

Glossary

Anisotropic	Having properties that vary with direction within a material.
Autoclave	A closed and heated pressure vessel used for consolidation and curing of thermoset composites.
Binder	An agent (usually a thermoset or thermoplastic polymer) used to provide cohesion to fibres, yarns or fabric layers within a <i>preform</i> .
Blend	Mixture of two or more fibre types in a yarn.
Braid; plait	The product of braiding.
Braiding; plaiting	The process of interlacing three or more threads in such a way that they cross one another in diagonal formation. Flat, tubular or solid constructions may be formed in this way.
Commingled yarn	A yarn comprising intimately mixed reinforcement and matrix polymer fibres.
Crimp	The waviness or distortion of a yarn that is due to interlacing in the fabric.
Cure	Change of thermoset resin state from liquid to solid by the formation of crosslinks during polymerisation.
Delamination	Failure of a laminate by separation of layers, usually due to external stresses.
Denier	A measure of linear density, corresponding to the mass in grams of 9000 m of yarn.
Dobby	A mechanism for controlling the movement of the heald shafts of a loom. It is required when the number of picks in a repeat of the pattern is beyond the capacity of cam shedding (~8).
Drape	The ability of a fabric to conform to a complex geometry.
Ends	Another name for warp yarns.
Fibre	Textile raw material generally characterised by flexibility, fineness and high ratio of length to thickness.

Filament	A fibre of indefinite length.
Harness	A frame positioned across a weaving loom with a set of heddles mounted on it. This is used to raise or lower the warp yarns.
Heddle	A wire or thin plate with an eye through which a warp yarn passes.
Homogenisation	Determination of material properties from unit cell or representative volume analysis (RVE) for use in models at larger scales.
Intra-ply shear	Deformation mechanism for bidirectional fabrics, involving in-plane shear of the material via rotation of yarns at their crossovers.
Isotropic	Having properties that do not vary with direction within a material.
Jacquard	A shedding mechanism, attached to a loom, that gives individual control of up to several hundred warp threads and thus enables large figured designs to be produced.
Knitting	A process to manufacture textiles via looping of yarns around a series of needles.
Laminate	A composite material reinforced by a number of distinct textile layers (laminae, in this context).
Linear density	The mass of a yarn per unit length.
Locking angle	The maximum level of intra-ply shear that can be achieved for a fabric reinforcement before wrinkling/buckling occurs.
Matrix	In this context, the polymer resin in which textile layers are embedded, providing the medium for load transfer.
Maypole braider	A machine provided with three or more carriers that are driven by means of horn gears along tracks that cross at intervals, enabling the yarn drawn from the carriers to interlace to form a braid.
Monofilament	A yarn consisting of one filament only.
Net-shape	Referring to a manufacturing process whereby the component is produced in the correct dimensions and requires no trimming.
NCF	Non-crimp fabric; a fabric constructed from unidirectional crimp-free fibre layers, assembled together using a light stitching yarn. More properly referred to as a warp knit with inserted yarns.
Orthotropic	Related to properties with three perpendicular axes of symmetry.
Permeability	The property of a porous material (textile reinforcement here) allowing pressure driven fluid flow.

Picks	Another name for weft yarns.
Plain weave	The simplest fundamental weave pattern, where each warp yarn interlaces with each weft yarn.
Ply yarn	Several strand yarns twisted together.
Porosity	The volumetric fraction of voids within a body (here usually either a textile reinforcement or solid composite).
Preform	An arrangement of dry fibres in the three-dimensional shape of the final component for liquid moulding processes such as resin transfer moulding (RTM) and vacuum infusion (VI).
Prepreg	Pre-impregnated composites, comprising reinforcements combined (usually) with a partially cured thermosetting polymer.
RFI	Resin film infusion; a manufacturing process that involves consolidation of interleaved layers of thermoset resin films and fabric layers.
Roving	A flat yarn, normally sized, containing straight filaments
RTM	Resin transfer moulding; a form of liquid moulding whereby positive pressure is used to drive a liquid thermosetting resin into a mould cavity containing a dry fibre preform.
RVE	Representative (or repeating) volume element; the smallest element that can be used to describe the behaviour of textile reinforcements or composites. In this context this is normally equivalent to the smallest region that can be used to define the textile structure.
Satin	A fundamental weave characterised by sparse positioning of interlaced yarns, which are arranged with a view to producing a smooth fabric surface devoid of twill lines (diagonal configurations of crossovers).
Shed	A gap between warp yarns where a weft yarn may be inserted.
Shuttle	A weft insertion device, which is shut from side to side of a weaving loom.
Sizing	An agent, normally resin, added to yarn to keep fibres in a non-twisted yarn together and/or to improve adhesion to the matrix in composites.
Spinning	A process, or series of processes, used in production of yarns by insertion of twist.
SRIM	Structural reaction injection moulding; a liquid moulding process by impingement mixture of two or more reactive monomers, which impregnate a dry fibre preform.

Staple yarn	A twisted yarn comprising fibres of predetermined short lengths.
Tex	A measure of linear density, corresponding to the mass in grams per kilometre of yarn.
Textiles	Originally woven fabrics, but now also applied to fibres, filaments and yarns, natural or synthetic, and most products for which they are the principal raw materials. This definition embraces, for example, threads, cords, ropes and braids; woven, knitted and non-woven fabrics; hosiery, knitwear and other garments made up from textile yarns and fabrics; household textiles, textile furnishing and upholstery; carpets and other fibre-based floor coverings; industrial textiles, geotextiles and medical textiles.
Thermoplastic	A polymer material that is softened by heating and hardened by cooling in a reversible process.
Thermoset	A polymer material that is hardened by an irreversible chemical reaction (curing).
Tow	An essentially twist-free assemblage of a large number of substantially parallel filaments.
Twill	A fundamental weave with yarns interlaced in a programmed pattern and frequency to produce a pattern of diagonal lines on the surface.
Twist	Number of turns per unit length in a twisted yarn.
Twisted yarn	A yarn with fibres consolidated by twisting.
Unit cell	A representative unit of a textile or composite used in analysis (usually equivalent to a representative volume element, RVE).
VI	Vacuum infusion; a liquid moulding process where the preform is enclosed between one solid tool and a vacuum bag, so that the driving resin pressure is one atmosphere. Also known as vacuum-assisted resin transfer moulding (VARTM).
Void	A resin-free cavity within the composite (usually corresponding to entrapped air).
Volume fraction	The volumetric proportion of a constituent in the composite (often an abbreviation for fibre volume fraction).
Warp	The machine direction for a weaving machine/yarns in the machine direction.
Weave	The pattern of interlacing of warp and weft in a woven fabric.
Weaving	The action of producing fabric by the interlacing of warp and weft threads.

Weft (fill)	The direction across the width of a weaving machine/ yarns across the width of a fabric.
Wrinkle	A defect formed during composite forming, formed via in-plane compression of the fabric/composite.
Yarn	A product of substantial length and relatively small cross-section consisting of fibres and/or filaments with or without twist.
Yarn count (number)	The length of a yarn per unit mass.
Yield	A measure related to yarn count or linear density, corresponding to length per unit mass (yd/lb).