

Dimensional changes of three addition silicones after autoclaving



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INTRODUCTION

A successful rehabilitation depends on many factors such as dimensional stability, detail reproduction of impressions and models (Hamalian et al., 2011). Taking impressions is one of the crucial steps when it comes to oral rehabilitation. Impression quality determines the optimal adjustment of the restoration (Rupp et al., 2005; Balkenhol et al., 2010).

The aim of the impression material is to obtain a replica of the hard and soft tissues of the oral cavity in three dimensions and has to be dimensionally stable (Craig e Powers, 2002; Hamalian et al., 2011).

Nowadays, elastomers are considered the standard of care for the material for definitive impressions in fixed prosthodontics (Lee, 1999). Within the family of elastomers, we can find polysulfides, condensation silicones, addition silicones and polyethers (Noort, 2007). The addition silicones and polyethers tend to be used most frequently due to their physical and mechanical properties (Lee, 1999; Hamalian et al., 2011).

Disinfection procedures weren't used until the twentieth century. Impressions are contaminated by plaque, blood or saliva, creating a vehicle of cross-infection for a variety of pathogens, such as HIV, Hepatitis B, herpes and tuberculosis. Therefore it is necessary to control cross infection in clinical practice (Drennon e Johnson, 1990; Martin et al., 2007; Thomas et al., 2008; Rentzia et al., 2011).

The ADA Specification nº19 (1977) states that the maximum negative change in dimension 0,5% and the ISO 4823:2000 has a maximum of 1,5%.

OBJECTIVES

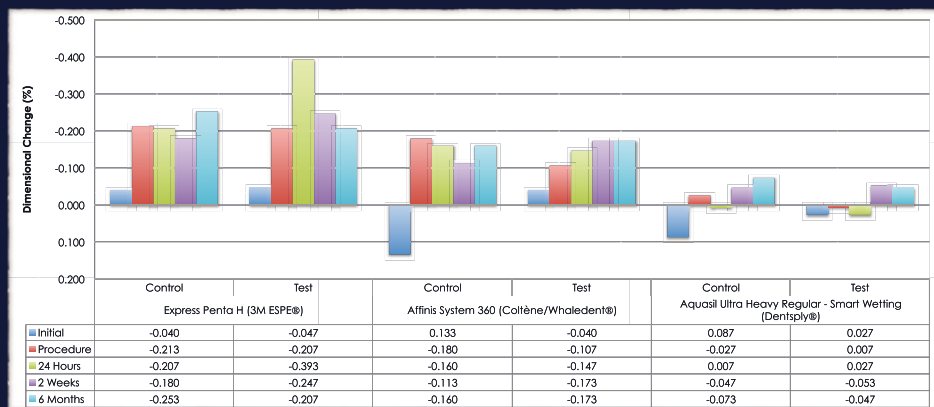
Study the dimensional stability of three addition silicones after steam autoclave sterilisation.

HYPOTHESES

When subjected to autoclaving, the addition silicones suffer dimensional changes.

When subjected to autoclaving, the addition silicones don't suffer dimensional changes.

RESULTS



Express Penta H (3M ESPE™) → Lowest dimensional stability
 Aquasil Ultra Heavy Regular – Smart Wetting® (Dentsply®) → Highest dimensional stability

