

The Golf Ball

“No power on earth will deter men from using a ball that will add to the length of their drive.”

...Golf Illustrated, 1902

Grown men yell at it. Women curse at it under their breath. Professionals draw pictures on them. Some put them on display to mark significant achievements, both real and imagined! While still others collect them (one such collector has over 15,000)! The golf ball has been maligned in lore and been the butt of humor. It has been made to perform magical feats in movies (such as *Caddyshack I & II* or some of the Three Stooges charades). It has defied gravity (witness Fred Couples tee shot on the 12th at the 1992 Masters), and has been struck with a modified 6-iron on the moon. Whereas clubs are thrown, broken or abandoned in the closet, a golf ball will lie in wait, under leaves, in creeks, ponds, lakes and rivers; in corn fields, under ice plants or in deep rough, just waiting for another unsuspecting golfer to happen by and announce to his fellow competitor, “...*what-are-ya-hittin’!*” before plopping it into his bag, for it to await its turn on the tee!

Most of us have our favorite brand; be it Titleist, Spalding, Maxfli, Hogan, Slazenger, Wilson, Precept, Ram or any of the other 10 brands of manufacturers. They all claim that theirs has the secret to: **Make Your Selection Here** spin, extra spin, low trajectory, high trajectory, distance, extra distance, stopping power, control, feel, or some other yet unknown need. They tell us that they are Pro balls or Tour balls (no ball claims to be for the 18-handicaper, as though the 18-handicapper, playing the right ball, could shoot par!) with two pieces or three-pieces, with covers made of balata, zbalata, Elastomer or surlyn; and contain either titanium, wound threads, liquid centers, a new liquid center or a space-age center. It can be a bit confusing...and even a little intimidating no matter how long you’ve been playing this game! But in reality, playing the WRONG ball could affect your game tremendously. If your ball won’t stop on the green, you’ll probably be chipping and putting all day for bogeys. And if you play high soft approach shots to very large greens, and you aren’t a particularly adept putter, the result could be the same. Playing a ball with a lot of spin could exaggerate your slice or hook, thus causing you even more shots! So how do you know which ball you should be playing? The same way you buy a car...test drive them! Buying golf balls today is not exactly like it was a few years ago!

Try walking into a golf shop and telling them you want a dozen balls...tell ‘em you want a Titleist! Should be easy, right! Best selling ball...the one you’ve been buying for years, right! Better think again. The response you get might sound like you just stepped into the circus sideshow, where the barker is attempting to draw you into the show; “*Yes sir, well, we got your DT, your Wound DT; we also got your HP, and your HP2, and the HP Tour; and today, just for you, we’ve got something really special! We got the Tour Balata or the New Professional. Yes sir, you want balls, we got your ball!*” After you’ve gathered your composure you tell him you want their longest ball. After a slight chuckle, the salesman/pro, just doing his job, begins to cross-examine you, just to see if you’re worthy of a Titleist “...*do you want a 2-piece or 3-piece ball?*” If your response proves acceptable, he asks the follow-up question “...*how do you want the ball to feel?*” The words “*You mean besides like a golf ball?*” cross your mind, but fearful that he might withdraw his offer you make a feeble response, to which he adds, “*Oh, by the way, do you have a preference for the type of cover material?*” Believing that “white” isn’t the answer he’s expecting, you believe your continued silence will lead him to believe you’re just contemplating your options. [Remember the adage...“*better to say nothing and let them think you’re a fool, than open your mouth and confirm it!*”] And we haven’t even discussed “*Red or Black*”! And you thought you just wanted a golf ball!! By the way, if you do find a pro or salesman who really can help you, be sure to get his name and address...you’ll want to make certain to keep them on your Christmas card list.

Titleist may be the leading ball on the Pro Tours, but Spalding produces more balls than any other manufacturer [which also includes range balls, which most likely accounts for the high volume]. Nicklaus and Norman tout Maxfli as their ball, though Nicklaus played Macgregor for much of his career, and

Raymond Floyd has been winning with Precept! So the question must be asked, does it really make a difference which ball you play? Is there a difference between balls? Should you even care? Some players just scour the rough, hoping that your errant shot will become tomorrow's ammo! [This publication's publisher went to Clinton Hill the other day and found over 270 assorted spheres!] Or should you just pluck down your \$15 bucks for those 15 Pinnacles? What is the difference between the \$40 ball and the \$15 ball? What would Old Tom Morris do? Let's look back at the early days of the golf ball.

