



(Wood Finishing)

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1 .

1.

1)

, (weathering), , ,

2)

, ,

3)

Design 가 , ,

4)

, ,

2.

,

, design

3.

가

[

가

가

,

2 .

1.

1)

2)

, , , , , ,

3)

:

,

가

가

,

가

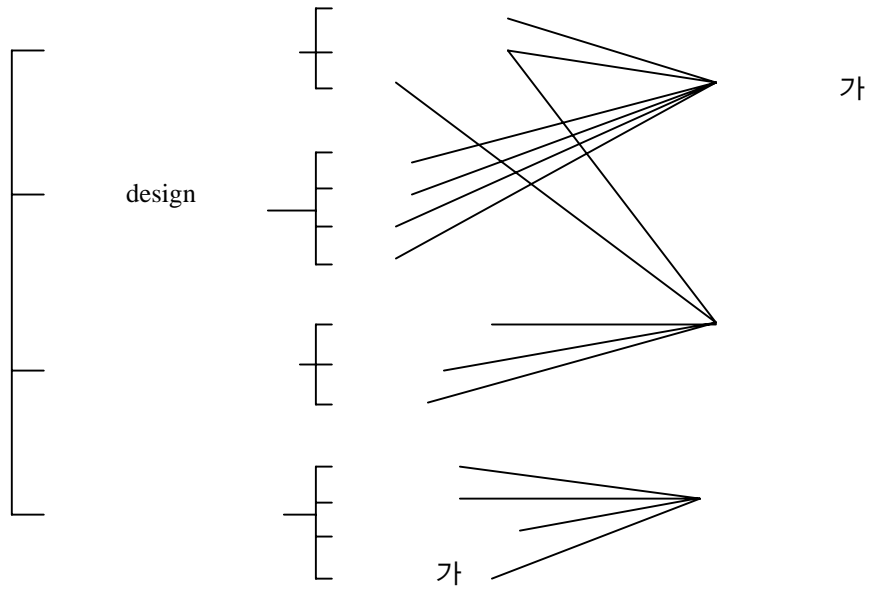
4) brushing, dipping, spraying, etc.

5) . , , ,

[solvent thinner
 22±3 가

[52±3 %가
 가

2.



3 .

1.

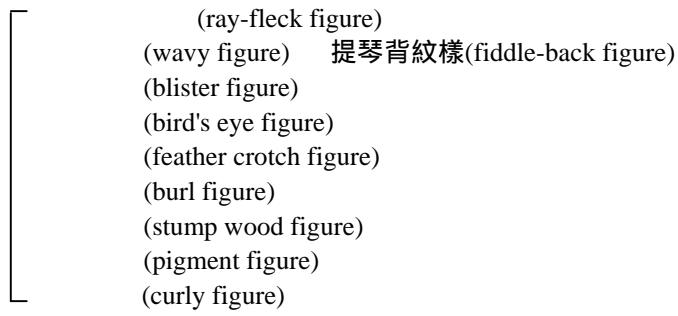
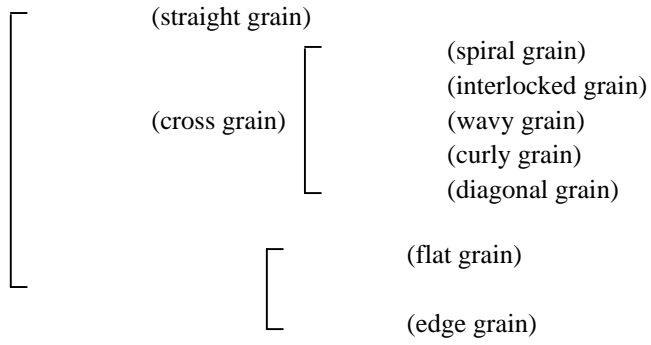
1) .

, softwood, (無孔材)
 , hardwood, (有孔材)
 가 90%
 5 --49%, 30 -- 70%

2) .

