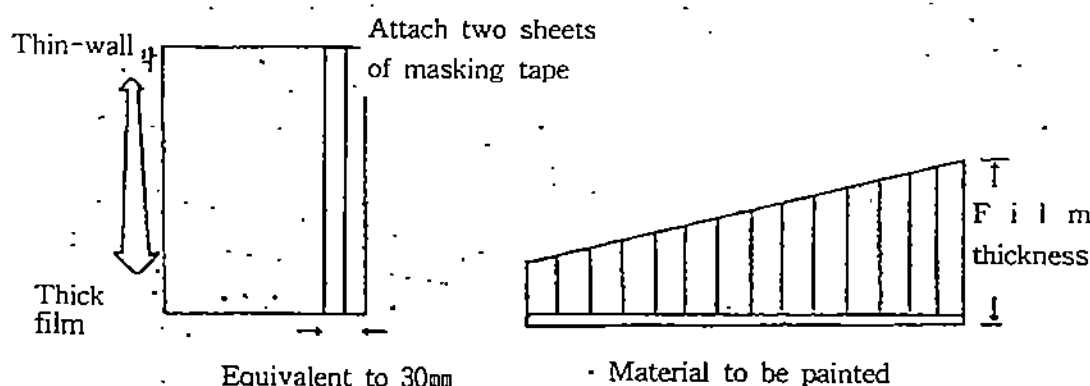


Fig. 1 Test method of test piece

7. Sagging Generating Limit

(1) Purpose

Measure the Sagging generating thickness limit of top coat coating material.

(2) Test instrument

Measuring instrument of film thickness, drying furnace, masking tape, impact testing instrument (Dupont type), Magic pen

(3) Method of making test piece

After indicating on the test piece with Magic pen, make hemispherical shape with Dupont type impact testing instrument.

(Use the pointer of 1/2 inch and weight of 300g, and 40-50 cm height)

If there is a danger of damage on film, preheat the test piece at 80C - 100C temporarily.

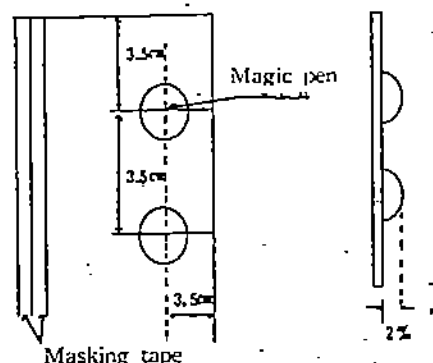


Figure 2

(4) Testing method

Test by the same method as that of 6.3.

(5) Test

Measure the film thickness of flow generated part and below body painting film thickness on the test piece and indicate it as a top coat single film thickness.

In the sagging generated part, indicate it as the lowest sagging generating limit film thickness of top coat single film thickness.

(6) Standard

The sagging generating limit shall be equal to that of existing coating material or better.

Remark If sagging generates under the test condition equivalent to mass product line, thicken the film by the post-compensation hand spray (or pre-compensation hand spray, if necessary), and check limit film thickness of sagging.

8. Smoothing Limit

8.1 Purpose

Measure the smoothing limit film thickness due to the difference between top coat coating material and test the smoothing level.

8.2 Testing equipment

drying furnace, measuring instrument of film thickness, masking tape

8.3 Testing method

- (1) Attach the a sheets of masking tape to the test piece.
- (2) Paint to be equally distributed top coat by using appropriate painting instrument to be 25 u film thickness.
- (3) Set for the fixed time. (During it, remove another masking tape.)
- (4) 소부 according to the fixed 소부 temperature condition in the drying furnace. But, as a rule, when 소부 of painting, the test piece shall be in a horizontal position.

8.4 Standard

The film thickness shall be equal to smoothing limit of existing top coat or below it.

9. Sensitivity of Crater

9.1 Purpose

Supposing that impurities is attached to top coat coating material, test the sensitivity of crater generating, if silicon is attached to it.

9.2 Testing instrument

Silicon liquid, drying furnace, oil benzen or white gasoline, waist

9.3 The method of making test piece

Use the steel plate specified in 4. (3)

9.4 Test method

9.4.1 Clean the surface of the test piece with oil benzen or white gasoline.

9.4.2 Prepare same top coat coating material where silicon liquid of 2-3% is added in the Cup Spray Gun.

(Discuss the adding percentage of silicon liquid separately.)

9.4.3 After painting as the following method with air spray gun, add silicon liquid to cup type spray gun and attach top coat coating material dust to the film surface of top coat Wet.