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(71)

(72) ,  
, - 66424 , 11  
,  
, - 66265 , 26

(74)

(54) 2

가 (layered silicate)  
, (oriented)

lyolefin film) (laser - markable), (transparent), (oriented po

(polymeric material) (marking)  
(wavelength range) (radiation) 가 (laser pigment)  
가 (radiation - sensitive additive)

2 (biaxially oriented), 2 (3μm 100μm)  
(polyolefin film) (haze) (gloss) 2 (thermal stability), (a  
pearance), (haze) (gloss) 2 (3μm 100μm)

, , 2 (through hole) 가 가  
(fisheye) (bubble) 가

가 (metal oxide) (layered sili  
cate) ( ) (multilayer),  
(sub - claims)

, 98 % 100 % , 85 %, 90 % 100 %

, 2 8  
(copolymer)

, 90 %, 10 %, 94 %, 100 %, 98 %  
100 % (comonomer), 0 %, 6 %, 0 %, 2 %

155      165      ,      (isotactic propylene homopolymer)      140      170      ,  
 1.0 g/10min      10 g/10min      ,      (melt flow index) (230      , 21.6N      DIN 53 735      )  
 2      %      5      %      .      1.5 g/10min      6.5 g/10min      . n -  
 (starting polymer)      1      %      10      %      ,

<sup>13</sup> C - NMR (chain isotacticity index)	(isotactic) (spectroscopy)	n -	.
95%	96%	99%	

0.8 % 1.5 % , 0.01 % . 4 %, 0.5 % 2.5 %, 가

(platelet - shaped)  
(mica), (muscovite), (biotite), (phlogopite), (v  
ermiculite)  
(synthetic mica) 가  
(dry grinding process)  
가

, (stirred ball mill) , (corundum) 가  
가

(air classification)

(color intensity)

(hiding power)

cuole formation)

(stretching process)

(detachment)

(va

(optical properties)

(laser markability)

(balanced ratio)

가

PS), CO<sub>2</sub>

(image analysis)

3

(sensibility)

(SEM - I

ilizer),

(antistatic)

가

(lubricant)

가

(neutralizer),

(stab

modified),

loxanes){

(ethoxylated)

(polydialkylsiloxanes),

(alkali metal alkanesulfonates),

(polyether -

} /

- (C<sub>1</sub> - C<sub>4</sub>)

(propoxylated)

가

(polydiorganosi

, ,

10 20

, N,N - (2 - )

가

10 20

0.0

5 %

0.5 %

.

0.03% 0.5%

sters),

0.02 %

(higher aliphatic acid amides),

(higher aliphatic acid e

가

1 %

0.01 %

0.01 %

3 %

% 2.0 %

% 가

0.25 %

0.25 %

0.02 %

(erucamide)

5000

1,000,000mm<sup>2</sup>/s

가

(stabilizing acti

가) 0.7  $\mu\text{m}$ , (absolute particle size) 가) 10  $\mu\text{m}$ , (spec  
 ific surface area) 40  $\text{m}^2/\text{g}$  (dihydrotalcite), /  
 가).

3 10

1 -

1 % 10 %, 2.5 % 8 %, 25 %, 4 % 20 %

, 1 - 10 % 40 % . 0.1 % 7 % , - 1 - 50 % 90 %

g/10 min,	/			1.5g/10 min			30	
	3g/10 min	15g/10 min	120	140	120	150	.	.
		5g/10 min	9g/10 min				.	.
		230 , 21.6N	(DIN 53 735)				.	.

, (peroxidically) (degradation factor)  
 3 15 , 6 10  
 , , , / 가  
 가 (antiblocking agent) 가 %  
 ,  
 (silicon dioxide),  
 가 / , , ,  
 (incompatible) (benzoguanamine - formaldehy  
 de) , 0.1 % 0.8 % 1μm 6μm , 0.1 % 2 % 2μm 5μm ,  
 EP - A - 0 236 945 DE - A - 38 01 535

3 5  
 (base layer) 4 5  
 (interlayer) / 가  
 0.1μm 0.3μm 3μm , 0.4μm 1.5μm ,  
 ,  
 / 가  
 0.3μm 1.0μm 15μm , 1.5μm 10μm  
 4μm 60μm , 5μm 50μm , 10μm 35μm  
 40% 100%  
 (coextrusion)

(flat - film die) (melts) , (solidificat  
 ion) (roll) , (stretching){  
 (orienting) } , (heat - setting) , 가  
 ona) ,  
 2 (biaxial stretching) ( ) (sequential  
 stretching) 2 ( ) ( ) (flat film p  
 rocess) (simultaneous stretching) 가  
 (blowing process) 가

가  
(  
(take-off roll)

가 가

10 . ( ) , 100 160 0.1 .  
50 . (wind - up unit) .  
가 10 100 , 20

가 . , 120 170 . 80 150 , 가

2 (flame) . , (intensity) 37mN/m 50mN/m , 39mN/m 4  
5mN/m .

