

# SS-175 Translucency of CAD/CAM Ceramics: Effect of Thickness, Cement Shade, and Background Color

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**OBJECTIVES:** To evaluate the effect of different resin cement shades and background colors on the translucency parameter (TP) of dental ceramics with different thicknesses.

**MATERIALS-METHODS:** Rectangular specimens (n = 12 per group) with three thicknesses (0.8 mm, 1.0 mm, and 1.2 mm ± 0.01 mm) were prepared from lithium disilicate (IPS EMAX CAD), zirconia-reinforced lithium silicate (CeltraDuo), and leucite-reinforced glass ceramic (VITA Suprinity). Three cement shades (opaque, translucent, and A1) were tested on two composite backgrounds (A1 and A3). Cementation was simulated using a glycerin gel (refractive index = 1.52) to ensure consistent optical contact. Translucency values were measured via spectrophotometry using the CIE Lab\* system on both white and black backgrounds. Statistical analyses included Shapiro-Wilk and Kolmogorov-Smirnov tests for normality, one-way ANOVA, Tukey HSD *post hoc* testing, and both paired and one-sample t-tests ( $\alpha = 0.05$ ).

**RESULTS:** All groups showed significant translucency differences by thickness ( $p < 0.001$ ). ANOVA revealed that

cement shade and background color significantly affected TP in several groups, particularly EMAX 1 mm on A3 ( $p < 0.001$ ), VITA Suprinity 1 mm on A1/A3 ( $p < 0.05$ ), and CeltraDuo 1 mm on A3 ( $p = 0.012$ ). Translucent cement consistently yielded higher TP values than A1 and opaque shades ( $p < 0.001$ ). Paired-sample t-tests showed TP values were significantly lower over A3 backgrounds, especially in the EMAX group ( $p < 0.003$  for all thicknesses). One-sample t-tests confirmed statistically measurable TP in all groups ( $p < 0.001$ ), with the highest mean in EMAX 0.8 mm on A3 (1.0728).

**CONCLUSIONS:** Both resin cement shade and background color play a significant role in the final translucency of ceramic restorations. Translucent resin cement used over lighter backgrounds yields more favorable optical properties, particularly in high-translucency ceramic systems.

**Keywords:** Translucency, resin cement, CAD/CAM ceramics, lithium disilicate

# SS-176 In Vitro Evaluation of Methyl Methacrylate (MMA) Release from Different Temporary Denture Base Materials

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**INTRODUCTION:** Residual methyl methacrylate (MMA) released from temporary denture base materials is of clinical concern due to its potential biological effects. Recently, light-polymerized and 3D-printed denture base resins have emerged as alternatives to conventional cold-polymerized acrylics. This study aimed to compare the in vitro MMA release levels of three clinically relevant temporary denture base materials.

**MATERIALS AND METHODS:** Three materials were tested: cold-polymerized acrylic resin, light-polymerized baseplate resin, and 3D-printed denture base resin. Ten samples were prepared for each group (n=10), standardized to 0.05 g per specimen. Samples were immersed in 2 mL and 5 mL of artificial saliva and incubated at 37°C. MMA release was quantified using high-performance liquid chromatography (HPLC) at 15 minutes, 30 minutes, 1 hour, and 24 hours. Data distribution was analyzed with the Shapiro-Wilk test; the effects of time, material, and saliva volume were assessed using two-way ANOVA and Tukey post-hoc tests ( $p < 0.05$ ).

**RESULTS:** No MMA release was detected before 24 hours in the 3D-printed and light-polymerized groups. The cold-polymerized acrylic group showed progressive MMA release starting from 15 minutes, with a significant increase over time ( $p < 0.001$ ). At 24 hours, it exhibited the highest MMA levels among all groups. A significant difference between 2 mL and 5 mL saliva volumes was observed only in the cold-cure group. The 3D-printed resin showed the most stable performance across all time points.

**CONCLUSION:** Temporary denture base materials should be selected with consideration of residual monomer release. The results support the biocompatibility of 3D-printed resins for short-term clinical applications, especially when early MMA release and toxicity are of concern.

**Keywords:** 3D-printed resin, Methyl methacrylate, Temporary denture base, Cold-polymerized acrylic, Light-polymerized baseplate, HPLC