

# Estudios científicos – ALGINATOS CAVEX

## IMPRESSED BY IMPRESSION MATERIAL

During the 16th biennial European Dental Materials Conference held the 6th September 2001 at the University of Glasgow we presented the test results on Cavex ColorChange by means of a poster.

During the development of Cavex ColorChange many tests were performed in the Cavex R&D laboratory. To substantially found the Cavex statement that Cavex ColorChange has a dimensional stability of 5 days it was essential to check our results by an objective institute like the University of Amsterdam (ACTA). Therefore, the poster is the result of the combined efforts of the University of Amsterdam (ACTA) and Cavex Holland BV. For details we refer to the attached abstract.

## Clinical Relevance:

Thanks to the new formulation of the Cavex ColorChange alginate, the reaction mechanism is in balance, which guarantees a complete hardening reaction, and as a consequence a dimensional stability of at least 5 days. This means that you can store an impression of Cavex ColorChange for at least 5 days, without shrinkage. So more time for pouring out or enough time to pour out twice. Whatever suits the dentist or the dental laboratory technician best.

5 days dimensional stability: more time for pouring out, less risk of mistakes

## ABSTRACT

Evaluation of the Dimensional Stability of some Impression Materials.

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## Introduction:

The accuracy of a gypsum cast is of main importance for creating high quality prosthetic restorations. Most impression materials undergo a shrinkage during setting while the gypsum casting materials expand during setting. Therefore the precision of the cast depends mainly on the moment of pouring the impression after its setting and on the compatibility of the impression material with the gypsum used. In general, the shorter this period, the higher the accuracy. For this reason the time span involved with sending an impression to the dental laboratory makes it hardly possible to use (ir-) reversible hydrocolloid impression materials for prosthetic procedures without pouring the impression in the dental surgery. Recently, some alginate-based impression



materials came onto the market with the potential of having a dimensional stability good enough to make high precision casts on a delayed time.

#### Aim:

The aim of this study was to compare the dimensional stability of these new hydrocolloid based impression materials with silicone based impression materials (addition- and condensation- type) and to evaluate the influence of the type of gypsum used on the accuracy of the cast.

#### Materials and methods:

Eighteen impression materials were tested and combined with natural or synthetic gypsum. Impressions were made (n=3) of a copper bar on which two engravings were cut at a distance of 50 mm. Directly after setting of the impression the distance between the marks was measured on the impression material using a light measuring microscope, where after the impression was poured in gypsum (Moldano blue, Heraeus Kulzer, or Moldasynt pink, Heraeus Kulzer). The gypsum casts were made directly after the first measurement of the impression, after 1 hour, 24 hours and 5 days respectively. Also the distance between the marks was measured on the gypsum casts.

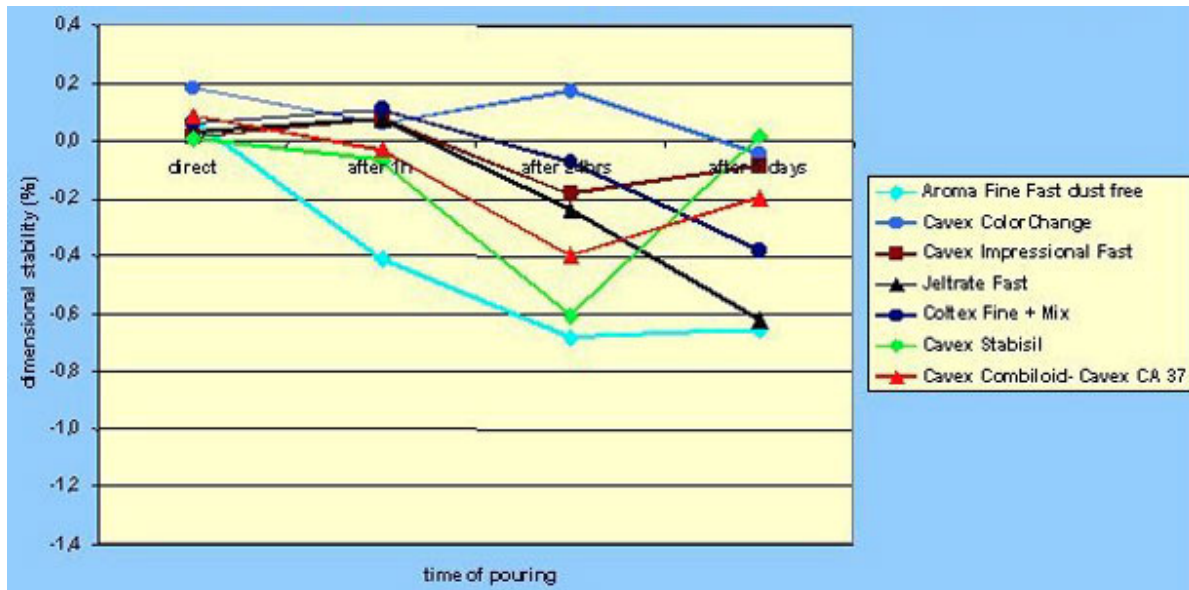
#### Results:

