RF Preheating 101
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Thermoset plastics are polymer resins that irreversibly cure through a chemical reaction. The cure may be initiated solely by chemical means (two-part epoxy, for example) or the cure may be done through heat (usually above 200 °C or 392 °F). Most heat activated resin systems are ideally suited for Radio Frequency (RF) heating. RF Preheating of thermoset plastics provides superior material performance and improves production speeds.

Some examples of common thermoset plastics suitable for RF Preheating are:

**Polyester resin** is used in sheet molding compound (SMC) and bulk molding compound (BMC). Panels fabricated from polyester resins reinforced with fiberglass (FRP) typically used in restaurants, kitchens, restrooms and other areas that require washable low-maintenance walls.

**Epoxy** is a copolymer formed from two different chemicals. Applications for epoxy-based materials include coatings, adhesives and composite materials especially those using fiberglass reinforcement such as circuit boards, extruded or pultruded rods and shapes.

**Phenol-formaldehyde (Bakelite)** is used for small precision-shaped components where specific properties are required, such as molded disc brake cylinders, heat resistant handles, electrical plugs, switches, circuit boards and semiconductor encapsulation. Bakelite was the first commercially successful synthetic resin.

**Melamine-formaldehyde (Melamine)** is used in kitchen utensils and plates (such as Melmac) as well as high-pressure laminates, such as Formica, Arborite, and laminate flooring.

**Urea-formaldehyde (UF)** is used as adhesives for the bonding of plywood, particleboard, and other structured or engineered wood products.

TRADITIONAL THERMOSET COMPRESSION MOLDING
Traditional thermoset molding operations have utilized compression molding. In this process, a measured amount of molding compound (resin, filler and pigment) is introduced into a two part cavity mold which is heated to processing temperature. The mold is compressed under high pressure. The mold slowly closes as the molding compound gradually melts and forces its way into the crevices of the mold.

After a period of minutes, the heat from the mold migrates through the molding compound until the entire part has reached the processing temperature.

When sufficient time has elapsed to insure that all parts of the product have reached at least minimum temperature for minimum time, the press is opened and the finished part(s) removed.

**COMPRESSION MOLDING WITH RF PREHEATING**

In this process, a measured amount of molding compound is introduced into an RF Preheater. The RF is activated and the molding compound is heated to its softening point usually in less than one minute.

The softened compound is transferred to the molding press which is immediately closed. The soft material is then free to flow into the recesses of the mold.

RF Preheating of thermoset plastics is a proven technology that offers a wide range of product quality, competitive and profit advantages at modest cost.
About Thermex Thermatron

Thermex Thermatron, LP, is a trusted developer and manufacturer of industrial microwave and radio frequency equipment, including batch ovens, generators, presses, heat sealers, welders, and other custom engineered machinery. The company also provides extensive services to help manufacturers through the United States get the most from RF and MW technology.