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Ketac Nano Light-Curing Glass Ionomer Restorative (3M ESPE) (Project #07-025) (11/10)

Ketac Nano Light-Curing Glass Ionomer Restorative (3M ESPE) is the first paste/paste, resin-modified glass ionomer material based on bonded nanofiller technology. This technology is advertised to result in a nano-ionomer, supposedly forming a new marketing class in glass ionomers. Ketac Nano is said to be more esthetically pleasing than traditional resin-modified glass-ionomer materials due to the incorporation of the same filler particles used in Filtek Supreme; these nano-particles are touted to allow a higher initial polish while providing excellent esthetics and high wear resistance. 3M ESPE claims that Ketac Nano provides a high fluoride release that is rechargeable and the material is said to produce an *in vitro* caries inhibition zone similar to other resin-modified glass-ionomer materials. Ketac Nano features two delivery systems: The familiar 3M ESPE "clicker" system requiring hand mixing as well as the newer "Quick Mix" capsules that allows direct injection of Ketac Nano material in what is described as consistent and correct proportions of materials. Ketac Nano is available in eight shades (A1, A2, A3, A3.5, A4, B2, C2, and Blue).

Manufacturer:
3M ESPE
3M Center
St. Paul, MN 55144-1000
(800) 634-2249
(612) 733-8524
(800) 888-3132 FAX
www.3MESPE.com

Suggested Retail Price:

$311.99 Ketac Nano Light-Curing Glass Ionomer Restorative Introductory Kit—Clicker Dispenser (#3304I)
Includes
- 1–12g Clicker Dispenser A1
- 1–12g Clicker Dispenser A3
- 1–6.5 mL Bottler Primer
- 50–Delivery Tips with Pistons
- 50–Fiber Tips
- 48–Disposable Mixing Wells
- 1–Shade Guide
- 1–Instructions; Technique Guide

$143.99 Ketac Nano Light-Curing Glass Ionomer Restorative Introductory Kit – Quick Mix Capsule (#3305TK)
Includes:
- 10–A2 Quick Mix Capsules
- 10–A3 Quick Mix Capsules
- 1–6.5 mL Bottle Primer
- 1–Instructions; Technique Guide

Government Price: (Item number and contents as listed above)
$243.35 Ketac Nano Light-Curing Glass Ionomer Restorative Introductory Kit – Clicker Dispenser
$112.31 Ketac Nano Light-Curing Glass Ionomer Restorative Introductory Kit – Quick Mix Capsule

ADVANTAGES:
+ Flexure strength/modulus stable over storage and simulated environmental use/storage conditions
+ Simpler to prepare than older powder/liquid methods
+ Does not require mechanical trituration for preparation
+ Advertised fluoride release
+ Displays thermal analysis behavior similar to that displayed from other RMGI products

DISADVANTAGES:
- Diametral tensile strength less than Fuji II LC and Vitremer Restorative
- No observable dark cure
- Flexural strength and modulus less than Fuji II LC and Vitremer Restorative
- Widely variable coefficient of thermal expansion values
- Cost per gram may be higher than products currently in use
- No long-term track record of its performance

SUMMARY AND CONCLUSIONS:
Ketac Nano is advertised as a new class of resin modified glass ionomer product that is said to be more esthetic than both conventional and resin modified glass ionomer restorative materials. Laboratory testing found that Ketac Nano did display behavior similar to other glass ionomer products when analyzed using differential scanning calorimetry thermal analysis. Under DECS testing conditions, thermographic analysis found that Ketac Nano does contain increased resin content compared to other RMGI products and also displayed a widely variant mean coefficient of thermal expansion behavior. Although Ketac Nano demonstrated an evident polyalkenoate acid-base behavior using infrared analysis, the reaction rate was lower than other conventional products, and did not possess any dark cure capability. Ketac Nano was found to have a higher one-week flexure strength than that observed at 24 hours, which was maintained over 12 months storage. Furthermore, Ketac Nano was not adversely influenced by aggressive simulated environmental storage/usage conditions. However, Ketac Nano was found to have significantly less flexure strength, modulus, and diametral tensile strength compared to more conventional RMGI restorative products. While Ketac Nano may provide some preparation and delivery advantages, its cost per gram can be more expensive compared to some RMGI restorative products. Although 3M ESPE has a reputation for quality with glass ionomer products, a cautious approach is recommended with general use consideration until long-term clinical data becomes available. **Ketac Nano** is rated **Acceptable** for use in US Air Force dental facilities.