

**DUNLOP**  
SPORT

THE TRUTH BEHIND THE TECHNOLOGY 2012

DUNLOP TENNIS

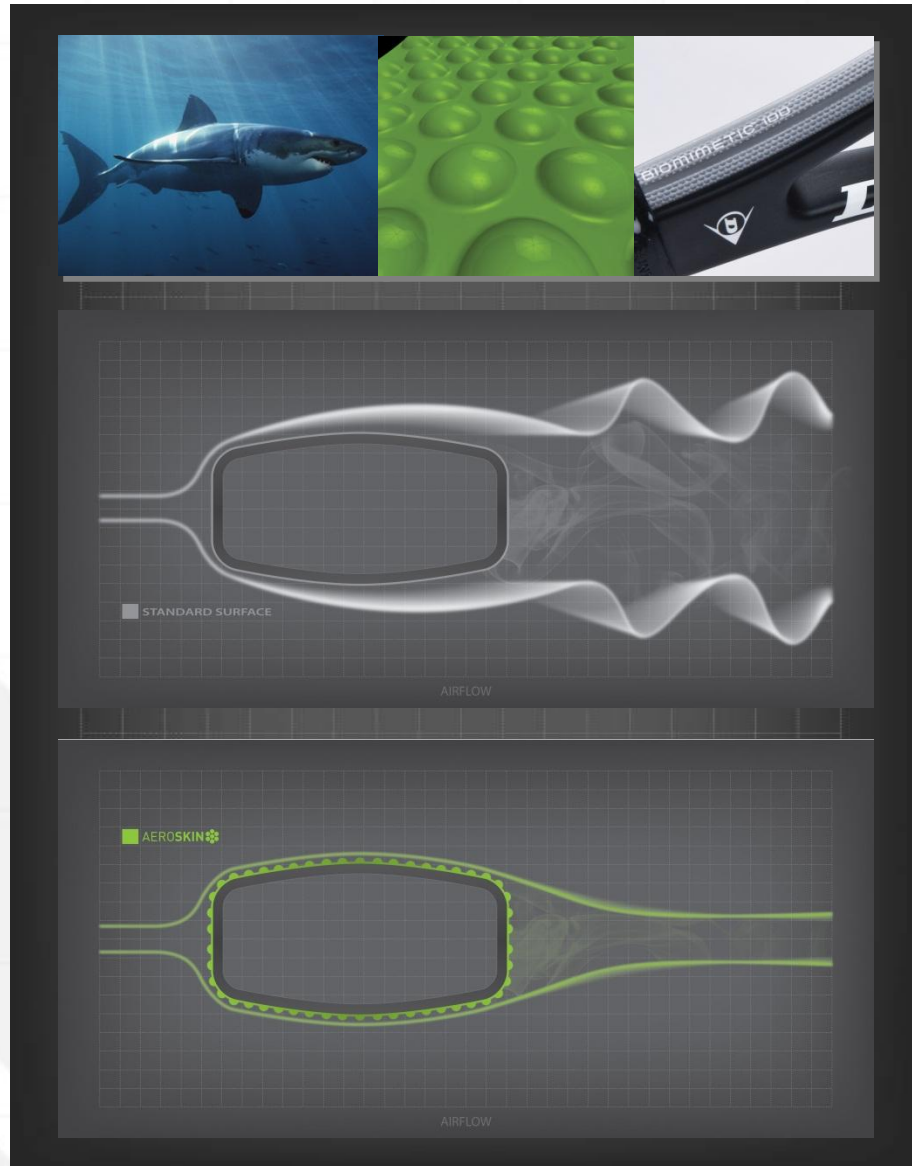
2012

7/26/2011

[BIOMIMETIC]

# AEROSKIN

- Inspired by sharkskin
- Unique surface application strategically applied
- Texture creates localised turbulence
- Smooths airflow over the racket surface
- Reduces aerodynamic drag by up to **25%**
- **Performance benefit of enhanced racket speed & power**



