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I. H. Godlove 1951 가 (hue),
(depth), (brightness)가 3가 가 ,
3가 .

5.1

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가

1920

가

18

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(DIN-5003)

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(ISO)가 , ISO 2/1, 1/1, 1/3, 1/6, 1/12, 1/25
6 , (JIS) 1/1, 1/6, 1/25 3 .

1) Godlove

1954 .

(S) ,

(A) .

$$S = (16V^2 + C^2)^{\frac{1}{2}}$$

$$A = S + 0.025C \text{ (}\Delta H10PB\text{)}$$

2) Rabe-Koch

1957 DIN . (θ)

$$\theta = [(10-1.2D)/9]S + 1.06D$$

3) Gall

1965 CIE . (B)

$$B = K + Sa\lambda f \sqrt{Y} - 10\sqrt{Y}$$

K ; B 0

S ;

$$S = 10[(X - 0.3100)^2 + (Y - 0.3162)^2]^{\frac{1}{2}}$$

$a\lambda f$;

4) Taylor

1970 14~18 14

『 가 』
(Rmin) < 5.1>

< 5.1> Taylor

色 濃 度 水 準	最小反射率 (Rmin)
2/1	1.7 ± 0.2 (%)
1/1	3.0 ± 0.3
1/3	7.5 ± 0.7
1/6	13.0 ± 1.0
1/12	21.0 ± 1.5
1/25	28.0 ± 2.0

5) Garland

1973 가

, Avis , .

$Avis = X' + Y' + Z'$

$X' = \sum_{400}^{700} F\lambda E\lambda \overline{X}\lambda \Delta \lambda$

$Y' = \sum_{400}^{700} F\lambda E\lambda \overline{Y}\lambda \Delta \lambda$

$Z' = \sum_{400}^{700} F\lambda E\lambda \overline{Z}\lambda \Delta \lambda$

$F\lambda;$ λ , K/S .

$E\lambda;$ λ

$\overline{X}\lambda, \overline{Y}\lambda, \overline{Z}\lambda;$ λ

가

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5.2 H, C*, B*

(H), (C*), (B*)

H C* B* 가

가

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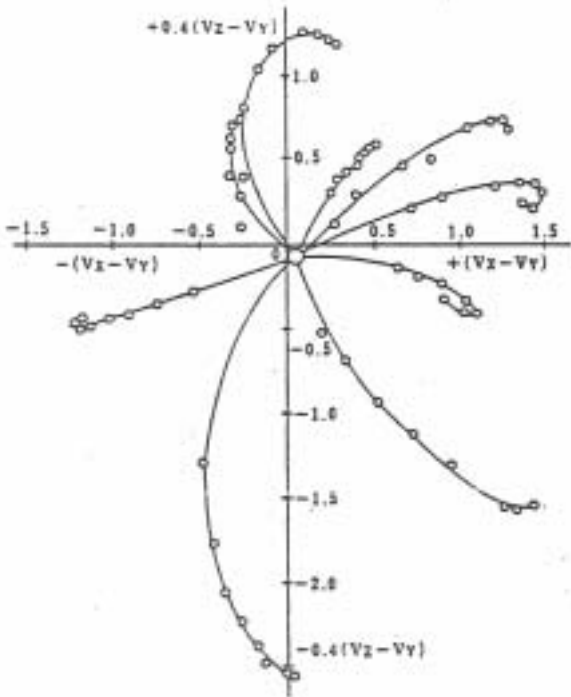
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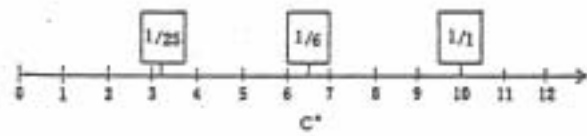
9가 가

