



CLUBMATE **GOLF** AUSTRALIA
GOLF CLUB COMPONENTS

eTECHREPORT

Welcome to the March issue of Tom Wishon's eTech Report!

In this issue:

1. **USGA Proposes Rule Change for Scorelines**
4. **USGA Alludes to Future Changes in the Rules Regarding Adjustability of Clubs**
5. **Former USGA Executive Director Speaks Out on Recent USGA Equipment Policies.**
5. **Moment of Inertia vs Clubhead Resistance to Twisting**
6. **Shaft Swing Speed Ratings – When to Deviate or Not in Shaft Fitting**
8. **12 Myths on Audio CD**
9. **Tom Wishon Confirmed to be Keynote Speaker at 2007 European PGA Teaching and Coaching Conference**
9. **TW and MOI Matching Featured in Golf Digest**
10. **New Design Profile – 949MC Fairway woods**

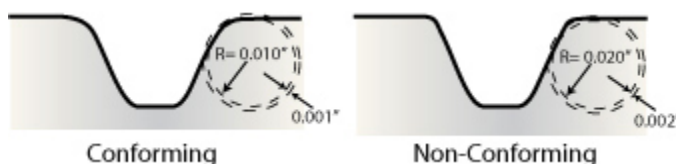
USGA Proposes Rule Change for Scorelines

TWGT Clubmakers:

As many of you know by now, the USGA recently issued a proposal to change the Rule governing the shape and area size of scorelines. After an extensive and expensive study, the USGA is proposing to decrease the radius of the top edge of scorelines and impose a new rule limiting the area of the grooves. The TWGT E-TECHreport wanted to explain and discuss this important new announcement to all TWGT Clubmakers, but after reading industry business reporter Terry McAndrew's article on the matter, we felt no one could explain it any better, including all of the foibles within the USGA's proposal. So without further adieu, here is the best possible explanation of the new scoreline rule proposal.

Big brother, check that, the big brotherS are at it again. The USGA and R&A both have announced changes to the Rules governing golf clubs. The gist of the first one has to do with new regulations for grooves. The second one concerns adjustable features of woods and irons.

The ruling bodies have become concerned with the direction the game has taken in recent years towards a bomb and gouge type approach by PGA Tour players. "The skill of driving the ball accurately has become much less important in achieving success on Tour than it used to be," USGA Senior Technical Director Dick Rugge stated. "Our analysis of statistical data measured by the PGA Tour since 1980 shows that historically driving accuracy was as comparably correlated to winning as putting. Beginning in the early 1990s, however, driving accuracy became much less important. Today, the correlation between driving-accuracy rank and money winning rank on the PGA Tour is very low." Essentially the penalty for missing a fairway is no longer what it once was, that is, at the elite level. So the respective brain trusts have independently and yet collectively proposed on precisely the same day that a change is now in order.

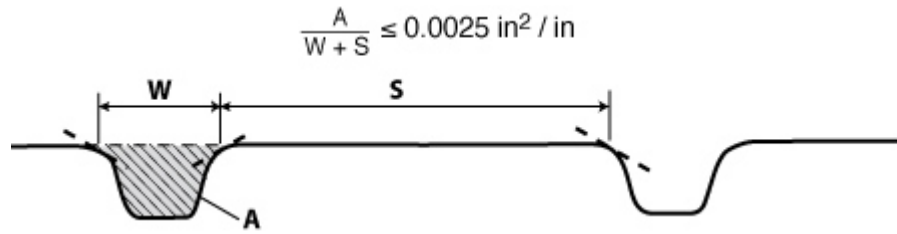


Groove edges must have an effective radius which is not less than 0.010 inches (0.254 mm) when measured as shown above. Deviations in effective radius within 0.001 inches (0.0254 mm) are permissible.

To the rank and file it may appear on the surface that the proposed amendments toward grooves are minor, but it would be inappropriate to think that way. First up sharpness of the groove edge is to be limited to an effective minimum radius of .010 inches, which means the new groove edge will be twice as rounded as what is conforming now. The second would limit the total cross-sectional area of a groove divided by the groove pitch (groove width plus separation between grooves) to 0.0025 square inches per inch. This new measurement forces companies to make their grooves more shallow, which in USGA minds means less area to channel moisture away from being between the ball and the face, As indicated, it appears to the naked eye that nothing has changed, at least by that much, but the trickle down effect could be quite contrary.

