SCOPE OF APPLICATION	기술 표준 ENGINEERING STANDARD	SHT/SHTS
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ESTABLISHED BY POLYMERIC MATERIALS RESEARCH TEAM	MATERIAL SPECIFICATION	SPEC No. MS 343-11

TITLE:

WALL PAPER

CONTENTS

SYM	EO NO	DESCRIPTION OF CHANGE	REV.PAGE	REV.DATE	REV.BY
Ⓒ	EMS60174	ADDTION AND CHANGE OF REQUIREMENT	1,2,3,5,6/7	2006-08-23	J.G NOH
Ⓑ	EMS30341	ADDTION OF REQUIREMENT, REVIEW	ALL	2003-09-09	K.Y Jeong
Ⓐ	EMSR0129	CHANGE OF REQUIREMENT AND PAGE (WAS 7 PAGE)	1,2,3,4/6	1994-11-30	T.S Lee
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ESTABLISHMENT	REFERENCE	PREPARED BY	CHECKED BY	APPROVED BY
1985-09-04	THJH-내장-00205-060821	SIGNED J.G.NOH 2006-08-22	SIGNED S.H.KIM 2006-08-23	SIGNED T.W.HWANG 2006-08-23
ORIGINAL FILED AT **IPIS** (ES/MS MANAGEMENT SYSTEM)				

1. SCOPE

This specification defines the quality of wall paper for automotive interior.

2. TYPES

Wall paper shall be classified as shown in Table 1 depending upon application and weight.

Table 1

Types		Weight(g_f/m^2)	Application	Materials	Remarks
Type A	A1	Max. 400	RR SHELF RR PACKAGE TRUNK MAT TRUNK TRIM	PET, PP	NON-BACK COAT & BACK COAT
	A2	Min. 400			
Type B		-	TRUNK MAT		BACK COAT

3. REQUIREMENTS

3.1 General Requirements

1) Wall Paper shall be coated with polyethylene film or latex for reinforcement, prevention of wrinkles, bare skin and shrinkage.
2) Wall paper shall be free from defects in appearance such as flaw, bare skin, spikes and pits, tack, unevenness, staining, etc.
3) Wall paper shall have no excessive difference from agreement samples between parties in color pattern, uneven color, feeling, etc.
4) The backing of wall paper shall attach uniformly to the fiber layers. The thickness of both backings and carpets shall be uniform.
5) Wall paper for use in floors shall be fabricated in the form otherwise specified and shall free from tear or crack.
6) When wall paper is used with different components and in contact with different materials, it shall have no defect for use such as stain, fade, crack and corrosion.

3.2 Detail Requirement

Wall paper shall be tested by the method specified in clause 4 and shall conform to the requirements in Table 2.

Table 2

Test Items	Types		Requirements			Test Methods
			Type A		Type B	
			A1	A2		
Thickness (mm)			As specified on the drawing			4.2
Weight (g_f/m^2)			As specified on the drawing			4.3
Tensile Strength kN (kg_f/50 mm)	Normal State	Warp	Min. 0.20(20)	Min. 0.39(40)	Min. 0.49(50)	4.4
		Weft	Min. 0.20(20)	Min. 0.39(40)	Min. 0.49(50)	
	After Immersion	Warp	Min. 0.20(20)	Min. 0.39(40)	Min. 0.49(50)	
		Weft	Min. 0.20(20)	Min. 0.39(40)	Min. 0.49(50)	
Elongation (%)	Normal State	Warp	Min. 60	Min. 70	Min. 70	
		Weft	Min. 80	Min. 80	Min. 80	
	After Immersion	Warp	Min. 60	Min. 70	Min. 70	
		Weft	Min. 80	Min. 80	Min. 80	
Tear Strength N (kg_f)	Normal State	Warp	Min. 49.0(5)	Min. 98.1(10)	Min. 117.7(12)	4.5
		Weft	Min. 49.0(5)	Min. 98.1(10)	Min. 117.7(12)	
	After Immersion	Warp	Min. 49.0(5)	Min. 98.1(10)	Min. 117.7(12)	
		Weft	Min. 49.0(5)	Min. 98.1(10)	Min. 117.7(12)	
Abrasion Resistance (Grade)			Min. 3			4.6
Water Immersion Shrinkage (%)		Warp	Max. 1			4.7
		Weft				
Color Fastness to Washing (Grade)			Min. 3			4.8
Color Fastness to Rubbing (Grade)		Dry	Min. 4			4.9
		Wet				
Fade Resistance (Grade)			Min. 3			4.10
Color Fastness to Rubbing after Fade Resistance (Grade)			Min. 4		Min. 3	4.11
Heat Aging Resistance			No defects such as tear, color change, Peeling off, tack etc			4.12
Low Temperature Resistance			No defects such as tear, crack etc			4.13
Crease Resistance (%)		Warp	60 ±15	60 ±15	70 ±15	4.14
		Weft				
Flammability*Note 1) (mm/min)			Max. 80			4.15
Odor (Grade)			Min. 4			4.16
Hazardous Substances			Each Material must meet the requirements of MS 201-02.			MS 201-02

*Note 1) Shall be tested in laminated state when it is not used alone.

4. TEST METHODS

4.1 Conditioning

Specimens shall be conditioned for a minimum of 24 h at 23 ± 2 ℃ and 50 ± 5 % relative humidity prior to testing, and tested under the same condition. If the temperature and humidity of the laboratory is not standard condition, then record them.

4.2 Thickness

Shall conform to clause 4.2 in MS 300-35.

4.3 Weight

Shall conform to clause 4.4 in MS 300-35.

4.4 Tensile strength and elongation

Shall conform to clause 4.5 in MS 300-35.