, 가
, 가 , tylosis,

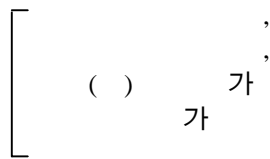
3)



4)

가

5)

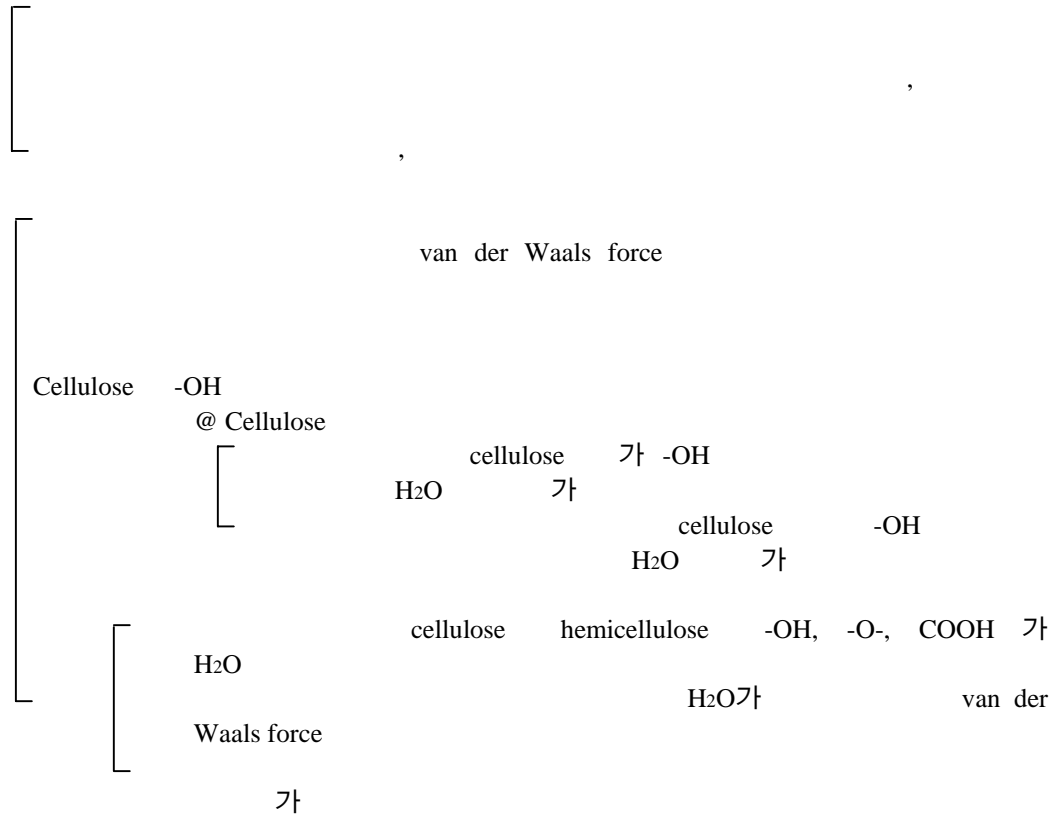


2.

1)

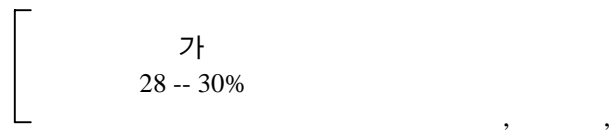
, ,
(blushing),

2)



(water of constitution)

가



Tangential direction : radial direction : axial direction = 100 : 60 : 4

3)

4)

5)

*

가

tape 가

6)

) Lauan 9 mm 95%, 20%, 66 0.8 mm , Nitrocellulose lacquer coat, 60 , 6

	(%)
7%	40
14%	60
19%	100

7)

가

,

4 .

,

1.

