

KES

Method of Hot Stamping

KES T – L286

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1. Scope of Application

This standard shall specify the foil for hot stamping, which is executed for the purpose of display & indication on the plastic material of vehicle interior & exterior.

Remark : The employed plastic material to the foil is hard material with more than curve flexibility of 4000 kg f/cm² {394 MPa}.

2. Structure

The completed foil structure as a product is shown on the figure 1 & 2.

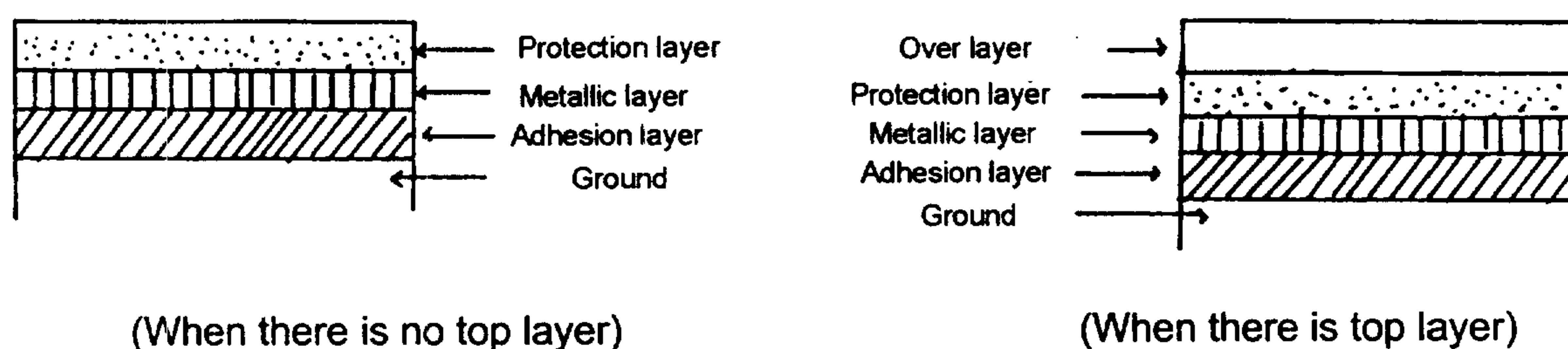


Figure 1 Metallic Foil

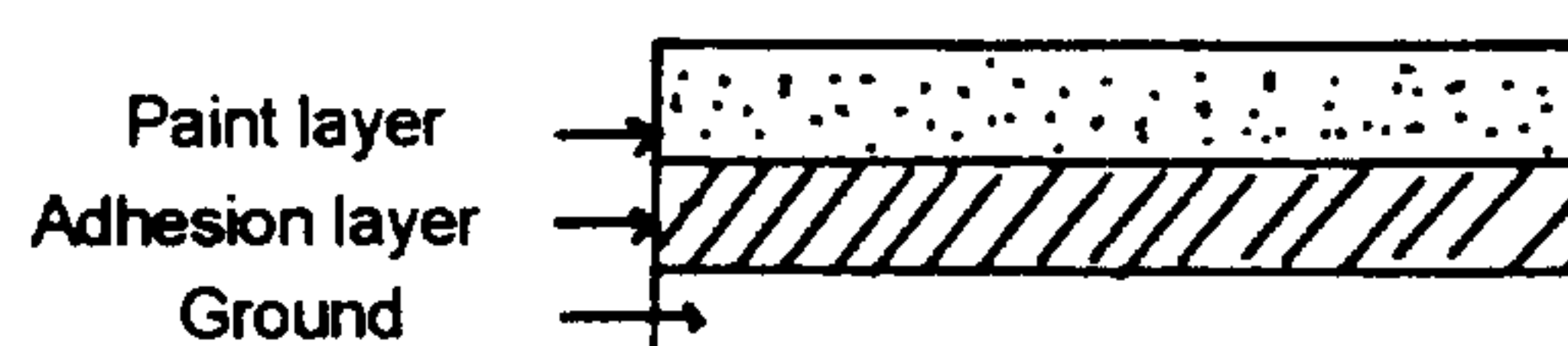


Figure 2 Paint Foil

3. Mean of Terminology

The mean of mainly used terminology on this standard is as follows.

(1) Effective surface

It is an important surface for usage and referred the following case.

(The detailed indication is on the drawing.)

(a) The surface to the normal direction at employed condition

(b) The surface, which is easily grinded or damaged

(c) The surface, which affects the change of functions by corrosion, change & peel-off of film layer

(2) Vehicle interior material : It is a materials, which are directly & indirectly not exposed to rain and winds on the mounted condition to the completed vehicle.

(3) Vehicle exterior material : It is a materials, which are exposed to rain and winds on the mounted condition to the completed vehicle.

