

BRUNSWICK REVIVOR RESEARCH

PROLONGING LIFE & BRINGING BACK REACTION ON REACTIVE & PARTICLE COVERSTOCKS

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Brunswick has tested and documented changes in ball reaction with use and has come to the following conclusions and recommendations that match up well with the conventional wisdom circulating in the bowling community.

Our results to date include:

- Both particle and reactive coverstock balls lose some hooking action with use.
- This effect occurs faster with high-load particle coverstocks than reactive coverstocks.
- The primary reason for the change in ball reaction is the absorption of oil into the coverstock.
- Brunswick's PowrKoil™, N'Control, Activator® and Octane™ coverstock balls can be rejuvenated, to a "like new" condition by using the oil removal warming devices found in some pro shops.

Recommendations

- Revive high-load particle balls every 30-50 games.
- Revive reactive coverstock balls every 60-80 games.
- Brunswick anticipates that low-load particle balls will behave similar to reactive coverstock balls, but our testing to date hasn't included low-load particle coverstocks. Since Brunswick has identified oil absorption as the primary cause of reduced ball reaction with use, it makes sense to use techniques that reduce oil absorption.
- Wipe oil from the surface of the ball between shots.
- Use a ball cleaner to remove oil from the surface of the ball after bowling.

Why the change in ball reaction?

The absorption of oil changes the physical properties of the coverstock. When new, your Brunswick ball has a coverstock free from oil contamination. With use, the coverstock becomes 'coverstock + oil'. This new, oil-soaked coverstock has diminished ability to traction through oil and create friction with the lane, and diminished ability to respond aggressively to the dry boards on the lane. Using the warming process to remove the oil from the coverstock returns your Brunswick ball to its original condition.

Test Setup

We created three pairs of bowling balls for our test:

- Two, shiny Raging Red Fuze® reactive coverstock balls
 - Two, 320-grit dull Raging Red Fuze reactive coverstock balls
 - Two, 320-grit dull Fuze Detonator high-load particle coverstock balls
- Each pair of bowling balls was tested and identical ball reaction was confirmed for both balls in each of the three 2-ball pairs. One ball from each pair was put aside as a control ball, the other was the test ball. We then started accumulating games on the test balls, 1-2 hours a day, 3-4 days a week. We checked the test balls against the control

balls every 30 games on 38 foot and 50 foot, smoothly blended 3/1 oil patterns laid down on both synthetic and wood lanes.

30 games –No change, both reactive and high-load particle test and control ball reacted identically.

60 games – Little or no change in the reactive coverstock balls. The high-load particle coverstock balls showed slightly reduced hooking action both in the mid-lane and on the back-ends requiring a 1 and 0, or a 2 and 1 move to the outside to be lined up to strike compared to the control ball.

90 games – Both the reactive and high-load particle coverstocks showed reduced hooking action in the mid-lane and on the back-ends requiring a 2 and 1, or a 3 and 1 move to the outside to be lined up to strike compared to the control ball. At this point in the test, we documented reduced ball reaction with all the test balls. Our next step was to use the available techniques that offered some hope of restoring the test balls back to their original reaction characteristics.

Clean with a ball cleaner:

No change in the reaction of the test balls compared to the control balls.

Light resurfacing:

1-2 minutes with sand paper and a ball spinner. Surface finish was returned to beginning of test condition. No change in the reaction of the test balls compared to the control balls.

Machine resurfacing:

Test balls were resurfaced with a **Haus Machine** (25 minutes with diamond cutters): Surface finish was returned to beginning of test condition. The first 3-5 shots looked promising, but once a little oil was worked into the surface there was no change in the reaction of the test balls compared to the control balls.

Pro Shop oil removal:

Test balls were warmed in the Revivor. Oil was wiped from the surface of the ball every 10-15 minutes using ball cleaner and paper towels. Six cycles of oil removal were required before the test balls stopped sweating out oil. After this procedure, the reaction of the test balls was identical to the reaction of the control balls.

Non Issue:

Brunswick's Revivor testing has included brand new, unused bowling balls from all four of Brunswick's major coverstock families including PowrKoil, N'Control, Activator® and Octane™. In each case we have not seen any evidence of the 'bleeding reactive resin out of the coverstock' issue that occasionally appears on internet message boards and post-competition problem solving sessions. The removal of oil from the test balls' coverstock was by far the most effective method for reviving the reaction of the test balls, and in fact completely restored the test ball reaction to their original 'like new' hooking action. At this point in the test we put the control balls away and started accumulating additional games on the test balls. The test balls were checked against the control balls at 30 & 60 & 90 games with results similar to the first cycle. At 90 games since the first revival, 180 games total, we made our second attempt to bring back the reaction of the test balls. With our second attempt we went directly to the oil removal process, warming the test balls using the oil removal oven. The results were the same. The reaction of the test balls was completely revived to a "like new" ball reaction.

Warming & Durability:

Caution – Do not warm the ball over 150°F. Brunswick also conducted a separate test on the effects of warming and coverstock durability. This test involved creating unwarmed control balls and warmed test

balls, all with zero games, which were tested in Brunswick's durability testing lab. These tests showed no differences in coverstock durability (resistance to cracking) between the test balls warmed five times and the control balls never warmed.

Summary:

After 270 games and three warmings, our test balls react identically to the control balls that have less than 10 games on them. The oil removal warming process revives the ball reaction of oil soaked bowling balls with no durability problems. The Innovative Revivor Oil Extraction Unit is recommended for this procedure. Brunswick has no opinion on other methods at this time. Readers should be aware that Brunswick's results are not necessarily applicable to the coverstocks from other companies and differences in opinion between bowling ball manufacturers may simply be due to the use of different coverstock materials. In reading and absorbing the information published on this subject, Brunswick encourages readers not to try to decide which company has the correct answers, but accept the advice given by each company as the best advice for their products.