1)

가

,

* Putty(パテ)

가

,

凹凸

*

[Vinyl 가 가
 Epoxy, acryl, polyseter
 - 가 ,

가

가

+ ,

가

가

2)

: 가

,

, cellulose

:

,

, 가

:

:

가

(solvent)

(thinner)

가

(vehicle)

,

vehicle

vehicle

,

,

: 亞麻仁油, 大豆油, 桐油, 魚油
 (boiled oil): 가 2
 原油
 가 : 生漆, cashew nut shell oil
 : rosin, ester gum
 : phenol, urea resin
 : nitrocellulose, acetylcellulose
 : asphalt
 Gum : gum

가 : , dibuthyl phthalate, trycresyl phosphate
 : mangan naphthenate
 : , ; polyester methylethylketone peroxide
 : silicone, triethanol
 amine
 : triethanol amine
 : casein, , , vinyl emulsion) 가
 ; 凹凸

(dye)

: hematoxylin(hematein) logwood bluish black;
 ;
 : kermesic acid kermes insect
 : ,

(direct colors): ;
 alkali 가 ; 가
 4, 5 ; Cotton, Congo, Diazo, Chicago, Direct, Benzo
) Congo Red

* 日光堅牢度(Blue scale)

1 : 最弱 2 : 弱 3 : 可 4 : 良
 5 : 良 6 : 良 7 : 優 8 : 秀

(acid colors): alcohol ;
 ; Acid, Azo, Metanil, Water, Naphthylamine, Soluble, Wool,
 Crocein, Naphthol, Milling, Alkali, Palatine

(basic colors): alcohol ;
 acetic acid 가
 ; Methyl, Acridine,
 Rhoduline, Methylene, Janus, Leather, Diazine

: benzene, solvent naphtha ;
 ; Oil Red, Oil Orange, Oil Yellow

Alcohol : alcohol ;
 ; Spirit(or Metanol) Red, Orange

(Mordant or acid mordant colors):

; Cr, Al, ;

; Cr 가

; Alizarine, Chrome, Mordant, Anthracene

; Sunchromine, Mitui Chrome, Acid Chrome, Palatine
 Chrome, Acid Mordant, Anthracene Acid, Acid Alizarine

azo (Insoluble azo or Ice colors) Naphthol (Naphthol colors):

(下漬) amine (顯色) 2가

azo ; (naphthol

) (amine) 一浴

Rapid color ; ice color

; ; ;

(pigment)

素地) enamel
 Vessel line) (目止劑)
 凹 ,) Putty(パテ)
 凹) sanding sealer
 凹) surfacer
 ; magnesium, silica)aluminium powder
 ,) carbon black , alkali
 ; talc, asbestos
) , (ZnS, ZnCdS)
)船底塗料 (PbCrO4)
)aluminium powder

[: ,
 : lake pigment

@ Lake pigment [alumina 體質物 白土, 黄土, Azo] ,

[vessel line, 凹 @ 가 , 가 , alkali]

Pigment wiping stain
Enamel

(solvent)

[Tar terpene , benzene, toluene, xylene
Ester ethyl acetate, methyl acetate
Ketone acetone, methyl ethyl ketone
Glycol ether ethyl ether, dioxane
dichloroethyl ether, trichloroethylene]

[: 100 acetone, methyl ethyl ketone
: 100 -- 150 methyl isobutyl ketone, butyl acetate
: 150 -- 200 diisobutyl ketone, diacetone
alcohol]

(thinner)

Coal tar toluene, xylene
gasoline, kerosine

(, latent solvent)
; methanol, ethanol, isopropyl alcohol

2.

1)

가 ; 가 가
 Vinly emulsion vinyl resin
 Milk casein milk casein
 Casein casein
 alkyd()+ 가 ()+

Boiled oil 가

Paint boiled oil +
 varnish +
 enamel varnish +
 varnish boiled oil + asphalt
 Aluminium paint varnish + aluminium particle
 +

Nitrocellulose lacquer cellulose
 Acetylcellulose lacquer cellulose
 Benzylcellulose lacquer cellulose
 Acryl lacquer acryl 가