In the Beginning; 1400-1850

“Nobody strikes the ball on the streets with clubs of lead or iron heads”

...Ordinance of Zierikzee, 1429

The early links were played with wooden balls...which would account for those courses being little more than 2,000 yards. When the featherie ball came in the mid-1500's it greatly improved the golfers ability to get the ball airborne, though at a price...as the wet feathers were stuffed into the leather ball, with their hand-sewn covers, only a few could be produced in a day, even by the most talented Ballmaker..and they had a price to match. As the feathers dried they expanded, and as the leather covers shrank, the ball became quite hard. But with their hand-sewn seams, they did break apart with great frequency, which clearly indicated they weren't the answer. But these balls did fly well! The record drive of 361 yards was recorded in 1836 at the Old Course by Samuel Messieux, without the benefit of titanium or graphite! The featherie would last for almost 400 years - until the arrival of the first gutta-percha [affectionately known as the "guttie"] in the mid-1850's.

The Gutta-Percha era; 1850-1897

“Had the gutta-percha golf ball not been invented, it is likely enough that golf itself would now be in the catalogue of virtually extinct games, only locally surviving, as stool-ball and knurr and spell”

...Horace Hutchinson, 1899

The Guttie was a solid rubber ball, made from natural Malaysian gum. These early balls were smooth and round, and were much cheaper than the featherie! With the new balls, scores began to come down into the low 80's, with the occasional round in the 70's. Clubs began to improve and specialized clubs became available depending on the type of shot required. But these balls had a significant drawback...they would not stay airborne! A new ball would travel about 150 yards and then would dive to the ground. [At an 1859 driving contest, the winning drive was only 175 yards!] But as the balls became scuffed, they would fly longer and straighter! [It appears that those "seams" on the featherie allowed for it to stay airborne better]. While not completely understood, modern aerodynamics of the golf ball were being felt. Courses began to get longer, though just slightly. The average course of those days was still under 5,000 for 18 holes [remember there were no 18 hole courses in the US until 1893, as most early courses were six, nine or twelve holes] with many still just over 4,000. To have a course approaching 6,000 would be like having an 8,000 yard course today!

The first golf ball patent was awarded in 1876 to Captain Duncan Stewart of St. Andrews. He patented a gutta-percha covered ball which surrounded a mixture of cork and metal filings. It was designed to keep the ball from splitting [a problem that existed up until the 1970's with certain types of balls!] But in the end, his design proved no more successful.

The first US Open in 1895 was held over the 9-hole track at Newport Golf Club. Low scores for the winner, Horace Rawlins, was only a pair of 41's and several players shot in the 50's. The 1896 US Open at Shinnecock Hills GC was contested over a full 18-hole course for the first time. Though only about 4,600 yards long, the shortest course in the history of the Open, the scores of best players were still mostly in the

high 70's and low 80's. Jim Foulis' winning final round of 74 would hold up until 1904 when Willie Anderson managed a 72.

Ball technology was still in its infancy, as many players still made their own balls or re-molded newly purchased ones to suit their game. The "guttie" was consistent, but it had begun to reach its limits. Many ballmakers attempted a variety of designs, with the most successful being the "bramble-pattern", which resembled a series of raised dots or bumps on the surface. But the modern ball would still be a few years away.

The Modern Era; 1898-present

"I really do not see why we should allow the Haskell to come in. It should be slaughtered at the ports. The discovery of a ball that flies considerably further would be a menace to the game of golf. It would immediately make all our holes the wrong length."

...Manchester (England) Guardian, 1901

"One never realized what a stubborn, inert thing a gutty is until the Haskell came on the scene."

...Golf Illustrated, 1902

When Coburn Haskell developed his ball and patented it in 1898, it had an immediate impact. The top professionals and amateurs could now drive the ball over 300 yards. The development of balls and clubs once again would parallel each other during this era. With each new development of the ball, new clubs began to appear, some with very odd designs, all meant to take advantage of the new technology. This ball was the first true modern ball. Haskell had worked closely with Bertram Work of the B.F. Goodrich Company and these early balls had a very tight hand-wound elastic thread around a rubber core. This was covered by gutta-percha at first and later by natural balata. The modern era had arrived.

