

# INLAY CASTING BODY의 DIMENSIONAL CHANGE에 대한 고찰

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## I. 서론

Inlay crown wax pattern 가 (Ehms model wax pattern) 2가 dimensional change 가

25 0.00035% ( $350 \times 10^{-6}$  per )가 wax inlay wax wax 가 wax inlay wax pattern inlay wax 가 0.35%가 1

## II. 본론

### A) Inlay wax

inlay wax paraffin wax, gum dammar, carnauba wax paraffin wax가 40~60% gum dammar paraffin wax

carnauba wax paraffin

20 가 inlay wax 0.7% 37 20

### B) 치과주조용 합금(dental casting gold alloys)

gold silver, copper, Pt, Pd, Zinc 75%

(corrosion) ( ) Ag Pt Pd Au (tarnish) ductility Cu

4가

| 종 류      | 강 도       | 사용도                | Au 함유량  | BHN    |
|----------|-----------|--------------------|---------|--------|
| type I   | soft      | simple (inlay) 용   | 83 % 이상 | 40~75  |
| type II  | medium    | crown 용            | 78 %    | 70~100 |
| type III | hard      | crown and bridge 용 | 78 %    | 90~140 |
| type IV  | extrahard | partial denture 용  | 75 %    | 130 이상 |

Casting Shrinkage 3가

가  
thermal contraction

contraction

contraction

1.25 ± 0.1%

<Linear thermal contraction of gold alloys and gold from their melting points>

| metal                     | 녹는 점에서 25°C (77°F)로 될 때의 선수축 |
|---------------------------|------------------------------|
| gold (100 %)              | 1.76 %                       |
| gold (90 %) silver (10 %) | 2.03 %                       |
| gold (90 %) copper (10 %) | 1.62 %                       |
| gold (90 %) nickel (10 %) | 1.91 %                       |

<Linear casting shrinkage of inlay casting gold alloys>

| metal          | casting shrinkage (%) |
|----------------|-----------------------|
| gold (100 %)   | 1.67                  |
| 22-carat alloy | 1.50                  |
| Type I         | 1.56                  |
| Type II        | 1.37                  |
| Type III       | 1.42                  |

### C) Gypsum investments for inlay products

hemihydrate of Gypsum  
Silica(SO<sub>2</sub>) molten metal  
shrinkage  
(setting expansion, thermal expansion, hygroscopic expansion)  
high heat casting technique setting expansion, thermal expansion 가

30  
34% thermal expansion w/p  
Ratio가 0.3 700 (1292 ) +0.89%

### D) impression materials

가 rubber impression material alginate

#### Rubber impression materials

Polysulfide Rubber impression materials  
average linear coefficient of thermal expansion

150 ± 10<sup>-6</sup>/ (0.00015)

Silicone Rubber impression materials average linear coefficient of thermal expansion

200 ± 10<sup>-6</sup>/ (0.00020)

37 20  
-0.26% (polysulfide), -0.34% (silicone)  
shrinkage가

rubber

#### Irreversible hydrocolloid impression materials

potassium alginate 12%, calcium sulfate 12%, diatomaceous earth 70%, trisodium phosphate 2% 가  
0.6%

80 0.1%  
10  
0.01 ~ 0.05%  
alginate material

**E) Dental stone**

dental stone class  
class class stone class  
stone  
class stone mixing 가 class  
w/p ratio mix class  
stone가  
high consistency stone class  
stone low consistency stones  
class stone class stone  
hygroscopic expansion

| material   | w / p ratio | setting time (분) | setting normal (%) | expansion hygroscopic (%) |
|------------|-------------|------------------|--------------------|---------------------------|
| A          | 0.30        | 5.5              | 0.16               | 0.27                      |
| Class I. B | 0.30        | 7.0              | 0.09               | 0.19                      |
| C          | 0.28        | 8.0              | 0.18               | 0.27                      |
| D          | 0.23        | 6.5              | 0.08               | 0.13                      |
| Class II E | 0.24        | 5.5              | 0.09               | 0.15                      |
| F          | 0.24        | 7.0              | 0.10               | 0.14                      |
| G          | 0.24        | 6.5              | 0.09               | 0.13                      |
| H          | 0.23        | 7.5              | 0.08               | 0.16                      |

dental stone w/p가 0.30  
0.27% .( 가 dental stone)

F) 상기 치과재료를 사용함으로써 오는 Dimensional change을 직접법과 간접법으로 나누어서 고찰하여 보면 다음과 같다.

**Direct method**

a) Wax Pattern taking dimensional

change -0.48%( 0.48% .)

b) setting expansion : 30 +0.34%  
thermal expansion : w/p Ratio 0.30  
700 +0.89%

c) casting gold alloys (casting shrinkage) ;  
-1.25 ± 0.1% 3가

$$( ) = (-0.48) + (0.34) + (0.89) + (-1.25 \pm 0.1) = -0.50 \pm 0.1\%$$

**Indirect method**

a) Alginate impression material dimensional change +0.02%

b) stone for the model +0.27%(w/p=0.30 )

c) wax pattern taking -0.48%

d) Investment setting expansion : 30 +0.34%  
thermal expansion : w/p ratio 0.30  
700 +0.89%

e) casting gold alloys(casting shrinkage); -1.25 ± 0.1% 5가

$$( ) = (0.02) + (0.27) + (-0.48) + (0.34) + (0.89) + (-1.25 \pm 0.1\%) = -0.20 \pm 0.1\%$$

**III. 결 론**

dimensional change가

Inlay wax

## 참고 문헌

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