Shellac varnish Laccifer insects가
 Dammar varnish Dipterocarpaceae
 varnish alcohol + rosin

phenol resin + formaline
 Phthal phthalic acid resin + glycerine +
 urea resin + phthal
 Melamine melamine resin + phthal
 Aminoalkyd melamine + 35 -- 45%
 alkyd
 vinyl -acryl vinyl + acryl
 vinyl - vinyl vinyl + vinyl
 Epoxy epoxy resin
 Silicone silicone resin
 polyester polyester resin
 Polyurethane polyurethane resin
 Acryl acryl resin
 gum gum
 gum styrol + butadiene

漆塗料

漆 ; urushiol 63 -- 70%, gum 7 -- 9%, 15 -- 26%,
 1.4 -- 3.9%

[*Rhus verniciflua* urushiol ; , ,
Rhus succedanea laccol ; , ,
Melanorrhoea usitata thitsiol ; , ,

Cashew cashew nut shell oil; *Anarcadium occidentale*(cashew tree)
 ; cardol anacardic acid 2 phenol ; cardol urushiol

2)

가
가

가

brushing
spraying
+, -

1

;

boiled oil

가

alkyd resin, asbestos
aluminum paint 400 -- 500

가

Co, Ni; X = halogen, NO₃, SO₄, CNS; y = 9 ; MX₂(CH₂)₆N₄yH₂O (M = 10)

;

, ,

;

,

;

, 鉛丹

가

가

,

,

gum

對被途物

, , concrete, ,

3.

,

:

,

(polar) phenol resin, urea resin,
(non-polar) gum, gum ,

cellulose -OH 가

가

aminoalkyd , polyurethane
가

acryl lacquer, nitrocellulose lacquer

4. 色數

1

100 cc

가 0.001 g

) aminoalkyd

50
400 -- 500

5.

1)

2)

가

$$(R) \quad R = (A/S) \times 100(\%) \quad A: \quad S:$$

$$(\mu m) = \quad (\mu m) \times R(\%)/100$$

6.

1)

가

, 가

가

Coal tar

a. 가

b. 가

가

Vinyl emulsion ,
c. 가

가

Varnish

a. 가

漆塗料

b. Co, Mn 가
가

, boiled oil,

가
가

polyamide amine

가

epoxy , polyester

가
가

, varnish

a. 가 가
가

가 가

가

Epoxy , lacquer, silicone
b. a

가 가

Polyurethane

가 가 가 가
가

, aminoalkyd

가 가 가 가

가

aminoalkyd (油脂)

200 -- 400 nm monomer

Photoinitiator benzoin, benzophenone, benzoinalkyl ether
Acrylated polyester , acrylated urethane

2)

, , ,

가

22 ± 3 , 52 ± 3%(EMC 9 -- 10%)가 10
가

漆 52 ± 3%가 80% 가 가
polyurethane 가 가
가 가

a. 가 가

b. 가 gas

c. 가

3)

脂觸乾燥(Set to touch) 가
粘着乾燥(Dust free) 가
定着乾燥(Dry through) 가
固着乾燥(Tack free) 가
硬化乾燥(Dry hard) 가
固化乾燥(Dry to handle) 가
完全乾燥(Full hardness)

4)

가

		20--25	()		(μm)
			-----	가	
			20 -- 25	40--45	
Lacquer	wood sealer	1--2	5 -- 10	15 -- 20	5 -- 7
Lacquer	sanding sealer	1--2	15 -- 25	30 -- 60	20 -- 30
Polyurethane	wood sealer	1--2	5 -- 10	15 -- 20	10 -- 20
Polyurethane	sanding sealer	2--20	30 -- 60	60 -- 80	20 -- 60

가 : 가
8 -- 10%

8%	
()	(%)
30	43
40	46
50	50
60	55

a.

가 가

b.

