



# SPORT & TECHNOLOGY

SPGM



DEVELOPING A  
TRUE OUTDOOR  
SHUTTLE

EFFECTS OF  
GOLF BALL  
DESIGN ON  
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## DEVELOPING A TRUE OUTDOOR SHUTTLE



*by John Hart*

In response to a challenge posed by George to create a viable outdoor badminton solution, the development of the Decathlon licensed Feenix, the first true outdoor shuttlecock, began. The objective was to recreate the indoor experience, shots, and moves while overcoming the adverse effects of wind on outdoor play. The design involved careful optimization to maintain the center of mass while removing the central shuttle portion responsible for unique flight behaviors. Extensive prototyping and user testing led to the creation of a robust and wind-resistant shuttlecock, which was licensed to Decathlon and launched successfully across Asia and Europe.

Read the publication [here](#)

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## EFFECTS OF GOLF BALL DIMPLE SURFACE OCCUPANCY, VOLUME RATIO AND DEPTH ON AERODYNAMIC CHARACTERISTICS DURING ROTATION



*by Kohei Moriyama & Hiroo Okanaga*

In this study, the importance of flight distance for golfers' score improvement was investigated. Golf balls with different dimple occupancies and dimple volume ratios were manufactured and subjected to wind tunnel experiments for lift and drag measurements. A flight trajectory simulation based on the experimental results revealed that rotating golf balls with shallow dimple depths ( $D/d = 4.55 \times 10^{-3}$ ) and an occupancy ratio of 80% or higher exhibited a higher lift-drag ratio, resulting in increased flying distance. However, for deeper dimples ( $D/d = 6.82 \times 10^{-3}$  and  $D/d = 9.09 \times 10^{-3}$ ), the occupancy ratio had little effect, and deeper dimples showed a 15% lower lift-drag ratio. Additionally, increasing dimple volume ratio led to higher drag coefficients, with the highest lift-drag ratio observed in the dimple volume ratio range of  $11.0-12.0 \times 10^{-3}$ .

Read the publication [here](#)

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## HISTORY, PHILOSOPHY, AND VALUE OF MECHANICAL MODELS IN SPORTS SCIENCE AND ENGINEERING



*by Veit Senner*

Veit Senner wrote an article on the history, philosophy, and value of mechanical models in sports science and engineering. He explains the importance of these models in the field of sports engineering and suggests a categorization for them. Additionally, he provides two examples with literature and an overview of manuscripts in the special section.

Read the publication [here](#)