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*Supporting narrated video (NV) demonstrations, high-speed video (HSV) clips, technical proofs (TP), and all of my past articles are available online at [billiards.colostate.edu](http://billiards.colostate.edu). Reference numbers used in the articles help you locate the resources on the website.*

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This is my 15-year anniversary issue as a BD columnist, and I am very happy to still be writing for this great magazine. When I first started writing, I had a list of about 20 ideas for things I wanted to write about. Now, my list of future topics has grown to over 100. The more I write, the more I come up with topics that I think might interesting. This helps keep it fun and exciting, constantly re-prioritizing what I want to do next.

This month, I want to summarize results of some carbon fiber shaft testing I did recently in online video [NV J.12](#). The video talks about how to select a cue, and demonstrates how to do simple squirt testing to compare shaft cue ball (CB) deflections. It also looks at the advantages of carbon fiber shafts, and compares the popular Predator Revo to the new Cuetec 15K.

I often get asked how to select a cue. First of all, it really doesn't matter that much. A different cue will not make you a better player, and any good player can learn to adjust to and play well with any cue (assuming it has a tip that holds chalk). If you care how a cue looks, just get one that looks good to you. And if you care how the hit of a cue sounds or feels, get one that sounds and feels good. If you are like me and do not really care about these things, the only performance measure that really matters is the amount of CB deflection (AKA squirt). The most important advice concerning cues is to stick with one and spend time getting used to it. Don't keep changing equipment thinking a new or different cue will make you a better player. That is not the case ... "it's the Indian, not the arrow." For more info and advice concerning how to select or purchase a cue, see "[selecting a cue](#)" in the FAQ section at [billiards.colostate.edu](http://billiards.colostate.edu).

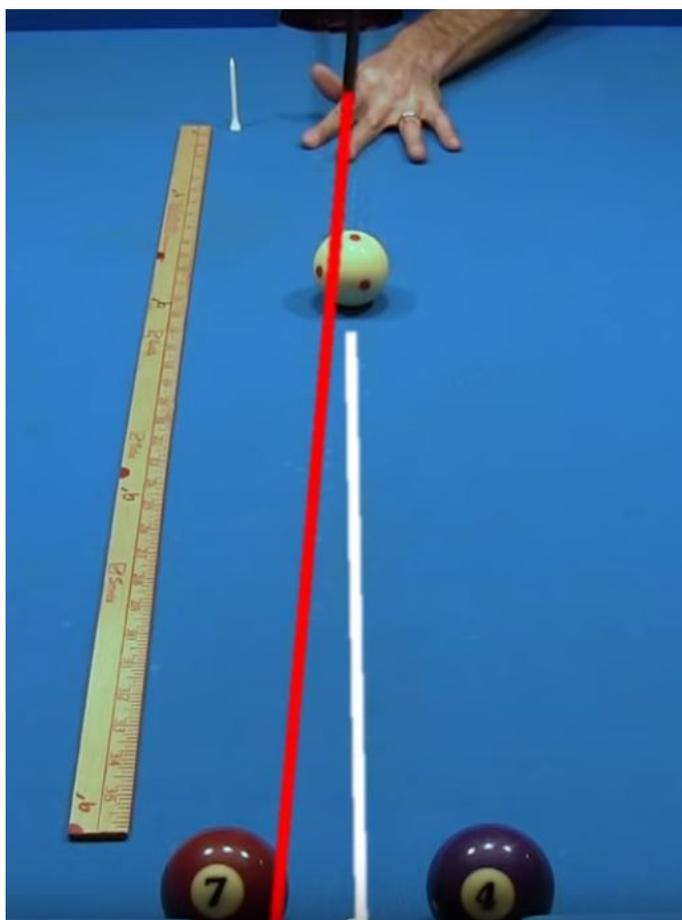
**Diagram 1** shows a very simple way to compare the amount of CB deflection (squirt) different cues or shafts create. I am aiming the center of the CB at the center of an object ball (OB) on the rail. I am using close to maximum sidespin with every shot, and I am using "parallel english," where I first aim center-ball and then shift the cue sideways to apply the sidespin, keeping the cue parallel to the aiming line. When doing squirt testing it is best to use fast speed to minimize the effects of swerve, which varies with spin amount, shot speed and distance, cloth conditions, and amount of cue elevation. For more information, see "[squirt and swerve effects](#)" in the FAQ section at [billiards.colostate.edu](http://billiards.colostate.edu). In the video, I test a 12.4 Predator Revo, the new Cuetec CT-15K, a Predator Z-2, and a Players cue with a typical solid maple shaft with a large ferrule. Even the lowest deflection shafts create CB deflection. As shown in **Diagram 1**, the Z-2 CB deflection or squirt is about the same as the Revo, the Cuetec deflects more, and the Players even more.