[

lamp
energy
가

5)

(sanding)

sanding ; aminoalkyd
sanding ; 가 가 nitrocellulose lacquer, acryl lacquer
sanding; 가 가

*

1)

, (sagging, running)
[가 thinner

[spray gun nozzle
sand paper

, (flooding, floating, mottling)

[thinner가 가

[make
thinner

2)

(brushing mark), roller (roller mark)

[

[roller
10

Seeding , 가

[가

[

Orange peeling orange

[thinner
spray 가
가 가

[thinner
spray gun 4 kg/cm², spray 15 -- 20 cm,
25 -- 30 cm

Cratering 가

[油分 , silicone, wax 가
spray gun cap 油分

[silicone

gum 가 가 nozzle

spray gun nozzle

Pin holing

[setting 가
spray 가 油分

[setting 가
spray

(lifting), (wrinkling)
[가 가
가

[가

Bleeding

가

sealer

(blushing) 가

[가 lacquer

[75%
15%
spray air 가

thinner가
spray 油分
1 가 가

[thinner

(Fading) , 가 ,

Chalking 가 , 가

Checking, cracking
[, 가

[

Flaking wax, silicone, 油分
15% 가 가

[

8.

Aminoalkyd , polyurethane
polishing
Nitrocellulose lacquer, acryl lacquer
polishing

* gloss meter ;
Gloss meter 60° 60°

5 .

1.

1)

가

韌性(toughness)가

Lacquer , dibutylphthalate(DBP), tricresyl phosphate(TCP) 가

Aminoalkyd amino alkyd

(1)	
	Sward rocker
Nitrocellulose lacquer	21
vinyl	23
	14
Cashew	25
Aminoalkd	26
Polyurethane	27
polyester	35

2)

Polyurethane , epoxy , aminoalkyd
polyester 가 가

100 1 2 mm scotch tape
目數

2.

1)

白化

[가 ; shellac varnish, nitrocellulose
lacquer ; polyurethane ,
aminoalkyd

acryl lacquer 230 g/m²/24 hrs.
clear lacquer 179 g/m²/24 hrs.
aminoalkyd 183 g/m²/24 hrs.
polyurethane 37 g/m²/24 hrs.

가

Nitrocellulose lacquer, acryl lacquer
Polyurethane , aminoalkyd

, ink

2)

[가 ; cellulose
 lacquer , gum , vinyl , alkyd
 ; phenol , amino , polyurethane , epoxy , silicone
 , whisky table,

[alkali gas 가
 phenol , polyurethane , epoxy , gum , vinyl
 ester alkali

	10%	10%	5%
Nitrocellulose lacquer			
vinyl			
Aminoalkd			
Cashew			
Polyurethane			
polyester			

alkali

가

alkali

3.

1)



[가

[energy energy 가
 benzophenon , benzotriazole

(mm)	가 (%)	
	360 nm	380 nm
4	0.5%	1.5%
2	1.0%	3.0%
1	2.0%	6.0%

400nm	. 2 mm lacquer 1.0% 가					
	340 nm	360 nm	365 nm	376 nm	380nm	394 nm
100%	100%	99%	95%	92%	50%	27%

2)

[가 가

Acryl lacquer,
Polyurethane

aminoalkyd

가 가

[가 가

cellulose lignin lignin quinone, quinone methide
carbonyl, caboxyl, hydroperoxide

3)

, ; , , , ,

[

Nitrocellulose lacquer, urea
Polyurethane

, vinyl
polyester

, 가 ,

6 .

1.

1)

凹凸, 油分,

[sanding knife mark, raised grain, woolly grain 가凹凸,
 (水) 凹凸 生地研削
 belt sander 手工研削

2) Sand paper

[#80 -- 100 sand paper 80%

[#150 -- 180 sand paper 20%

)
 [#100 #220
 [#100 #150 #220

Denmark [#80 #150 -- 180
 [#80 #120 #150 -- 180

paper sand

3) paper 가 cork, sand

4) Wide belt sander, portable sander
 Portable sander

2.