The directly poured and 1 hr casts of Moldano blue (results) were significantly more accurate compared to Moldasynt pink (results). The dimensional stability of the new alginates, when stored under proper conditions, is comparable to addition silicone impression materials.

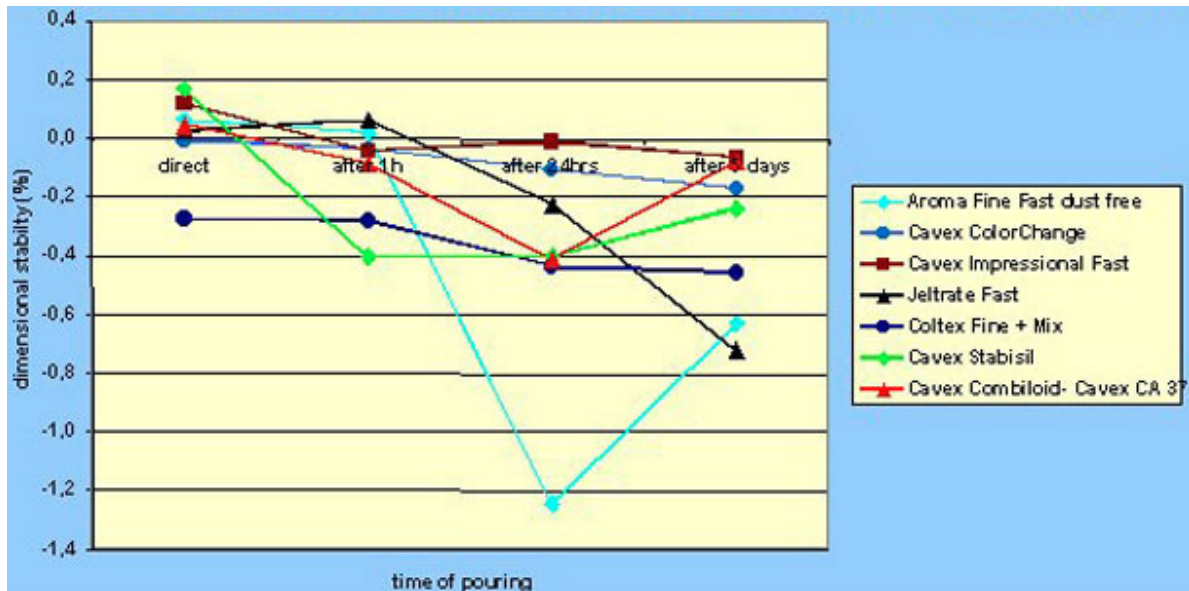
#### Conclusions:

- 1) The dimensional stability of Cavex ColorChange is comparable to addition silicone impression materials.
- 2) The influence of the compatibility with gypsum is generally underestimated.