## [BIOMIMETIC]

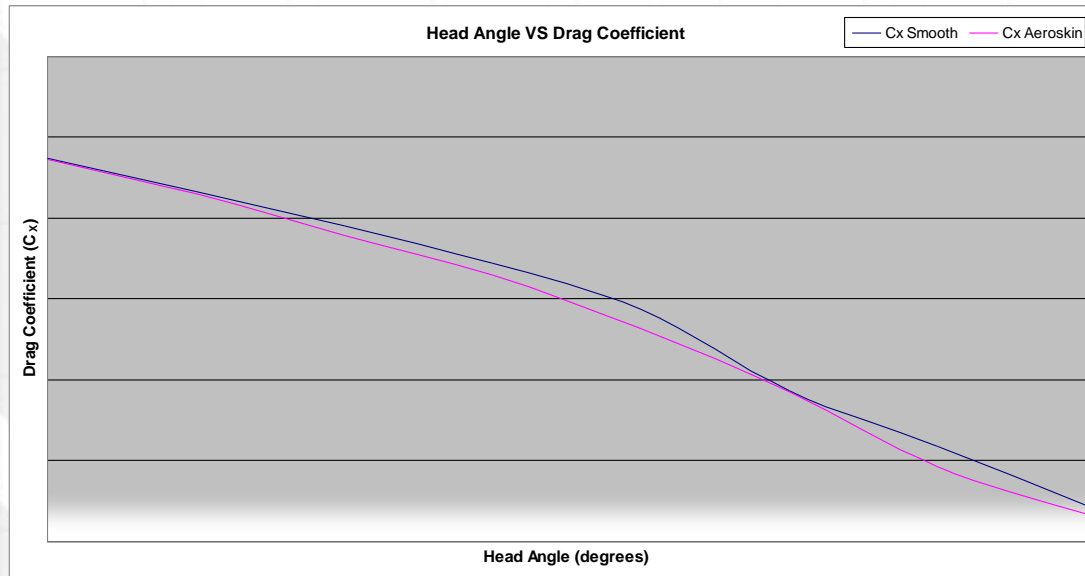
## The Facts Behind The Figures..

- Experiments were carried out with leading UK sports engineering research facility
- Wind tunnel used to determine characteristics of Aeroskin technology
- Various wind speeds and head angles used to simulate different tennis strokes





## The Facts Behind The Figures..



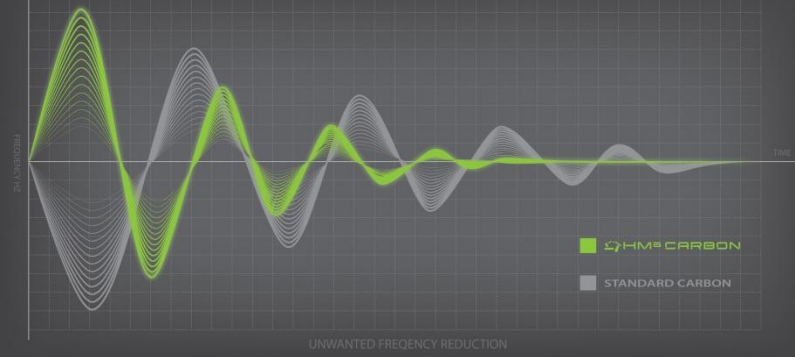
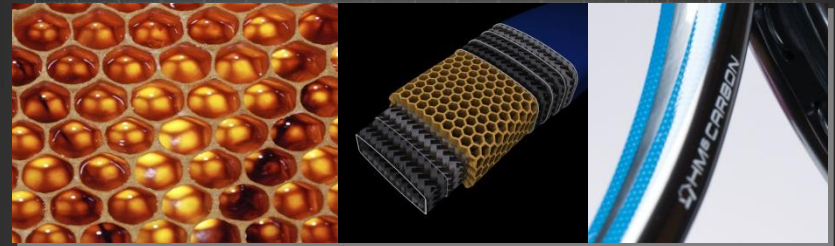
	Max Drag Coefficient Variance ( $C_x$ )	Percentage
Smooth	0.0904	24.8 % Decrease
Aeroskin™	0.0680	

