
I-MARV Technical bulletin



Properties of I-MARV Y-135 / EVA-based compounds

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Hydrogenated petroleum resin **I-MARV**

The properties of I-MARV Y-135 / EVA-based compounds

1. Outline

The performance of the Y-135/EVA, Y-135/S-100/EVA, Y-135/Y-100/EVA, and Y-135/P-100/EVA-based compounds(Hot Melt Adhesives) were evaluated respectively.

2. Experiment

(1) Formulation: TF / EVA / Wax = 50 / 35 / 15 (pbw)

TF; (a) I-MARV Y-135

(b) I-MARV Y-135 / I-MARV S-100=7/3

(c) I-MARV Y-135 / I-MARV Y-100=6/4

(d) I-MARV Y-135 / I-MARV P-100=5/5

EVA; VA=28%, MI=400(Tosoh Corporation)

Wax; PARAFINT H1 (Fischer Tropsch wax, SASOL)

(2) Measurement item and measuring method

(a) Penetration

Measuring temperature: 25deg C

Specimen number: 3

(b) Cloud point

Test tube method; The sample was melted in the test tube above 180deg C (temperature which becomes transparent). Mixing by a thermometer, natural cooling was carried out and the temperature becoming cloudy was checked.

Hotplate method; The sample was applied on a glass plate. (Thickness; 90-micrometer) And it was heated until it became transparent. Then, natural cooling was carried out and the temperature becoming cloudy was checked.

(c) Viscosity

Measuring temperature; 120, 140, 160, 180deg C

Viscometer; Brookfield (HM type No.2rotor)

(d) Creep test

Adherend; Corrugated cardboard / Corrugated cardboard

Spread of compounds; 3g/m(0.075g/25mm)

Open time; 2sec

Set time; 2sec

Pressing load; 19.6N{2kgf}

Specimen number: 5

Measuring temperature: 60deg C

(e) Heat stability(Skinning, color change)

Heating condition; 180deg C x 24,48,72h

3. Results

The results are shown in Table-1 and Fig.1-6.

(a) Penetration (Table-1, Fig.1)

The influence of grade of I-MARV is considerably low.

(b) Cloud point (Table-1, Fig.2)

The cloud point become low by adding the 100deg C grade* of I-MARV.

As for the effect which lowers a cloud point, S-100 is the highest.

Because the content of S-100 is lower than Y-100 or P-100.

* I-MARV S-100, Y-100, and P-100

(c) Viscosity (Table-1, Fig.3)

The viscosity becomes low by adding the 100deg C grade of I-MARV.

As for the effect which lowers a viscosity, S-100, Y-100, and P-100 are almost same.

(d) Creep test (Table-1, Fig.4)

The creep properties of HMA which added 100deg C grade are slightly higher than that of Y-135.

It is guessed that the reason is adhesion force of an interface improved.

(e) Heat stability (Table-1, Fig.5, 6)

In this test, the heat stability of HMA which added I-MARV P-100 is best.

Especially, the skinning doesn't occur even if after 72hours heating.

(In this test, we don't add the antioxidant.)

