



Expertise & Innovation

Stories by Coats

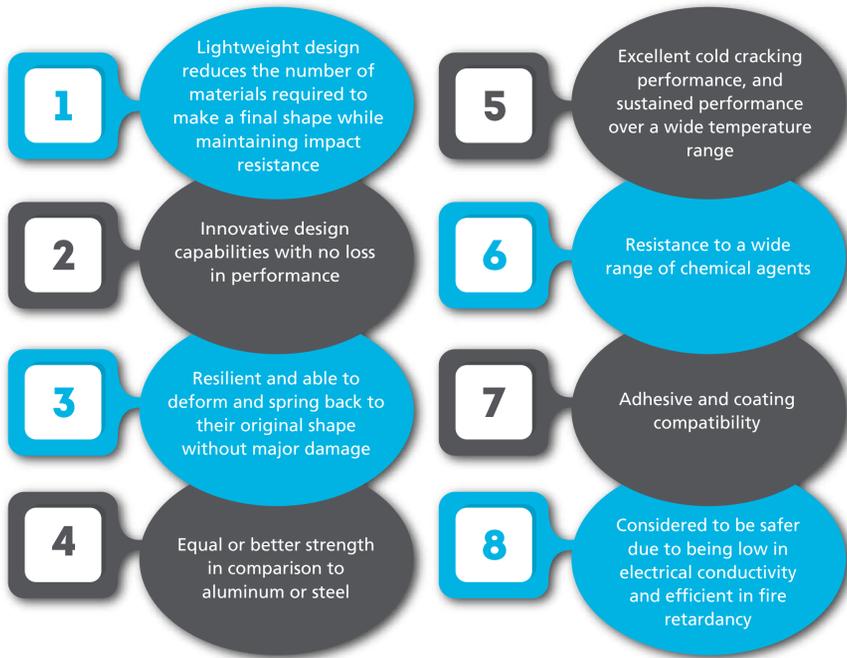


How do Olympians advance their training? The best sporting equipment is high performing, lightweight and strong

The enjoyment of and participation in sports dates back to around 760BC, when the first Olympic Games were recorded. Since then, types of sports have evolved as well as the equipment required to perform in those sporting events. As the love of sports has grown, athletes continue to look for cutting-edge products which are lighter weight and offer increased tensile strength, durability, impact absorption, resistance and stiffness to improve performance.

Around the globe composite materials have made their way into nearly every facet of sports. Made from blending two or more base materials together, composites can offer multiple benefits which far outweigh those of wood or metal. This shift has helped professional athletes continually improve their performance so much so, that amateur athletes are seeking out equipment with the same qualities.

Benefits of Composites



To attain the perfect composite part, a thermoset or thermoplastic process can be used, and one of the numerous methods for fabricating composite components. All involve some form of moulding, to shape the resin and reinforcement. A mould tool is required to give the uniformed resin and fibre combination its shape and some method of curing is needed.

THERMOPLASTIC	THERMOSET
<ul style="list-style-type: none"> • Uses yarns which can be re-melted • Increased impact resistance (in comparison to thermoset) • Lower moulding cycle time • Improved flexibility to mould small parts of different shapes • Faster, easier to process (pourable, automatable, meltable, etc.) • Can be recycled (as long as not reinforced or containing only short fibres or mineral fillers) • Lower cost alternative (to thermoset) • Challenging to impregnate reinforcing fibres (uniformity of thermoplastic yarn and reinforcement fibre a must) • Special tooling and equipment needed 	<ul style="list-style-type: none"> • Uses resin which cannot be re-melted • Excellent resistance to solvents and corrosives • Excellent resistance to heat and high temperature • Good fatigue strength • Tailored elasticity • Excellent adhesion • Excellent finishing (polishing, painting, etc.) • Low raw material costs • Slow curing process • Limited shelf life

No matter the process, from performance bikes to tennis racquets, golf shafts, fishing rods and surfboards, composites can now be found in nearly 70% of the most popular sport and recreational activities. It has been reported that the global sports composites market could reach \$3.75 billion by 2021, registering a CAGR of 5.59% between 2016 and 2021.

(<http://www.marketsandmarkets.com/PressReleases/sports-composites.asp>)

From the field to the venue, composite fibres are making their way into every facet of your favourite sporting event.



Composite bicycle frames have been a largely American phenomenon, as a spin-off technology from the aircraft and boating industries. A complex structure to manufacture, performance characteristics required include lightness, rigidity, durability and shock absorption. Other bicycle applications include: forks, handle bars, connecting bar ends, seat posts



The move from wood to composites for tennis racquets has not only improved its strength to weight ratio, but it also allows an athlete more control and accuracy in his or her style of swing. No matter the level of play, racquets made with composites allow for all types of players to enjoy the characteristics of lightweight, balance and swing height.



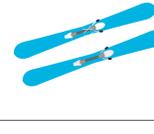
Originally manufactured from wood, the surfboard industry was one of the first industries to embrace composites when fibreglass was introduced after World War II. Composites increase a surfboards toughness which enables it to survive the damaging and tumultuous effects of sea water as well as reduces weight and enhances flexibility for riders to better propel them through the waves.



Golf club shafts have been manufactured from a wide variety of materials including metals, plastics, ceramics, wood and composites. Those made with composites enable players to sharpen their game while reducing fatigue and injury. Mainly due to these shafts being lighter in weight, they also provide the same stability and consistency as steel.



A physically demanding activity, the right pair of running shoes is paramount. Made over the years with various materials, composites are now being included in designs to help provide rearfoot stability, impact cushioning, arch support and forefoot propulsion. With this change a runner can experience a lesser number of injuries and can see an improved performance due to the added value of lightweight composites bring to the final design.



Previously made completely from wood, skis are now made with the addition of composites typically placed above and below the core to provide strength as well as flexibility. In addition to strength and flexibility advantages, composites also lightweight skis and provide resistance again the pull of gravity as a skier is going downhill.

Coats Synergex is a custom range of composite fibres which offers the perfect combination of lightweight and strength to high performance sporting equipment. Using a patented process, known as Lattice, Synergex commingled or twisted composite fibres can be laid uni-directionally into a net-shaped preform. The advantage being more optimized fibre placement, quicker processing times, reduced material waste and costs as well as perfectly repeatable parts.

Find out more. Email marketing@coats.com