

# 인산염 매몰재 special liquid의 농도변화에 따른 주조체 적합도에 관한 실험적 연구

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=Abstract=

## An Empirical Study on the Fitness of Casting Body the Variation of Density of Phosphate Bonded Investment 's Special Liquid

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To observe the difference of the special liquid influencing to the fitness of casting body among the many elements influencing to the die fitness of the casting body, we fit L/P ratio each investment, using two kinds of phosphate bonded investment, divided the density of the special liquid by 5 groups(Density 100, 75, 50, 25, 0), made 10 copying per each group and experiment 10 groups, totally 100 copying and finally we could get the result as following ;

- 1) In such a case of CB-30, the casting fitness of the density 100 of special liquid, group 6, was the best and in order of the density 75, 50, 25, 0 the fitness is better.
- 2) In such of Denti-vest, the fitness of the density 100 of the special liquid, group 1, was the best and in order of the density 75, 50, 25, 0 the fitness is better.
- 3) Therefore we should change the density according to the transformation of the environment as investing because of increasing the expansion of phosphate bonded investment, as increasing the density of the special liquid.

## 1. 서론

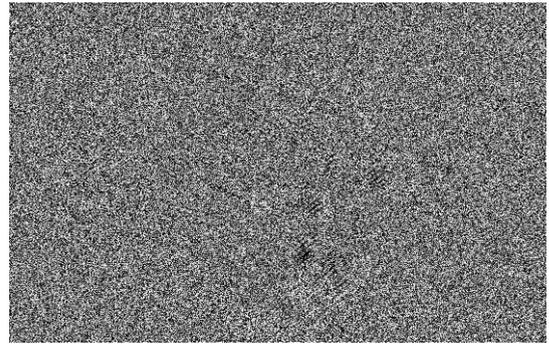
Ni-Cr, yield strength, 가 .  
finishing, soldering, polishing 가 .



## 2. 실험방법

Coping die 4.4mm, 6.6mm die  
 Wax pattern die (whip-mix, U.S.A) dipping wax 98 dipper dipping 0.3  
 0.4mm wax carving margin  
 Margin wax(Metalor, Switzerland)  
 Sprue single method 10gague  
 wax 10mm metal ling  
 가 1/4inch가  
 wax pattern Wetting agent(Surcast G.C. Japan) metal ling liner  
 , Korea) Ticonium Denti-vest(CB-30(U.S.A))  
 1 1

2  
 L/P ratio liquid  
 100, 75, 50, 25, 0  
 group 10 coping  
 100 casting body 10  
 group



1. group

special liquid

W/P ratio

( 2)

1

furnace

wax

250

30

1

850

30

Casting metal Ceradium V (Match. Inc., U.S.A) porcelain metal new gas casting

ring

50μm

aluminum

oxide sand sand blasting

(

1)

# 1/2,

#2, #8 round bar

die

8

2. Special liquid

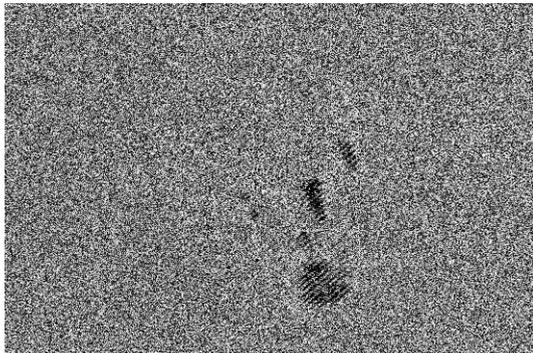
group

: %(cc)

	매물재 분류	special liquid : distilled water
group 1	Denti-vest	100 : (17 : 0)
group 2	Denti-vest	75 : 25(12.75 : 4.25)
group 3	Denti-vest	50 : 50(8.5 : 8.5)
group 4	Denti-vest	25 : 75(4.25 : 12.75)
group 5	Denti-vest	0 : 100(0 : 17)
group 6	CB-30	100 : 0(18 : 0)
group 7	CB-30	75 : 25(13.5 : 4.5)
group 8	CB-30	50 : 50(9 : 9)
group 9	CB-30	25 : 75(4.5 : 13.5)
group 10	CB-30	0 : 100(0 : 18)

\* Special liquid의 SiO<sub>2</sub> 함량은 Denti-vest는 30%, CB-30은 30%인 희석액을 special liquid 100으로 본 것이다.

Coping die gab  
margin , occlusal  
surface ,  
gab diamond trimmer  
1/3 가 trimmer  
trimming  
rubber wheel die  
adaptation . occlusal gab  
.( 2)



2. trimming

coping 8  
1/100mm  
가 special liquid  
coping ,

### III. 실험결과

가  
special liquid  
group  
5group( 100, 75, 50, 25, 0)  
10 , 2 100  
< 3>

3.