## Dimensional Stability of different Impression Materials with Moldano Blue



## Dimensional Stability of different Impression Materials with Moldasynth Pink



## Double-poured Alginate Impression Material

Our alginate's user instructions state that an impression could be cast twice. To cast an impression twice the impression material must remain sufficiently strong and elastic for the cast to be removed without damaging the impression. Because the cast offers little grip a certain amount of tugging is often needed to remove the cast from the impression. During removal there is a risk of damaging and/or distorting the impression. The second cast should not differ significantly from the first regarding plaster surface and dimensions.

In order to examine the change in characteristics over time the physical characteristics of Cavex CA37SP and Cavex Impressional Fast were assessed in accordance with ISO 1563. Two casts were made: one after several minutes after curing and another after 1 hour's storage at 100% relative humidity. Impressions were made using a metal mould. Casts were made of Moldano (class III) and Moldastone (class IV).

All casts were evaluated for detail reproduction and surface quality. Distortion of the impressions was also examined by measuring the lengths of the diagonals of both the first as well as the second cast.

After one hour characteristics of the alginate did not differ significantly from those immediately after curing. After one hour the impression had gotten slightly bigger in strength and a little tougher. Recovery, the ability to get back into shape, had gotten somewhat better as well. It seems reasonable to conclude that an impression could be cast twice as long as the first cast is removed from the impression with some skill.

Exact measurement revealed all casts to be larger than its original (approx. 0.1%). The second cast was always slightly larger than the first (approx. 0.1 % larger in comparison with the 1st cast). This was presumably due to a combination of factors: shrinkage of the alginate, expansion of the gypsum and distortion of the impression when removing the first model. These discrepancies are of a very acceptable level in all cases. In comparison, C silicones shrink by 0.6 - 0.8 %.

### Conclusion

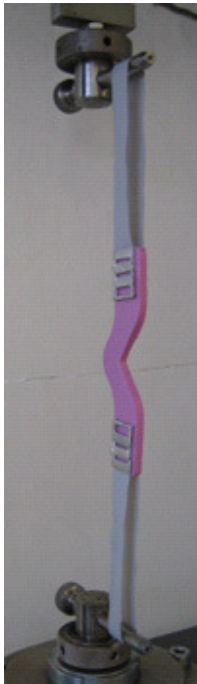
In general impressions taken with Cavex CA37 and Cavex Impressional could be cast twice. Quality of the second cast is in no way inferior to the first. However, it is advisable to remove the first cast very carefully from the impression and it is wise to make sure the impression does not dry out. Removal of casts should be done by an experienced person to avoid any breakage or distortion.

### Literature:

Oper Dent 1998 Mar-Apr;23(3):128-31 Using double-poured alginate impressions to fabricate bleaching trays. Haywood VB, Powe A Medical College of Georgia, School of Dentistry, Department of Oral Rehabilitation, Augusta 30912-1260, USA.

## Cavex Alginates proven to have best tear strength in new ISO1563 test

In dental/orthodontic practices it is very important to have an alginate impression material, which is sufficiently strong and elastic to be removed from the patients mouth without getting damaged. When removing the impression tray from the mouth a certain amount of tugging is often needed. This tugging can cause ruptures and distortions in the impression.



The International Standard Organisation (ISO) provides manufacturers of alginate impression materials product specifications to test and control the quality properties of their alginates. Current ISO1563:1990 for Dental Alginate Impression Materials is the most relevant and widespread used product specification. This test gives a good indication of the strength of the material in general, but it does not give any information about its tear strength.

In the revision of the ISO1563 for Dental Alginate Impression Material, which probably will be validated at the end of 2005, a new test will be added. This new test enables manufacturers to determine tear strength of their alginates. Cavex is represented in ISO and helped developing this new test.