, < 5.1> 가 , 20

C*



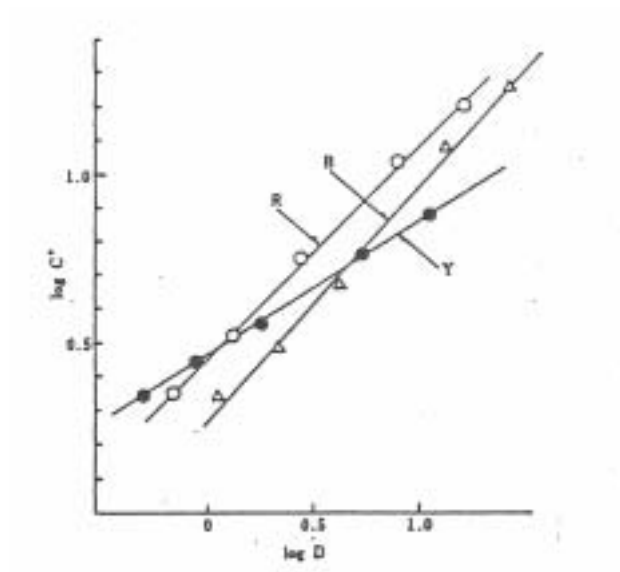
< 5.1>



< 5.2> C* (C* = 0 : , C* = 10 : 1/1)

C* , D

< 5.3> .



< 5.3> D C^* $[D = (1-R_{min})^2/2R_{min}]$

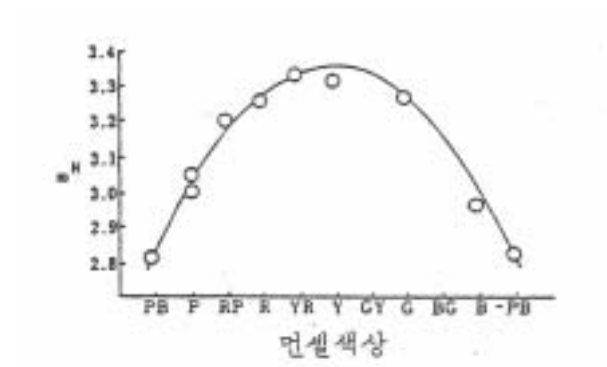
$$D = (1 - R_{min})^2 / 2R_{min}$$

$$D = 1 \quad \log C^* \quad m^H,$$

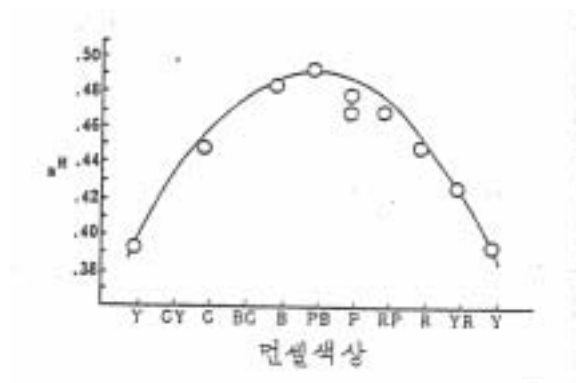
$$n^H.$$

$$C^* = m^H (D)^{n^H}$$

$$m^H \quad n^H \quad \text{가} \quad D$$



< 5.4> m^H



< 5.5> nH

m^H n^H 가

< 5.4> < 5.5>가 .

m^H PB , Y
 n^H Y , PB ,

$$m^H = 2.5 + 2.204 \times 10^{-2} (\Delta H_{5PB}) - 2.208 \times 10^{-4} (\Delta H_{5PB})^2$$

$$n^H = 0.39 + 4.22 \times 10^{-3} (50 - \Delta H_{5PB}) - 4.24 \times 10^{-5} (50 - \Delta H_{5PB})^2$$

mH , nH 가 < 5.2>

D
 가 가 < 5.6>
 D ,

$R_{min} = 1\%$ B-PB - P , Y

가 , $R_{min} = 50\%$ Y

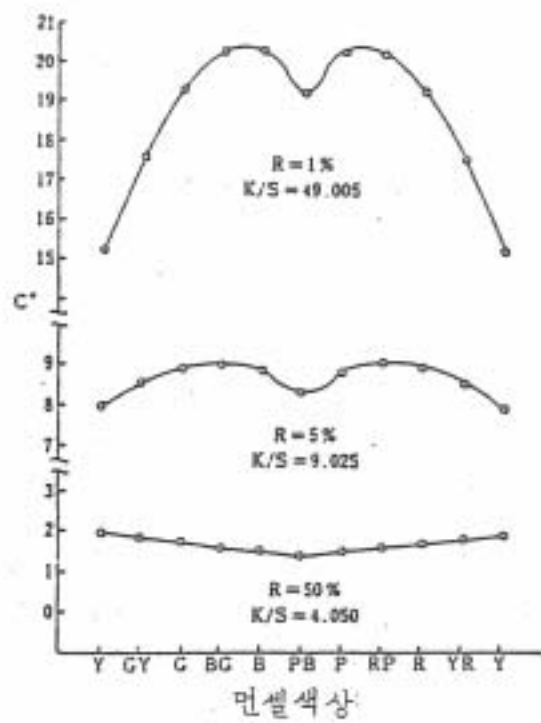
B-PB-P .