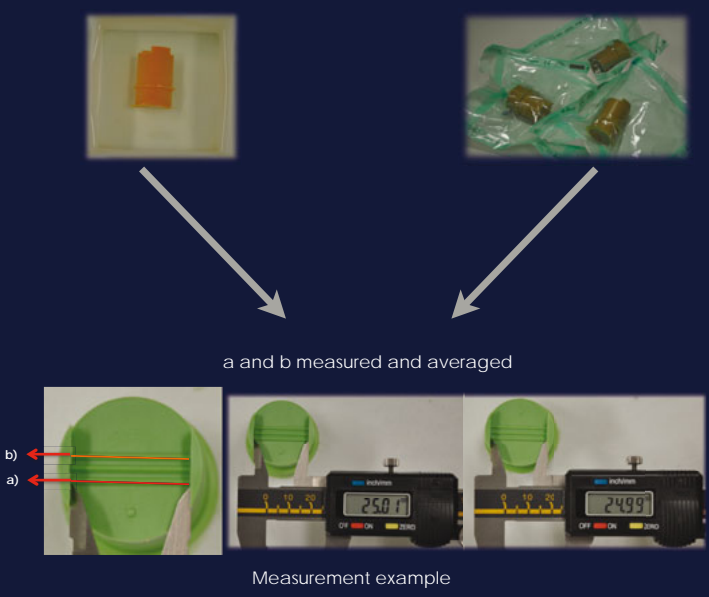
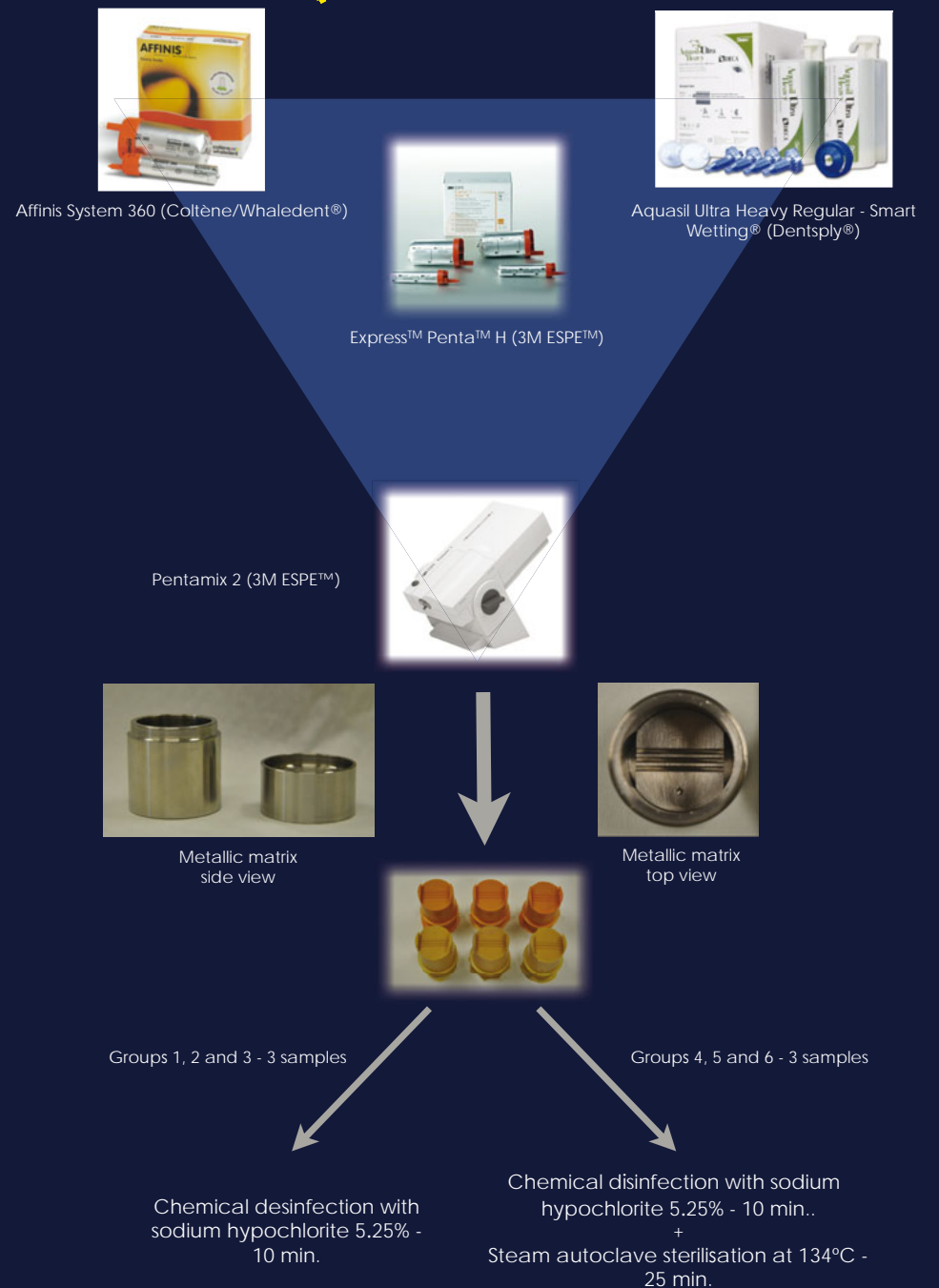
CONCLUSIONS

The null hypothesis is rejected.

The impression materials show dimensional changes after autoclaving.

The dimensional changes are below the maximum allowed by ADA Specification nº19 (1977) and ISO 4823:2000, therefore, steam autoclave sterilisation should be considered a valuable disinfection procedure.

MATERIALS AND METHODS



References

ADA Specification nº19 (1977) for non-aqueous, elastomeric dental impression material.
 Balkenhol, M.; Haunschild, S.; Erbe, C. e Wostmann, B. (2010) "Influence of prolonged set ring time on permanent deformation of elastomeric impression materials". *J Prosthet Dent.*, 103(5), pp. 288-294.
 Craig, R. G.; Powers, J. M. (2002) "Impression Materials - Chapter 12" In *Restorative Dental Materials*, 11a edição, pp. 329-390, Mosby, Texas.
 Drennon, G. e Johnson, G. H. (1990) "The effect of immersion disinfection of elastomeric impressions on the surface detail reproduction of improved gypsum casts". *J Prosthet Dent.*, 63(2), pp. 233-241.
 EN ISO 4823:2000 - Dentistry: Elastomeric impression materials, European Committee for Standardization.
 Hamalian, T. A.; Nasr, E. e Chidiac, J. J. (2011) "Impression materials in fixed prosthodontics: influence of choice on clinical procedure". *J Prosthodont.*, 20(2), pp. 153-160.
 Lee, E. A. (1999) "Predictable Elastomeric Impressions in Advanced Fixed Prosthodontics: A Comprehensive Review". *Pract Periodontics Aesthet Dent.*, 11(4), pp. 497-504.
 Martin, N.; Martin, M. V. e Jedynakiewicz, N. M. (2007) "The dimensional stability of dental impression materials following immersion in disinfecting solutions". *Dent Mater.*, 3, pp. 760-768.
 Noort, R. V. (2007) "Clinical Dental Materials" In *Introduction to Dental Materials*, 3a edição, Elsevier Limited, Reino Unido.
 Rentzia, A.; Coleman, D. C.; O'Donnell, M. J.; Dowling, A. H.; O'Sullivan, M. (2011) "Disinfection procedures: Their efficacy and effect on dimensional accuracy and surface quality of an irreversible hydrocolloid impression material". *Journal of Dentistry*, 38, pp. 133-140.
 Rupp, F.; Axmann, D.; Jacobi, A.; Groten, M.; Geis-Gerstorfer, J. (2005) "Hydrophilicity of elastomeric non-aqueous impression materials during setting". *Dental Materials*, 21, pp. 94-102.
 Thomas, M.V.; Jarboe, G. e Frazer, R.O. (2008) "Infection control in the dental office". *Dent Clin North Am*, 52(3), pp. 609-28.