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# Improved orthodontic bonding to silver amalgam. Part 2. Lathe-cut, admixed, and spherical amalgams with different intermediate resins

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**ABSTRACT**

Flat rectangular tabs (n=270) prepared from spherical (Tytin), admixed (Dispersalloy) or lathe-cut amalgam (ANA 2000) were subjected to aluminum oxide sandblasting with either 50-µ or 90-µ abrasive powder. Mandibular incisor edgewise brackets were bonded to these tabs. An intermediate resin was used, either All-Bond 2 Primers A + B or a 4-META product—Amalgambond Plus (AP) or Reliance Metal Primer (RMP)—followed by Concise. All specimens were stored in water at 37°C for 24 hours and thermocycled 1000 times from 5°C to 55°C and back before tensile bond strength testing. The bond strength of Concise to etched enamel of extracted, caries-free premolars was used as a control. Bond failure sites were classified using a modified adhesive remnant index (ARI) system. Results were expressed as mean bond strength with SD, and as a function relating the probability of bond failure to stress by means of Weibull analysis. Mean tensile bond strength in the experimental groups ranged from 2.9 to 11.0 MPa—significantly weaker than the control sample (16.0 MPa). Bond failure invariably occurred at the amalgam/adhesive interface. The strongest bonds were created to the spherical and lathe-cut amalgams (range 6.8 to 11.0 MPa). Bonds to the spherical amalgam were probably more reliable. The intermediate application of the 4-META resins AP and RMP generally created significantly stronger bonds to all three basic types of amalgam products than the bonds obtained with the All-Bond 2 primers. The effect of abrasive-particle size on bond strength to different amalgam surfaces was not usually significant ($p>0.05$). The implications of these findings are discussed in relationship to clinical experience bonding orthodontic attachments to large amalgam restorations in posterior teeth.

For Part 1, see: Zachrisson BU, Büyükyilmaz T, Zachrisson YØ. Improving orthodontic bonding to silver amalgam. Angle Orthod 1995;65:35–42.

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