: mm

매물재 종류	Group	표본수	최소치	최대치	평균
Denti-vest	1	10	0.1	0.4	0.235
	2	10	0.6	0.9	0.705
	3	10	0.7	1.2	0.945
	4	10	0.9	1.3	1.135
	5	10	1.15	1.85	1.525
CB-30	6	10	0.025	0.1	0.0625
	7	10	0.6	0.95	0.77
	8	10	0.9	1.3	1.02
	9	10	1.0	1.35	1.12
	10	10	1.05	1.35	1.202

Denti-vest special  
liquid 100 group 1  
gap 0.1mm, gap 0.4mm ,  
0.235mm 가 group 가 가  
75 group 2 가 0.705mm,  
50 group 3 0.945mm, 25  
group 4 1.135mm , distilled  
water 100 group 5  
1.525mm 가 가  
CB-30 special liquid  
100dls group 6 가 0.025mm,  
0.1mm, 0.625mm, 75 group  
7 0.77mm, 50 group 8  
1.02mm, 25 group 9  
1.12mm, 0( 100) group 10  
1.202mm  
special liquid 가 100 group 6 가  
가  
10 group 가 가  
가  
가 special



silica

가 , , ,  
 가  
 가  
 가 special  
 liquid SiO<sub>2</sub> 30%  
 Denti-vest가 1.25%, CB-30 2.0%  
 가  
 CB-30 가  
 base metal alloy liquid ratio  
 special liquid : distilled water  
 80:20

special liquid 100 가  
 가  
 Denti-vest base metal alloy  
 special liquid 100  
 가 .( 1)  
 100 group 1, 6  
 가 가 0  
 distilled water 100 가 가 가  
 200 400  
 special liquid

colloidal silica  
 ( silica)  
 ring liner, hand spaltulation, ringless

liquid

data

liquid  
가

### V. 결론

Casting body die  
 가 special liquid 가  
 2  
 L/P ratio special liquid  
 5 group(100, 75, 50, 25, 0)  
 group 10 coping 10  
 group 100 coping 가  
 1. CB-30 special liquid 100  
 group 6 가 가  
 75, 50, 25, 0  
 가  
 2. Denti-vest special liquid 가  
 100 group 1 가 가  
 75, 50, 25, 0  
 3. 가 special liquid  
 ( , )

### 참고 문헌

1. 김주태, 치과주조학, 경영원, 69-71, 1986.

2. 김웅철, 치과재료학, 대학서림, 268-240, 1985.
3. 김경남 외 6인, 치과재료학, 군자출판사, 383, 1995.
4. 장완식, 금속소부도재학, 유림사, 94, 1982.
5. 한복섭, 치과주조용 합금의 주조시 매물재의 중요성 고찰, 군자출판사, 47-54, 1996.
6. 김은숙, 인산염 매물재 special liquid의 온도 변화에 따른 margin 적합도, 대한치과기공학회지 vol. 18, 1996.
7. 김사학, 석고계 및 인산염계 매물재의 liquid 온도에 따른 주조체 적합도에 관한 실증적 연구, 대한치과기공학회지 vol. 18, 1996.
8. 황경숙, 매물재의 혼수비가 치관보철물 변연의 적합성에 미치는 영향에 관한 연구, 대한치과기공학회지 vol. 18, 1996.
9. Asgar, K. Arfaei, A. H., 'Castability of crown and bridge alloy', J. Pro. Dent. 54 : 60, 1985.
10. Marsaw, F. A., de Rijk, W. G., Hesby, R. A., 외, 'Internal volumatic expansion of casting investments,' J. Prosthe. Dent. 52 : 361, 364, 365, 1984.
11. Jose, F. F., Santos, R. Y. Ballester 'Delayed "hygroscopic" expansion of gypsum products,' J. Prosthe. Dent. 52 : 366-370, 1984.
12. Dern, W. M., Hinman, R. W., Hesby, R. A., Pelleu, G. B., 'Effect of a two-step ringless investment technique on alloy castability,' J. Prothe. Dent. 53 : 874-875, 1985.
13. Lacy, Assad Mora. Issarawan Boonsiri 'Incidence of bubbles on samples cast in a phosphate-bonded investment,' J. Prothe. Dent. 54 : 367-369, 1985.
14. Phillips, R. W., 'Skinner's Science of Dental Materials,' eds, Philadelphia, 1982, W. B. Saunders Co., 393-411, 439-440.
15. Sass, F. A., Eames, W. B., 'Fit of unit cast fixed partial dentures related to casting ring size and shape,' J. Prosthet. Dent. 43 : 163, 1980.
16. Wenys, W., De Boever J. 'Radiographic assessment of the marginal fit of Cast restorations,' J Prosthet. Dent. 51 : 485, 1984.
17. Schiffler, B. Z., Ziebert, G. J., Dhuru, U. B., Brantley, W. A., and Khosrow Sigaroudi 'Comparison of accuracy of multiunit one-piece casting,' J Prosthet. Dent. 54 : 776, 1985.
18. Eden, G. T., Franklin, O. M., Prowell, J. M. Ohta, Y, and Dickson, G 'Fit of porcelain-fused-to-metal crown and bridge castings', J. Dent. Res 58 : 2360, 1979.
19. Hinman, R. W., Tesk, J. A., Parry, E. E., and Eden, G. T. 'Improving the casting accuracy of fixed partial dentures,' J. Prosthet. Dent. 53 : 469-470, 1985.
20. Jarvis, R. H., Jenkins, T. J., and Tedesco, L. A. 'A castability study of nonprecious ceramometal alloys,' J Prosthet. Dent. 51 : 493, 1984.
21. Barreto, M. T., Goldberg, A. J., Bitkin, D. A., Mumford, G. 'Effect of investment on casting high-fusion alloys,' J. Prosthet. Dent. 44 : 504, 1980.
22. Sawada, T. 'Onsetting mechanism and hygroscopic expansion of phosphate bonded investment mixed with colloidal silica solution'. J. D. M. A., 1974.
23. Kato, R., Shita, M., Nakamura, M., and Ariyoshi, T. 'Study on phosphate bonded investment (1)' Report. Insti. Med. Den. Eng. 10 : 45, 1986.
24. Neiman, R., and Sarma, A. C. 'Setting and thermal reaction of phosphate bonded investment' J. Dent. Res. 9 : 1478, 1980.