

USBC refocuses on System of Bowling Research

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USBC News



USBC supports more research on 'regulation ball' concept

The **United States Bowling Congress** is refocusing its efforts on research and testing relating to the System of Bowling in the interest of seeking practical solutions to the sport's credibility issues.

USBC's major concern is the degree of influence technology is having over player skill as the primary factor for success in bowling today. The equipment and playing fields in bowling have evolved as technology has improved. One result has been an explosive increase in scoring in recent years.

The renewed emphasis on this testing will concentrate on all four elements of the System of Bowling, a USBC-driven study of the key components that affect scoring in tenpin bowling: bowling balls, bowling pins, lane conditioning and lane surfaces.

The System of Bowling was formally established in 1991 in response to the technological advancement in bowling balls, lane oils and lane machines that occurred in the early and mid 1990s. The USBC Specifications and Certification department, working with other entities in the bowling industry, continues to perform research and testing regarding technology issues.

The research is being conducted in the USBC Specifications and Certification testing laboratory in Greendale, Wis., which includes eight lanes in a climate-controlled building.

"Our objective is to study all the key components of the System of Bowling," said USBC Director of Sport Jeff Henry. "We believe that the answers to bowling's credibility issues are to be found through comprehensive research and testing of all four of these areas."

Following is a summary of current System of Bowling research by USBC:

1. BOWLING BALLS: USBC is working on a study of bowling ball motion. Through this research, expected to last about 18 months, USBC's goal is to learn and understand even more about today's high-tech bowling balls with complex cores and weight blocks and the inner motion characteristics of the balls.

USBC will use this information - in addition to that gleaned in working cooperatively with ball manufacturers and other industry leaders - to set performance-based specifications for bowling balls used in USBC-certified competition.

For the study, USBC research scientists are using advanced testing equipment such as the robotic precision bowling ball thrower nicknamed "Harry" - a similar machine to the United States Golf Association's robotic golfer called "Iron Byron" - and the Computer Aided Tracking System, commonly referred to by the acronym C.A.T.S.

Created in the USBC research lab in 1993, C.A.T.S. consists of 23 small, round sensors placed along the outside of the channel on two test center lanes which record the exact moment, speed and board on the lane that a bowling ball rolls past them. The sensors are connected to a computer, which uses that information to determine ball speed, how much and when the ball hooks, entry and launch angle and relative friction.

In this ball motion study, USBC is testing bowling ball samples in random groups, such as balls with low and high radius of gyration (RG), differential and cover stock material (i.e. resin and particle). To make the process more encompassing, tests also are being performed with balls in groups organized by similar characteristics (i.e. all low RG balls) to determine if any trends become evident.

The research and testing, which has the full cooperation of 16 bowling ball manufacturing companies, is expected to be completed in the 2007-08 season.

USBC supports more research on 'regulation ball' concept

USBC encourages continued research on the World Tenpin Bowling Association's proposal to limit high-level athletes to one ball in international competition. The concept of a "regulation ball" is currently being studied by the WTBA technical committee.



"USBC encourages the continued study of all components of the System of

Bowling," said USBC Chief Executive Officer Roger Dalkin (pictured). "We also recognize that the regulation ball proposal is just one of the many factors that have an effect on scoring. We welcome scientific research on this topic and look forward to reviewing the data."

Dalkin will elaborate on this position during his "Why USBC?" seminars to be held Tuesday, June 27, from 10:45-noon (Texas Station Hotel and Casino) and 3-4:30 p.m. (Las Vegas Hilton) during the International Bowling Pro Shop and Instructors Association and Bowling Coaches Summit in Las Vegas.

2. BOWLING PINS: USBC is engaged in a new round of research intended to test the scoring impact of bowling pins with various specifications. USBC is testing bowling pin samples of different weights and centers of gravity (CG) submitted from pin manufacturers worldwide.