1)

* #150 -- 200 sand paper

2)

(28%) (30 -- 35%) 1 : 1

1

- i) 0.3% (NaCO₃) 60 -- 70 30 가 65 -- 75
 2% (NaClO₂) 30 -- 40
- ii) 3 : 100 60 -- 70 가 0.5 : 100
- iii) 가 가 40 -- 50
- vi) gas 1 -- 2 2 -- 3 3 -- 4
 Teak, lauan , 油分 , 黄味
- i) No. 1 (Na₂CO₃) 10 g 50 60 cc
 No. 2 (35%) 80 cc 20 cc 가
- ii) No. 1 No. 2 5
 No. 2 No. 2
 3 18
 -- 24
- iii) No. 1 No. 2
 No. 1 2 20
- Sliced veneer, rotary veneer
- iv) No. 1 2
- vi) 가 가 가
- cf) , 黄味가 가 가

1)

[; 가
 ; 가 가

가

2)

i)

: , 가, bleeding
 : , 가 , 木毛
 : spraying, brushing, dipping

ii) Alcohol

Alcohol ethanol, methanol
 : , 가 ,
 : 木毛 , ,
 : spraying

iii)

mineral spirit(white spirit)
 : , 가 , 가
 : bleeding , , 가 , 가
 : spraying, brushing

iv) N.G.R.(non-grain raising)

, alcohol ethyl cellosolve, methanol, toluene
 (木毛, wood wool) diethylene glycol 가
 N.G.R. stain thinner ;
 methanol
 : , 가 ,
 : , 가, bleeding , diethylene glycol 가
 aminoalkyd
 : spraying

i)

, varnish 가 toluene

pigment wiping

stain

:
: 가 , aminoalkyd , polyurethane
,
: spraying, brushing

ii)

: ,
,
:
: spraying, brushing

tannin

[15%
15%
1%

[15%
15%
1%

[15%
15%
1%

Teak [15%
15%
1%

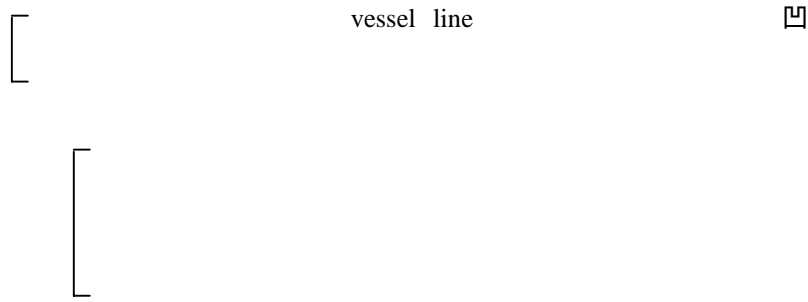
: , , 가 가
: . , 가 가
: brushing

Fumed oak [gas tannin
Denmark oak chair
ammonia gas
5% tannin
5% (sodium pyrophosphate)
5% (pyrocatechuic acid)

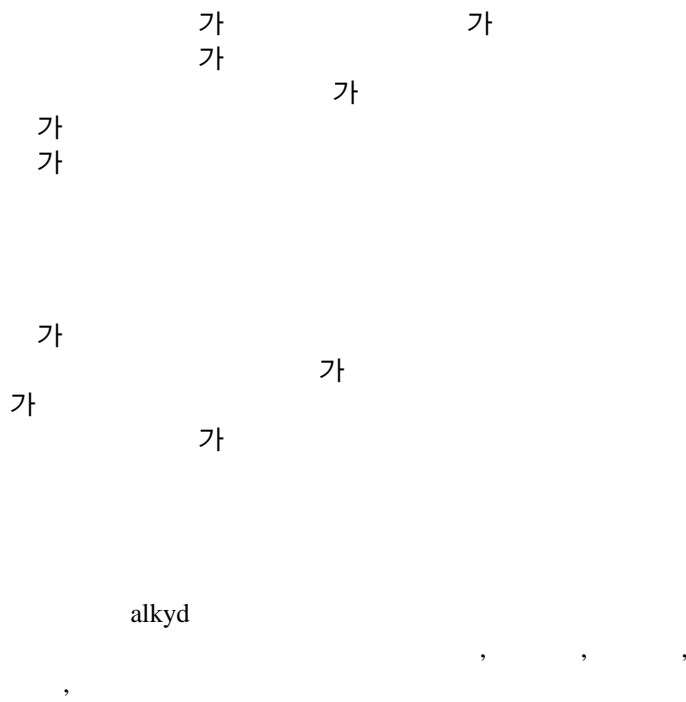
, 燒印, burner
:
: (--), 가

4.