The early-Haskell ball, like its predecessors, did have one drawback; it was still very smooth! Enterprising professionals like Jim and Dave Foulis began to take the Haskell ball and "mark" it (in effect giving it a "dimple-type" pattern) which allowed it to fly further. Today's dimple patterns were born out of these early "markings". But in 1905 an English Engineer, William Taylor, developed and in 1907 he was granted the patent for the dimple pattern we know today. When the Spalding Company purchased the US rights to his patent in 1908, the birth of the commercial ball market in America had begun. The familiar Spalding trademark "DOT" began and would be used for almost 60 years.

The first liquid center balls were patented in 1908 when a Scotsman, Frank Mingay, developed his ball. He theorized that a liquid in the center would better receive and transmit clubhead energy with less loss of energy. The Spalding Company also purchased these rights, but did not use them until 1916 when they introduced the "Witch". Several other ball manufacturers had already introduced liquid-center balls by that date as well, so by then Spalding was just keeping up!

The first one-piece ball was patented in 1923 by Thomas Miller, but it wasn't mass produced for use until the 1960's. These balls never did become widely popular, and are still rarely seen today.

In 1935 two chemists William Geer and Sidney Cadwell, each working independently for B.F. Goodrich and U.S. Rubber Co., respectively, developed the vulcanizing process which toughened the cover of the ball. Some of the balls of this era had the words "Cadwell Cover" or "Geer Patent Cover" stamped on them, while others used the "Cadwell-Geer Cover" name. This became the standard cover used on balls until the 1960's when Surlyn was first used. Later, the words "Vulcanized Cover" replaced the Cadwell or Geer names, as this appeared on balls produced later in this era.

The USGA and Royal & Ancient stepped into the fray in 1931, with rules relating to weight and diameter, though each had their own standard. The US balls could be no heavier than 1.55 oz., and at least 1.68" in diameter; while the British, feeling that their windswept links demanded a different type of ball, came in at 1.62 oz and 1.62 inches. In 1932, the USGA also sanctioned the 1.62 oz ball, but kept the larger diameter dimensions as their standard. This remained in effect until 1990 when the 1.68" ball became the world standard for golf! The familiar "Penfold" balls, today being re-introduced as the "British Open balls", were considered the standard when Americans ventured to Britain to play in the Open.

The next major decree from the USGA came in 1941 when they invented a machine to test the initial velocity of a ball. In 1942, the limit was set at 250 feet per second [plus/minus 2.5% @ 70 degrees F., at sea level] as the standard. Newer changes by the USGA have pertained to maximum distance plus roll of 280 [plus or minus 6%] yards, for a maximum of 296.8 yards. If a ball ends up further than that, it is considered an illegal ball.

Today there are at least 29 golf ball manufacturers, with over 100 different variations and models, offering a variety of covers, dimple patterns, compression's, and makeup. They have specialized balls for Ladies, Seniors and everybody else. There are balls designed for the Pro's and better Amateurs, as well as balls touted as being the longest ball, the most illegal ball and the one with the most dimples. Some are designed for short courses [Cayman balls], while others are for Nite-Golf [which by the way is a really great time!] Despite being one of the most integral parts of the game, and that most of us have owned hundreds during our career, few of us know much about these durable projectiles.

With all these manufacturers, surely there must be one which is right for you, right! The answer is a resounding PROBABLY! Let's examine some of the technology behind the modern ball!

Golf Ball Technology:

"It's considered good sportsmanship not to pick up lost golf balls while they are still rolling."

...Mark Twain

Let's get the facts out of the way first. Over 500 million balls are produced annually in the US, most selling between \$1 and \$2 each. Yet a ball made in the 1890's, if you find one in your shag bag, could bring you almost \$400. And some balls made in the early 1900's and into the 1920's would be valued at between \$400 and \$600! Rare as they are, you can find them at Golf Collector shows, and at the bottom of a few lakes or ponds. [Years ago, when Senior Pro Bill Hall was the head professional at Glen Echo, they dredged the lake off the 15th fairway and found dozens of balls dating back to the turn of the century! Many of these were sent to Golf House for authentication and some of the results were very interesting! Have you ever heard of a "Colonel Click" or a "Baby Dimple"! What about a "Silver King" or a "Radio-Radio" ball? Others found include several Acushnet's, Titleist, Dunlop's, Sapling's (Dot and Kro-Flite) and U.S. Royal along with Wilson Hol-Hi's, Top Notch, Staff, Sweet Shot and K-23.]