As has been the case in the past with the USGA, the current rule proposal phase is soliciting feedback. But it isn't considered to be going on out a shaky limb to suggest that this will eventually become a hard and fast rule some time either later this year or early in 2008. The comment period concludes on August 1, 2007 for interested parties to share any relevant thoughts on the topic with the USGA. Don't bet on the ruling bodies to take a mulligan on this since it would be out of character.

The USGA is further proposing that these new groove rules become effective for all new clubs that are manufactured after Jan. 1, 2010. A related Condition of Competition would be added to the USGA Rules of Golf to become effective Jan. 1, 2009. This Condition would allow a Committee to require the use of clubs that conform to the new groove rules for competitive events conducted after Jan. 1, 2009. Similar to other equipment-related Conditions of Competition, the USGA would recommend that the Condition apply only to competitions involving highly skilled players, although it didn't define just who is represented in this segment. The PGA Tour is a given, as is likely the worldwide tours, but whether the NCAA is to fall into this, it isn't clear. USGA competitions (male, female, juniors and seniors), equally are a given as likely are PGA Section events but how that is interpreted at the state and local levels (club championships) for competition is also murky for the time being. Nor is it readily apparent how a Competition committee would be able to identify conforming grooves unless it has the equipment companies' cooperation to note which of their respective products are kosher in the eyes of the ruling bodies' sets of rules.



The cross-sectional area (A) of a groove divided by the groove pitch (W+S) must not exceed 0.0025 square ounces per inch (0.064 mm²/mm).

The slippery slope picks up some speed with the treatment of existing golf clubs that currently conform to the Rules of Golf, but would not under the proposed new rules. The USGA is floating the idea of grand fathering their use for a lengthy period of time (at least 10 years) for handicapping purposes. The USGA is proposing that its new groove rules become effective for all new clubs manufactured after Jan. 1, 2010, meaning what you own today or buy tomorrow may be a waste of money if you want to play by the rules in the future.

If one's head isn't pounding at this point from attempting to process where this is all going, consider this added nugget from the blue blazers in Far Hills, NJ. The changes in grooves required under the proposal would have very little effect on the performance of Surlyn cover balls, which according to the USGA, are favored by most golfers. It stated that more than two-thirds of golf balls sold in the U.S. are Surlyn covered. The impact of its proposal would be felt primarily by "highly skilled" players using urethane-covered balls, the USGA said. So the needs of the few, in effect, outweigh those of the many.

Where this hits potentially the hardest is with equipment companies. Sales of clubs overall in the industry, including irons haven't exactly been robust. At best they have held their own, as noted by sales figures revealed from some of the larger equipment companies throughout the past several years. However, the cost of doing business is going up in the form of retooling charges (wax injection die changes, CNC machining changes, face polishing/grinding, plating, etc.) to comply with the rules for highly skilled players starting as early as possibly 2009. The opportunity to recoup these re-tooling costs in the form of commercial sales are thus destined for further down the road for the club companies. China is the initial benefactor since it handles most of the equipment companies' manufacturing these days and equipment companies have a relative short amount of time to get the product squared away for its pyramid of influences - PGA Tour players since its likely they would need them starting in 2009, assuming this is when it would go into play. If the rule changes are successful in reducing the amount of spin Tour players can create out of the rough, it could be argued that the USGA has forced the club companies to create a diluted product compared to today's irons. For the masses that play a Surlyn ball, it's a moot point, according to the USGA. The opportunity for innovation for all companies without the context of the rules would be smaller should this proposal take effect.

And last but certainly not least, is the plight of the PGA Tour itself. After all it appears this is something that is being created due to the scoring proficiency of its constituents. Keep in mind the PGA Tour plays by the USGA Rules, literally. Does less spin mean the likes of Tiger, Phil and company, win more, less, or the same going forward?. Or does it mean that Fred Funk can come back in his 50's and teach the young guns a thing or two about finding fairways and winning FedEx points? What hangs in the balance is the entertainment factor the Tour possesses in hearts and minds of its loyal fan base, which are the same people who buy the equipment, including the Surlyn balls which do not spin any different with V or the current sharper edges U-shape grooves. If the entertainment factor isn't the same, then television is going to feel it first and foremost.