가

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< 5.2> mH nH (: 5.0PB)

Hue Step	Munsell Hue		mH	nH	Hue Step	Munsell Hue		mH	nH
0	5.0PB	5.0PB	2,800	,495	11,0	6,0P	4,0B	3,016	,490
0,5	5,5PB	4,5PB	2,811	,495	11,5	6,5P	3,5B	3,024	,490
1,0	6,0PB	4,0PB	2,822	,495	12,0	7,0P	3,0B	3,033	,489
1,5	6,5PB	3,5PB	2,833	,495	12,5	7,5P	2,5B	3,041	,488
2,0	7,0PB	3,0PB	2,843	,495	13,0	8,0P	2,0B	3,049	,488
2,5	7,5PB	2,5PB	2,854	,495	13,5	8,5P	1,5B	3,057	,488
3,0	8,0PB	2,0PB	2,864	,495	14,0	9,0P	1,0B	3,065	,487
3,5	8,5PB	1,5PB	2,874	,495	14,5	9,5P	0,5B	3,073	,486
4,0	9,0PB	1,0PB	2,885	,494	15,0	10,0P	10,0BG	3,081	,485
4,5	9,5PB	0,5PB	2,895	,494	15,5	0,5RP	9,5BG	3,089	,485
5,0	10,0PB	10,0B	2,905	,494	16,0	1,0RP	9,0BG	3,095	,484
5,5	0,5P	9,5B	2,915	,494	16,5	1,5RP	8,5BG	3,104	,484
6,0	1,0P	9,0B	2,924	,494	17,0	2,0RP	8,0BG	3,111	,483
6,5	1,5P	8,5B	2,934	,493	17,5	2,5RP	7,5BG	3,118	,482
7,0	2,0P	8,0B	2,943	,493	18,0	3,0RP	7,0BG	3,125	,482
7,5	2,5P	7,5B	2,953	,493	18,5	3,5RP	6,5BG	3,132	,481
8,0	3,0P	7,0B	2,962	,492	19,0	4,0RP	6,0BG	3,139	,480
8,5	3,5P	6,5B	2,971	,492	19,5	4,5RP	5,5BG	3,146	,479
9,0	4,0P	6,0B	2,980	,492	20,0	5,0RP	5,0BG	3,152	,478
9,5	4,5P	5,5B	2,989	,491	20,5	5,5RP	4,5BG	3,159	,478
10,0	5,0P	5,0B	2,996	,491	21,0	6,0RP	4,0BG	3,165	,477
10,5	5,5P	4,5B	3,007	,491	21,5	6,5RP	3,5BG	3,172	,476



< 5.6> D 가 C^*

C^* , $C^* = m^H(D)^{nH}$ 가

, 가 가 5PB

< 5.3> .

, $V = 19$ $0.03C^*$, $V = 10$ $0.6788C^*$,

$V = 2$ $21.7C^*$ 가 .

C^*

mH nH , D 가 DT .

C^* 가 가

, 가 .

3 X, Y, Z , 3

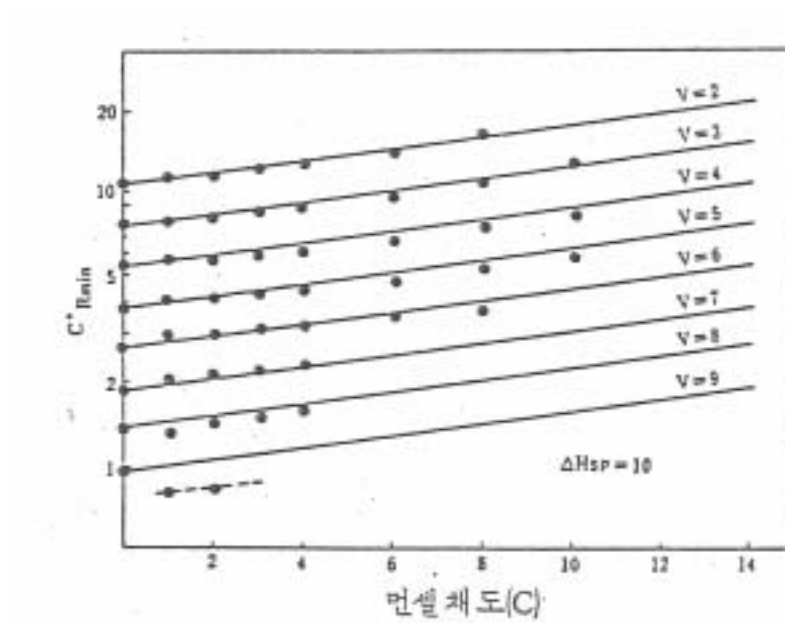
3 H, V, C .

