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KES

Hot Stamping Foil for Automobile Plastic Part

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Quoted Standard

KIA MOTORS

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1. Scope of Application

This standard specifies hot stamping foil (hereinafter referred to as the "foil") applied to plastic part for decoration or indication in interior and exterior parts of automobile.

Remark The plastic base material on which the foil is applied shall be rigid ones having 4000kgf/㎠ {394MPa} of bending elasticity.

2. Construction

The construction of the foil completed as a product is shown in Fig. 1 and Fig. 2.

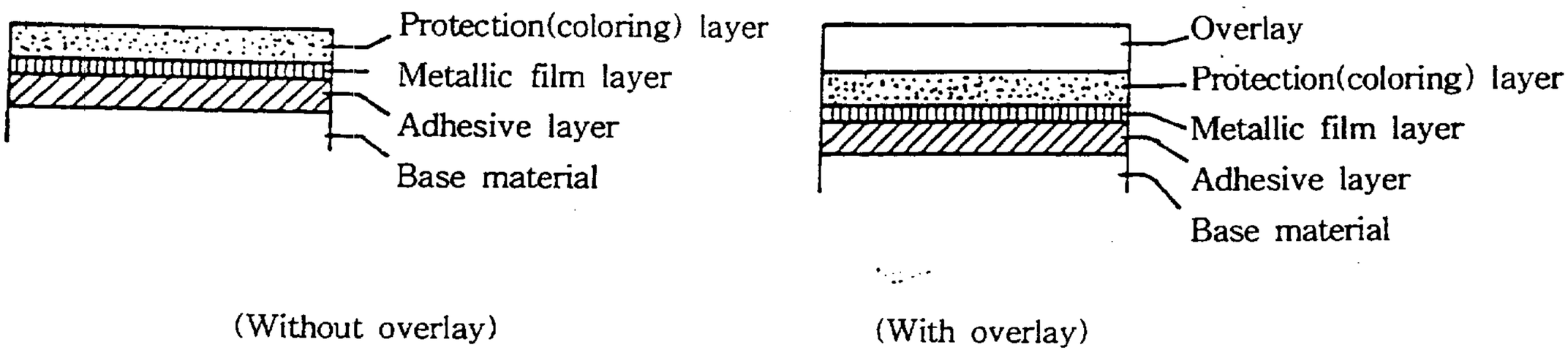

Fig. 1 Metallic Foil

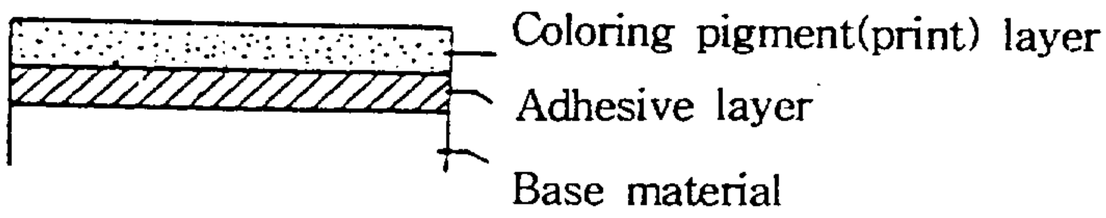

Fig. 2 Pigment(print) Foil

3. Definition of Terminology

Major terminology used in this standard shall be as follows.

3.1 Effective surface

Refer to one of the following among important surfaces in use.
(Details shall be indicated in drawing.)

(1) Surface seen from normal direction in the use conditions.

(2) Surface on which abrasion or scratch occurs easily.

(3) Surface such that corrosion forming, film variation or peeling gives variely to function.

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3.2 Interior parts

Parts which are not exposed to wind or rain directly or indirectly in the built up and attached condition on the vehicle.

3.3 Exterior parts

Parts which are exposed to wind or rain directly or indirectly in the built-up and attached condition on the vehicle.

3.4 Standard parts

Completed product, test pieces or acceptance sample and the like preserved in a dry chamber in a cool and dark place to avoid influence by sunlight, humidity, temperature, dust and others for the purpose of periodical observation and comparison with test samples after testing, and approved by the inspection department of Kia.

4. Type and Symbol

Types and symbols according to use of the foils shall conform to Table 1.