E-TECH: If you think it is not wise to issue a rule proposal without a clear decision for how long current irons are going to be conforming, or without a clear designation for which events on all levels of play

are to be compelled to compete under the new Rule, we would urge you to write or email the USGA to express your opinion. After all, the USGA's proposal states that a period of comment will be in effect until August 1, 2007. It is the opinion of TWGT that the new scoreline rule proposal is not in the best interests of the game or the vast majority of golfers. Since the matter of increased spin with current clubs exists only with players who possess much higher than average swing speeds and who use a urethane cover ball, and since 2/3's of all balls sold are Surlyn covered, it seems a far wiser way to reduce spin for such players and increase the penalty for hitting the tee shot into the rough would be to either change the cover material of the balls or grow the rough longer at the elite (aka Tour) tournament venues. To compel manufacturers to change their groove edge and area to new specifications poses a potential risk to the golf companies for loss of club sales and equally forces golfers for whom the rule will make NO difference and who feel an obligation to play with conforming clubs to buy new clubs. If you feel strongly enough about this proposed Rule change, we ask you to write the USGA to express your opinion.

Terry McAndrew is the publishing/editor of the Web Street Golf report newsletter located at <http://www.golfbiz.net>. It is published weekly and devoted to the current events surrounding and effecting the golf industry. Past issues are warehoused in the archive section. The newsletter is subscription based and available for US\$49.99 on an annual basis. Quarterly and semi annual subscriptions are also available at a reduced rate. To sign up simply visit <http://www.golfbiz.net> and select the section titled BECOME A MEMBER located on the left hand side of the home page. Use the promotional code WISHON and the price of the newsletter will be reduced to US\$29.99 for a one year subscription.

USGA Alludes to Future Changes in the Rules Regarding Adjustability of Clubs

While the USGA taketh on the groove side of the ledger, it giveth back, in a sense, by offering an adjustment. The USGA is considering modifying its position that woods and irons must not be designed to be adjustable, except for weight. It's the belief of the ruling body that changes regarding adjustability can help many golfers obtain clubs that are well suited to their needs without causing any harm to the game. In accordance with past practices, no adjustments to clubs would be allowed during a stipulated round.

"After we informed club manufacturers that we were looking into relaxing this rule, some of them told us that allowing more club adjustment would allow them to create new types of golf clubs that could help average golfers," USGA Senior Technical Director Dick Rugge said. "The USGA believes that helping average golfers without taking away from the challenge of the game is a good thing for golf." Ah ... hum ... okay, not exactly sure how that could work, but it sounds good!

Rugge continued, "PGA Tour players have long had the opportunity to have their clubs adjusted or modified quickly and often. This has allowed them to fit their clubs to their swings as they feel the need to do so. By relaxing the rules to permit club adjustability, average golfers can enjoy similar fitting benefits." Does this mean manufacturers will be backing of their Tour trailers at golf courses across America to help the common man before they hit the first tee?

Consider this to be a token gesture by the USGA, under the heading of public relations spin, especially since it was announced simultaneously as it shared how it wants equipment manufacturers to get their respective groove on. The proposed rule change to allow more adjustability of golf clubs, if adopted, would become effective Jan. 1, 2008.

While no specifics about what adjustability features may be allowed, it is expected that interchangeable shaft mechanisms and adjustable lie angle mechanisms which could be locked in a way to prevent adjustment during a round could very well be allowed at some point in the future.

Former USGA Executive Director Speaks Out on Recent USGA Equipment Policies

The name and face of Frank Hannigan is not unknown to most golfers. The former Executive Director of the USGA from 1961 to 1989, Hannigan was also a regular commentator on network telecasts of major championship tournaments. Now retired, Frank Hannigan has recently come back into the eyes and ears of golf through a series of letters written to veteran golf writer Geoff Shackelford in which he offers his insights and opinions on the recent equipment limiting actions of the USGA.