**Diagram 1 CB Deflection Comparison at Fast Speed**

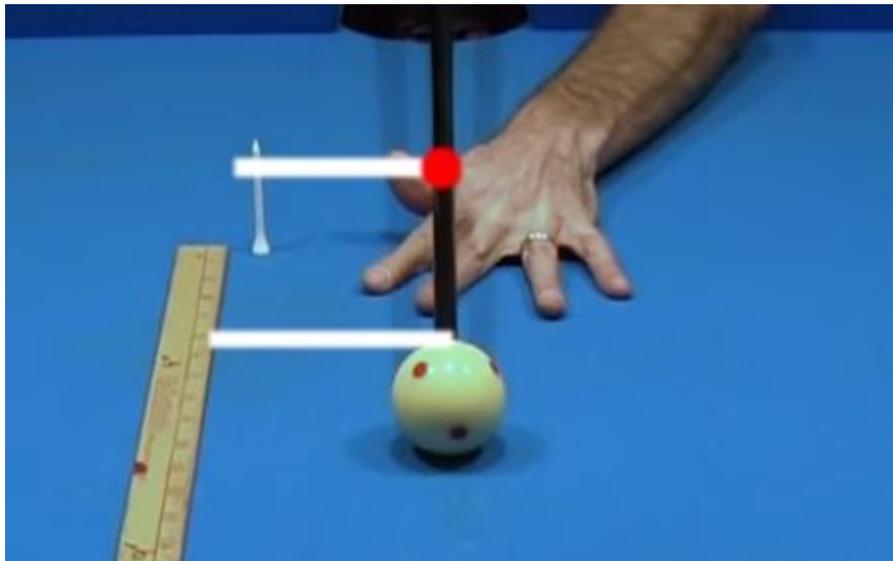
Obviously, it is possible to adjust your aim when using sidespin so the CB heads in the desired direction. (If this were not possible, nobody would be able to play this game at a high level). One method to do this is to use the new back-hand english (BHE) / front-hand english (FHE) calibration system described and demonstrated online video [NV J.9](#) and in the [BHE/FHE Calibration Document](#) linked in the video description. This system works with any bridge length and any cue you want, and can be applied to shots of different speeds and distances. I use the BHE/FHE method in [NV J.12](#). For the long, medium-speed shot in the video, using my normal bridge length of about 12", the Revo and Z-2 required 70% BHE and 30% FHE, the Cuetec required 90% BHE and 10% FHE, and the Players required 100% BHE.

A more accurate way to test a shaft for CB deflection and compare it to others is to measure the shaft's "natural pivot length." A good way to do this is to set up a short-to-medium distance shot straight into a pocket as shown in **Diagram 2**, with two blocker balls that allow the CB to barely pass into the pocket. With an accurate hit, the CB will enter the pocket without disturbing the balls. If the bridge length is just the right distance, 100% pure BHE will automatically cancel squirt and send the CB in the desired direction. This bridge length is called the "**natural pivot length**" of the shaft. As before, for an accurate measurement, you need to use fast speed so the CB will not have time to swerve. You can use any amount of sidespin, but the test is more accurate if you use close to maximum sidespin.



**Diagram 2** Pivoted Aim for Squirt Compensation

As shown in **Diagram 3**, the bridge or pivot length is the distance between the front of the CB and the pivot point on the bridge hand. When the bridge length is too short, BHE over compensates for squirt, so with right sidespin, the CB will go too far to the shooter's right. If this happens during the test, increase the bridge length. And if the bridge length is too long, the BHE pivot will not compensate the aim enough, causing the CB to go too far to the shooter's left. In that case, decrease the bridge length. **Diagram 2** shows the bridge length corresponding to the "natural pivot length" for the Cuetec shaft. Look how much the aim must be adjusted (the red line) to compensate for squirt.