Because of their tougher thermoplastic covers, today's balls are more durable than ever and rarely are cut or gouged like their predecessors. In years past, this explained why only the better player played the soft-covered balata balls. One mis-hit and it was history.

There are basically two types of balls, 2-piece and 3 piece balls, and three types of cover materials used; Surlyn, Balata [synthetic] and Elastomer.

The leading ball producers, Spalding and Titleist, differ on the best method of forming the cover and dimples on a 2-piece ball. While Spalding employs a conventional injection molding, Titleist uses compression molding. Both will defend their method and have statistics to back up their claims. The general rule of thumb used to be that pro's played three piece balls because of their ability to work the ball and make it spin. Most amateurs, on the other hand, generally played two-piece [sometimes one piece]

balls for durability. But with the new combinations of covers and cores the differences between these is narrowing. Two-piece balls are becoming more workable, while three-piece are becoming more durable!

Golf Ball Collecting

“I found very little difference in the length of drive between the Haskell and gutta balls; perhaps they run further, but certainly don’t carry as far. They are also more difficult to stop when approaching and on the putting green are very liable to jump out of the hole.”

...James Braid

Collectors are becoming increasingly savvy about what they purchase. However they really *aren't* making them like they used to! No one makes featheries or gutties anymore. Replica's sell very well, but just aren't the same. For those of you interested in learning more about golf ball collecting, I am noting several Web sites that you should consider venturing into. One of the best is Leo Kelly's Old Chicago Golf [<http://www.webcom.com/oldgolf/>]. He will list dozens of balls (as well as related equipment) that are available for purchase! Other sites are; [<http://www.strictlygolf.com/>]; [<http://www.flash.net/~oldgolf/>]; [<http://www.golfshow.com/>]. There are many more, this is just a few.

St. Louis' own Keith Foster, architect extraordinaire, has quite a collection of old golf balls, along with other golf memorabilia. Several of them are pictured here.

Q&A

What is the difference between a three-piece ball and a two-piece ball?

You mean besides one piece? (Couldn't resist) A three piece ball consists of a center core [solid rubber, liquid filled etc.], a winding around the core, and a cover, usually balata or Elastomer, though there are three piece balls using surlyn's today! The manufacturers can affect what the ball does [spin rate, hardness, feel, etc.] by mixing different combinations.

Two piece balls are just that...two pieces. The differences are in the type of material used in the core, how large it is, relative to others, how hard it is and the thickness of the cover. One significant change in 3-piece balls today is that some three piece balls (Maxfli in particular) do not use a winding. Instead they have a fairly large center core, a thin durable layer around the core and finally wrap them both in the cover.

The basic facts remain the same however; 3-piece balls generally fly higher and land softer. From a distance perspective, they are usually not as long as most 2-piece balls, but we're only talking about less than 7-10 yards difference. They will tend to fly further, but roll less. They usually have a softer cover and will feel softer when hit. The dimple pattern used will also be a factor in determining if the ball flight is high or low!

What's does compression really mean?

Compression relates to "feel". A 100 compression [usually black number] will feel harder than a 90 compression [red] ball. They have nothing to do with distance! Similarly a 100 compression liquid center ball will feel softer than a 100 compression two-piece ball! There are no performance differences between 90 and 100 compression versions of the same ball!

What do dimple patterns really do?

Most ball manufacturers will acknowledge that any number of dimples between 300-500 accomplish almost the same effect on the ball. It is the position of dimples, the size of the dimple and their depth that affect the trajectory, distance and accuracy. In practical limits, only 85% of a golf ball can be covered with dimples! Remember the early smooth Guttie! The smoother a ball, the more distance will be lost. Titleist research states that larger and/or deeper dimples create a lower ball flight with less carry and more roll, while smaller and/or shallower dimples make a ball fly higher with more carry and less roll. One problem

with the latter is that the smaller and shallower the dimples, can have more of a ballooning effect! Finally the dimple pattern affects accuracy. The more symmetrical the pattern the more consistent the ball flight will be. The dimple patterns are designed to make the air around the ball stay closer to the ball, thus allowing it to “bore” through the air better, and create more lift (when combined with spin).