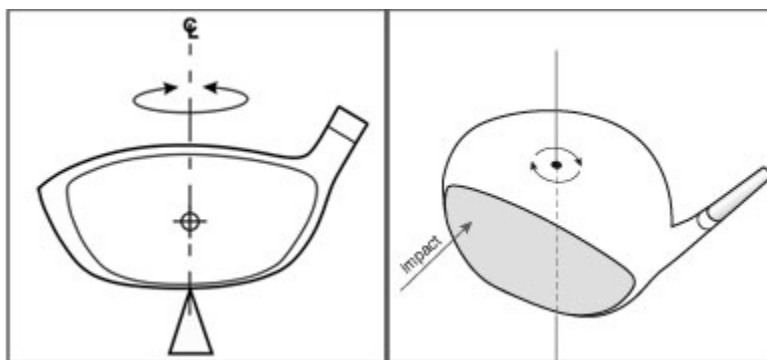
Hannigan's letters share insights that only a person with a long history inside the workings of the ruling body of the game can know. Never known as a man to seek the limelight of political controversy, TWGT thinks all Clubmakers and golfers need to read and think about what Frank Hannigan feels strongly about to share publicly on writer Geoff Shackelford's web site.

To access and read Frank Hannigan's letters, head to the following link:

<http://www.geoffshackelford.com/homepage/2007/3/5/letter-from-saugerties-march-6-2007.html>

Moment of Inertia vs Clubhead Resistance to Twisting

In an effort to continue expanding our scientific basis for design and clubfitting research, TWGT works closely with a few university engineering departments around the country. Most recently, we were able to have two engineers from one of our consulting universities construct a computer model to predict the effect of the MOI Izz on the actual amount of resistance to head twisting from an off center impact. While other engineers have checked and labeled the science behind this modeling project to be sound, at some point in the near future, TWGT plans to use a high speed camera to duplicate the model in real life and thus determine if the model we are about to discuss is fully and completely accurate.



The MOI shown in this line art is the MOI Izz and is the pertinent MOI being increased through new driver design technology today)

FYI, the MOI Izz is the designation of the Moment of Inertia that is now being measured and reported in the marketing of the new square driver heads. This is the MOI that affects how much the head will twist about a vertical axis through the head's Center of Gravity. Heading into the 2007 playing season around the country, the golf industry's newest design technology being hyped to golfers are the drivers heads which claim a higher MOI Izz than before. Some companies are using a square shape, some a more extended back shape, to move mass farther from the CG and achieve the higher MOI numbers being advertised.

As a frame of reference for better understanding this discussion, it should be known that the highest MOI being claimed for one of the new square drivers is a measurement of 5200 g-cm². Other high MOI

drivers being marketed to golfers this season claim an MOI of 5000 g-cm². More conventional shaped 460cc driver heads created in 2005-2006 have an MOI that ranges from approximately 4100 g-cm² to 4900 g-cm². So the question that begs to be answered is, "How much do the new higher MOI drivers reduce head twisting, and from that, improve off center hit performance."

The computer modeling project for identifying the effect of higher MOI on head twisting was constructed to compare head twisting differences between a driver with an MOI of 3800 g-cm² and 5200 g-cm² for a clubhead speed of 109mph, with impact located ½" above face center and ¾" toward the toe side of face center. For modeling purposes, air cannon testing on a major OEM driver revealed a COR at the off center impact position of 0.73.

The computer modeling results predict that a 109mph impact with a driver head with an MOI of 3800 g-cm² at a position ¾" horizontally and ½" above face center would produce a twist of the head of 1.5 degrees. If the MOI is increased to 5200 g-cm², for the same impact conditions the head will twist 1.0 degrees. This means for an increase of 1400 g-cm² in the MOI, the head's resistance to twisting is improved by only ½ degree.

If you consider that the modeling impact speed of 109mph is quite high compared to the swing speed of most golfers, it can be said that for the vast majority of golfers, the improvement in head twisting for an MOI increase of 1400 g-cm² will be substantially less than ½ degree. When you consider that any golfer who bought a 460cc driver in the past two years is currently using a driver with an MOI of 4100 g-cm² or higher, the amount of improvement in resistance to head twisting offered by the new drivers will be in the area of ¼ degree!

One of the most important points that Clubmakers have to keep in mind when talking to golfers and answering questions about high MOI driver head models is that the design of the face is extremely important for determining the "forgiveness" of a driver. Based on our engineers' modeling study, a well designed face that can reduce the loss in face flexing for off center hits will deliver much more distance on off center hits than a higher MOI.

When the COR at the off center impact point in the computer model was increased from 0.73 to 0.79, ball speed for a 109mph impact speed was found to increase by 5.1 mph. At an average of 1.8 yards of carry distance per 1mph increase in ball speed, it is pretty clear when comparing that figure to an improvement in head twisting resistance of ¼ to ½ degree, that a well designed face on a driver with an MOI of >4000 g-cm² will hit the ball farther for off center hits than a driver with an MOI of 5200 g-cm² and a lower quality face design.

