Competitive Product Comparison

Paradigm™ Nano Hybrid Universal Restorative

Gradia® Direct X™

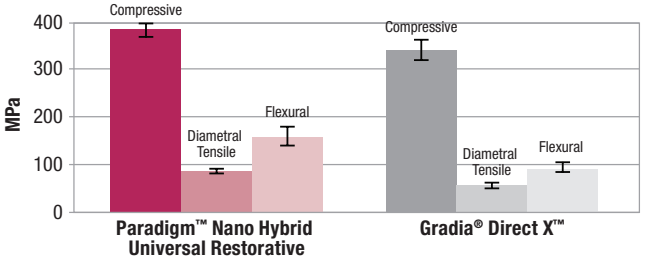
(Manufactured by GC Corporation)

Summary—Paradigm™ Nano Hybrid Universal Restorative offers these advantages:

- Paradigm Nano Hybrid restorative has a greater compressive strength, diametral tensile strength and flexural strength than Gradia Direct X.
- Paradigm Nano Hybrid restorative fracture toughness was measured to be greater than Gradia Direct X.
- The in-vitro wear rate of Paradigm Nano Hybrid restorative is lower than Gradia Direct X.
- The shrinkage of Paradigm Nano Hybrid restorative is less than Gradia Direct X.

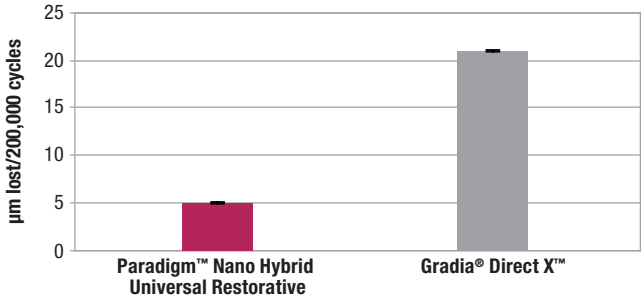
Test Results and Discussion:

Strength



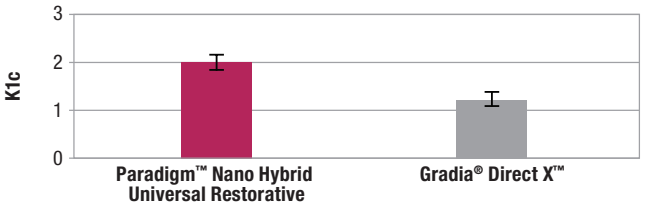
Strength: The compressive, diametral tensile and flexural strengths of Paradigm Nano Hybrid restorative were measured to be statistically higher than that of Gradia Direct X.

Wear Rate (In-vitro)



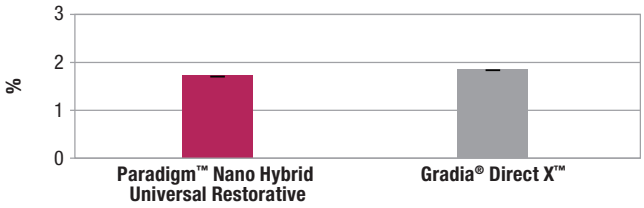
In-vitro wear: Wear rates were determined using a 3-body, in-vitro test. Dimensional loss during the 200,000 cycle test was measured every 40,000 cycles and the wear rates were calculated using linear regression. Paradigm Nano Hybrid restorative exhibited less wear than Gradia Direct X.

Fracture Toughness



Single Notch Fracture Toughness: The single notch fracture toughness of Paradigm Nano Hybrid restorative was measured to be statistically higher than Gradia Direct X.

Volumetric Shrinkage



Volumetric Shrinkage: The volumetric shrinkage of Paradigm Nano Hybrid restorative was compared to Gradia Direct X using the test methodology described by Watts and Cash.

Internal 3M ESPE test data

3M ESPE

Competitive Product Comparison

	Paradigm™ Nano Hybrid Universal Restorative from 3M ESPE	Gradia® Direct X™ from GC Corporation
Composition	Resin: BIS-GMA, UDMA, BIS-EMA, PEGDMA and TEGDMA Filler System: • Surface modified zirconia/silica with a median particle size of approximately 3 microns or less • Non-agglomerated/non-aggregated 20 nanometer surface modified silica particles • 82% by weight (68% by volume)	Resin: • Urethane dimethacrylate 15–30% • Dimethacrylate 0–5% • Camphorquinone <0.1% Filler System: • Silica powder 10–20% • Prepolymerised filler 20–30% • Fluoro Alumino-silicate glass 30–40% • Lanthanide nanofiller (posterior only)
Indications	• Direct anterior and posterior restorations including occlusal surfaces • Core build-ups • Splinting • Indirect restorations including inlays, onlays and veneers	Direct restorative for Class I and II cavities
Manufacturer's Claims	• Easy to polish • Excellent strength and wear resistance • Does not stick to instruments when adapting • Easy to shape • Does not slump — holds shape prior to cure • Radiopaque • 12 shades that cover most dentists' daily needs	• Excellent wear resistance — and won't wear away opposing enamel, either • Extremely low polymerisation shrinkage stress for reduced post-operative sensitivity • Activated filler particles strengthen matrix for increased fracture toughness • Smooth handling for easy placement, sculptable and brushable • Improved radiopacity
Shades	A1, A2, A3, A3.5, A4, OA2, OA3, B1, B2, B3, C2, D3	Standard Shades: X-XBW, X-BW, X-A1, X-A2, X-A3, X-A3.5, X-B1, X-B2, X-C2, X-D2 Inside Special Shade: X-AO2 Outside Special Shade: X-WT
Delivery Options	3g syringes or 0.20g capsules	5.0g syringes or 0.3g unitip

Information obtained from the GC website and Gradia Direct X Instructions for Use.

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3M ESPE

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