



## Carbide Burs—Update 2019

**Gordon’s Clinical Observations:** Low-cost diamond rotary instruments have long been accepted as similar in performance to diamond instruments that cost ten times more. What about carbide burs? Are they all equal? Do some break more often? Are they all concentric? Do they meet the International Standards Organization (ISO) sizes and shapes? *This CR study evaluates low-cost carbide burs both scientifically and also clinically.*

Since CR’s last evaluation of carbide burs just a few years ago, several additional brands have become available, some at attractively low prices (as low as \$1.00 per bur). Because of the continued popularity of carbide burs for operative dentistry among North American dentists, CR has compared and tested these newly available carbide burs.

**This report compares the quality, price, and cutting efficiency of various brands of carbide burs.**

### Improving Your Operative Technique

#### ► Gordon’s “Go-To” Burs for Operative Dentistry

• **The following burs are ideal for Class I–Class VI preparations:**

- 329, 330: round-end pear, *ideal for operative dentistry*
- 1156, 1170: round-end straight or tapered fissure burs, *for deep box forms*
- 1/4, 1/2: small round burs, *for adding mechanical retention to facial/lingual aspect of box form*

• **Bur size for conservative Class II preparations:**

- 329: diameter of bur is adequate for width of isthmus on premolars
- 330: diameter of bur is adequate for width of isthmus on molars

• **Conservative tooth preparations:** Small, conservative preparations reduce chair time, use less restorative material, preserve tooth strength, and can increase restoration longevity.

• **Cross-cut burs** (example 557, 556) are **NOT** advised for operative dentistry. These burs were designed for now obsolete “belt driven” handpieces. The aggressive cross-cut designs cause heavy chipping of *both* enamel *and* dentin. The flat, non-rounded shape creates sharp line angles in preparations which concentrate stresses and may lead to microfractures and cracks.



329 330 1156 1170 1/4 1/2

### Testing of Carbide Burs

Since our last evaluation of carbide burs (*January 2017*), CR has identified several brands which were not previously evaluated. CR tested five different brands of (FG 330) carbide burs, compared them to previously evaluated burs, and measured the following characteristics: bur dimensions (compared to ISO standards), cutting efficiency on plate glass, resistance to breakage, and clinical tactile rating.

Brand, Company	Cost/Bur	Head Length	Sterile Packaging	Construction	Overall Quality	Cutting Efficiency	Clinical Tactile Rating	Overall Grade
Peter Brasseler C-Series 330 FG, Brasseler USA	\$2.00	2.0 mm	No	Single Piece	Excellent	Excellent–Good	Excellent	Excellent
EdgeBurs FG 330, EdgeEndo	\$1.00	2.0 mm	No	Two Piece	Excellent	Excellent–Good	Excellent–Good	Excellent
Midwest Once FG 330, Dentsply Sirona	\$2.32	2.0 mm	Sterile	Single Piece	Excellent	Excellent–Good	Excellent–Good	Excellent–Good
Carbide Burs FG-330, SS White	\$2.05	1.8 mm	Available	Single Piece	Excellent	Good	Excellent–Good	Excellent–Good
Carbide Burs FG 330, Microdont	\$2.09	2.1 mm	No	Two Piece	Excellent	Good	Good	Good

#### Observations from testing:

- **Cost/Bur:** Price varied from \$1.00–\$2.32 per bur (*distributor pricing per 100 burs shown*).
- **Head Length:** *Longer head lengths were generally preferred*; longer heads facilitate smooth, fast side-cutting and improve access in deeper preps.
- **Sterile Burs:** Available from some companies; generally more expensive than non-sterile versions.
- **Bur Construction:** Many factors affect bur performance. Single-piece burs experienced less breakage in CR testing, but overall performance can vary depending on lot or batch (*factors beyond control of clinician*).
- **Cutting Efficiency:** Multiple cuts made through standard plate glass over set time to determine removal rate.
- **Clinician Tactile Rating:** Qualitative grade of bur operation judged by CR clinicians.
- **Previous CR Choice Burs (2017) include:** Alpen 330 FG by Coltene, FG 330 by Henry Schein, and NeoBurr FG 330 by Microcopy.



While these FG 330 burs each meet ISO standards, dimensions vary significantly across brands; important consideration when cutting preps, using as depth gauge, etc.

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### Clinical Tips

- **Operative Dentistry Tooth Preparations** can be more refined if at least finished with an *electric* handpiece. NSK, Kavo Kerr, and BienAir are excellent proven brands. See *Clinicians Report May 2018*.
- **Improving Visibility:** Air–water lavage cools teeth and removes debris during heavy cutting. However, light refinement of operative or crown preparations can be done safely dry without heating pulp; this improves visibility, thus ensuring complete removal of caries and smoother cavosurface margins.
- **Caries Excavation:** Removing soft caries using hand instruments (*example: spoon excavator*) or a slow-speed handpiece and round bur provides improved tactile ability and reduces unnecessary removal of healthy tooth structure.
- **Interproximal Tooth Shields** (*e.g., FenderWedge by Garrison or Parkell; Triodent Wedgeguard by Ultradent*) protect proximal surfaces of adjacent teeth from inadvertent damage during a Class II preparation.
- **Cost Effectiveness of Sterilization and Reuse.** 2/3 of clinicians surveyed will sterilize and reuse operatory carbides, often more than once. Consider the potential costs of reusing burs:
  - **Reduced cutting efficiency (dulling):** On average, burs tested lost 40% of their original cutting efficiency after use and sterilization (*results varied widely*) suggesting that reusing burs may increase procedural times and/or require additional force while cutting (*accelerates handpiece wear, increases heat in tooth, etc.*).
  - **Time and supplies for bur processing:** Staff members must clean, package, and sterilize burs prior to subsequent reuse.
  - **Infection control risk:** Risk to patients is minimal; however, instrument processing is a common source of sharps injury among staff.

**CR CONCLUSIONS:** All brands of 330 carbide burs evaluated were clinically acceptable. Carbide burs with highest overall ratings in CR testing were: Peter Brasseler C-Series 300 FG by Brasseler and EdgeBurs FG 300 by EdgeEndo. Cross-cut carbides and flat-ended burs can lead to microfractures and decreased longevity of restorations. Single-patient use of dental burs offers improved infection control as well as improved cutting efficiency (*requiring less time and less force for procedures resulting in better outcomes and fewer handpiece repairs*).

## What is CR?

### WHY CR?

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