
Supporting narrated video (NV) demonstrations, high-speed video (HSV) clips, technical proofs (TP), and all of my past articles can be accessed and viewed online at billiards.colostate.edu. The reference numbers used in the articles help you locate the resources on the website. If you have a slow or inconvenient Internet connection, you might want to view the resources from a CD-ROM or DVD. Details can be found online at: dr-dave-billiards.com.

Have you ever heard claims about chalk like the following: “Pre-flag Master chalk is much better than Flag Master chalk.” or “Blue Diamond and Kamui chalk let you put a lot more spin on the ball.”? Because I got tired of hearing anecdotal claims like this without see convincing proof, I decided to do a careful and thorough set of tests to compare the performance of five commonly used and often-discussed chalk brands: pre-flag Master, Master, Lava, Blue Diamond, and Kamui (0.98). Four different sets of tests were performed to determine:

1. the miscue limit for maximum sidespin.
2. the amount of cling/skid/kick caused by a chalk mark at the ball contact point.
3. the number of sidespin shots possible with a single application of chalk before miscuing.
4. how long chalk marks persist on the cue ball after multiple shots.

The testing procedures and results are documented in detail in online video **NV F.1**.

The first set of tests determined if the maximum amount of sidespin or miscue limit varied with the type of chalk. For each chalk, a large number of shots were attempted at increasing tip offsets from center. As is clear in **NV F.1**, all of the chinks seemed to perform equally well concerning maximum sidespin and miscue limit. With no chalk on the tip, very little sidespin can be applied, so chalk is important. It just doesn't seem to matter which brand you use when it comes to getting maximum sidespin, assuming the tip is chalked before each shot.

The next set of tests determined the amount of cling (AKA skid or kick) caused by a chalk mark at the cue-ball-object-ball contact point. Remember, cling is an excess amount of throw caused by extra friction at the ball contact point. To measure cut-induced throw, I used the 45° angle frozen-combo shot shown **Diagram 1**. The balls were tapped into place and marked with self-adhesive hole-reinforcement donuts to ensure consistent ball placements. The extra cue ball (CB) frozen to the 1 was used to help ensure an accurate hit of the 1 into the 2. As a baseline, the clean balls, with no chalk marks, were first tested for the expected amount of throw. The amount of throw varies some with speed, but the shots with the most consistent speed were selected to provide a meaningful average. Then, the 1 ball was struck with a chalked tip to create a natural chalk mark on the ball. The chalk mark was then placed at the contact point with the 2 ball for a test. After this test, a spare piece of table cloth was used to lightly wipe off the chalk mark, and the test was repeated with the wiped-off mark at the contact point.

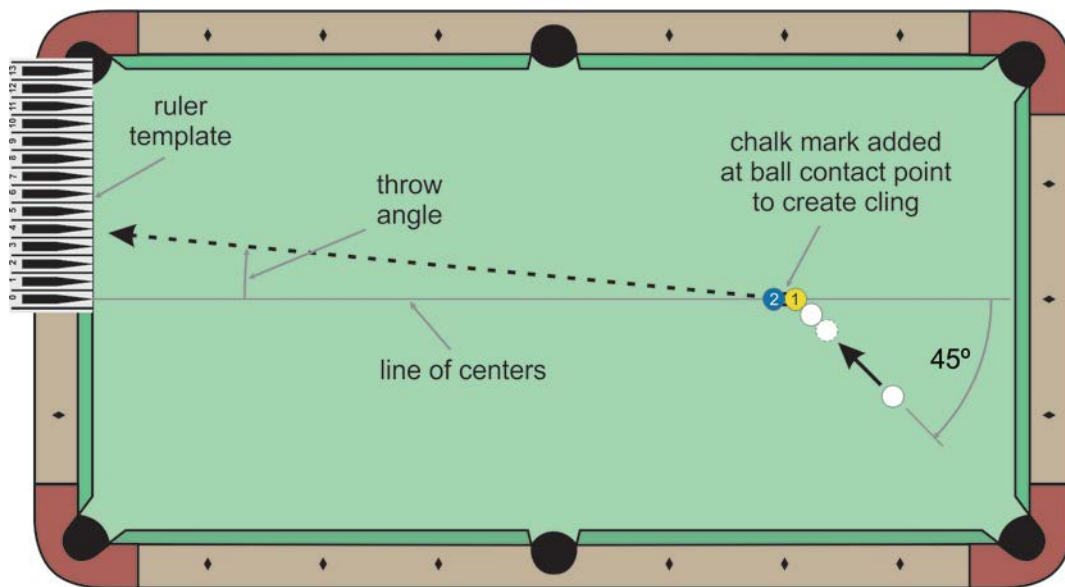


Diagram 1 Shot setup used to measure cling caused by chalk mark

Table 1 summarizes the results from the cling experiment. The chalk marks from all of the brands resulted in significant cling. The amount of throw in each case was much greater than with the clean set of balls with no chalk mark. For example, the Master chalk mark threw the 2 ball 8.9°, compared to 4.0° for the clean balls. The Kamui chalk resulted in the largest cling (10.9°). Even after the Kamui chalk mark was wiped off, the residue still created more throw (6.7°) than with the others (in the 4.2-5.4° range).

