



# ADVANCED COMPOSITE FIBRES



# About Coats



Coats has used its core capability in high performance yarn to develop an innovative patent pending process to produce a range of enabling composite solutions.

Coats Synergex™ and Lattice™ is the perfect harmony of strength, weight and performance. Compared to more established methods and existing textile technology, Synergex™ and Lattice™ can provide manufacturing and process cost efficiencies, plus help to reduce material waste.

This custom range of composite fibres can be commingled as well as twisted and are supported with first in class leading distribution and performance.

## Synergex™

A method of commingling dissimilar fibres for final property optimisation to produce a specific product requirement

## Lattice™

A fibre preform technology that utilizes multidirectional fibre placement to maximise performance and eliminate waste

Synergex™ and Lattice™ is typically used to mould parts for industries, including:

- Automotive
- Sports & Leisure
- Aerospace
- Wind Energy
- RTP (Reinforced Thermoplastic Pipes)

Find out more. Email [marketing@coats.com](mailto:marketing@coats.com)

## Commingling

Coats proprietary technology intimately commingles reinforcement fibres, like carbon and fibreglass, with thermoplastic yarns to produce a single mixed roving of uniform dispersion across its cross section. This unique technique minimises filamentation of the reinforcement fibre and ensures parallel alignment of the fibre mix as well as a homogenous distribution resulting in an excellent consolidation.

Reinforcement Fibre	Tow Size
Carbon	3K
	6K
	12K
	24K
	50K
Reinforcement Fibre	Tex Size
Para-aramid	164
Fibreglass	600

Matrix Polymer	Tg Temperature		Melting Point	
	Fahrenheit	Celsius	Fahrenheit	Celsius
UHWPE	-185	-120	270	132
PP	15	-9	340	171
Nylon 12	105	40	360	182
Nylon 6	140	60	425	218
PET	155	68	475	246
PPS	185	85	535	279
PEEK	290	143	650	343

## Twisting

Reinforcement fibres can be customised to meet end use application demands by twisting one or more fibre types together. Coats proprietary technology can twist 1-5 ply constructions making a stronger, more controllable composite fibre which can be used to create fabrics containing unique hybrid properties.

Fibre	Tex Range	Construction
Carbon	100-4800	1-5 ply
Para-aramid	75-4000	1-5 ply
Fibreglass	150-7000	1-5 ply

## Coatings

Coatings can be applied to the composite fibres to improve their abrasion resistance, adhesion levels and durability. Coats offers a range of coatings that are all friendly to the environment.

Coatings include:

- Adhesion Promoters
- Lubricants
- Sizing
- Anti-wick
- Anti-stat

## Winding services

Manufacturing processes can be optimised through Coats converting services. A great way to eliminate scrap, Coats can wind put-ups to customer specifications easily and quickly.



## Comparison of Mechanical Properties of Compression and Resin Transfer Molded Test Panels

Fiber	Synergex™		Carbon Fiber	
Layering	0°/90°/90°/0°		0°/90°/90°/0°	
Molding	Compression Molding		Resin Transfer Molding	
Test Direction	0°	90°	0°	90°
Tensile Strength, MPa	655	645	668	592
Tensile Modulus, GPa	56	54	52	52
Carbon Fiber Content, % wt	65		61	

\*Data is from compression molded test panels with unidirectional fibre layering at 65% weight carbon fibre

