Materials and Manufacturing 2 – List of Terms

Casting
Pouring liquid metal into a mould, having the shape of the product.

- Pattern → replica of the desired product used for making the mould
- Flask → support for the mould
- Cope → top part of the mould
- Drag → bottom part of the mould
- Parting line → seam between cope and drag
- Pouring basin → molten metal is poured in
- Sprue → metal flows downwards
- Running system → channels to transport the metal to the mould cavity
- Gates → part of the running system
- Vents → transport gases and hot air from the mould
- Risers → supply additional metal to the casting as it shrinks during solidification

Lay-up
Placing layers of fiber-reinforced polymers onto a mould.

- Vacuum bagging film → film to close the laminate from the outside
- Breather fabric → ensures air can flow to the vacuum pump
- Bleeder fabric → absorbs excess resin
- Peel ply → ensures easy removal of other films after curing

Resin Transfer Moulding
Placing fibres into a closed mould, after which resin is sucked through it.

- Preform → reinforcement shaped in shape of the mould
- Dry spots → non impregnated areas after resin is added
- Pot life → time until the resin viscosity starts to change

Filament Winding
Winding fibers (with resin on them) onto a rotating mould.

- Mandrel →mould for winding
- Reel → holds the dry reinforcement fibers
- Winding angle → angle under which the fibers are wound
- Geodescally → reinforcement takes the shortest route from A to B
- Hoop winding → winding under 90° angle
- Polar winding → winding under 0° angle
- Helical winding → winding under other angles

Forging
Shaping a work-piece by compressive forces.

- Slug → workpiece (part of metal that is forged)
- Billet → workpiece (part of metal that is forged)
- Preform → workpiece (part of metal that is forged)
- Flash → thin flat piece of metal attached to the product after forging

Metal / Polymer Extrusion & Pultrusion
Squeezing a metal/polymer through an opening with the shape of the final product.

- Billet → 'metal bar'
- Die → opening that determines the shape of the product
- Profile → the billet after it has passed the die
- Voids → hollow section in a extrusion
- Rovings → untwisted bundles of continuous filaments

Compression Moulding
Compressing a mix of reinforcement and resin between two mould-halves.

- Cavity → bottom section of the mould
- Force / plug → top section of the mould
- Moulding compound → mix of reinforcement resin
- Charge → mix of reinforcement resin
- Knitlines → point where flow fronts merge, reinforcements can't cross these lines

Deep Drawing
Using a punch to stamp a metal sheet into the desired shape.

- Metal blank → flat piece of metal
- Blank holder → clamp to ensure the blank doesn't move

Separation by Shearing
Cutting a piece of material. (For example, by punching pieces out of a sheet.)

- Cutting blade → blade to cut pieces of a material (Saw)
- Punching → removing a part of the sheet by punching it.
- Blanking → the same but now the part punched out is the product
- Nesting → placing as many parts on a sheet as possible
- Beveling → placing the punch under an angle to control the shear location

Separation by Removal
Separating a material by removing small pieces from it. (For example, sawing.)

- Kerf → narrow zone that is removed from the workpiece.
- Chisel → tool that removes chips from the workpiece
- Chips → pieces removed from the workpiece
- Rake face → side of the chisel on which the chip pushes
- Flank → other side of the chisel