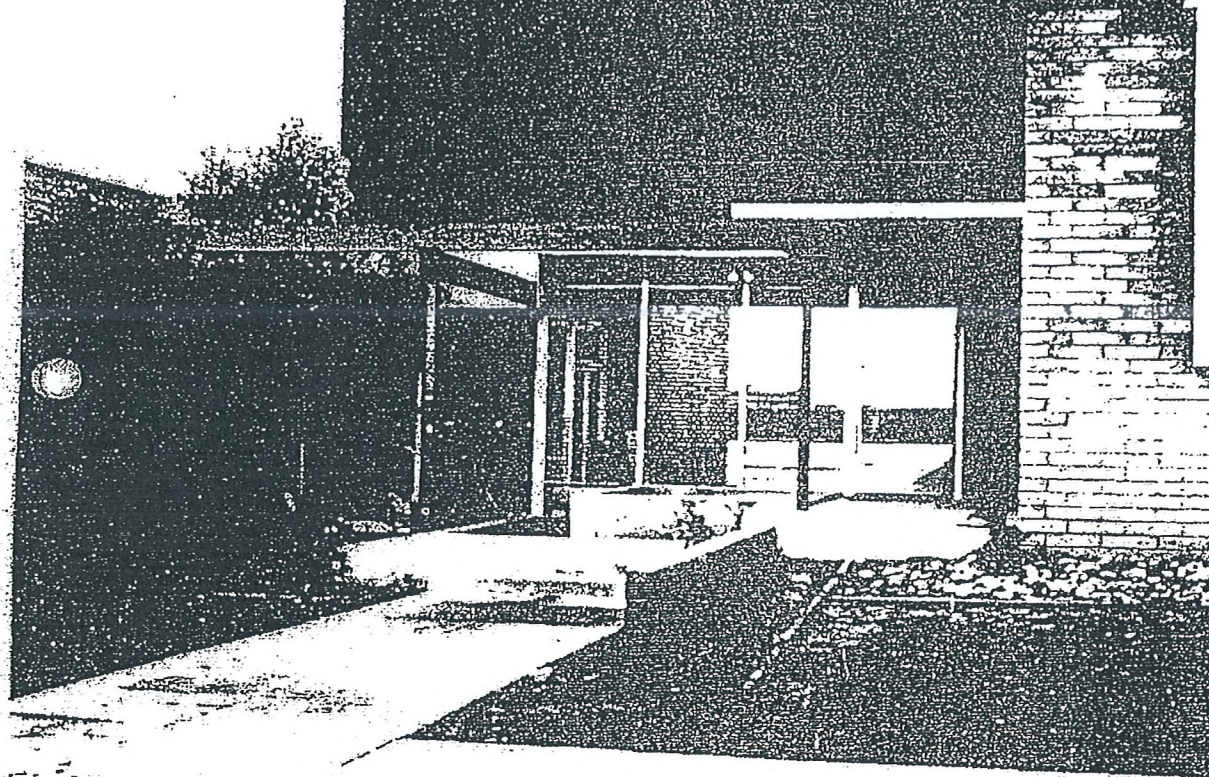


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ABOUT REICHOLD PHENOLIC MOLDING COMPOUNDS?

Ten years ago when other companies were pulling in their horns and getting out of the business of manufacturing phenolic molding compounds, Reichold Chemicals, Inc. reversed the trend and went into the business.

At that time, Reichold took out a license to manufacture these compounds using an extruder process developed in Europe. This method of mixing the ingredients to make a phenolic molding compound is the key factor in making RCI phenolic molding compounds different from most other compounds available today.

Robert Schmittberger, Manager of Research and Development for Molding Compounds, explains this as follows: "All general-purpose phenolic molding compounds are basically the same. But the fact that Reichold injection type materials are out-performing others in industry is due to a number of factors.

"First, there is a similarity between the method of injection molding and the manner in which RCI materials are manufactured. Reichold Chemicals is the only phenolic molding compound supplier who manufactures exclusively by extrusion instead of the conventional two-roll mill method. The similarities in our extrusion production equipment and injection molding equipment are readily apparent in the feed hopper, jacketed cylinder and screw with separate temperature controlled zones which are common to both. In the extruder, raw materials are plasticized into a plastic mass which becomes the finished product. This finished product is then taken by the molder who plasticizes it in his machine in the molding operation, advancing it further to the three-dimensional fully-cured polymer of the molded article.

"Second, RCI's products have little or no tendency to set up or freeze in the injection machine barrel. If the products did have a tendency to build up in the cylinder of an injection machine, they would do so in RCI's extruders and could not be processed. This is assurance to the molder that he can expect continuous trouble-free performance.

"Third, RCI injection materials can be held for an exceptionally long time after plasticizing in an injection cylinder and still flow out and fill a mold. For example, RCI 25000 has been held in a plasticized state at 240°F for three minutes and after this long delay, still filled a 10-cavity mold when it was injected.

"Fourth, RCI materials are formulated to extrude uniformly based on work input and thermal history.

This lends itself to uniformity of plasticizing and molding in injection machines. By contrast, use of the conventional two-roll mill to manufacture phenolics inherently leads to non-uniform heat history since the material fed on the rolls first has the most heat history. There is also no mixing from the left side of the rolls to the right side. The work input is greater on a two-roll mill and power input increases as rolling time increases. Sheet cuts are made to try to achieve mixing, and this operation leads to widely varying work inputs as indicated on wattmeters attached to the drive motors. The RCI extruders thoroughly mix materials at lower and constant work input and at a steady temperature gradient in the extruder. This results in better molding latitude as well as more efficient mixing."

One of the most essential characteristics needed for an injection material is good mold release, which is a combination of factors: (a) the parts must readily eject from the cavities; (b) the sprue should break sufficiently far back toward the cylinder so that a hard plug is not left for the succeeding shot; and (c) the flash and material in the vents must come off with the pieces and runners. If it is necessary to open the door to blow off a piece of flash or chip off some flash in a vent, optimum cycles cannot be obtained.

RCI injection materials are specially formulated and lubricated to ensure that the entire mold will be clean after ejection by the knockouts.

In an extruder it is necessary to formulate to prevent build up on the steel in the extruder. This idea is compatible with good mold release or freedom from sticking to the steel molds. On the other hand, with a two-roll mill formulations must be adjusted so that they will stick to the steel rolls, but not stick to the steel molds. These ideas are incompatible. RCI's extruded materials have proven themselves to be the best for mold release.

Faster cure speed is always accompanied by a loss in molding latitude and slower cure speed is always accompanied by a gain in molding latitude. In other words, molding latitude and cure speed are on opposite sides of the scale and one is gained at the expense of the other. The RCI extrusion process inherently moves the scale of molding latitude versus cure speed upwards; so that while the relationship of cure speed and molding latitude still exists, both of these properties are improved simultaneously. Two examples of the application of these inherent advantages were related in the foregoing article.