



SOFTBALL ACADEMY

with Mitch Alexander

Composite Bats - Part I

Composite bats started hitting the softball scene in the late 1980's, with its first appearance in slowpitch. Later similar bats were manufactured for fastpitch and baseball use. A composite bat is typically made of several different materials including carbon fiber, plastic resin, graphite, Kevlar, and even glass – hence the name composite. Each manufacturer has their own secret recipe for composite design. These bats are used everywhere in the world of Fastpitch. You see them in the hands of 8 year olds, NCAA players, professional players, and weekend warriors of every age.

What's so great about composite bats? Why do so many people consider them a must have item in their equipment bag? The number one reason may surprise you – it's because composite bats have larger "sweet spots" than comparable aluminum or wood bats. What's a "sweet spot?" It's the flat area on the barrel of the bat that produces a solid hit. Why is this so important anyway? Baseball players have used wood bats with tapered barrels with tiny sweet spots since the game started. Again, the reason may surprise you. It's because our youth hitters don't typically have great mechanics, so they need an advantage to help them compete. Composite bats help mediocre hitters perform like good hitters, and good hitters perform like superstars.

Composite bats can also be designed to be lighter than other types of

bats. Again, these give youth players an advantage because they can typically swing a longer bat at a lower weight, which improves their bat speed and plate coverage. You can find really light bats for 10u players: 30” at 17oz, which is a ridiculously light bat with a minus 13 drop! Bat speed is really important at all ages, but it is particularly difficult to get a beginning player to have a level swing plane and to get the bat around fast enough to be a great hitter. These composite bats work wonders for beginning players.

Composite bats are also very good at reducing the vibration created by hitting a heavy mass like a softball. The carbon fibers can be arranged differently along the surface of the bat to control stiffness and vibration. This helps with off-sweet spot hits. Most of us have seen youth players drop their bat after hitting a ball off the very end of the barrel. This is an off-sweet spot hit. Many of the current 2013 or 2014 bats are multi-piece designs. This means they are not manufactured as one continuous piece. Instead the individual pieces of the bat are manufactured separately and they are assembled together. Two-piece bats are currently available from most manufacturers, and three piece designs are the latest in multi-piece design. Some multi-piece bats have a dampening agent like gel or foam used between the barrel and the handle to reduce vibration.

Composite bats also have a property called a “trampoline effect.” When the ball and the bat collide, the wall of the bat deforms and flattens out in response to the shock of the collision. As the bat is being pushed further through the contact point, the composite material begins to rebound back to its original shape and position resulting in the trampoline effect which increases the speed of the softball coming off the bat. Think of a child jumping on a trampoline as the softball and the trampoline surface as the barrel of the bat. The child jumps in the air and on their way down

they become the softball heading towards the flat surface of the trampoline which is the sweet spot on the barrel of the bat. They hit the trampoline surface, which becomes deformed under the weight of the child. Because the trampoline material has elastic properties, it can absorb the change in material shape. As the load of impact lessens and the trampoline material is stretched to its maximum, the material begins to return to its normal flat position, and in so doing, it drives the child up and in the air. There has been some controversy around the trampoline effect in composite bats.

Some composite bats are made with a single barrel wall which potentially results in a higher ball exit speed. A disc is used inside the bat to limit the amount the single barrel wall can flex and deform when it makes contact with a softball. This is the familiar clicking sound heard on some bats. Another type of design is a double barrel wall, where the flex is limited by having two walls instead of one. These types of bats may have larger sweet spots since they can structurally support a larger area than a single wall design can.

Composite bats also have some disadvantages. Composite bats do not last very long. While it's difficult to get information on how long composite bats are supposed to last, two numbers are often spoken about. One is length of service. Some experts recommend replacing composite bats after no more than one and a half year of normal usage. Some parents routinely buy their daughter the latest bat every year, which eliminates the age of service issue. The second number is the number of hits. Again, some experts recommend replacing a "worn out" bat after approximately 5,000 swings. This may sound like a lot, but it really isn't and for a travel fastpitch player probably translates into about a year and a half of hits.

Composite bats do not like cold weather, which is considered anything

under 60 degrees. This is problematic as there are probably thousands of girls swinging a composite bat while I am writing this article in temperatures under 60 degrees. Many people say the core of the softballs get much harder in lower temperatures and they are harder on the composite materials. This is absolutely true, but it's also true that the composite material in the bat becomes stiffer at colder temperatures and is more likely to shatter or develop internal cracks at lower temperatures. The colder it is, the worse the problem. Composite bats need to be treated like a member of the family – don't leave it in the trunk of a cold car, or in a garage. Keep it warm. I've seen many Facebook pictures of youth players sleeping with their new prized composite bats next to them!

Composite bats should never be used with anything other than regular softballs. Lighter foam balls and whiffle balls are OK too. There have been some new reports about multi-piece bats cracking when used with heavy sand or gel balls. Dimpled balls in batting cages are particularly damaging to composite bats. Nothing works more quickly to make a composite bat reach the end of its life than dimpled balls being thrown at a high rate of speed in a batting cage. Parents should insist that players carry at least two bats with them: one is their composite bat, and the other is an aluminum bat with a similar weight and size for use in batting cages, gel ball drills, etc.

Next month, we'll have a look at composite bat break in, a deeper look into the trampoline effect, bat testing, and new certifications.

Mitch Alexander is the CIO for a major electronics company and coaches both Little League and Travel softball teams and is currently completing his PhD. He is a certified SUNY, ASA, and Double Goal Coach. His wife, Marie was one of the first female student athletes in the country to play Little League softball after Title IX was passed and played in the first Little League Softball World Series. Over the years, both have managed teams together and helped spark a love for softball in their student athletes. In his spare time, Mitch designs websites for fastpitch teams and businesses and can be reached at fastpitch2001@optonline.net.