

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.⁷
C23C 22/34

(11)
(43)

10-2004-0043135
2004 05 22

(21)
(22)
(86)
(86)

10-2003-7017270
2003 12 30
2003 12 30
PCT/EP2002/006888
2002 06 21

(87)
(87)

WO 2003/002781
2003 01 09

(30)
(71)
(72)
(74)

10131723.9
가 가
-40217
-40225
-92700
-46149

2001 06 30
1 15 1
5

(DE)
33
83
10

(54)

, a) 0.02 20g/l / Zr, Ti, Hf Si
 , b) 10 49.9 mg/l -
 .

(bare metal)

가

(rinsing)

(conversion treatment)'

가

US-A-5 129 967 a) 10 16 g/l , b) 12 19 g/l
 , c) 0.17 0.3 g/l d) 0.6 g/l
 - (no-rinse treatment) () (baths)

EP-B-8 942 a) 0.5 10 g/l b) 0.2 8 g/l H_2ZrF_6 , H_2
 TiF_6 H_2SiF_6 (pH 3.5)
 a) 25 100 g/l b) 25 100 g/l H_2ZrF_6 ,
 H_2TiF_6 H_2SiF_6 c) 17 120 g/l

DE-C-19 33 013 0.1 15 g/l , 0.5
 30 g/l , 3.5 pH

DE-C-24 33 704 가
 ; 0.1 5 g/l ZrO_2 0
 .1 3.5 g/l pH
 pH가 6 8

US-A- 992 116 2.5 5 pH 3
 :

a) 1 500 mg/l 1.1×10^{-5} 5.3×10^{-3} mol/l ,
 b) Zr, Ti, Hf Si(, 1.6 380 mg/l) 1.1×10^{-5} 1.
 3×10^{-3} mol/l,

c) 가 () 0.26 20
 g/l.

2.5:1 1:10

DE-A-27 15 292
 10 ppm / , 10 1000 ppm /
 , 13 ppm 1.5 4 pH 가

WO 92/07973 0.01 18 % H_2ZrF_6 0.01 10 %
 3-(N-C₁₋₄- -N-2-)-4-
 0.05 10 % SiO_2 ,
 0.06 0.6 %

가

DE 100 05 113

가

/ 2가

/ 2가

/ - /

DE 100 05 113 가
- 0.05 200 g/l
DE 100 05 113

/ Zr, Ti, Hf Si

, a) 0.02 20 g/l

b) / Zr, Ti, Hf Si 10 49.9 mg/l 가

, 0.3 2 g/l '(non-layer-forming) / 2가

Zr, Ti, Hf Si
pH

pH

, pH 가

(= (terpolymer)) 2- 3 2

113 가 ; DE 100 05

2 가

H 가 2 p

가 pH
a) b)
, 5 20g/l, 8 16 g/l , Zr, Ti, Hf / Si가
20 1000mg/l, 50 400mg/l 20 45mg/l
-
- , 1

[1]

	Luviskol , BASF/ISP
/	Luviskol , BASF/ISP
/	Luvitec , BASF
/	Luvitec , BASF
/	Luvitec , BASF
/	Luvitec , BASF
/	ISP , Antaron
/	ISP
/	ISP , Styleze
/ ,	ISP , Gafquat
/ /	ISP
/ -	ISP , Gafquat
/ /	ISP , Advantage
/	ISP , Antara

가 ,
(free fluorides)
가 , 가
가 / () 가 가 10ppm
가 , Zr, Ti, Hf Si 1 6 2 5.5 pH 가 pH
가, Zr, Ti, Hf Si -가 , 가 , pH ,
가

가

()

가 ()

가

X-

(no-rinse process)

2 20 (rinsing)

pH 가 1 6 pH 가

2 6 ; 3 5 2 4

3.5 5 pH

가 15

60 20 45

'(acid pickling) '(pickle passivation)

1 :

: (Hot-dip galvanized steel)(HDG), (EG), (AC120), (CRS)

():

1. : (Ridoline)1570, 3%; 82 , 55

(Ridosol)1270, 0.3%()

2. :

3. : , 0.23%, 82 ,

4. :

5. : 108 ; 30 , H₂ZrF₆ (45%; 1.38g/l), / (37mg/l)

6. :

7. :

8. : (BASF CG 310)

: 20~23μm

_____2: 3 4

_____:

:

: -가 CASS

DIN 50021, 10

: SS DIN 50021, 21

: (scribe) (Creepage)(

):

U/2 mm; - (K , K=1: , K=10:)

[2]

	CRS	HDG	EG	AC120
	U/2 mm	K	K	U/2 mm
3, 4	0.7	8	9	0.8
3, 4	1.6	10	10	0.9

_____3: ()

: CRS, EG, HDG

():

1. : (Ridoline)1570, 2%; (Ridosol)1237, 0.3%; 5 ;
55 ()

2. :

3. : 180 ; 30 ,

H_2ZrF_6 (45%, 1.38 g/l)

/

(= P_a) +

/

(= P_b) (37 mg/l)

4. :

5. :

6. : PES 5807/RAL 5009 GL(TIGC- ,
); . 60-80 μ m

DIN 50021 SS, 21

: , ;
- (cross-cut)

[3]

		- (0 5)
CRS	1.7mm	0
EG	2.5mm	0
HDG	1.8mm	0

, , - / $P_a > 0$ $P_a \% = 100\% - P_b \%$.

4: ()

: CRS

()

1. : (Ridoline)1570, 2%; (Ridosol)1237, 0.3%; 5 ; 55

2. :
3. : 180 ; 30 ,
H₂ZrF₆ (45%, 1.38 g/l)
+ /
(= P_b) +
/
(= P_a) (22 mg/l)
4. :
5. :
6. : PES 5807/RAL 5009 GL(TIGC- ,
); . 60-80μm

DIN 50021 SS, 21

[4]

100% P _a	3.9mm
70% P _a	2.3mm

가

(57)

1.
Zr, Ti, Hf Si
a) 0.02 20g/l / Zr, Ti, Hf Si
, b) 10 49.9 mg/l
가
2.
1 ,

- 1

3.

2

,

-

가

.
4.

1

3

.
5.

4

,

1

3

.
6.

1

3

.