Better yet is a full custom fitting of the driver for all golfers which can pinpoint the best length, loft, face angle, shaft, swingweight/MOI and grip size. So when it comes to discussing new technology with your golfers, be smart and get them to focus on the total benefits of full custom fitting rather than hyped up individual clubhead marketing claims.

Shaft Swing Speed Ratings – The State of the Situation and When to Deviate or Not in Shaft Fitting

Thank gosh the concept of awarding a swing speed rating to shafts came about in the early 1990s as a way to begin the shaft fitting process. When the fact that no standardization exists for letter flex codes in the shaft industry first came to light in Tom Wishon's 1991 book, *The Modern Guide to Shaft Fitting*, determining a way to describe the overall flex of shafts through a swing speed rating has become the only way Clubmakers have to begin the task of fitting the right shaft to each golfer.

The first swing speed ratings for shafts were offered in Wishon's 1991 book. Thanks to the able assistance of Tom's technical assistant at the time, Jeff Summitt, a method for combining the butt frequency with the torque was used to allow Clubmakers to be able to identify shafts that could be the starting point for matching golfers to the right shaft. Since that time, both Wishon and Summitt have modified their original swing speed rating method several times to incorporate more about what all goes into determining the overall stiffness of shafts.

Fifteen years ago the butt frequency was the primary determinant of the swing speed rating of a shaft. Today it is completely possible to see two shafts with quite different butt frequencies end up with the same swing speed rating because of the influence their different bend profile designs will have on a golfer's perception of the overall flex feel of the shafts. Likewise it is possible to see two shafts with the same butt frequency be ranked with different swing speed ranges for the same reason.

How valid are today's swing speed ratings for shafts? Because of the critical importance of individual golfer desires for the bending feel of the shaft, the swing speed rating of any shaft cannot be used as the sole criteria of matching the golfer with the overall stiffness of a shaft. Some golfers prefer a very firm feel while others a more flexible feel for their preferred sensation of the bending action of the shaft during the swing.

No matter what, with literally thousands of different shafts from which to choose to fit their golfers, Clubmakers must have a swing speed rating for shafts to which to refer as a starting point for shaft fitting. While TWGT only designs and sells its own shafts, to be able to offer swing speed ratings for all of the shafts in our TWGT Bend Profile Software, we had to study as many sources for shaft swing speed ratings as possible to evaluate their accuracy.

As a result of that work, we believe that the swing speed ratings offered for a wide variety of vendor branded shafts by Golfsmith and by Dynacraft's new owner, Hireko, are more currently accurate than the swing speed ratings offered by other shaft sellers. For example, after a quick inspection, it is evident that all shafts of the same letter flex are awarded the same swing speed rating by GolfWorks. Clubmakers must know this cannot possibly be accurate because of the lack of flex standards among shaft makers as well as from their experience in fitting shafts of the same letter flex from different shaft companies.

Once you have a list of the swing speed ratings for many shafts, what next? To assist Clubmakers, following are a number of tips to follow which will make your shaft fitting a little more accurate for all types of golfers.

- Among all shafts of the same swing speed rating being used by golfers with a swing speed that lies in the middle of the range, shafts with a stiffer butt section bend profile design will always feel stiffer overall to most players with a perception for shaft bending feel. Likewise, shafts with a stiffer tip section bend profile design will tend to display their increase in stiffness feel right before and through impact. However, this also depends on just how stiff the butt section may be in any tip stiff design, and vice versa. While very soft butt + stiff tip and stiff butt + soft tip shafts are pretty rare in the game, the softer of the two sections in any shaft will typically influence its feel more to players with the ability to detect differences in bending stiffness. Remember, we are talking about shaft bending FEEL, not strictly performance.
- Golfers who begin the downswing (the transition move in the swing) with a faster, more sudden and forceful strength are typically going to be better matched for overall stiffness feel and performance with shafts that have a swing speed rating that is HIGHER than the golfer's measured swing speed. For example, if the golfer with such a forceful transition move has a 90mph swing speed, shafts with a 90-100mph swing speed rating will typically be a better starting point for fitting the overall flex. Only if the golfer wants the bending feel to be even more stiff and has an extremely forceful

transition would the swing speed rating of the shaft need to be more than 10mph higher than the golfer's swing speed.

