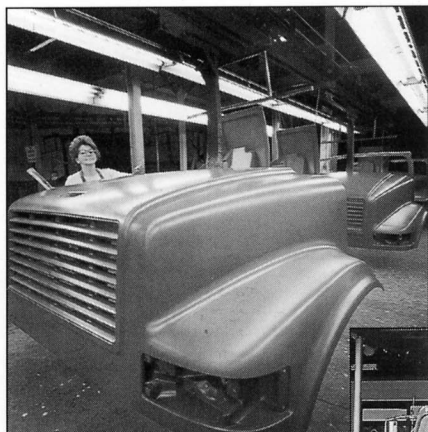


# Vacuum Systems Improve Efficiency of Core Materials Corp.'s Truck Components In Compression Molding Process

**C**ore Materials Corp., formerly Navistar's Columbus Plastics Operation, is located in Columbus, Ohio. This 320,000 sq.ft. facility with over 420 employees, was established in July 1980, and manufactures Fiberglass Reinforced Plastic (FRP) components for the truck, marine, and automotive industry.



To produce their truck and personal watercraft components, a compression molding process is used. The key compound used in this process is Sheet Molding Compound (SMC) of which 32-34 million pounds are manufactured here annually. This sheet molding compound (a thermoset material), is cut, weighed and loaded into a heated mold. A hydraulic down-acting press compresses the material in the mold under high pressure to form the part. During the cure cycle of molding the part, an In-Mold Coating (IMC) is injected onto the part surface. Pressure is then reapplied to the mold to finish the cure cycle. Prior to and during each of the molding and IMC steps of the cycle, a vacuum is pulled to remove all air to ensure surface quality.

The vacuum necessary to perform this process was provided by a Busch rotary vane vacuum pump, which is connected to each mold. However, as the product components became larger, a quicker recovery time in

the cycle was needed. That is when Core Materials decided to purchase Busch triplex vacuum systems.

Each Busch triplex vacuum system consists of (3) Busch single stage rotary vane vacuum pumps with direct coupled TEFC motors, an ASME coded vertical receiver, (3) isolation valves, (3) in-line check valves (3) flexible connectors, (3) vacuum gauges, (3) inlet filters, vibration isolators, and an automatic alternating electrical control center. It comes complete with ready-to-run automatic alternating lead/lag<sub>1</sub>/lag<sub>2</sub> systems. One vacuum pump is selected as the lead pump and meets the majority of the system demand, while the second, or lag<sub>1</sub> pump meets peak demand conditions. The lag<sub>2</sub> pump is usually employed as a



backup pump in the event the lead or lag<sub>1</sub> pump should be out of service, although it, too, will come on stream to meet excessive demand conditions. Automatic alternation of the three pumps ensures even pump wear.

The vertical receiver has solved Core Materials Corp.'s initial problem. They are now able to get a faster and deeper vacuum for quicker recovery time because the receiver tank is able to store vacuum for use as needed. This improves overall efficiency and energy conservation enabling the pumps to run at a higher vacuum because they do not have to pump down from atmospheric pressure. There are also other advantages of the triplex vacuum systems. With the systems, they are able to do on-line maintenance service with no down time since there is always a backup pump which automatically comes on stream, ensuring no loss of production. The design of the system provides easy access to servicing and there are less space requirements since the three pumps are stacked.

Should their vacuum capacity needs increase in the future, easy-to-install mechanical and electrical modules can be added to the predrilled, prepiped frame, without using additional floor space.

Core Materials Corp. now has a total of seven Busch triplex vacuum systems and are pleased with their performance. Controls Engineer, Mike Miller says, "The Busch triplex vacuum systems meet all of our specifications. When evaluating new equipment for a given task, I consider performance, reliability and serviceability for the long haul with flexibility for continued growth. Their performance and reliability have proven to us to be dependable in our environment. The feature to shut down and lock out a single pump/motor unit permits true scheduled PM servicing. Finally, the system offers the flexibility and ease to increase system capability by adding a pump/motor unit at minimum cost. They are real compact workhorses."



**R5 Triplex Vacuum System**

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