Table-1 Properties of EVA-based HMA

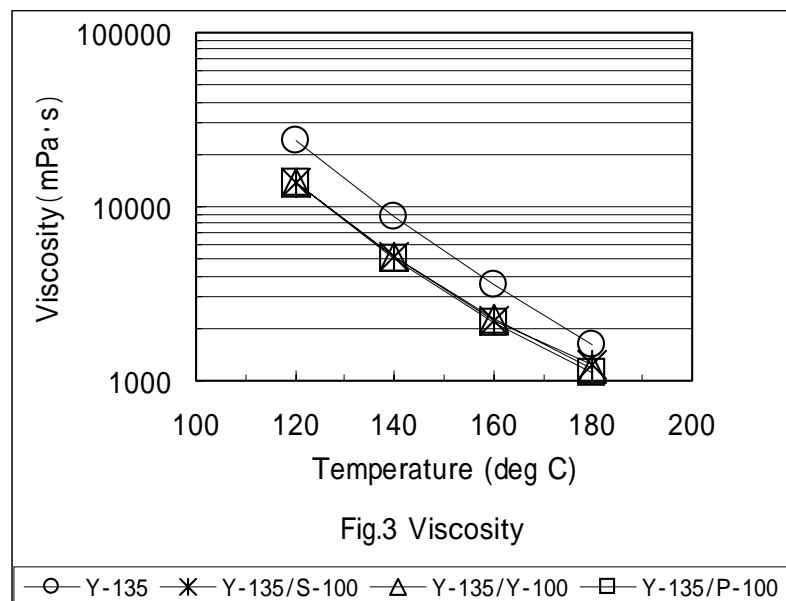
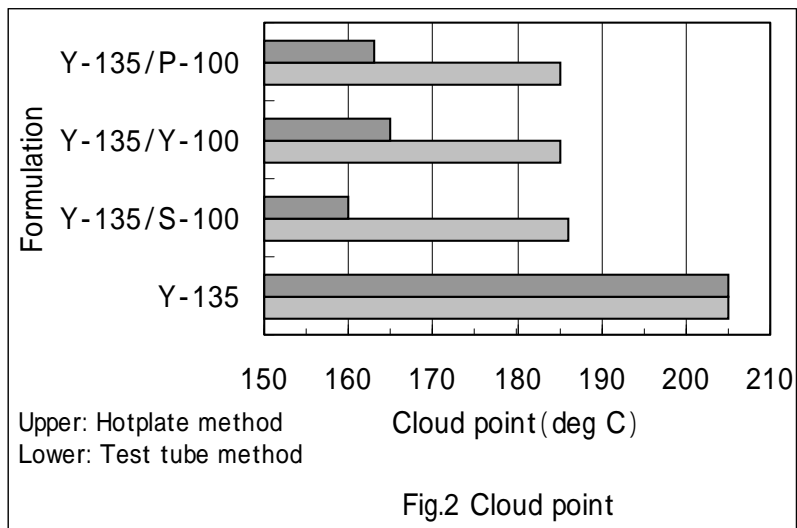
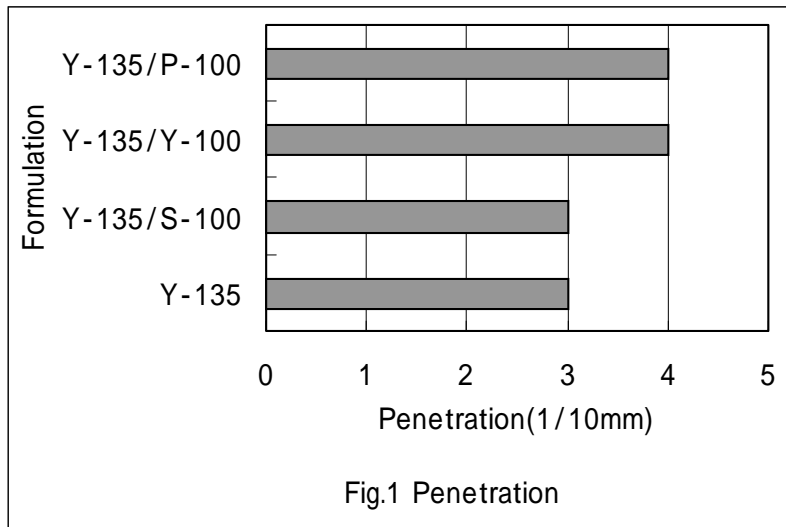
	Y-135	Y-135/S-100	Y-135/Y-100	Y-135/P-100
[Formulation]				
I-MARV Y-135	50	35	30	25
I-MARV S-100		15		
I-MARV Y-100			20	
I-MARV P-100				25
EVA ¹⁾	35	35	35	35
Wax ²⁾	15	15	15	15
[Properties]				
Penetration[25] (1/10mm)	3	3	4	4
Cloud point (TT) ()	200<	186	185	185
(HP) ()	200<	160	165	163
Viscosity[120] (mPa·s)	23,750	13,620	13,880	13,820
[140] (mPa·s)	8,720	5,150	5,160	5,020
[160] (mPa·s)	3,530	2,230	2,250	2,180
[180] (mPa·s)	1,630	1,220	1,180	1,120
Creep test[60]3) (min)	20	33	37	34
Heat stability[180deg C × 24h]				
Skinning ⁴⁾	5A	0	0	0
Color[Gardner]	5	5	5	5
Heat stability[180deg C × 48h]				
Skinning ⁴⁾	15A	0	100B	0
Color[Gardner]	7	7	8	7
Heat stability[180deg C × 72h]				
Skinning ⁴⁾	95D	20B	100C	0
Color[Gardner]	9	8	9	8

