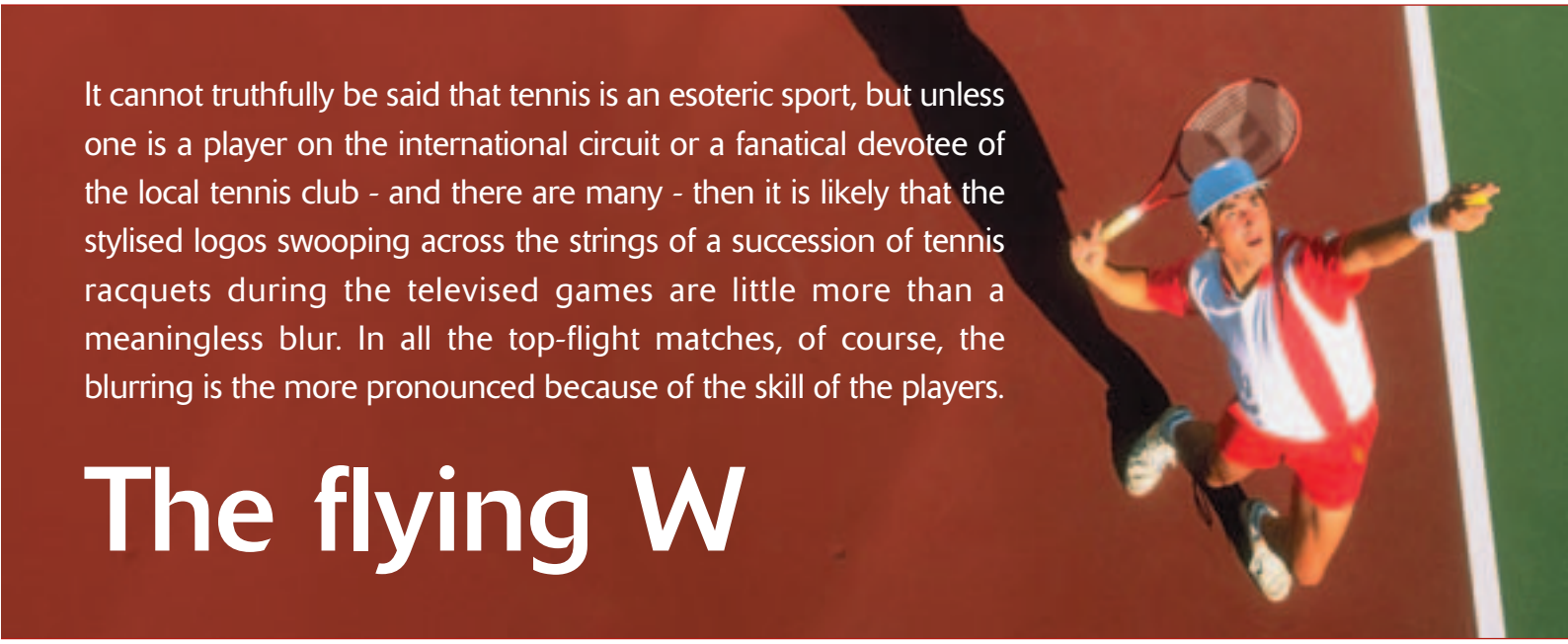


It cannot truthfully be said that tennis is an esoteric sport, but unless one is a player on the international circuit or a fanatical devotee of the local tennis club - and there are many - then it is likely that the stylised logos swooping across the strings of a succession of tennis racquets during the televised games are little more than a meaningless blur. In all the top-flight matches, of course, the blurring is the more pronounced because of the skill of the players.

The flying W

But in recent years one logo, the stylised W of the Wilson Sporting Goods Company, seems to have registered more readily than others, appearing regularly on the TV and in the printed media as the Williams sisters, Venus and Serena, power their seemingly unstoppable way to victory after victory on the world's tennis courts.

Wilson began building tennis racquets in 1913 and no doubt the products then consisted of a wooden frame, probably taken from the ash tree, *genus Fraxinus*, and strings acquired from natural materials – for which source see our company profile below. Ninety years later and the successors to those early ranges hit the sweet spot with titanium, carbon fibre, polymer-based shock absorption materials, DuPont Kevlar and frame sections developed using CAD. And if you accept the premise that tennis hardware owes much of its efficiency to aerodynamics - then it's hardly surprising that those materials all have prime usage in the aerospace industry.

The first racquet frames were, of course, solid. But not any longer. The 2004 version of Wilson's Triad series uses tubular carbon fibre with a CAD-developed decahedral geometry in the hoop framing, which the company says provides exceptional stiffness and stability under the dynamics exerted by powerful players.

Applying a totally different aspect of carbon fibre technology, the established Hammer series of racquets - already well-publicised as the favoured equipment for the Williams sisters – has been further developed as Series H with the application of a fibre 'skeleton'. Known as Isogrid, this consists of twisted carbon and DuPont Kevlar fibres laid as a tubular matrix, surrounded by Wilson's own Hyper Carbon and then heated to form the frame of the racquet. Hyper Carbon is said to be four times stiffer, four times stronger and 65% lighter than titanium, offering a combination of improved power and strength in an ultra-light frame. Previously used in cycle frames and baseball bats, the Isogrid construction allows Wilson to produce the H Series as a very light racquet, but one where the weight is concentrated in the head.



The Triad racquet's three-part construction is clearly visible in this picture. Iso Zorb shock absorbing polymer sits at the joint between head and handle.