- Experiments show that Aeroskin reduces coefficient of drag by up to 25%

# BIOMIMETIC

## HM<sup>6</sup> CARBON

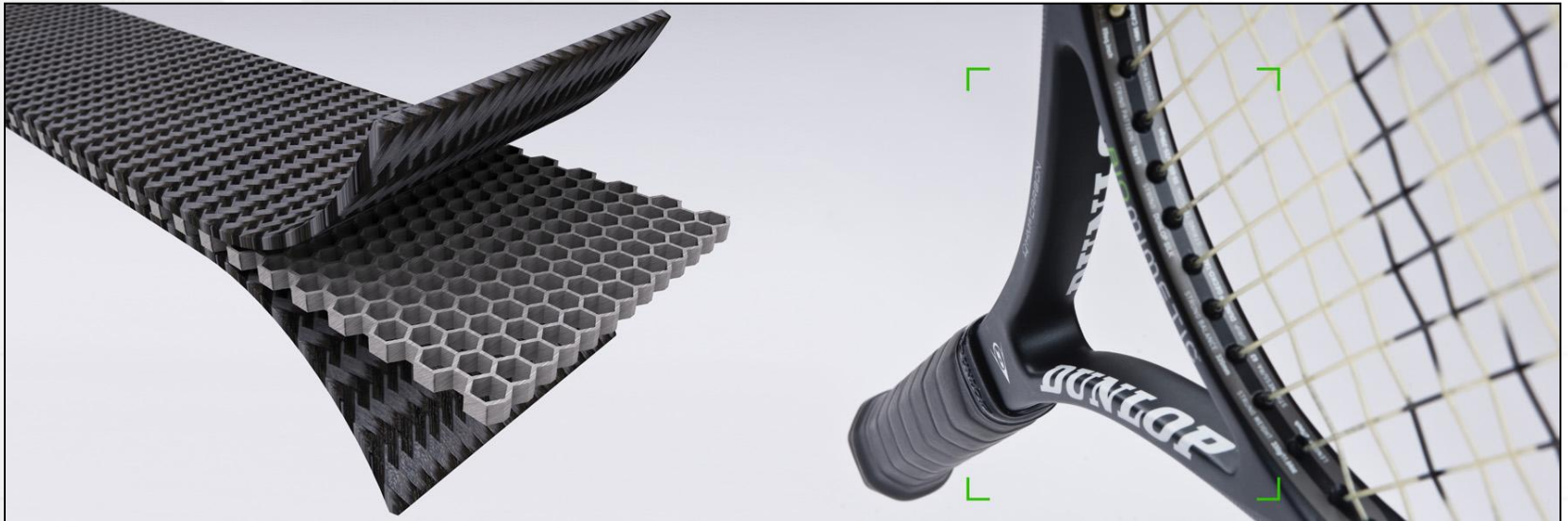
- Inspired by honeycomb
- Ultra High modulus carbon fibre engineered into hexagonal sheets
- Placed between layers of Aerogel enhanced carbon
- Forces evenly distributed through HM6 on ball impact
- Absorbs unwanted racket frequencies by up to **10%**
- **Performance benefit of enhanced player feel**