Table 1

Type symbol	Use
HS - I	Interior parts
HS - E	Exterior parts

5. Quality

Quality of the foil shall conform to the standard specified in Table 2 when tested according to test methods of item 6. However, in case there is indication on special quality, it shall meet the specification in the drawing.

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Table 2. Quality Standard

Evaluation Characteristics / Type Symbol / Quality Deterioration Item		Appea-rance	Color and Gloss	Tightness(1)		Others	Related Evalue-tion Method
				Tesse-llated test	Scratch		
Initial quality	HS-E HS-I	○	○	○	○	The hardness shall be HB or more(2)	6.2, 6.3 6.4, 6.5
Warm water resistance	HS-E	○	○	○	○	-	6.6
Moisture resistance	HS-I	○	○	○	○	-	6.7
Heat resistance	HS-E HS-I	○	○	○	○	-	6.8
Repeating cold-heat resistance	HS-E HS-I	○	○	○	○	-	6.9
Corrosion resistance	HS-E	○	○	○	○	The generation of rust be within 1mm from the end of exposed surface or scratch.	6.10
Abrasion resistance	HS-E HS-I	○	-	-	-	No base material exposure(3).	6.11
Accele-rative weather-ablility	300h	HS-E	-	Gray scale 4 or more(4)	-	-	No base material exposure until 3,000 cycles or less of rubbing test	6.12
	1200h		○	Gray scale 3 or more(4)	○	○	-	
Accele-rative light resis-tance	300h	HS-I	-	Gray scale 4 or more(4)	-	-	-	
	400h		○	○	○	○	-	

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Table 2 (Continued)

Evaluation Characteristics / Type Symbol / Quality Deterioration Item		Appearance	Color and Gloss	Tightness(1)		Others	Related Evaluation Method
				Tessellated test	Scratch		
Outdoor Weatherability	HS-E	○	Gray scale 4 or more (4)	○	○	No base material exposure until 3,000 cycles or less of rubbing test	6.13
Outdoor light resistance	HS-I	○	Gray scale 4 or more (4)	○	○	-	
Weather and warm water resistance	HS-E	○	○	○	○	-	6.14
Benzine resistance	HS-E	○	○	○	○	-	6.15
Guide wax resistance	HS-E	○	○	○	○	-	6.16
Guide wax remover resistance	HS-E	○	○	○	○	-	6.17
Liquid resistance	HS-I	○	○	-	-	-	6.18
Acid resistance	HS-E HS-I	○	○	-	-	-	6.19
Alkali resistance	HS-E HS-I	○	○	-	-	-	6.20
Impact resistance	HS-E	○	-	-	-	-	6.21
Quality standard	-	No crack, peel-off, swelling, chalking, pinhole flaw, etc.	Within the limit of standard sample	Class 4 or more	Class 4 or more	-	-

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Note (1) In case tessellated test is not possible, scratch test shall be performed for the section and number of times designated by inspection department of Kia.

(2) In case the strength of base material is specified value or less, the specified value shall be the strength of base material or more.

(3) Determination for edge and corner shall conform to an agreement between the parts manufacturer and the inspection department of Kia.

(4) Standard parts to be used for evaluation discoloration shall be evaluated by the Grey scale for discoloration specified in KS K 0911 and evaluation standard shall be as shown in Table 3.

Table 3

Grade	Evaluation Standard
1	Change in color corresponds to Grey scale No 1 or exceeds the degree it.
2	Change in color corresponds to Grey scale No 2 for color change.
3	Change in color corresponds to Grey scale No 3 for color change.
4	Change in color corresponds to Grey scale No 4 for color change.
5	Change in color corresponds to Grey scale No 5 for color change.

6. Testing Method

6.1 Common evaluation condition

6.1.1 Standard atmospheric condition for testing

Unless otherwise specified, the standard atmospheric condition shall be a standard temperature condition of 20℃, or 23℃, class 2 and a standard humidity condition of 65%, class 5 of KS A 0006(Standard Atmospheric Condition for Testing).

However, in case the test place is not in standard condition, record the condition in testing records.

6.1.2 Preparation of test piece

(1) The material to be used in test shall be product or adopted test materials. The selection of specimens shall be approved by the Inspection Dept. of Kia.

(2) The test material shall be the one left 24 hours or more after foil is applied.

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