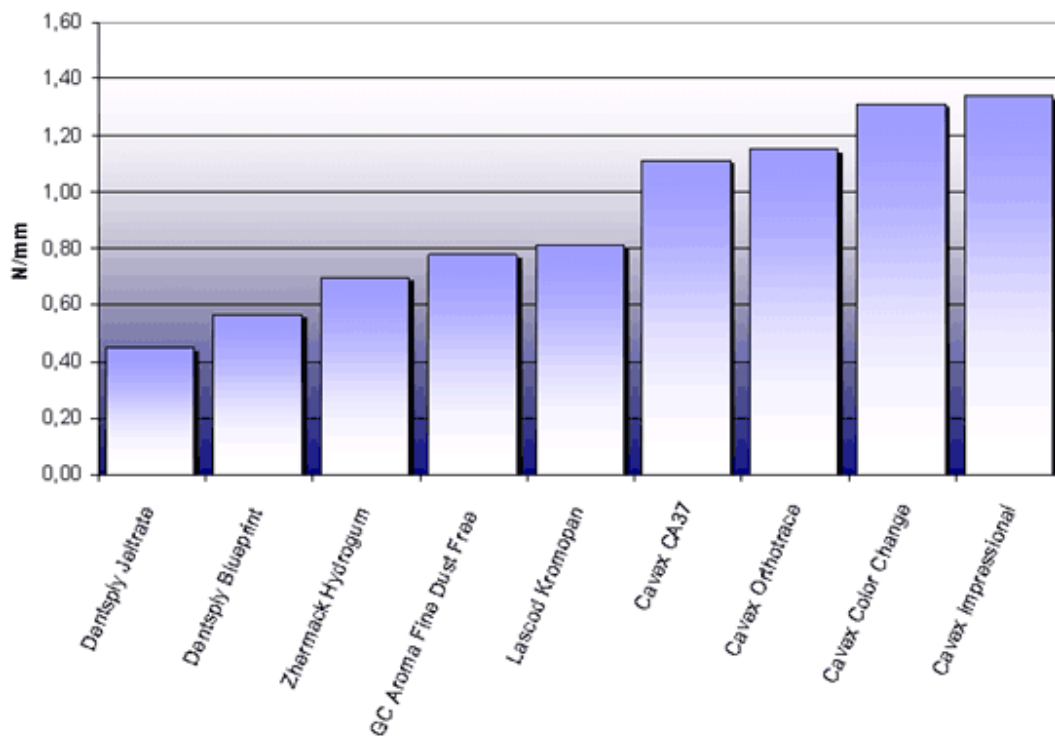
For this test a flat V-shaped mould is filled with a mixture of the alginate impression material. The filled mould is placed into a water bath 35°C ( $\pm 1$  °C) and remains there as long as specified by the manufacturer for leaving the impression in the mouth.

Immediately after removal from the water bath the sample is placed in the grips of a tensile strength device and force is applied at a speed of 500 mm/min until rupture of the sample (picture 2)

In the Cavex laboratory Research & Development for Quality Control this test was performed for all types of Cavex alginates and many competitor brands. The results were very positive. Cavex Alginates exhibit significant higher tear strength compared to the tested competitor brands.

## Alginate Impression Material

Tear strength according to ISO 1563 (draft)



Given the results above we can clearly state that Cavex alginate impression materials are stronger and more resistant to forces applied during impression taking and pouring with gypsum. Cavex alginate impression materials offer users the most reliable impressions and most predictable results.

A high tear strength gives better results when double-pouring impressions. To cast an impression twice the impression material must remain sufficiently strong and elastic for the cast to be removed without damaging the impression. During removal there is a risk of damaging and/or distorting the impression. Cavex alginates have proven themselves to be the best choice.