- Golfers who begin the downswing (the transition move in the swing) with a smoother, more gradual application of strength are typically going to be better matched for overall stiffness feel and performance with shafts that have a swing speed rating that is LOWER than the golfer's measured swing speed. For example, if the golfer with such a forceful transition move has a 100mph swing speed, shafts with a 90-100mph swing speed rating will typically be a better starting point for fitting the overall flex. Only if the golfer wants the bending feel to be more flexible and has an extremely forceful transition would the swing speed rating of the shaft need to be more than 10mph lower than the golfer's swing speed.
- If the shaft is being fit with an eye toward changing launch angle, spin and trajectory, the first task is to identify if the golfer has the required swing movement of a later to very late unhinging of the wrist-cock angle that is necessary to allow any shaft to display its launch, spin and trajectory differences in response to the golfer's swing. In such cases, choosing a shaft with a swing speed rating that is 10mph lower than the golfer's actual swing speed should result in a higher launch, more spin and higher trajectory. Doing the opposite and selecting shafts with a swing speed rating that is 10mph higher than the golfer's actual swing speed should result in a lower launch, less spin and lower trajectory. This approach of deviating from the swing speed rating vs golfer swing speed will always bring a change in stiffness feel with the height and spin difference, so you will need to evaluate if the golfer is going to be in agreement to that feel change. If not, this is where you can select shafts to change launch, spin and height of the shot which are within the golfer's swing speed, but which have either a stiffer tip section (lower flight, lower spin) or more flexible tip section (higher flight, higher spin).

12 Myths Now on Audio CD

Do you have prospective customers for custom fitting who commute daily in their cars? If so, the new professionally done audio CD of the 12 Myths of Golf will be a superb way to get the message out that custom fitting beats standard off the rack, and turn those golfers into your custom fitting customers.

Read by a professional voice talent and professionally produced, the audio 12 Myths CDs are not as low cost as the 12 Myths booklets, but for people who don't have the time to sit down and read, popping the CD into their car stereo will be a much better way to get the message of custom fitting into the ears and minds of golfers in your area.

We recommend all Clubmakers get at least 2 copies – one to show and one to loan out for prospective customers to listen to. TWGT has again chosen to forego the profit to be able to get the word out in as many ways and to as many different golfers as possible.

One hitch though. We can't put them into the hands of your golfers. You have to do that. But just like the Search books and the 12 Myths booklets, the more golfers you turn on to the message of custom fitting, the more fitting sessions you will book and custom clubs you will build and sell!



Tom Wishon Confirmed to be Keynote Speaker at 2007 European PGA Teaching and Coaching Conference

While each European country has its own organization of professional golfers, every two years all of the European PGA organizations get together for a week of seminars and discussions aimed at collectively increasing the awareness of all European PGA members. The 8th PGA's of Europe Teaching and Coaching Conference will be held at the Exhibition and Convention Center in Malmo, Sweden from October 11-13 this year, with the theme being, "Aiming to Simplify the Game for Golfers."



Hosted by the PGA of Sweden, more than 1,000 European PGA professionals and guests will convene in the southern Swedish city of Malmo to listen to a program of presentations by leading specialists in the game, and discuss a range of searching questions.

"A lot of people give up golf because it is too time consuming or just too difficult," says Swedish PGA Managing Director Mikael Sorling. "The speakers for this year's PGA Europe conference will provide an excellent platform for European PGA professionals to come together to discuss these critical issues and work together to strengthen the integrity of the sport all over Europe."

TWGT's Tom Wishon has been asked to be one of the keynote speakers, to travel to Europe to share his knowledge of how full custom fitting can make the game a little easier for all levels of golfers from beginner to expert. Other speakers scheduled to present at the 2007 conference include the "teacher's teacher" Chuck Hogan, the much lauded Swedish teaching duo of Lynn Marriott and Pia Nilsson, Greg Rose and Dave Phillips from the Titleist Performance Institute, Callaway Golf VP of advanced design Alan Hocknell, Director of Coaching for the English Golf Union Peter Mattsson, and others.

Wishon's presentation will encourage European PGA pros to learn and launch custom fitting in their shops as a way to help golfers overcome some of the difficulties in achieving a level of play that sustains their interest and participation in the game. His talk will be from 10AM to 12:30 PM on Friday, October 12 and will follow a 90 minute presentation by Alan Hocknell from Callaway Golf.

