

Compression Moulding Sheet Moulding Compound (SMC)

Introduction

Sheet moulding compound (SMC) is an uncured thermoset compound, in sheet form, that is used to make glass reinforced plastic (GRP) products. It is formed into products by compression moulding. Compression moulding involves placing a sheet of SMC onto a heated mould, then forcing it into the mould cavities using a heated plug. Heat from the plug and mould softens the SMC and allows it to flow into the mould cavities. After a few seconds, the heat begins to cure the SMC, which solidifies and hardens. The whole process takes up about 3 minutes to complete. This is called the cycle time.

Compression moulding is an excellent method of making lots of identical GRP products.

The tools required are:

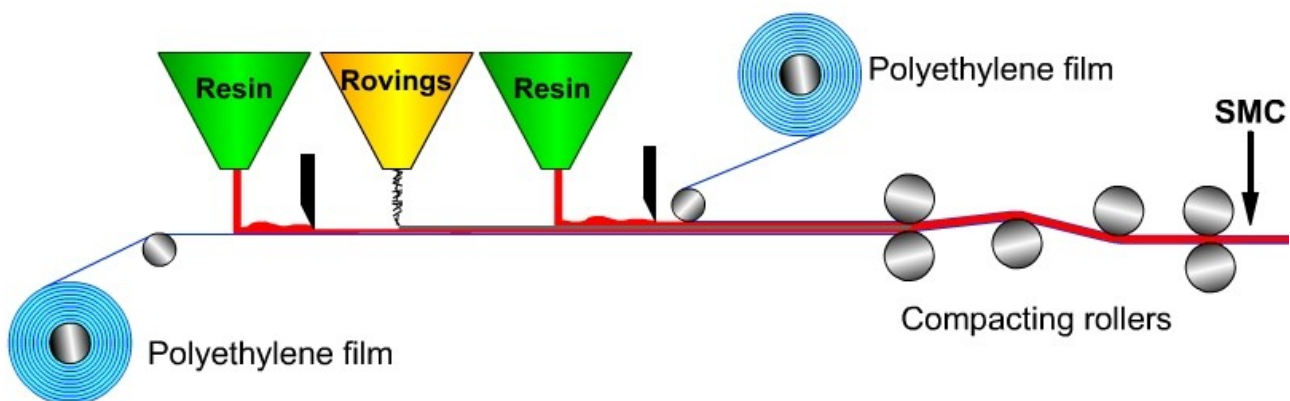
- a mould (of the part that will be moulded)
- a plug that will force the sheet moulding compound into the mould
- a mechanical or hydraulic press that will close the mould, (i.e. that will force the plug to push the sheet moulding compound into the mould).

Sheet Moulding Compound (SMC)

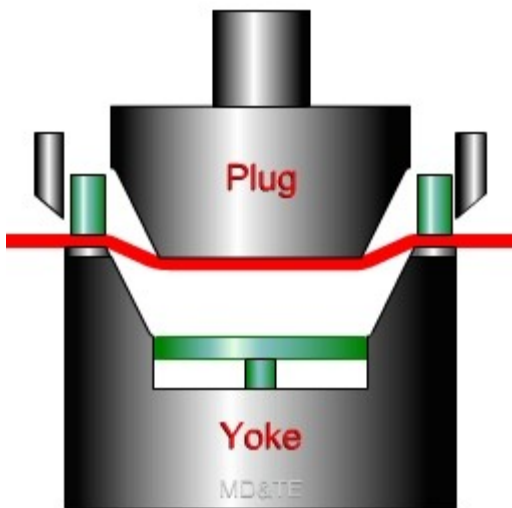
Sheet moulding compound (SMC) is an uncured thermoset compound in sheet form that is composed of:

- resin, (unsaturated polyester resin, or epoxy resin)
- chopped glass fibres, usually 25mm - 50mm long
- inert fillers (e.g. calcium carbonate)
- a catalyst
- a release agent
- other additives that will give the SMC its required physical and chemical properties.

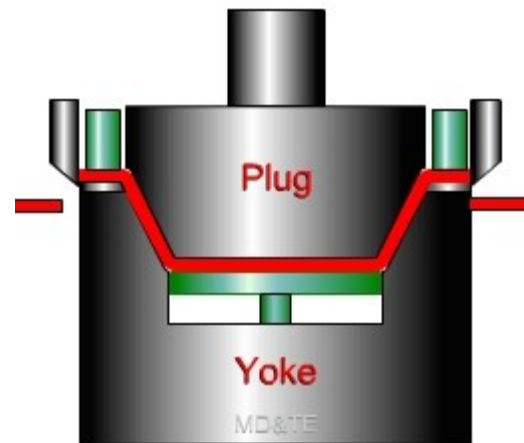
Making sheet moulding compound (SMC)



The SMC Moulding Process



The plug pushes the SMC into the mould.
Heat from the mould cures the SMC.



When the SMC has cured, it is ready to be trimmed and ejected from the mould.

Sheet moulding compound (SMC) is formed by compression moulding.

The compression moulding process has four main stages:

1. **Charging the mould with SMC.** A sheet of sheet moulding compound is placed onto the heated female mould, (the yoke).
2. **Closing the mould.** The heated male side of the mould (the plug) is closed, forcing the sheet moulding compound into the mould cavities. Heat from the mould initially softens the sheet moulding compound so that it flows into every part of the mould very accurately, then it cures the compound.
3. **Curing the compound.** The mould stays closed until heat from the mould cures and hardens the compound, usually within about 2 - 3 minutes.
4. **Ejecting the product.** When the SMC has cured and hardened sufficiently, the plastic moulded product is ejected from the mould.