## How to disinfect dental impressions

Based on studies in our own laboratory and a growing number of publications in various dental journals, a short-term immersion during 10–15 minutes in a suitable water based disinfecting solution, is an effective and clinically acceptable way of infection control in the surgery and the dental laboratory for impressions made of:

- Cavex CA37, Cavex Impressional, Cavex ColorChange and Tulip Alginate
- Cavex Outline
- Combined alginate / Cavex Combiloid impressions

The correct procedure is as follows:

1. Follow the general hygienic guidelines.
  2. Rinse the impression, after removal from the patient's mouth, gently with tapwater.
  3. Immerse the total impression plus tray, including the grip, for 10 minutes in a suitable water based disinfecting solution, prepared according to the manufacturers instructions.
  4. Rinse the impression gently with tapwater.
  5. Remove the excess water from the impression.
  6. Pour the impression immediately with gypsum. This gives the best results for alginate impressions and combined alginate/Cavex Combiloid impressions.
- Store the impression for transport in an atmosphere of 100% R.H. (e.g. in a closed plastic bag, do not add extra water)  
This is a necessity for alginate impressions and combined alginate/Cavex Combiloid impressions when not poured immediately.  
Note: Combined alginate/Cavex Combiloid impressions can be stored for a maximum of 3 hours this way.
  - Treat the impressions in the usual way for Cavex Outline.  
This procedure will guarantee:
    - no significant dimensional change
    - no significant effect on detail reproduction
    - no significant effect on surface-smoothness of the gypsum cast
    - in some cases even a slightly increased gypsum surface hardness
  - In most studies, including one carried out in our own laboratory, sodium hypochlorite solutions (in concentrations ranging from 0.5 - 2%) or glutaraldehyde solutions (concentration 0.13 - 2%) were used. Although the main purpose of all studies was the effect of immersion on the dimensional stability of the impression and the quality of the gypsum surface, it is suggested many times that the solutions mentioned would be effective in terms of infection control.
  - Do not use water based glutaraldehyde solutions with a pH of 8 or higher for since this might affect the gypsum surface.

Conclusion:

A 10 minutes disinfection of an Alginate impression in a fresh prepared 1% hypochlorite solution is a clinically acceptable procedure.

(1 part Sodium hypochlorite, containing 4 gram Chlorine /100 ml + 3 parts demi-water)

LITERATURE

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PAGE VIEW COMPLIMENTS OF: Cavex Holland BV

## Cavex ColorChange

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[www.practicon.com/cavex](http://www.practicon.com/cavex)



### Consultants' Comments

- “The self-measuring water dispenser is unique, accurate and very nice.”
- “Very few bubbles.”
- “It doesn't seem to inadvertently flow down the throat.”

### Description

**Cavex ColorChange** is an all-purpose alginate featuring a three-step color shift from the start of mix to placement to completed set. The product is appropriate for all traditional alginate impression uses. **Cavex ColorChange** is dust-free and may be mixed by hand or in an auto-mixer. Distilled water is recommended to standardize the color shifts and setting time. With a 30-second hand-mix, the total setting time is approximately 2 minutes 15 seconds (1 minute in the mouth). The manufacturer states that multiple pours of impressions may be made, and if placed in an airtight plastic bag, pouring of gypsum may be delayed up to five days without sacrificing accuracy or detail. The starter kit includes three, 500-g bags of alginate powder; scoop; storage canister; water measure; bowl; spatula; and cleaner. Single-dose packs are available. **Cavex ColorChange** was used in over 300 applications by 27 consultants. This product received a 96% clinical rating.

### Suggested Retail Cost

- \$46.99/starter kit

- \$11.99/refill bag

## Product Features

The viscosity and smoothness of the mix, ease of loading trays, firmness of the set material, lack of bubbles, and model quality were ranked highly. The powder and water combined readily with hand mixing and produced a smoothly-textured gel. The color change feature was new to some clinicians and received favorable comments. The powder canister holds one bag of alginate with a place inside the lid to store the scoop. The canister has a tight seal to prevent moisture contamination of the powder. Eighty-two percent of reporting clinical consultants found **Cavex ColorChange** to be equal to or better than their current alginate, 71% would switch, and 76% would recommend **Cavex ColorChange** to colleagues.

## Clinical Tips

- For patients with a strong gag reflex, sprinkle a bit more powder into the mix to make it more viscous.
- Giving some material to the patient to watch the color change provides some distraction.

**More About:** [Cavex Holland B.V., Alginate](#)