



# “THE ATOMIZATION OF ALGINATE AS AN ALTERNATIVE PROCEDURAL METHOD OF APPLICATION FOR CASTING.”

SMITH, G.D.

EASTERN MICHIGAN UNIVERSITY ORTHOTICS & PROSTHETICS MASTERS PROGRAM

## INTRODUCTION

Development of an alternative procedural method for alginate casting by using an automotive grade gravity-fed conventional spray gun for capturing accurate and detailed impressions. This method is achieved through spraying alginate directly onto the skin in layers. The development of the procedural application leads to a method of casting which uses the material more efficiently while not compromising detail. This method is ideal for use in the development of cosmetic prosthetics, development of residual limb teaching aids for the field of prosthetics education, and further exploration and economic use of alginate casting material.

## METHOD

The application of alginate in a propellant aerosol form requires the use of Alga-Safe<sup>®</sup> Breeze which is a liquid form of alginate typically mixed 1 part alginate to 5 parts distilled water heated to 80.0°F/27.0°C for traditional pouring application. For applying with a gravity-fed conventional spray gun the ratio and temperature of the alginate must be altered to 1 part alginate to 5.5 parts distilled water heated to 77.5°F/25.3°C increasing the workable pot-life of the material and lengthening the cure time of the material once applied. A compressor and a conventional spray gun are necessary for the application. The regulated PSI of the compressor must be set to the range of 30-35 PSI prior to spraying the alginate. The 5.5 parts distilled water is heated to 77.5°F/25.3°C and poured into the pot of the spray gun, the 1 part Alga-Safe<sup>®</sup> Breeze alginate (measured prior) is gently and continuously poured into the pot while stirring the distilled water/alginate mixture continuously for 30-40 seconds or until completely incorporated, but not more than 2 minutes. The application of alginate is sprayed 4-6 inches from the surface of the prepared skin while making continuous back and forth passes to gradually build up the material on the surface. The pot-life of the material is increased to 20 minutes providing adequate time to cover the desired area. Once completely covered, cotton is imbedded into the material by gently pressing the cotton into the external shell of the alginate cast. Then the curing cast is wrapped in fiberglass gauze while still on the skin providing stability to the cast and preventing distortions when the cast is removed and back-filled later with wax, urethane, or plaster.

## RESULTS

The impressions captured illustrate great detail (cleavage-lines, pores, scars, and flesh nuances) without material distortions, air bubbles, or other material defects resulting in poor impression cast.

## DISCUSSION

Due to the novel nature of this application method, I have yet to come across any current research attempting to atomized alginate allowing for it to be applied in the propellant aerosol method, which this abstract is built upon. Continued exploration of this method will be developing the rigidity of the mother cast (fiberglass gauze) around the sub cast (alginate) so that the encompassing shape does not become distorted or ruined when removed from the original form and resulting in a discard cast.

## CONCLUSION

The goal of this new application of alginate is to increase the impression detail of large surface areas while using only the necessary material needed for capture and to create an alternative method for alginate casting.

## CLINICAL APPLICATIONS

The procedural development of alginate as a propellant aerosol would allow for Prosthetists to capture unique anomalies in great detail for development of socket suspension systems, cosmetic prosthetics, and lead to the development of teaching models for Residency students, while conserving materials within their practice.

## REFERENCES

No known references at this time to report upon, all information has been acquired through experimentation of alginate materials and previous casting knowledge.

American Academy of Orthotists & Prosthetists  
**41st Academy Annual Meeting &  
Scientific Symposium**  
February 18 - 21, 2015