

Paradym Ai Smoke Vidcast: Drivers + Fairway Woods

Hosts

Dave Neville – Sr. Product Director

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Intro

Dave: “We’ve had an unbelievable year with Paradym - #1 market share in Drivers, #1 in Fairway Woods, #1 in Woods and that’s on a global position. We saw with Paradym that this was a fundamentally better driver, with a paradigm shift in construction. What’s going to take us to the next level?”

Brian: We were looking at it a year ago as we were starting production on Paradym we knew we had something special with Paradym. We were seeing consistent downrange dispersion, great distances and so we challenged the team how do you make a better version of that, and we were doing the things that you'd expect an R&D organization to do. We went out and talked about how we could improve our head speed, we talked about how we could make our carbon chassis more efficient and if we had just stopped there, we'd have improvements to make on this #1 line of golf clubs, but we didn't stop there.

Our team had been exploring a real breakthrough for us in the AI space, an Ai-driven breakthrough using Real Player swing Dynamics. And we had done some prototyping efforts that showed that there was a whole new level of performance available to us using AI in our design process.

Dave: Yeah, and you know we've been talking about AI for a number of years going all the way back to Epic Flash, but it really goes way beyond that. I know there are others out in the industry talking about Ai, but we’ve been working on this for a long time. Just talk a little bit about the highlights of where we are with Ai, we really feel like we have a leadership position in that in the industry.

Brian: We do it's been a 15-year journey for us and it's been an investment in both people and in infrastructure. So we've been building this system and this engine around how golf design works and how we use AI to predict what's possible in terms of golf ball launch trajectory. And when we first started talking about AI in terms of a face performance, we were really using it for ball speed. We were looking for COR benefits and when we used it for Epic Flash that was a single focus for us.

Now we're using it in a much more sophisticated way, so we've built a platform around it that allows us to put more sophisticated data in to ask Ai to solve for more sophisticated outputs and outcomes.

New Ai Smoke

Dave: And it's interesting what you're saying before is, you could have just taken Paradym right which was the #1 selling driver so far this year, make those kinds of improvements to the mass properties the carbon chassis, the APW, and say it's Paradym 2 and here it is, but we're not doing that. Really through Ai we're taking that to the to the next level and that's allowing us to introduce the all-new Paradym Ai Smoke which we all are extremely excited about. I know this is a multi-year journey from the marketing side we're saying sweeter from every spot.

We're going to talk about really what that what that means, but just talk about this this Smart Face. How is it different fundamentally from the Flash Face that we've had in before, to the point where we felt like this is such a breakthrough that it needed almost a new name? It's not just an evolution of the Flash Face.

Brian: Our face design is unique - you've seen the images; you've seen the radical topography. It's a non-intuitive type of face. So we really understand what we can do with it by changing the topography. we're allowing the face to deflect in a different way from all other golf faces that are out there.

What we're able to do is really uh control the outcomes in a localized manner or and as part of a whole and so what we've done is we've created this basis now we've categorized using Real Player swing Dynamics and um now modeling in the way that players deliver the golf club head to the ball. We've categorized over 250,000 Real Player swings that are out there in the fitting environments and fitting Studios globally. We're looking at Callaway fitting centers and data from our own test center and driving range. We've built a platform now over 80,000 lines of custom code to harness that data and create a face that's unlike any other.

What Makes The Smart Face Different

Dave: So as we dig into this there's really three big points on this Smart Face on really what makes it different. We're going to talk about the swing code using Real Player data, the way that the face is created with the optimizations.

And then this thing that kind of blew my mind which is around the idea around micro deflections but let's dig into each of those in in order really starting with the swing code. Talk about how most faces are designed in the industry and what we're doing that's different.

Brian: It might not surprise you, but golf club companies for years have been out there, modeling and designing golf clubs in a neutral static environment. We're looking at how a face flexes on effectively a neutral or perfect swing. We design them that way we test them that way on robots and we wanted to really break away from that. So now what we've done is we've created a new way of designing and modeling to more closely reflect how golfers deliver the club.

What we've done is we've taken all this data from out there and we've categorized it, so we've gone out looked at fittings of players and we've grouped them together to come up with

Unique Designs and inputs for each model that we produce. And that's the swing code for these players. So the components of a swing code, we're looking at the clubhead speed that it's delivered in. We're looking at impact locations, we look at path, angle of attack, we look at face angle relative to path, we look at dynamic loft and lie.

So all the components of a swing that really result in what happens to the golf ball off the face. What we've done is we've categorized these swings, we have a swing code in our MAX D and MAX Fast Driver that represents the player who swings and comes in with a path from the outside, down and across the ball. Swinging down on it with a face that's open to path, typically a little slower head speed and impact locations that tend to range from low heel to high toe, that often results in a slice.

We've asked Ai to design a face that delivered that way can typically react in a different way for that player and improve their outcomes. And we contrast that with the core market for us, in the Ai Smoke MAX Driver. This is a player that has a path that's a little bit less from the outside, but still coming from the outside. Now they're starting to attack a little bit up on the ball and a little higher swing speed, and more consistent impact locations across the face. And a face that still is a little bit open to path.

Finally, we bring it home by looking at some of our better players out there, players that are fitting into Triple Diamond products. They're seeking lower spin, much more consistent impact locations, typically a much higher head speed, swinging up on the ball, a more neutral path, and a face that's square to that path.

Dave: So when we look at these impact patterns here typically with the robot, it would be just the impact pattern delivered kind of in a neutral way. You're not just getting that impact pattern you're getting all the different features of how the face is rotating the the dynamic loft all of that at impact so it's many, many more millions of data points.

