A Glossary of GRP Terms

Acrylates	A group of plastics, including Perspex. They are softened by polyester resin, so should not be used for formers, etc.
Binder	A PVA emulsion or polyester powder, used to hold together the strands in Chopped Strand Mat. A polyester powder is sometimes used instead of an emulsion - powder-bound gives faster 'wet-out', emulsion-bound gives greater ease of handling.
Catalyst	Often called 'hardener'. Any compound which initiates the curing process in resins. The catalyst for polyester resins is usually an organic peroxide (typically Methyl Ethyl Ketone Peroxide) or similar compound. These should be treated with care - they are corrosive, toxic and inflammable.
Cold Curing	Generic term for materials which harden at room temperatures, after the addition of catalyst.
Consolidating	The process of compacting the laminate, and removing air bubbles. This is easily done with a metal laminating roller designed for the purpose.
Contact Moulding	Any method of moulding plastics without external pressure (such as used in injection moulding). The commonest contact moulding methods are hand lay-up (the technique described in this handbook) and spray lay-up (a widely-used commercial production method).
Cure	The process of polymerisation by which the liquid resin becomes a solid plastic.
Curing Time	Usually taken as the time the resin takes to harden completely after the addition of catalyst - but in fact, a resin can often continue to cure for some time after it is apparently hard.
Epoxy	Resin used for some GRP. It bonds very strongly (and is used in many adhesives) but is difficult to use and not so popular as polyesters.
Ester	Compound produced together with water by the reaction of any organic acid with any alcohol. (See 'Polyesters').
Exotherm	The internal heat generated by the chemical reaction which occurs during curing. It increases in proportion to the volume of resin and can be a problem, since the heat can be high enough to crack a large moulding - large castings and thick laminates should be produced in stages to avoid this problem.
Filler	Any inert powder or granulated substance added to resin to alter its consistency, texture or properties. The term can include thixotropisers, metal powders, extenders, etc.
Former	Anything around which a laminate can be laid - a cardboard tube, for example, can be a former for a stiffening rib. The term is also, rather confusingly, applied to the 'pattern' or 'plug' from which a mould is taken.
Gel Time	The time taken for a catalysed resin to 'gel' - in effect, the period during which it is still workable. See "Trouble-Shooting Guide".
Glassfibre	Glass filaments drawn together into fibres and treated for use as a reinforcement. Sometimes used, rather inaccurately, as a synonym for 'GRP' - eg, when a boat is described as having a glassfibre hull. Glassfibre-Reinforced Plastic. Any plastic, but usually polyester, reinforced with glassfibre materials. The term is often used to describe plastics reinforced with carbon fibres, aramids or other materials, although these should be referred to simply as 'Reinforced Plastics'.
GRP Green Stage	A point reached during the curing of a laminate, when it becomes firm, but not completely hard. Trimming is very easy at green stage, since the laminate can be cut with a sharp knife.

Hand Lay-Up	Applying a laminate to the mould by hand, as distinct from 'Spray Lay-Up'.
Hardener	Conventional term for 'Catalyst'.
Inhibitor	Anything which slows or stops the curing process. Oil or water inhibit most resins. Air affects some resins, causing the surface to remain tacky.
Laminate	Any material in which separate layers are bonded together. In GRP, the layers are resin and glassfibre. For some applications, such as craftwork, resin can be used to laminate fabric, paper, felt, etc.
Lay-Up	The process, using brushes, rollers or spraying equipment, by which resin and glassfibre are applied to the mould.
Maturing Time	The time taken for an apparently hardened resin to become fully cured and stable. It is important in certain applications where undesirable trace chemicals could leach from inadequately-cured resin.
MEKP	Methyl Ethyl Ketone Peroxide. Basis of typical polyester catalyst.
Monomer	A substance capable of being polymerised.
Moulds	Most GRP projects require a mould. Moulds are usually produced by laminating over a 'plug' or 'pattern'. They can be male (with the laminate laid over the outside of the mould) or female (with the laminate on the inside).
Plug	The fullsize model or mock-up from which a mould is produced (also known as a pattern or former).
Polyester	Substance produced by reacting glycols with anhydrides. They are normally dissolved in styrene for use as GRP resins.
Polyurethane	A versatile material used for adhesives, paints, varnishes, resins and foam materials. These are often used in conjunction with polyester-based GRP - polyurethane paints and sealants are used on finished GRP items, the foam materials are used in sandwich construction, etc.
Post Cure	The application of heat to reduce the maturing time.
Pot Life	The working time of a resin - in effect, the same as the 'gel time'. Usually abbreviated to RP.
Reinforced Plastic	Any plastic produced from a resin reinforced with other materials, GRP being probably the most common form.
Release Agent	A substance used to treat a mould to prevent it bonding to the resin. Release agents are necessary for the resins are highly adhesive to most materials, with the exception of a few plastics, synthetic rubbers, etc.
Resin	Resins occur in nature as organic compounds, insoluble in water - eg, amber, shellac, etc. Synthetic resins have similar properties and are normally converted to solids by polymerisation.
Saturated Compound	A chemical compound incapable of polymerisation.
Shelf Life	All resins have a limited shelf life, from three months upwards, depending on the type of resin and the storage conditions.
Tensile Strength	Ultimate strength of a material measured under tension, normally expressed in MN/m2.
Thermoplastic	Plastic which can be softened by heating, and which still retains its properties after it has cooled and hardened. Typical thermoplastics are polythene and PVC.
Thermosetting	Plastics which harden by non-reversible chemical reaction, initiated by heat and/or curing agents - eg, polyesters and epoxies. Once hardened, they cannot being melted down without being destroyed or radically altered.
Thixotropic	Generally used to describe substances which have high viscosity when stable, but low viscosity when stirred or brushed. "Non-drip" paint is an obvious example, as is gelcoat resin.
Undercure	Inadequate hardening of resin (See "Trouble-Shooting Guide")
Viscosity	The ability of a liquid to resist flow - a thick, treacly substance has high viscosity, a thin, runny liquid has low viscosity.
Wetting Out	The process of impregnating the glassfibre with resin.
Working Life	Another term for 'Pot Life' or 'Gel Time'.