(4) Standard product : It is products, test specimen & limited sample, which should be escapable of effects by sunlight, temperature, humidity & dirt to inspect frequently & compare the test products and preserved in the cold, dark & dry vessel of certain conditions. They should be approved by Kia test team & inspection team.

4. Kind and Symbol

The kind and symbol of foil by its usage are as table 1.

Table 1

Kind Symbol	Usage
HS - I	Vehicle Interior Material
HS - E	Vehicle Exterior Material

5. Quality

When the quality of foil is tested by the test of 6, the results should satisfy the specification on table 2.

When the special quality is directed, it should satisfy the specification of drawing.

Table 2 : Quality Standard

Test Item Kind Symbol		Estimation Characteristics	Appea-rance	Color & Shine	Adhesiveness		Others	Correspond-ing Estimation Method
					Cross	Scar		
Initial Product		HS-E SH-H	○	○	○	○	More than HB (²) of Hardness	6.2, 6.3, 6.4, 6.5
Warm water Resistant		HS-E	○	○	○	○	-	6.6
Humid Resistant		HS-I	○	○	○	○	-	6.7
Heat Resistant		HS-E HS-I	○	○	○	○	-	6.8
Repetition of Heat Resistant		HS-E HS-I	○	○	○	○	-	6.9
Corrosion Resistant		HS-E	○	○	○	○	Occurrence of foundation is within 1 from edge of scar & exposed surface	6.10
Grinding Resistant		HS-E HS-I	○	-	-	-	No exposure of foundation (³)	6.11
Facilita-tion Durability	300hr	HS-E	-	(¹)sides Discoloration More than grade 4	-	-	Less than 3000 times of grinding test No exposure of foundation (³)	6.12
	1200hr	HS-I	○	(¹)sides Discoloration More than grade 3	○	○	-	
Facilita-tion Light Resistant	300hr	HS-I	-	(¹)sides Discoloration More than grade 4	-	-	-	
	400hr		○	○	○	○	-	
Exterior Durability		HS-E	○	(¹)sides Discoloration More than grade 4	○	○	Less than 3000 times of grinding test No exposure of foundation (³)	6.13
Exterior Light Resistant		HS-I	○	(¹)sides Discoloration More than grade 4	○	○	-	
Durability & Warm water Resistant		HS-E					-	6.14
Volatilization Resistant		HS-E					-	6.15
Guard Wax Resistant		HS-E	○	○	○	○	-	6.16

Table 2 (Continued)

<div>Estimation Characteristics</div> <div>Test ItemKind Symbol</div>		Appea-rance	Color & Shine	Adhesiveness		Others	Correspond-ing Estimation Method
				Cross	Scar		
Guard Wax Removing	HS-E	O	O	O	O	-	6.17
Solution Resistant	HS-I	O	O	-	-	-	6.18
Acid Resistant	HS-E HS-I	O	O	-	-	-	6.19
Alkali Resistant	HS-E HS-I	O	O	-	-	-	6.20
Shock Resistant	HS-E	O	-	-	-	-	6.21
Product Standard	-	(⁵)	Within the limited sample by standard product	More than grade 4	More than grade 4	-	-

- Note** (¹) When it is impossible to perform Cross test for adhesiveness, the scar test is performed on the directed region and number by Kia test team & inspection team.
- (²) When the hardness of foundation is below the specification, the specification is more than foundation hardness.
- (³) The end edge & corner region are determined by the discussion of subcontract companies, Kia test team & inspection team.
- (⁴) The employed standard product (JIS L 0804) for determination of discoloration is specified by discoloration gray scale. The estimation standard follows table3.

Table 3

Grade	Determination Standard
1	The change of color is discoloration gray scale type 1 or more than that.
2	The change of color is discoloration gray scale type 2.
3	The change of color is discoloration gray scale type 3.
4	The change of color is discoloration gray scale type 4.
5	The change of color is discoloration gray scale type 5.

6. Test Method

6.1 Normal conditions of test

- (1) Standard conditions of test place : The test performed place is standardized at 20 °C or 23 °C type 2 · 65% type5 of JIS Z 8703. When the test-performed place is not kept at standard conditions, the intended purpose is indicated on the test report.
- (2) Adjust of test product
 - (a) The employed specimen on test is product or gathered specimen from the product.
Otherwise, the employed specimen should be approved by Kia test team & inspection team.
 - (b) After the specimen is covered by foil, it should be left for more than 24 hours.
- (3) Adhesion condition of test product : When the test of table 4 is performed, the test product is adhered to the object with the same conditions to the actual tolerance.
Adhesion condition of the object such as plate thickness, curved surface shape, material & adhesion method is determined by discussion with test team & design team.