How does the cover material affect ball flight?

Cover hardness and thickness, along with the overall hardness of the ball, affect a ball’s “feel”. Also a part of the equation is the type of material used in the ball construction. The type of cover relates to how long the ball stays on the clubface [how much it rolls up the clubface for irons, or compresses on a driver] and this translates into spin. The longer the contact [in some cases the ball will seem to almost flatten against the club], the more spin can be generated! This is why you get more spin from a wedge or nine iron than you do with a driver! Spin, when combined with the correct dimple pattern, launch velocity and clubhead speed, translates into distance.

What about lift and drag on a golf ball?

Without getting too technical, remember that a smooth ball won’t go very far! Backspin helps create lift by forcing the air down, which forces the ball up! [Everyone remember Newton’s third law from Physics?] But cutting through the air also creates drag, which is why the smooth ball falls to earth quickly. It is the dimples that combine with backspin to reduce drag, improve lift and give today’s modern balls tremendous distance!

Which is the longest ball?

Sorry, there is no longest ball for everyone! It just isn’t that simple. As we said earlier, generally a two piece ball will roll more than a three-piece ball. And in terms of overall distance, both are relatively the same [the USGA makes certain of that]. The real answer is that for each golfer and for each club, their swing type and club shaft [graphite or steel, kick-point etc.] affect the “initial launch angle” which really determines the optimum distance. This is like shooting an arrow. The bow and string-tension affect how far it will go, but it is also affected by the angle at which you aim; level [90 degrees] midway [45 degrees] or somewhere in-between! This will be different depending on the other factors! In golf the “launch angle” [the initial direction of the ball at impact] is very important in determining distance. Other factors include spin [backspin and side-spin], ball hardness, cover hardness, dimple pattern and swing speed.

For example, for an 80 MPH swing speed [typical for beginners and ladies] independent testing showed that the Lady DDH was the longest ball at 198.40 yards; slightly longer than Precept EV Red (198.20) and Ultra High Trajectory (198.0). But the Ultra had the longest carry of the three (174.20) while the DDH had the shortest (172.8)! Yet the total distance separation of the three was only about a half-yard! In the same tests on a balata ball, it’s total distance was about 7 yards less at 191.40 [Ultra Tour Balata 90] while the Feel/Distance winner was the Slazenger 420 at 197.6 yards (173.4 carry). The biggest surprise was that the so-called “distance” balls, scored near the bottom of the overall category! The results would be completely different depending on the swing speed selected. But for the individual golfer, the course you play should also play a role in determining which ball is best for you!

And if you think you can call the USGA and ask them which ball won, sorry, they won’t release the results!

What are spin rates and how do they affect the ball?

Each club will have a slightly different spin rate with the same ball! At the same time, the center material for a three piece ball, the cover material and thickness all affect spin rates, as does the launch angle. For example, Tiger Woods plays the Titleist Professional. With his driver and ball combination, his spin rate is just over 3,000 rpm, while another pro will produce over 4,000 rpm’s with his. The lower spin rate helps reduce hooks and slices, while also maintaining a lower trajectory! Combine this with his clubhead speed [in excess of 160 mph] and launch angle, and this helps account for his tremendous length.

Which are the “hottest” balls today?

A survey of several local golf shops shows that Titleist and Precept are the hottest selling balls today. Other top sellers are Maxfli and the new Srixon, with it’s practically indestructible cover. Top-Flite,

Pinnacle, Ultra, Wilson Titanium, Hogan and others are also selling well. But the most asked for balls today are in the first two categories.

So when you walk into your local golf shop and are looking for the best ball for you, it might be wise to spend a little time thinking about your game first! Then again...sometimes the more we think, the worse it gets. Maybe searching the rough is the best answer after all! As someone once told me, the trouble with golf is that we've got too much time between shots...that's when we begin to think...and that can ruin your game! As the noted writer, P.G. Wodehouse wrote, ***"The least thing upset him on the links. He missed short puts because of the uproar of the butterflies in the adjoining meadows"***.