"I'm totally pumped and excited the European PGA's asked me to come over to talk to their members about custom fitting," said Wishon. "With more than 1,000 European club pros expected to be in attendance, I really can't wait to spread the common sense of how full custom fitting services can and will make for happier golfers who will be able to enjoy this great game a little more. This comes on the heels of the great news that the British PGA has officially selected my book, *The Search for the Perfect Golf Club* as required reading and curriculum for all British PGA apprentices in training to become full members. All of this tells me the European pros are ready and willing to begin to make a real effort to incorporate custom fitting into the services they offer their golfers and members."

MOI Matching and TWGT Featured in April Issue of Golf Digest

For Clubmakers who offer MOI Matching of their custom fit clubs, the wish for publicity that will enable you to convince golfers of the validity of the process has been granted. The April issue of Golf Digest magazine includes a feature article about MOI Matching within an article in the Golf Tech section of the magazine titled, *The Innovators*.

TWGT knows that golfers feel better about their equipment purchases when significant publicity from a respected publication highlights the company and the product. With such a feature on page 204 of the April issue of Golf Digest, Clubmakers now can show the feature article to their customers and know the power of publicity can help them convince golfers that their custom fitting needs are in good hands.



The same article on TWGT and MOI Matching can also be seen on the Golf Digest web site at the following link:
<http://www.golfdigest.com/search/index.ssf?/features/gd200704techwishon.html>

Because of the publicity value of this article, TWGT will be creating re-prints for Clubmakers to keep in their shops to show to prospective custom fitting customers. Availability of re-prints for this article will be announced in the next edition of the TWGT E-TECHreport.

New Design Profile – 949MC Fairway woods

Prior to 2004, the golf industry said it was not possible to design a fairway wood with a COR of 0.830, the limit imposed for driver heads. That year, TWGT proved the industry wrong by utilizing the combined elements of cup face construction, no vertical roll and a special new high strength steel alloy from Carpenter Specialty Metals to create the 515GRT fairway woods and their 0.830 COR. The 515 fairways went on to win a position on the 2006 Golf Digest Hot List and have proven their classic, traditional shape with high ball speed performance to tens of thousands of golfers.

Then the industry said it was not possible to design a more shallow face height fairway wood with a COR of 0.830, and this year, TWGT again proved them wrong with the introduction of the new 949MC fairway woods. With a face height of just 32mm to ensure easy playability for all golfers, the early season reports from Clubmakers and their golfers who are using the 949 fairways all center on the expressions of, “man is that hot”, or, “this is stupid easy to hit off even the tightest fairway lies.”

“The smaller the face area, the more difficult it is to design the face to flex inward enough to reach the COR limit of 0.830. At 32mm face height, the 949 fairway woods are 3mm more shallow than the 515 fairway heads. Utilizing a brand new cup face construction with TWGT’s unique GRT fairway wood face design helped in the challenge. However, the goal of a full 0.830 COR was not reached until TWGT



However, the goal of a full 0.830 COR was not reached until TWGT

employed the use of a new and higher strength steel alloy which allowed the faces of the 949 fairways to be produced at an incredibly thin, but durable face thickness of 1.6mm.

With more and more golf courses mowing their fairways closer, the old "cushy lie" for fairway wood shots is becoming a thing of the past. In addition, the 949 fairways are designed with a more radiused sole from heel to toe, which will help in hitting shots from the rough.

One of the fitting theories behind designing the 949 fairways with loft numbers only on the sole is for Clubmakers to offer a "two-fairway woods" fitting option to golfers who wish to use four wedges and/or more hybrids in their 14-club set makeup. For better ball strikers who have no problem getting a lower loft fairway wood well up to fly, the 949 14° and 18° make a solid fairway wood make-up for the better player. For less skilled players, choosing the 949 16.5° as the player's "second longest hitting wood" after the driver, in conjunction with the 949 21.5° wood proves to be an ideal "two-fairway wood" make-up.

949MC Fairway woods – Available now in lofts of 14°, 16.5, 18° and 21.5° in RH with 0.830 COR and 32mm face height for ease of play.

All eTECHreport (ISSN 1551-1103) articles written by Tom Wishon unless otherwise noted. Please refrain from unauthorized reproduction of text, photos, and/or graphics.