**Diagram 3 Bridge (Pivot) Length**

As summarized in **Table 1**, the Players cue has a typical amount of CB deflection with a natural pivot length of 9.5", the Cuetec has lower CB deflection with the pivot at 13", and the Revo and Z-2 have even lower CB deflection, with the pivot at 19". I played with the Z-2 for many years, so I was glad when I found out the Revo, which I play with now, had the same CB deflection. Because of this, I did not need to make any changes in the way I compensate aim when using sidespin.

**Table 1 Shaft Natural Pivot Length Comparison**

Shaft	Natural Pivot Length
Predator 12.4 Revo	19" (48 cm)
Predator Z-2	19" (48 cm)
Cuetec CT-15K	13" (33 cm)
Players Solid Maple	9.5" (24 cm)

Now, I'll share my observations concerning carbon fiber shafts. They can "feel" and sound very different (due to stiffness), but does a carbon fiber shaft offer any real performance differences? First of all, LD shafts (carbon fiber or maple), cannot get more spin than other shafts like some people think. Although, LD shafts do not need as much aim compensation when using sidespin, so there is slightly less chance for error. The stiffness of a carbon fiber shaft can result in a slightly more efficient hit, especially with a hard tip. With a more efficient hit, slightly less stroke speed is required to get the same CB speed. But this is not a big effect, and it is something a player can easily adjust to after a few shots. To me, the only true advantages of a CF shaft are:

- It is smooth and has very little friction, especially with an open bridge.
- It stays cleaner than a wood shaft, which can be difficult to keep sealed, clean, and smooth (with no scratches or dings).
- It is easy and safe to clean with a damp towel.
- It doesn't warp even under humidity and temperature extremes (so you can leave it in the trunk of your car in any weather).
- It doesn't scratch easily.
- It doesn't ding when you hit balls, bang up against furniture, or drop it on a hard and dirty floor.

I certainly like the Revo that I have been playing with. I don't think it makes me play any better, but it has all of the advantages just listed, and it requires much less care. As with the Cuetec, it should stay clean, smooth, and straight for a long time to come. Comparing the popular Predator Revo carbon fiber shaft to the new Ceutec CT-15K, they both have a long straight taper, making any kind of hand bridge comfortable. The Cuetec hit feels a little softer and less stiff to me compared to the Revo, but this will depend some on the tip you use. The white ferrule will be familiar to people and might help some people better visualize the shaft end which might make it easier to visualize cue alignment and tip position at the CB. The Cuetec has more CB deflection than the Revo, but some people will prefer this since it might be closer to what they are used to. But if you use my new BHE/FHE calibration method, you should be able to aim equally well with any cue and any bridge length. Regardless of which carbon fiber shaft you might choose, remember:

**Once you go black, you won't go back!**

When I used this phrase in the video, it did not occur to me that some people might read racial and sexual connotations into the words (as was pointed out to me by comments on the Internet). FYI, that was not my intention, and I hope it did or does not offend anyone. I just think it is a cool phrase applied to carbon fiber shafts (which are black). That's it.

I hope you learned something about how to test shafts, and I hope you now know more about why the carbon fiber shaft craze is probably here to stay. I also hope you look forward to another 15 years of articles from Dr. Dave. I sure look forward to writing them.

Good luck with your game,  
Dr. Dave



[NV J.12](#) – How to Select a Pool Cue, Cue Ball Deflection, Carbon Fiber, Revo vs. Cuetec  
[NV J.9](#) – "Got English?" – How to Aim Using Sidespin, With Game-Situation Examples

PS:

- I know other authors and I tend to use lots of terminology, and I know not all readers are totally familiar with these terms. If you ever come across a word or phrase you do not fully understand, please refer to the [online glossary](#) at [billiards.colostate.edu](http://billiards.colostate.edu).

*Dr. Dave is a PBI Advanced Instructor, Dean of the Billiard University, and author of the book: [The Illustrated Principles of Pool and Billiards](#) and numerous instructional DVD series, all available at: [DrDaveBilliards.com](http://DrDaveBilliards.com).*