

**J Dent Res 81(Spec iss A) 2002 Dental Materials A-170
1217**

**Suitability of Sapphire as a complete denture impression material.
J.Astroth, J.Kim and JW Stansbury, University of Colorado Health
Sciences Center, USA**

Objectives: Sapphire (SAPP; Bosworth), an ethyl/isobutyl methacrylate resin, is marketed as a complete denture impression material. No published data exist which compare the suitability of SAPP with commonly used elastomeric impression materials. Methods: This study compared selected physical properties of SAPP with Permlastic® (Kerr); CutterSil Mucosa®(Heraeus-Kulzer); Supersil™(Bosworth), and Impregum®(ESPE). According to American Dental Association standards, samples were tested for accuracy, dimensional stability with and without disinfection (iodine solution), and resolution. Data were analyzed by one-way ANOVA and Tukey correlation analysis. Results: 1) all samples demonstrated good initial linear dimensional accuracy (range 0.989-0.997) with no significant differences found between samples, 2) no differences were observed between samples for stability without disinfection at 2 min and 24h, 3) SAPP samples of 2.5 powder to liquid by volume demonstrated significantly less ($p<0.05$) post-disinfection dimensional stability than other samples at 10 min, 1h, and 24h intervals, 4) SAPP samples of 2.0 powder to liquid by volume showed no significant differences in post-disinfection dimensional stability compared with the elastomeric impression materials, 5) no differences were found in detail reproduction between samples. Conclusions: These data demonstrate acceptable accuracy, stability, and replication of detail for SAPP material and appear to support the suitability of its use as a complete denture impression material. Supported by a grant from Harry J. Bosworth Company.

J Dent Res 81 (Spec Iss A) 2002 Dental Materials A-335
2671 Effect of an inert filler on physical properties of ethyl/isobutyl methacrylate. J.Kim, J.Astroth, and J.W.Stansbury, University of Colorado Health Sciences Center, USA.

Objectives: No published data exist to explain the effect on physical properties of an inert, inorganic filler added to auto-polymerizing ethyl/Isobutyl methacrylate resin. This study compared selected physical properties of commonly used auto-polymerizing resins to determine the effect of an amorphous silicon dioxide (SiO₂) filler. Methods: According to American Dental Association standards, samples of Sapphire®(SAPP; a SiO₂/prepolymer filled resin) (Bosworth) as well as Trim® (Bosworth), SNAP® (parkell), and Jet® (Lang) (as examples of prepolymer only filled resins) were subjected to selected testing. Data were analyzed by one-way ANOVA and Tukey correlation analysis . Results: 1) SAPP demonstrated significantly ($p<0.05$) lower exotherms (32.7-35.4 °C depending on powder/liquid ratio) on polymerization than other samples (41.8 – 48.5°C), 2) SAPP showed significantly greater room temperature working (12.5 min) and setting (14.7 min) times ($p<0.05$) compared with the other materials (6.2- 8.3 min and 7.0-9.1 min, respectively); 3) linear polymerization shrinkage (range 0.12-0.40%) and detail reproduction were not significantly different between all samples, 4) no significant differences in water sorption were noted at the 1 and 4h testing intervals with modest differences ($p<0.05$) emerged after 8h water storage; 5) SAPP demonstrated slightly greater ($p<0.05$) water solubility (sample range 0.2-0.3 mass%). Conclusions: These data demonstrate that the addition of an inert filler to ethyl/isobutyl methacrylate resin can potentially enhance biocompatibility by minimizing the heat evolved during the setting reaction and offer extended handling properties that may be clinically useful. Supported by a grant from Harry J. Bosworth Company.