( 5kV      20kV      ,      5kHz      30kHz) 가

(non - polar polymer matrix) (polar inclusion)

(laser - inscribed) 가 .  
 (pulsed raser), CO<sub>2</sub> Nd:YAG (beam  
 path) 가 가 (absorption cross section) 가  
 (shade)

21.6N 230 DIN 53 735

(slide) . (scanning electron microscope)

e) , (contrast) (shade imag  
, . 10mm<sup>2</sup> , , ,

DSC , , 가 20 /min.

ASTM - D 1003 - 52

DIN 67 530 (optical parameter)  
 ASTM - D 523 - 78 ISO 2813 ] , (angle of incidence) 60 °  
 (electrical quantity)  $\kappa$  (dimensionless),

M<sub>w</sub> M<sub>n</sub> DIN 55 672, 1 M<sub>w</sub> / M<sub>n</sub> . THF , - (gel permeation chromatography) (eluent) (≈135 ).

(dry - ground) (mica) :

2cm (platelet) 가 5mm  
 . . . . . 5μm, 15μm 가  
 . . . . . 3.4 g/10 min. ( . . . . . ) 40 %  
 ch) 가 . . . . .

1

가  $30\mu\text{m}$  5 ,  
가  $0.7\mu\text{m}$  .  $5\mu\text{m}$

166  $\gamma$  3.4g/10 min 96.74 %,  
 60 % 1.2 % 40 %  
 3.00 %,  
 (Armostat) 0.14 %,  
 (erucamide) 0.12 %.

가  $2\mu\text{m}$   $\text{SiO}_2$  0.2 %.

: 260

255

240

: 20

: 110

55

가 : : 160

9

: 150

(convergence): 5%

2

3

3

1 2.2 % 1 40% ( , 5.6% )  
 , . , , 1

4

1 40% 1.95 % 1 0.78 %  
 % 40% 1.95 % 0.78  
 1 , , , , ,

5

2 , 0.6 %  
 2 , , , , ,

1

1 , 1 , , ,  
 , (moist suspension) (shear force)  
 , , , , ,  
 1 , , , , ,

2

1 1 ,  
 TiO<sub>2</sub> ,  
 , ( ) , 75 가 , T  
 pH 2.2 10% , 32% pH 가 pH 7 ,  
 iCl<sub>4</sub> , , , 110 700  
 1 , , , , ,  
 9.3μm 5 7J/cm<sup>2</sup> CO<sub>2</sub> 0.2 μsec  
 , (bar code) 가

[ 1 ]

		ASTM 1003 - 52	60 ° DIN 67 530	CO <sub>2</sub>	
E1	++	8	140	+++	1.2 %
E2	+++	5	145	+++	1.2 %
E3	+	12	120	+++	2.2 %
E4	+++	7	140	+++	0.78 %
E5	+++	4	145	++	0.6 %
CE 1	- - - ,	15 20	120 140	+++	
CE 2	- - -	20	140	+++	

E = , CE =

가

가

가

가 (oriented)

(57)

1.

, , (oriented) (polyolefin film)

te)

가

(layered silica

2.

1 , (platelet) (dry - grinding process)

3.

1 / 2 ,

4.

1 3 ,

5.

1 4 (mica), (biotite) (phlogopite) (vermiculite) (muscovite), (musco

6.

1 5 , ,

7.

1 6 , ,  $1\mu\text{m}$   $10\mu\text{m}$ ,  $2\mu\text{m}$   $8\mu\text{m}$   
,

8.

1 7 , , /  
/ ,

9.

1 8 , ,  $0.1\text{g}/\text{m}^2$   $0.7\text{g}/\text{m}^2$ ,  $0.10\text{g}/\text{m}^2$   $0.30\text{g}/\text{m}^2$   $0.1\text{g}/\text{m}^2$   $1.0\text{g}/\text{m}^2$ ,  
,

10.

1 9 , ,  $3\mu\text{m}$   $100\mu\text{m}$ ,  $5\mu\text{m}$   $50\mu\text{m}$   
,

11.

1 10 , ,  $\text{CO}_2$   $\text{Nd:YAG}$   
(excimer laser)

12.

1 10 (oriented) (packaging)

13.

1 10 .

14.

1 , , , ,  $3:1$   $9:1$   
(stretching ratio) , /  $\gamma$   $4:1$   $10:1$   $\gamma$