< 5.3> C* (Rmin)
(V = 11~19 가 .)

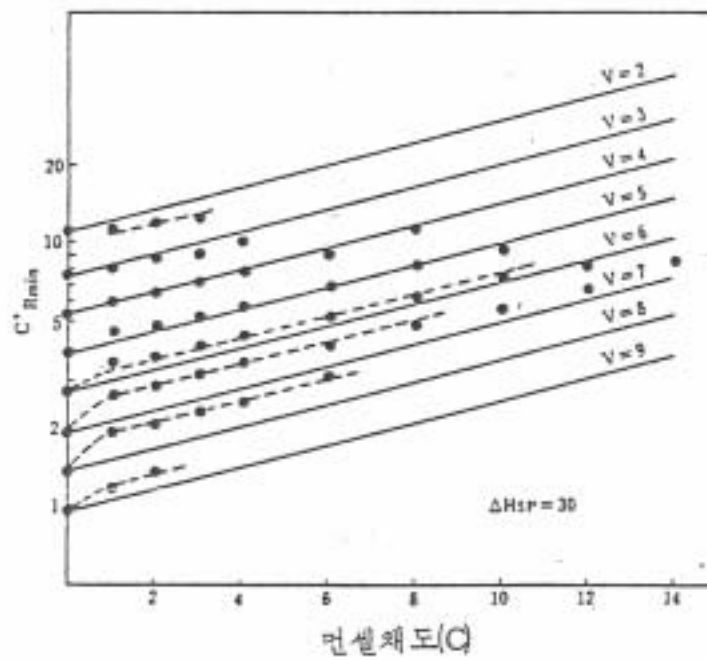
단색 明度(V)	C*	Rmin (%)
(19) (白 色)	.0300	99.67 (5Y로 한 計算値)
(18)	.0425	99.48 //
(17)	.0600	99.19 //
(16)	.0849	98.74 //
(15)	.1200	98.04 //
(14)	.1697	96.96 //
(13)	.2400	95.30 //
(12)	.3394	92.77 //
(11)	.4800	88.95 //
10 (準白色)	.6788	83.33 //
9	.9600	75.28 //
8	1.3576	51.26 (5PB로 한 計算値)
7	1.9200	39.38 //
6	2.7153	27.27 //
5	3.8400	17.83 //
4	5.4306	10.50 //
3	7.6800	5.78 //
2	10.8612	3.04 //
1	15.3600	1.56 //
0 (黒 色)	21.7223	0.78 //

C*Rmin C
, v가 <

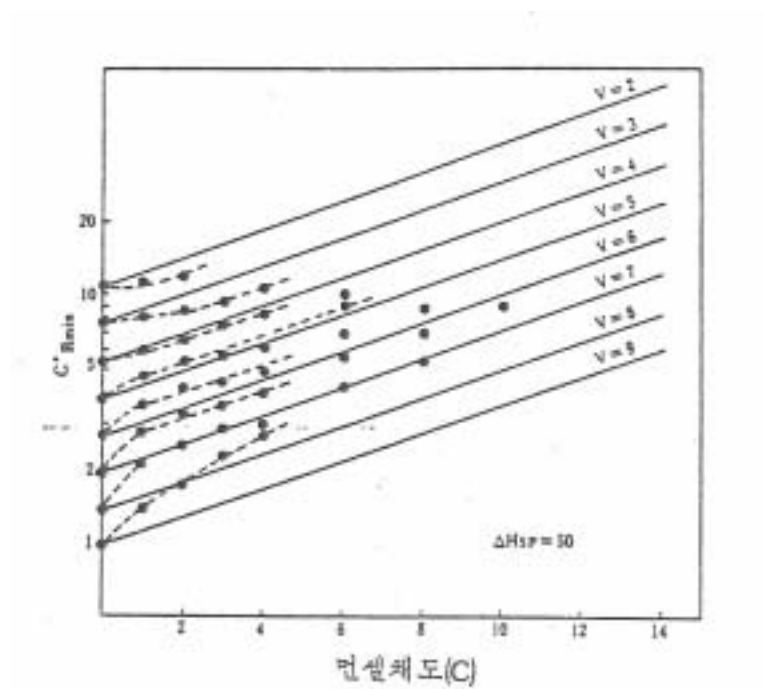
5.7-1>, < 5.7-2>, < 5.7-3> .



