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Principle Compomer Cement (Project 98-49) (09/99)

Principle Compomer Cement is a hand-mixed, powder/liquid luting agent marketed by the Dentsply/Caulk Company. As the name indicates, Principle's composition is based on that of compomer restorative materials. Its powder contains strontium aluminofluorosilicate glass, sodium fluoride, and initiators. In addition to initiators and an inhibitor, the liquid contains water, resin, polymerizable methacrylate/carboxylic acids, and a polymerizable acrylate/phosphate (PENTA). The small amount of water is included in the liquid to initiate an immediate



acid/base reaction upon mixing. This reaction is purported to give Principle the ability to form an immediate chemical bond to tooth structure. Dentsply/Caulk claims that the cement undergoes two other separate reactions. When the powder and liquid are mixed, a self-cure polymerization of the methacrylates begins that causes the cement to achieve a "gelled" state within 2 minutes under intraoral conditions. Because photoactivators are present in the cement, excess cement at the margins can be light activated to hasten the development of the gelled state. Once in the gelled state, excess Principle is purportedly easy to remove.

Principle is recommended for the luting of: conventional porcelain-fused-to-metal (PFM) restorations, PFM crowns with porcelain margins, all-metal crowns, gold inlays and onlays, and prefabricated and cast endodontic posts. It is contraindicated for: cast-ceramic/porcelain/resin composite restorations, porcelain jacket crowns, resin-bonded (i.e., Maryland) bridges, and porcelain veneers. Immediately prior to luting, the prepared tooth is cleaned to remove temporary cement and other debris; no etching or other pre-treatment is recommended by Dentsply/Caulk. The cement powder is available in two shades, tooth-colored and translucent, however only the tooth-colored powder is provided in the Introductory Kit. A Material Safety Data Sheet (MSDS) and graphics-containing summary instruction card are supplied with the product.

Manufacturer:

L.D. Caulk
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P.O. Box 359
Milford, DE 19963-0359
(800) 532-2855
(302) 422-4511
(800) 788-4110 FAX
www.caulk.com

Suggested Retail Price:

\$70.00 Principle Introductory Kit (product number 674100)
-one 12-g bottle of tooth-colored powder
-one 6-g bottle of liquid
-powder dispensing scoop
-mixing pad

Government Price:

\$38.50 Principle Introductory Kit (product number and contents as listed above)

ADVANTAGES:

- + Film thickness (36 microns) is comparable to that of other resin-based cements.
- + Working time is more than adequate; clinicians did not have to rush to complete the cementation process.
- + Gelled state makes it easy to remove excess cement from margins.
- + Conversion to gelled state can be hastened by use of visible light curing unit.
- + No etching or bonding of preparation recommended before use.
- + Adequately radiopaque.
- + Graphics-containing instruction card was helpful.
- + Powder/liquid ratio is graphically portrayed on side of bottles.
- + Expiration date and lot number are stamped on bottles.
- + Packaged with a Material Safety Data Sheet (MSDS).

DISADVANTAGES:

- Not recommended for all types of restorations.
- Bond strength measured by DIS was lower than the value claimed by Dentsply/Caulk.
- Not available in capsule form; users disliked dispensing and hand mixing.
- Evaluators did not believe Principle had significant advantages compared to other currently-marketed cements.

SUMMARY AND CONCLUSIONS:

Laboratory testing showed that Principle Compomer Cement has an acceptable film thickness, an appropriate working time, and is adequately radiopaque. The gel stage it enters after placement in the mouth makes it easy to remove excess cement at the margins. Use is straightforward because no acid or bonding agent treatment is done to the preparation prior to luting. Principle is not recommended for all types of restorations (contraindicated for all-ceramic, porcelain and resin composite restorations as well as "Maryland Bridges," porcelain veneers, and porcelain jacket crowns). Principle's bond strength as measured by DIS was only about 1/4 of the value claimed by Dentsply/Caulk. Users strongly disliked the fact that the product had to be hand mixed and felt it had few significant advantages compared to other luting cements. **Principle Compomer Cement** is rated **Acceptable** for use by the federal dental services.