USBC also is working with manufacturers to gather input about certain characteristics of bowling pins such as the base diameter, base radius and base attachment. The objective of the USBC Specifications and Certifications team's research is to gather data from this analysis and compare the interactions of the pins with the other three System of Bowling components.

Results from recent testing are in line with previous tests that support the conclusion that altering specifications of bowling pins may have too great an impact on many bowlers. For example, USBC is studying pins with lower centers of gravity than the current range of 5 40/64 inches and 5 60/64 inches and what effect that would have on bowlers of different ages.



"So far the data indicates that lowering the CG of bowling pins would have a disproportionate impact on the averages of youth, senior and many women bowlers," said USBC Technical Director Neil Stremmel (pictured). "Minor adjustments to bowling pin specifications, in conjunction with specification changes to bowling balls and/or lane dressing patterns, may have the appropriate effect. Continued testing will give us more functional data."

3. LANE CONDITIONING: Testing continues in several areas regarding the measurement

and application of lane conditioner (commonly referred to as "oil"), which is the liquid applied to wood and synthetic lanes. Lane oil has two purposes: to protect the bowling surface and affect the difficulty level of the game, depending on how it is applied.

USBC is studying different technologies to measure lane dressing. Currently the amount and placement of oil on a lane is measured with tape that absorbs the oil and which is read by a computer analyzer. USBC continues to work with ENSCO, Inc. to develop a tapeless lane oil analyzer and reader system.

In addition, USBC is working with another company to develop a device that measures the amount and location of friction on a lane. The amount of friction between a bowling ball and the lane surface dictates how much the ball will hook.

The more oil there is on a lane, the less friction. This causes a bowling ball to skid, much like a car tire on an icy road. Conversely, less oil means more friction and more hook on the bowling ball.

USBC also is considering changing the description of oil application from "units" to ratios and establishing a ratio-based lane dressing specification for USBC standard level competition by the end of the 2007-08 season.

Currently, USBC rules require that at least three units of oil be applied to each board of a bowling lane to constitute certified competition. The amount of oil on a lane typically is expressed as a ratio comparing how much oil is applied to the inside boards (approximately between the second arrows on each side of the lane) to the amount of oil laid down on the outside boards (the channel to around board No. 10 on each side of the lane).

For example, a lane condition with a 10:1 ratio means that there is 10 times as much oil in the middle of the lane than on the outside. The way in which oil is applied to a lane changes the difficulty level in bowling and is typically called an "oil pattern."

"Changing our terminology system to incorporate ratios to describe oil measurement and patterns may be more accurate and understandable," Stremmel said.

Multiple levels of play

Regarding lane conditions in a general sense, USBC endorses the concept of multiple levels

of play in bowling. The sport can take place as a recreation and on lane conditions in USBC-certified competition that allow for high and low scoring paces.

For example, standard USBC leagues often have lane conditions with as much as a 20:1 oil ratio which can result in a high scoring pace as the extreme differences in friction on the lane act to artificially steer bowling balls to the pocket.

Lane conditions in USBC Sport Bowling events - which include most of today's premier bowling tournaments, including all four of the Professional Bowlers Association majors - are at most a 3:1 ratio. This can result in a more challenging scoring environment because the absence of extreme differences in friction areas on the lane virtually negates the steering effect on the ball.

"Multiple levels of the sport don't diminish credibility," said Dalkin. "They only define the type of competition. It is okay to have different levels such as Sport, standard and bumper bowling."

4. LANE SURFACES: USBC researchers currently are concentrating on testing bowling balls, pins and lane conditioning aspects. The long-term plan calls for performing research into this System of Bowling component.

One of USBC's long-term goals of this research is to increase its members' understanding and awareness of the System of Bowling through communication channels such as bowl.com and member magazines US Bowler and US Youth Bowler, surveys and studies and partnerships with the PBA and other industry entities.

Future research plans include revising existing Sport Bowling lane dressing ratio specifications, and revisiting testing on how pin deck tilt affects scoring, studying potential changes in flat gutter specifications and conducting tests on lane surface coefficient of friction and hardness.