< 5.7-1> $C^* R_{min}$ (5PB)



< 5.7-2> $C^* R_{min}$ (5YR)



< 5.7-3>C*Rmin (5GY)

가 . C*

tan H° , C ×

tanH°

$$\log C^* = \log C^*_{ach} + C \times \tan H^\circ$$

$$C^* = C^*_{ach} \times 10^{C \cdot \tan H^\circ}$$

C*_{ach} ;

C*

$$C^* = 21.72 \times 10^{C \cdot \tan H^\circ} / 2^2$$

V = 0, C = 0 21.72C*가 .

$$(10-V) \qquad V = 10, C = 0$$

.

$$C^* = 0.6788 \times 10^{C \cdot \tan H^\circ} \times 2^{(10-V)^2}$$

$$\tan H^\circ = 0.01 + 0.001 \Delta H_{5P}$$

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Rmin

C*Rmin

HVC

C*_{HVC}가 .

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가 가 ,

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가 ,

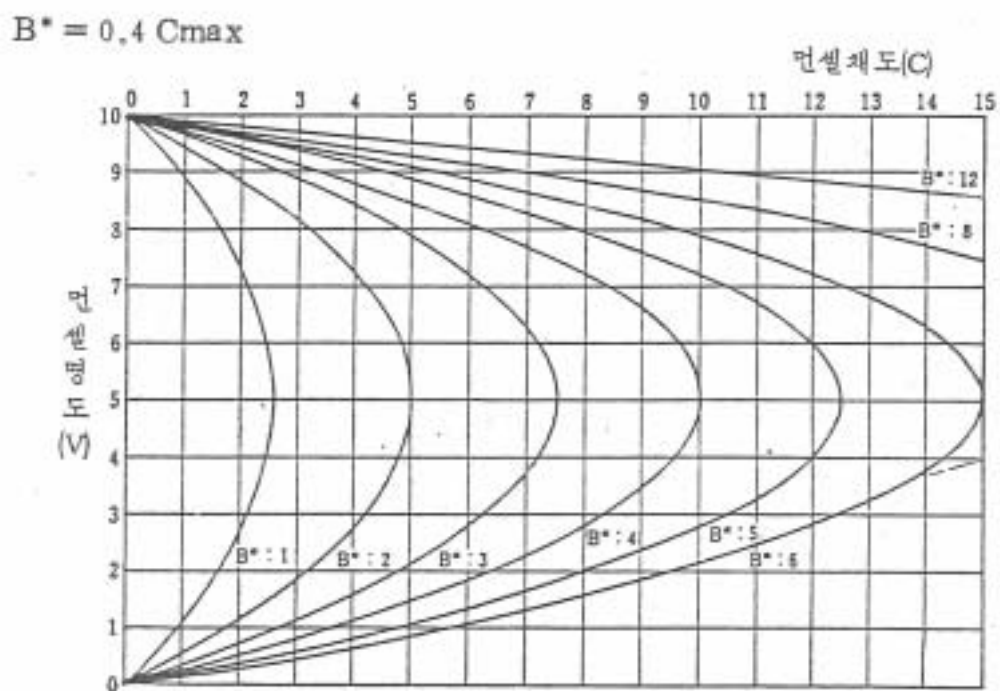
(Cmax) 가 . ,

V = 10 V = 0 .

$$V = 10, C = 0$$

B* .

< 5.8> B^* 가 .
 B^* .



< 5.8> V-C 가 B^*

(H) (C*) (B*)

HC^*B^* .

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hue ,

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