

USBC leads the way in bowling technology

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USBC Specs

By Paul Ridenour, USBC Research Engineer

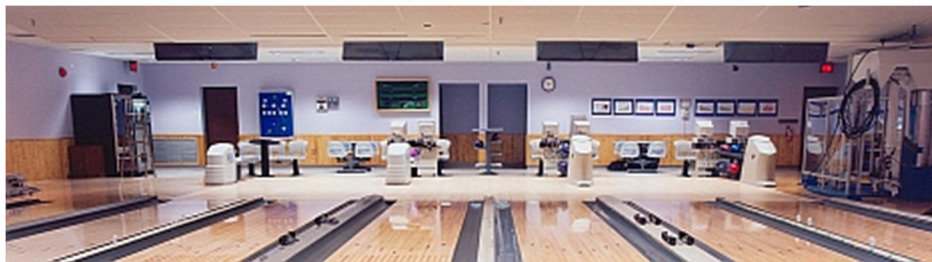
Whether it's in the telecommunications, computer or health care industries, technology continues growing all around us. Like those businesses, the sport of bowling has also evolved through technology.

Between polymer technology, automated scoring systems and other advanced electronic devices, technology is much more prevalent today in bowling than in years past.

However, not all technology studies are correct; at times it is difficult to determine what information sources are valid.

This article will cover the United States Bowling Congress' technological capabilities, thoughts on future areas of technical research and how future scientific understanding can grow bowling knowledge and, with it, the sport itself.

USBC is the sport's technology leader



USBC believes that to grow the sport of bowling, it must be the No. 1 source of bowling technology and information. To foster this philosophy, the **USBC Specifications and Certification** team has purchased or built several pieces of equipment in the eight-lane, climate-controlled testing facility at USBC Headquarters in Greendale, Wis.. *Click on the image to view it full size.*

One part of the science behind bowling deals with simulating oil patterns and ball motion on lane surfaces. The USBC research facility includes **seven different lane surfaces, six oiling machines**, an abundance of **different lane oils and cleaners** and a **temperature control system** that simulates any lane condition in the world.

USBC could invite bowlers here to test these oil patterns. But because human bowlers are inconsistent, USBC uses a **robotic precision ball thrower nicknamed "Harry"** (pictured right) to help imitate ball reaction on the lanes. *Click on the image to view it full size.*



Using the **Computer Aided Tracking System (or C.A.T.S.)** and the ball thrower, USBC can build mathematical models of bowling ball motion on the lanes.

USBC research engineers track data ranging from the difference in the intended path of a bowling ball, velocity decrease, angle difference between launch angle and entry angle into the pocket, break point and transition points between the skid, hook and roll phases of ball motion.

Ford Motor Co. engineer **Scott Sterbenz**– recently added as a volunteer technical advisor to the USBC Equipment Specifications and Certification Committee – has been a tremendous help building the necessary statistical data to properly model the USBC bowling ball motion study. Thanks to Sterbenz' background as an American Society for Quality Six Sigma Black Belt in statistical analysis, USBC's ability to mathematically model ball motion variables has significantly increased.

Another phase of technology deals with developing tests and standards for data currently not measured. Earlier this year USBC purchased a **Fourier Transfer Infrared Spectrometer**. This device can determine exactly which chemical compounds are inside of a certain material. USBC uses this tool to measure pin coatings, bowling ball cover stocks, lane surfaces and lane oil and conditioners and is considering its use for future applications.

Another test USBC is developing is a **bowling ball cover stock oil absorption test**. Oil absorption in today's high tech bowling ball cover stocks is vastly different than it was in the urethane or plastic ball era. The ability to measure oil absorption will determine just how

complex are the surfaces of bowling balls.

The USBC research staff also has the capability to **design and implement new standard testing devices** such as a replacement two-string **RG** measuring device and a new coefficient of restitution and coefficient of friction tester. USBC is constantly striving to improve the quality and accuracy of test procedures.

Through technology, bowling's future brings exciting possibilities

The future is difficult to predict, but USBC certainly is working to be proactive in testing procedures and technology to stay ahead of the curve. One area of technology that involves the USBC Coaching program as well as the Specifications and Certification department is "**biomechanical bowling studies.**"

Currently in its infancy, this technology uses such programs as **BowlersMap** and other motion tracking software, which help coaches develop a bowlers' proper form and, in turn, vastly improves their game. Going forward, this technology could involve using biomechanical techniques currently employed in tennis, golf, swimming and other Olympic sports.

Future studies could be conducted on grip pressure, muscle resistance, along with measuring pressure in the hip muscle to determine how deep a person's knee bend is during the slide portion of the approach.

Even though some studies have already been conducted on these subjects, the validity of their testing is still in question due to the true knowledge of our sport.

Imagine a future in which a small block inserted into a bowler's thumb hole could enable a coach to tell a bowler his or her precise ball path, initial velocity, entry angle into the pocket, exit angle out of the pocket, revolutions, final velocity, axis tilt angle and positive axis point.

This technology is not that far off. Those philosophies and ideas illustrate USBC's research capabilities and the importance of growing and understanding the science and technology the sport of bowling. USBC is at the forefront of this type of forward thinking.

