

ABSTRACT FINAL ID: 2423**TITLE:** Quality of Gypsum Casts Comparing One-Stage and Two-Stage Pour Methods**AUTHORS (FIRST NAME INITIAL LAST NAME):** C. Petersen¹, P. Hansen¹**AUTHORS/INSTITUTIONS:** C. Petersen, P. Hansen, University of Nebraska Medical Center College of Dentistry, Lincoln, Nebraska, UNITED STATES;**Group Author Abstracts:****ABSTRACT BODY:**

Objectives: Clinical techniques described in dental textbooks often are derived empirically or are a result of a clinician's experiences. Since the methodology is not based on rigorous scientific method, the techniques lack adequate scientific evidence. The goal of this study is to compare the one-stage pour method to the two-stage/instant inversion method of gypsum cast fabrication to determine if differences are produced in three key physical properties: detail reproduction, surface roughness, and surface porosity.

Methods: Custom trays were fabricated using Triad to take 20 Cavex alginate impressions of ANSI/ADA spec. 18 die, ten for each experimental group. Silky Rock was vacuumixed and vibrated into impression, with only the one-stage pour being instantly inverted. Casts set for 30 minutes, removed, set overnight, and randomized. Detail Reproduction measurements were scored as rank 1-4 based on reproduction of 75 μ m & 50 μ m lines as seen under a stereographic microscope (5x & 10x). Entire die surface examined and porosities counted. Continued with surface roughness measurements via Mitutoyo profilometer, 3 runs per sample yielding Ra values (μ m).

Results: See Tables 1-3

Conclusions: One-stage pour method shows significantly better detail reproduction of the 50 μ m line of the ANSI/ADA spec. 18 die ($p=.0272$) as well as a less rough surface than the instant inversion casts ($p=.0061$). No significant difference with regards to 75 μ m line or porosity.

TABLE TITLE:Detail Reproduction 75 μ m & 50 μ m lines (Wilcoxon Rank-Sum test)

Porosity (Two-Tailed t-test)

Superficial Roughness (Two-Tailed t-test)

Detail Reproduction 75 μ m & 50 μ m lines (Wilcoxon Rank-Sum test)

	Mean (75 μ m)	Std (75 μ m)	P Value (75 μ m)	Mean (50 μ m)	Std (50 μ m)	P Value (50 μ m)
Two-Stage (Inverted)	1.9	.568		2.3	.675	
One-Stage	1.5	.707	.0655	1.6	.843	.0272

Porosity (Two-Tailed t-test)

	Mean	Standard Deviation	P value
Two-Stage (Inverted)	3.1	2.998	
One-Stage	1.8	1.687	.1238

Superficial Roughness (Two-Tailed t-test)

	Mean	Standard Deviation	P value
Two-Stage (Inverted)	1.567	.3840	
One-Stage	1.326	.3342	.0061

TABLE FOOTER:

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KEYWORDS: Gypsum, Alginate, surface roughness, porosity, accuracy.

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