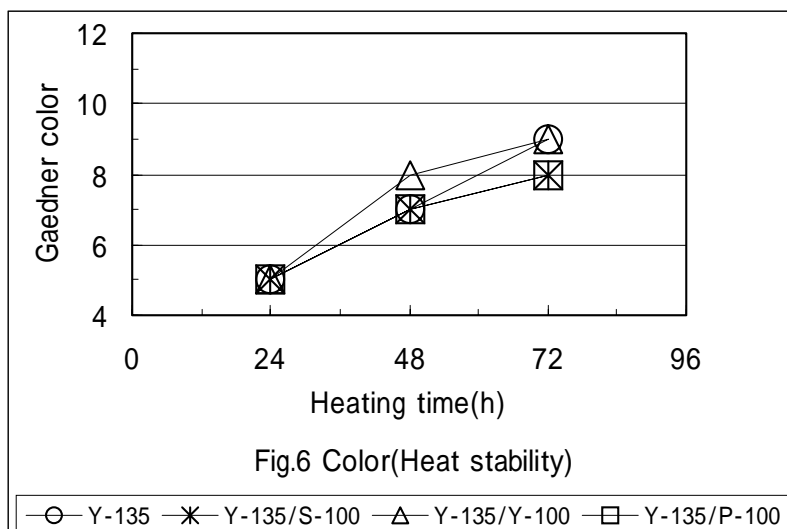
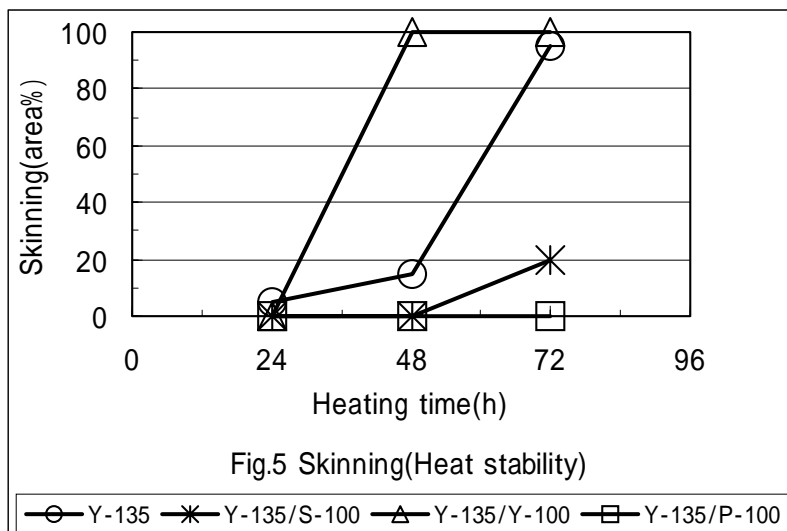
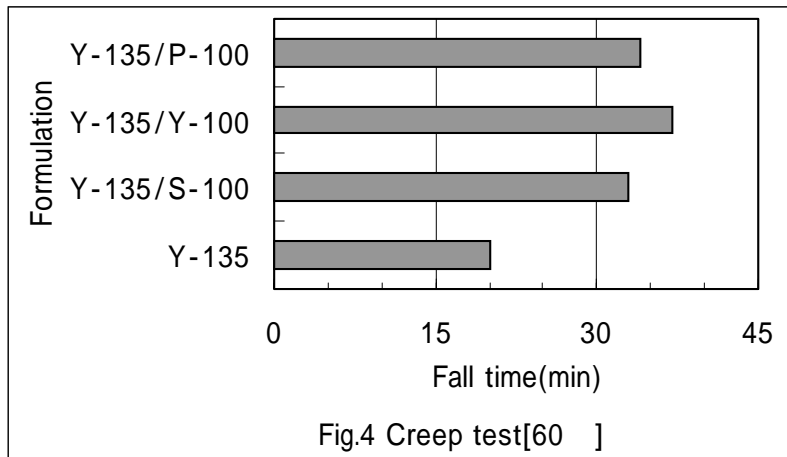
1) VA=28%, MI=400

2) Fischer tropesch wax

3) Adherend; Corrugated cardboard /Corrugated cardboard

4) A: Very thin B: Thin C: Normal D: Thick





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