## [BIOMIMETIC]

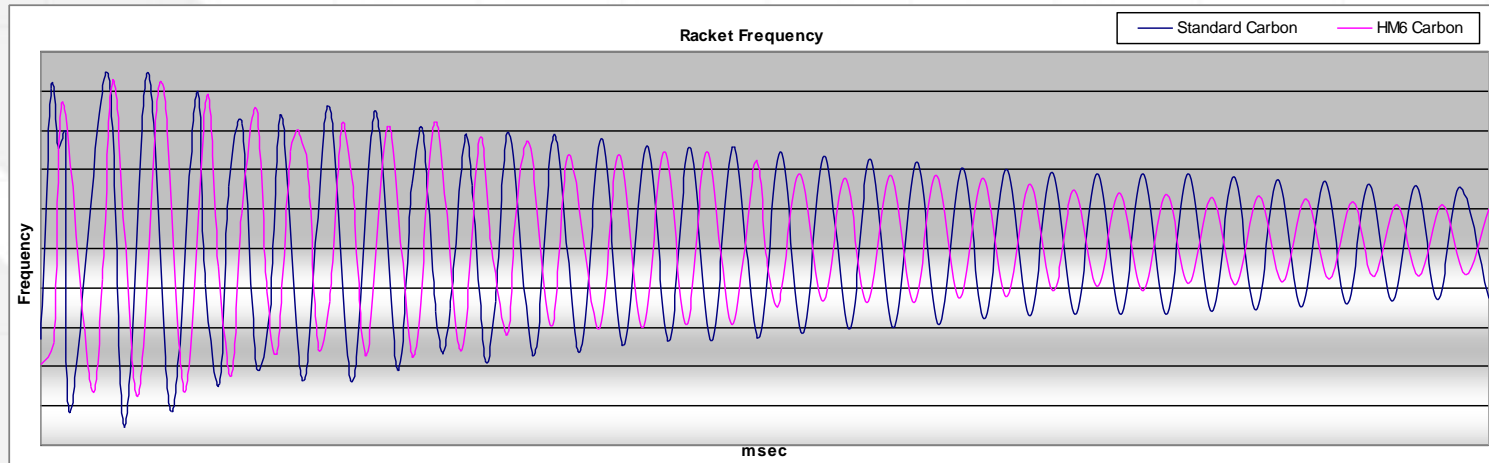
## The Facts Behind The Figures..

- Frequency measurement experiments were used to establish the dynamic effects of using 'HM6'
- The objective was to establish, does HM6 make an effect on the rackets mechanical performance and vibration absorption
- The experiment used identical rackets, one with standard construction and the other incorporating HM6





## The Facts Behind The Figures..




	Frequency Absorption	Percentage
Standard Carbon	0.095	10.5 % increase
HM6 Carbon	0.105	

- The results from the experiment show that HM6 carbon reduces unwanted frame vibration by up to 10%

## [BIOMIMETIC]


**GECKO-TAC**

- Inspired by gecko feet
- Unique Nano-scopic surface treatment
- Perforated design for extra moisture reduction
- Provides up to **50%** more grip and tack
- **Performance benefit of enhanced control**



**GECKO-TAC**

**STANDARD GRIP**

$$\left\{ \begin{array}{l} \text{Friction} \\ \text{Coefficient } (\mu) = \frac{\text{Friction Force (Fr)}}{m \times g \times \cos\theta} \end{array} \right\}$$



# BIOMIMETIC

## The Facts Behind The Figures..

- Industry standard inclined plane friction test apparatus was used
- The objective was to establish the grip tackiness of Dunlop's current premium grip versus the new Gecko Tac grip
- This device measures the coefficient of friction as well as the slip angle.



[BIOMIMETIC]

## The Facts Behind The Figures..

	Slip Angle	Percentage
Current Dunlop Premium Grip	62.56°	50% Increase
Gecko Tac Grip	93.96°	

- Results from the experiment show the Gecko Tac grip is up to 50% tackier than Dunlop's current premium grip

BIOMIMETIC

### 3 TIER TECHNOLOGY SUMMARY

UP TO 10 % FREQUENCY REDUCTION\*

**HMC CARBON** = ENHANCED FEEL

UP TO 50 % MORE GRIP\*

**GECKO-TAC**  
= ENHANCED CONTROL

UP TO 25% REDUCION IN AERODYNAMIC DRAG\*

**AEROSKIN** = ENHANCED RACKET SPEED & POWER

\*versus equivalent standard Dunlop product

**Key numbers to remember: 10%, 25%, 50%...**