Wilson claims its new Decometric Geometry produces a stronger, lighter frame for improved pick-up feel and manoeuverability.

Champion fusion

Speaking of titanium - and not to belittle the metal's qualities in any way - a combination with graphite, under the Double X technology label, produces additional strength by hardening the metal. In turn this allows for a reduction in the interior walls of the frames on the aptly-named Fusion series. The reduction in weight is estimated at 10% for each racquet against previous year's models.

Leading Swiss player Roger Federer has a preference for the Wilson Pro Staff series - making full use of the strength given to the frames by underlying the sheet Hyper Carbon outer with a double braiding of graphite and Kevlar followed



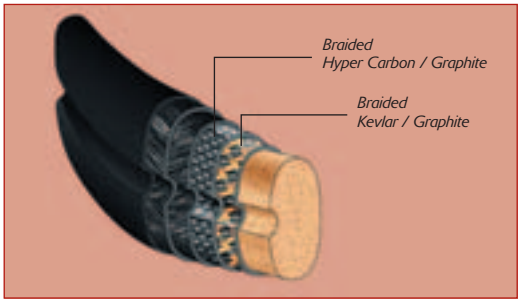
From the same series as that used by the Williams sisters, Hammer Tour offers a choice of head sizes (95 sq in and 106 sq in) and an unstrung weight of 283 grammes.

by another of graphite and Hyper Carbon fibres. The intention is to provide a constant flex to the whole racquet at the same time as strengthening the frame. Whether or not the technology is successful might be gauged by the quality of the Wimbledon and Australian champion's play.

The Wilson Triad series, first introduced in 2001, revolutionised the way that tennis racquets were constructed by becoming the first of its kind to combine the head and the handle as two separate pieces. The third ingredient, the material that joins the two parts together and absorbs the force of impact, is a precision-tuned polymer called Iso Zorb. The three pieces are bonded together with LocTite 496, an ultra-strong adhesive that requires a force equal to two and a half tons to break its grip, and that acts as a mechanical locking system. For 2004 Wilson has reduced the thickness of the Iso Zorb in the Triad racquets to complement the decahedral geometry mentioned earlier.

Racquet design and manufacture - and tennis is just a snapshot because we should not forget the existence of real tennis, badminton, squash and fives - owes much of its present design qualities to the aerospace and automotive industries. The latter in particular has been quoted as a major source of inspiration for graphical interpretations, and one can well appreciate the allusion if on the wrong end of a high speed serve to lose the game, set and match.

Derryck Draper



Wilson's Pro Staff racquet frames employ Double Braid technology.

From humble beginnings – the Wilson story

Wilson has a perfectly logical history, beginning trading in 1913 as the subsidiary of a meat packing business, Schwartzchild and Sulzberger, based in Chicago. Logical? Well - yes, because it dealt in the by-products of the parent company in selling dried gut as strings for violins and tennis racquets. Within a very short space of time, months in fact, it began manufacturing its own racquets in an interesting bid for vertical integration from the base upwards.

In 1914 the company was taken over by a New York banking group and Thomas E Wilson was appointed as its manager. The name was changed to Wilson and Company, based jointly on the name of new manager and the fact that US President Woodrow Wilson was at the peak of his popularity at the time.

A steady growth in sales volume encouraged Wilson to begin diversifying into the manufacture of other sporting products, including baseball masks, and by 1916 the company was committed to further additions to the product line and to becoming a leader in the sporting goods market. It began by acquiring a leather ball and baseball glove manufacturer, followed by another producing golf equipment.

By 1923, Wilson had purchased the Chicago Sporting Goods Company and now owned three major factories, a central warehouse and a baseball and softball manufacturing facility in New York. It merged with Western Sporting Goods Manufacturing of Chicago in 1925 to form the Wilson-Western Sporting Goods Company and this title was retained until 1931 when the organisation became known as Wilson Sporting Goods Company – the first formal use of the present name.

In September 1941, the corporate structure was again revised, creating two separate companies. Wilson Sporting Goods continued as the selling part of the organisation, while Wilson Athletic Goods Manufacturing Company was chosen to identify the production facilities.

The 1940s saw further acquisitions, including a number of manufacturing facilities to reflect the increased activity in baseball, football and basketball, and the embryo group moved into the sports apparel business for the first time. In 1947 an athletic shoe facility in Milwaukee became part of the organisation. The 40s also saw the development of an 'advisory staff' of the best athletes in their respective disciplines. They field tested the products and worked with the Wilson designers and research specialists to implement recommendations and suggestions on improvements to the company's sporting products.

In January 1957, Wilson moved to its present international headquarters where it established centralised research and engineering functions, together with extensive warehousing and storage facilities. An increasing and worldwide demand for Wilson products during the 1960s saw a series of moves and diversifications, and the company established offices in England, Germany, Hong Kong and Japan. In 1962 the largest golf club manufacturing facility was opened in the Scottish town of Irvine.

When the entire group was acquired by PepsiCo in 1970, the new owners speedily established America's largest tennis racquet factory, followed a year later by a baseball and softball manufacturing facility in Port-au-Prince, Haiti. The global expansion continued into the 1980s with the creation of wholly owned subsidiary companies in France, Germany and Japan, sales and distribution offices in Singapore and Ontario and a further tennis racquet production plant in St Vincent, West Indies.

In 1989, Wilson was acquired by its present owner, the Helsinki-based Amer Sports Group, and joined a stable of other international brands including Atomic, Suunto Wristop and Precor.