For tensile strength and elongation after immersion, immerse specimens into water at 40 ±2 ℃ for 16 h. Upon removal, complete the test within 15 minutes thereafter.

4.5 Tear strength

Shall conform to clause 4.6 in MS 300-35.

For tensile strength and elongation after immersion, immerse specimens into water at 40 ±2 ℃ for 16 h. Upon removal, complete the test within 15 minutes thereafter.

△b 4.6 Abrasion resistance

Shall conform to clause 4.9 in MS 300-35.

Use rubbing wheel CS-18. Apply a load of 1 kg_f per arm(both arm to load on each arm).

(RR SHELF & RR PACKAGE : 50 cycles, TRUCK TRIM & MAT : 100 cycles)

Table 3

Grade	Extent of Wear
5	Perfectly free from wear
4	Pile yarn cut and wear a little noticeable but not conspicuous
3	Pile yarn cut and wear a little noticeable but not conspicuous
2	Pile yarn cut/removal and wear clearly noticeable.
1	Pile yarn cut and wear excessive, pits excessive on wear surface

4.7 Immersion shrinkage

Shall conform to clause 4.10 in MS 300-35.

4.8 Color fastness to washing

Shall conform to clause 4.11 in MS 300-35.

4.9 Color fastness to rubbing

Shall conform to clause 4.12 in MS 300-35.

Apply test with both dry*Note 2) and sweaty*Note 3)

*Note 2) Use cotton No. 3 in Table 1 under KS K 9010.

*Note 3) Use a dry cloth soaked in artificial swat [6.4 D-Method under KS K9010 (Testing Method for Color Fastness to Perspiration).] that is prepared in one liter(PH 4.5) by dissolving the following agents into distilled water.

Agents : $Na_2HPO_4 \cdot 12H_20$ 8 g + NaCl 8 g + CH_3COOH 5 g

4.10 Fade resistance

Shall conform to ISO 105.

After the specified exposure, evaluate the degrees of discoloration and fading the extent of color change in accordance with gray scale specified in ISO 105-A02.

Intensity of irradiation : 65~100 w/㎡ (300~400 nm)

Table 4

Items	Irradiance	B.P. Temperature	Chamber humidity
RR SHELF RR PACKAGE	126 MJ/m²	89 ± 3 ℃	50 ± 5 %RH
TRUNK MAT TRUNK TRIM	42 MJ/m²		

* Irradiation intensity of 320 nm and less shall perform setting less than 1.5% of irradiation intensity of 300~400 nm

4.11 Color Fastness to Rubbing after Fade Resistance

Cut the specimen already subjected to the test in accordance with the conditions of fade resistance in clause 4.10 to 25 mm wide and 220 mm long. Apply the test specified in section 4.9. The load applied to the rubbing shoe shall be $1kg_f$.

Evaluate the wear state in accordance with Table 5.

Table 5

Grade	Extent of Wear
5	Perfectly free from wear
4	Pile yarn cut just a little produced.
3	Pile yarn cut noticeable but not conspicuous
2	Pile yarn clearly noticeable and pits a little noticeable.
1	Pile yarn cut and pits produced on wear surface

4.12 Heat aging resistance

Shall conform to clause 4.14 in MS300-35.

Table 6

Items	Condition
RR SHELF RR PACKAGE	80 ± 2 ℃ X 300 h
TRUNK MAT TRUNK TRIM	80 ± 2 ℃ X 300 h

4.13 Low temperature resistance

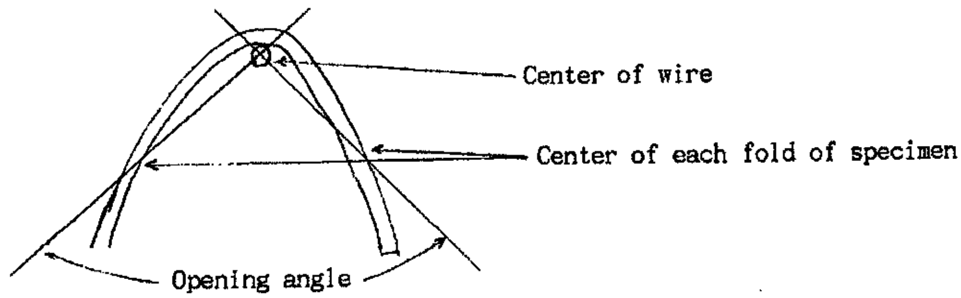
Shall conform to clause 4.15 in MS300-35.

4.14 Crease Resistance[*Note 4)]

1) Cut five specimens, 20 x 80 mm in both warp and wept direction(total ten specimens). Fold the specimen into two(onto 20 x 40 mm) with back side facing inward.
2) Put the specimen between smooth plates and apply a compressive load of 1 kg for 5 minutes. Upon release from load, hang the specimen along the impressed crease on a 0.5 mm diameter wire stretched. Allow to stand for 5 minutes and then measure the opening angle of the specimen.
3) Crease resistance A shall be obtained by the following formula.
   The average of five determinations in warp and weft directions respectively shall be considered as the result.

$$A = \frac{\alpha}{180} \times 100$$

Where, A : Crease resistance (%), α : Opening angle (degree)



*Note 4) Shall conform to 6.21.2 and 6.21.3 under JIS L 1079.

4.15 Flammability

Shall conform to MS 300-08.

4.16 Odor

Shall conform to MS 300-34.

5. INDICATION FOR DRAWINGS

This specification shall be indicated as following example.

Example) WALL PAPER (MS 343-11-TYPE-A)

6. OTHERS

If there is any doubt on this specification, contacts shall be made to Polymeric Materials Research Team of Research & Development division for Hyundai Motor Company & Kia Motors Corporation.