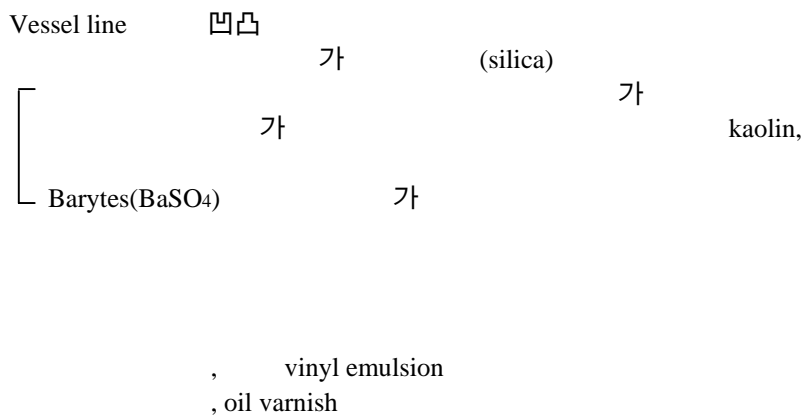
1)



2) (目止劑, filler)



3)



alkyd , epoxy , polyurethane ; , , ,

, mineral spirit,

4)

凹

5)

thinner 가 brushing

凹

가

가

, pin hole,

5. (Wash coating)

1)

가

가

2)

,

가

,

sanding

가

polyester

polyurethane sealer

)

3)

wood sealer
 Nitrocellulose lacquer lacquer wood sealer shellac lacquer
 相溶性 bleeding
 polyurethane wood sealer aminoalkyd sealer가 ;
 polyurethane wood sealer nitrocellulose lacquer
 polyester

4)

가 ;

Spraying brushing

6. (Sealer)

1)

凹

sanding sanding
 [sanding

2)

sanding sealer
 surfacer
 Nitrocellulose lacquer sanding sealer stearin 가;
 Aminoalkyd sanding sealer, polyurethane sanding sealer
 nitrocellulose lacquer sanding sealer

3)

가 sanding

vessel line , 凹

Spraying brushing

* sand paper
 [No. 80 -- 100
 No. 150 -- 180
 No. 180 -- 240

No. 240 -- 400

No. 400 -- 600

7. (Top coating)

1)

, , , ,

2)

clear varnish
) Nitrocellulose lacquer clear lacquer
 Polyurethane polyurethane clear
 Lacquer
 aminoalkyd 가
 Polyurethane

3)

가 orange peel
 가 sanding
 가

8.

, , ; 가 가

가

; No. 180 -- 240 sand paper

sanding

Nitrocellulose lacquer No. 240 sand paper No. 320 -- 360
 sand paper gasoline
 aminoalkyd No. 240 -- 280 sand paper
 No. 320 -- 360 sand paper

鏡面平滑

No. 400 -- 600 sand paper
 sand paper rubbing compound wax 綿布

- i) No. 400 -- 600 sand paper
steel wool 000 -- 0000 wax
1/2
- ii) No. 400 -- 600 sand paper
(Scotch Brite)
- iii) No. 400 -- 600 sand paper
320 mesh pumice stone powder
- * i > ii > iii

cf) Scraper

Denmark sanding nitrocellulose lacquer scraper Denmark
nitrocellulose lacquer 0.6 mm scraper가