Brian: It's a much more sophisticated process to now model how golfers deliver the club and to ask our team to solve for better outcomes as the golfer moves the ball and impact locations all over the face and delivers with all kinds of different conditions.

Dave: So that's the swing code. I would say that's kind of the input into the face and then as we look at how is the face created, talk about typical process here on number of faces that you would do versus what we're able to do. People ask what is the Ai really doing, what is the machine learning really doing. This is it, right?

Brian: Yeah, we've built a modeling system using our downrange arrow code to predict outcomes off different locations. And with different swing deliveries across the face. So we start a process and we're modeling outcomes all over the face. And the Machine learning process begins and tries to solve for more optimal solutions. When we first started talking about Ai, we would get what would be an optimal solution.

For us, in about 12,000 to 13,000 impact simulations, now the process takes about 50,000 impact simulations where it's much more sophisticated. What we're doing is looking to improve every outcome from every shot on the face by flexing the topography, changing the way that the face reacts in a localized manner, as well as part of a whole. And we can significantly reduce downrange dispersion by going through this process.

And when we get to a point where we find what models to be an optimal solution, that's when we test and verify the results. You were comparing that to Ai Flash but compare it also to a non-Ai type of process. You're looking at 7-10 different faces that you're picking from versus 50,000 virtual faces. Here it's a real advantage for us.

Typically, in a golf club development cycle, it takes time to get parts. So depending on your product launch cycles, you might get 3 to 6 different opportunities to see a part and test it. This allows us to do a virtual test on 50,000 prototypes and then go make that part. And what we've been encouraged about is that we've seen the performance signals from day one. So we put in new swing code dynamics, our very first prototype showed a leap forward in downrange dispersion compared to Paradym.

Ai in Ai Smoke

Dave: I think it's interesting because Ai has become almost a buzzword, it's used in so many different industries, you see it in commercials all the time and we always get to the question of like, how you're saying Ai smoke or using Ai. What is the Ai doing? It's the machine learning, it's learning to get a better and better face each time. So that's part of why I think we have the name there with Paradym Ai Smoke and really calling spoke and really calling out the Artificial Intelligence and Machine Learning.

And then this third piece here with the micro-deflections. This is one that really blew my mind when your advanced research team was explaining it to me. So this is something that as a concept I don't think the golf industry is even familiar with. What are micro-deflections and how is that different from a typical bulge and roll story?

Brian: Our face construction is very different from anything else that's out there. And it allows us to control localized flexure. So we can have a face that can flex in a different way from traditional golf faces. It lets us control the way that the golf club and golf ball react at impact.

We have locations that can resist gear effect, a location for example in the heel would result in a lot of cut spin. We can have our face deflect or push back and resist that cut spin and have a better result downrange. Similarly on a toe strike you would see a little more sidespin resulting in a hook or draw. We can control that location to get a more optimal downrange result.

For bulge and roll, it's basically starting it in a different place because of the golf ball spin with gear effect. We're now able to resist some of that gear effect in a way that no one else, can resulting in better performance all over the face.

Different Faces For Each Head

Brian: It's a unique solution for each of these segments of golfers that allows that face to flex in a way that improves those conditions for golfers, based on how they're delivering their swing to the ball.

Dispersion

Brian: For years MOI has been a primary tool to make a golf club more stable. We've come up with a whole new way of doing that. MOI is still important, but we're able to resist gear effect based on these micro deflections, which is an added benefit in downrange dispersion.

Robot + Player Testing

Brian: We wanted to see how the micro-deflections worked compared to Paradym. We tested points all over the face and we consistently saw improved launch conditions, resulting in downrange distance in dispersion. It's been a real breakthrough for us in a product that was already very forgiving, now even longer, and straighter.

What was exciting for us is these products were testing for everybody, and we didn't just test with players who matched that swing code. When we looked at players who were close matches for those codes, that's where we really saw massive improvement.

Final Thoughts on Driver

Brian: "We're really proud of what we've accomplished here, and we've seen a new level of performance that's possible in terms of how we use Ai, our Machine Learning, and design process to create a longer, straighter driver."

PARADYM Ai SMOKE FAIRWAY WOODS

Dave: The inputs that go into this fairway wood are different, so how would these codes be different for fairway woods compared to a driver?

Brian: We did take the same approach in terms of categorizing real player swings with their fairway woods to look at where there were commonalities or differences. We saw a lot of similarities in terms of things like path and face angle, but consistently different impact locations in our MAX D and MAX Fast player segments. We saw impact locations that were much lower on the face. Consistently on all these products, there were swing codes that swing down on the ball.

In our Smoke MAX core market segment, impact locations were still lower on the face, but just slightly before the center line. And the Triple Diamond player consistently had impact locations on the center of the face.

Fairway Wood Construction

Brian: We were pleased with the ability to bring in the composite sole on Paradym but we still had to reinforce it with steel to ensure our quality and durability. We tasked our composites team to get us to a place where we were on the driver with a full carbon chassis. We've been able to do that now with a full carbon sole and crown, we've been able to free up over 24 grams of weight and re-invent that. Half of it is moving forward into our Tungsten Speed Cartridge for low spin and distance, and half of it moving rearward to increase our MOI.

What We've Seen In Testing

Brian: Similarly compelling results to our driver, these fairway woods have tested longer and straighter, with improved dispersion, higher launch, and lower spin than their Paradym counterparts.