Table 1 Chalk mark cling experiment results

test	throw		
	inch	cm	degrees
clean	4 5/8	11.7	4.0
Master	10 1/4	26.0	8.9
Master wiped	4 7/8	12.4	4.2
pre-flag	9 7/8	25.1	8.5
pre-flag wiped	6	15.2	5.2
Lava	9	22.9	7.8
Lava wiped	6 1/4	15.9	5.4
Blue Diamond	9 3/4	24.8	8.4
BD wiped	5 3/8	13.7	4.6
Kamui	12 5/8	32.1	10.9
Kamui wiped	7 3/4	19.7	6.7

The purpose for the next set of tests was to determine how many shots could be hit before miscuing after a single application of chalk. For every shot, the center of the cue was aimed at the center of the red-circle edge of the Elephant Practice ball to ensure a fairly consistent amount of sidespin each time. The cue was also held in the same orientation for each shot, with a small marker at the joint pointing straight up. This caused the same part of the tip to hit the CB on each shot. The chalk mark on the CB was completely wiped and rubbed off with a cloth after each shot. After each miscue, the tip was scuffed and fresh chalk was re-applied for the next set of tests.

Table 2 summarizes the results from the number-of-hits-before-miscue experiment. The Blue Diamond and Kamui chinks took much longer to lose effectiveness. The single application of Kamui chalk lasted for almost twice as many shots as some of the others (15 shots vs. about 8) for the amount of sidespin tested. So if you don't chalk before each shot, or if you don't chalk properly, Blue Diamond, and especially Kamui, might result in fewer miscues.

Table 2 Number of hits before miscue results

chalk	number of shots before miscue		
	left	right	average
Master	6	10	8.0
pre-flag	8	7	7.5
Lava	7	10	8.5
Blue Diamond	10	11	10.5
Kamui	16	14	15.0

The purpose for the final set of tests was to determine how long chalk marks stay on the CB after multiple shots. The longer chalk marks persist, the greater the chance cling will occur. The same three-rail kick shot with top-right english was repeated six times with each chalk. The CB was positioned each time so if the chalk marks persisted, they would all be in the same general area on the ball. After the 6 shots, the chalk marks were observed carefully and categorized as either "clearly visible," "faint" or "very faint."

Table 3 summarizes the results from the chalk mark persistence test. Both the Blue Diamond and Kamui chinks seem to stick to the CB more and be retained longer. After 6 shots, the chalk marks from the last 5 shots were still clearly evident and at risk for cling. Therefore, one would expect cling to be more likely with the Blue Diamond and Kamui chinks, especially if the CB is not wiped clean often.

Table 3 Chalk mark persistence results

test	chalk marks retained		
	clear	faint	very faint
Master	2	1	2
pre-flag	2	2	1
Lava	2	1	1
Blue Diamond	5	1	0
Kamui	5	0	1

One more observation concerning Kamui chalk was that it goes on the tip very smoothly with no abrasive sound or feel at all ... almost like lipstick. One possible advantage of this is that it might not wear down the tip as fast. A possible advantage of the other chinks is that they might help keep the surface of tip slightly scuffed, helping the tip hold chalk better.

Here's the bottom line conclusion from all of the experiments: The brand of chalk doesn't really matter much, unless you don't chalk often or well enough, in which case the Blue Diamond and Kamui might help; although, they can result in more frequent cling. Remember, chalk before each shot, and keep the CB as clean as possible. Definitely wipe the CB off any time you get ball in hand, and before every game before breaking.

Good luck with your game,
Dr. Dave



[NV F.1](#) – Pool Chalk Experiment - Does the brand really make a difference?

PS:

- For more information, and for results from additional testing, see the “[chalk comparison resource page](#)” in the FAQ section at [billiards.colostate.edu](#).
- 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 don't fully understand, please refer to the [online glossary](#) at [billiards.colostate.edu](#).

Dr. Dave is author of “[The Illustrated Principles of Pool and Billiards](#)” book and DVD, and co-author of the “[Video Encyclopedia of Pool Shots \(VEPS\)](#),” “[Video Encyclopedia of Pool Practice \(VEPP\)](#),” “[How to Aim Pool Shots \(HAPS\)](#),” and “[Billiard University \(BU\)](#)” instructional DVD series.