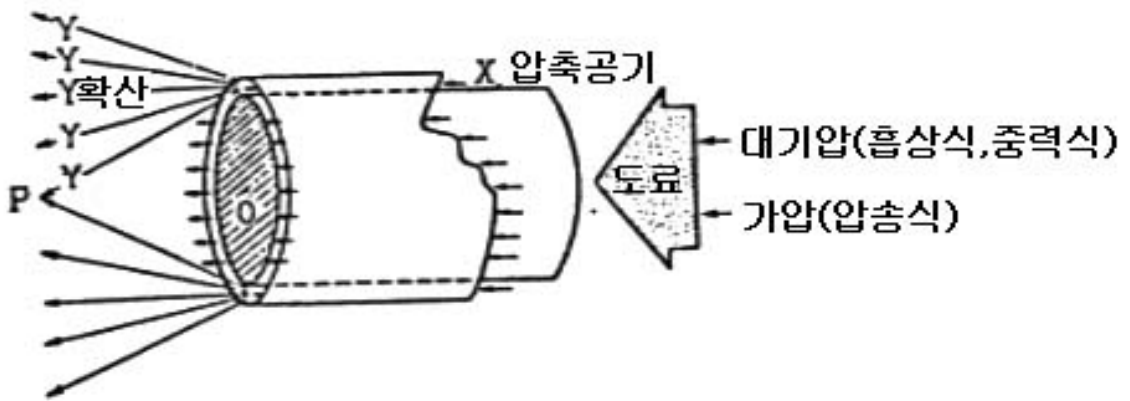
@ Scraper 가 150 mm, 50 mm, 0.4, 0.6, 0.8, 1.0 mm

7 .

I. Air spray

1. Air spray

Air spray 霧化 ;
가
Air spray 90°



Air Spray의 원리

(1) , air spray pipe

O가 O 底面 X 가 O 가
O 가 Y 가

가
가

(2) air spray
Paint tank container 가
飛出

2. Air cold spray

가

[가 air cap
spray pattern spray pattern
spray pattern spray pattern

(1) Spray gun spray gun

Pattern 가 pattern pattern pattern
spray 가 ; 150 -- 200
μm가 가
Pattern 가 가
Needle valve nozzle 가 needle valve
Needle valve nozzle orifice가
Needle valve packing packing
가

1 gun nozzle ,
가

(2) .

: , container
: , container 1 가 , 가 ,
, container

i) Cup

: , cup
: cup 0.5 가 , 가 , , cup

ii) Tank

: 가 , gun
 : gun tank , tank hose

: , gun , pipe

가
 : tank hose , compressor ,

3. Air hot spray

가

(1) Air hot spray

Air cold spray

가

Air hot spray [가 가 가 가
 가 ; nitrocellulose lacquer, vinyl , phthal ,

(2)

가 가 가 가 가

II. Airless spray

1. Airless cold spray

airless hot spray

Airless cold spray

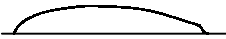
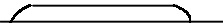
가 가 가 가

Airless hot spray

가 가 가 가 , gas
 가 spray gun nozzle 가

2. Air airless spray

	Air spray	Airless spray
energy	가	가
	1 15 cc/sec. 4 -- 7 cc/sec.	2 -- 3 40 cc/sec. 10 -- 15 cc/sec.
Pattern	50 cm stroke	100 cm stroke

Pattern		
	200 μm	150 μm
rebound		
凹		
	40 -- 50%	10%
	pattern 가	pattern 가
油分,		
	gun	가
		pump
	thinner가 가 gun 15 -- 20 cm gun 20 -- 25 cm	thinner 30 -- 40 cm

III. Curtain flow coater Curtain

1.

curtain

curtain

2.

1) Pouring head
curtain

細長

tank

가

curtain

slit

slit 2

lips

2) Conveyor belt
curtain

3) Receiver
Slit

tank

4) heater, cooler
가

3. ·

1)

conveyor belt 가 curtain 가

2)

Conveyor belt 가 curtain pouring head 가

IV.

1.

1)

+ -
+ +, - -

2)

- 가 - 가 + ,

2 A, B - 가 A + , B - 가
B 가 -
earth(接地) - + 가

가 - +

3)

- conveyor + - 가
ion 가 - ion 가 + - ion 가

2.

1)

; 30%, 50%
가 가

7 cm/min conveyor belt 가 ; conveyor 5 --

2)

