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PRECISION

PRECISION MACHINE & MANUFACTURING, INC.

CASE STUDY



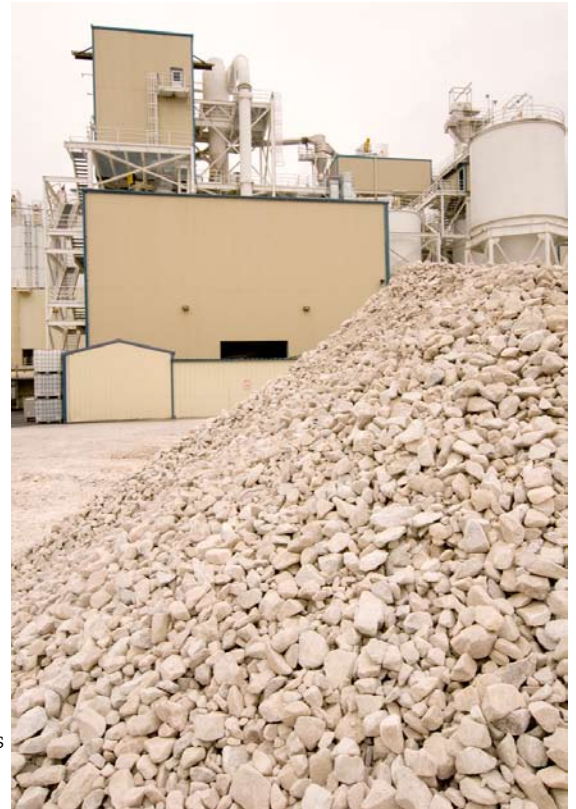
MORE THAN GREAT ROTARY VALVES, IT TAKES A GREAT VALVE COMPANY TO KEEP THE POWDER FLOWING FOR COLUMBIA RIVER CARBONATES.

In the calcium carbonate business, the productivity of the plant depends on each piece of equipment operating as specified, for as long as possible. And savvy plant managers are always on the lookout for pieces of machinery that can help them do their jobs better, for longer. This has especially been the case at Columbia River Carbonates (CRC) of Woodland, Washington. CRC grinds limestone rock, shipped in by rail from its quarries in Eastern Washington to make calcium carbonate powder with grains of different sizes, from 18 microns to 2 microns in diameter. The powder that CRC produces is used as filler in PVC pipe, in paints such as those used on roads, in putty, and as filler in sheetrock mud.

CRC transfers calcium carbonate around its plant using a technique called dilute phase pneumatic conveying. With this material transfer method, very high volumes of air are used to move a comparatively lesser amount of powder through pipes between processing stations and storage silos and trucks for shipment. Rotary valves are used to meter the powder out into the air stream for transport. Each valve functions as a rotary airlock (similar to revolving doors at an airport). The powder falls into the pockets of the valve's rotor, whose shaft is horizontal, more or less perpendicular to the pipe. As its rotor turns, the valve drops a controlled amount of powder into the air stream. At 4,000 feet per minute, the air stream can transport the powder over a distance of 300-350 feet, with the ability to carry the material upwards. If a rotary valve weren't used as an airlock, the air would rush up the chute and the powder wouldn't flow.

CRC started using European rotary valves in its plant in 1986, and then switched to valves from various U.S.-based suppliers. CRC's journey led them to Precision Machine & Manufacturing, Inc., a 30-year supplier of custom, high quality, long-life rotary valves, rotary feeders, and screw conveyors based in Eugene, Oregon.

Precision Machine's PMV Series valves are fabrications, assembled from machined components. All of the other valves that CRC has purchased have been castings, which the company thinks is responsible for long ordering lead times (typically, the suppliers of cast valves need to work with outside foundries that have their own lead-times and manufacturing schedules). Precision Machine manufactures



its PMV valves in-house using the latest CNC machining equipment and meticulous machinists and welders. And because Precision's valves are assembled from machined component parts, it is possible to replace only the worn parts rather than needing to remove and replace the entire valve. "This cuts our requirement for spare parts inventories and minimizes downtime when service is required," said Kurt Knutson, CRC Production Manager, "though we've had our PMV valves running constantly for thousands of hours now without requiring any service."

One design feature of PMV valves that promotes long-life operation is the precise positioning of the rotors in the center of the valves. The rotors in valves from other manufacturers require shimming in order to be centered in their barrels. If the rotor is not centered, calcium carbonate can cake-up and get hard along the barrel wall in a coating that CRC's plant engineers call "eggshell." This coating affects the accuracy and reliability of the valve's operation. The bearings of PMV valves do not require shimming. "The PMV valve parts just snap together and they're ready to go," said Kurt Knutson.

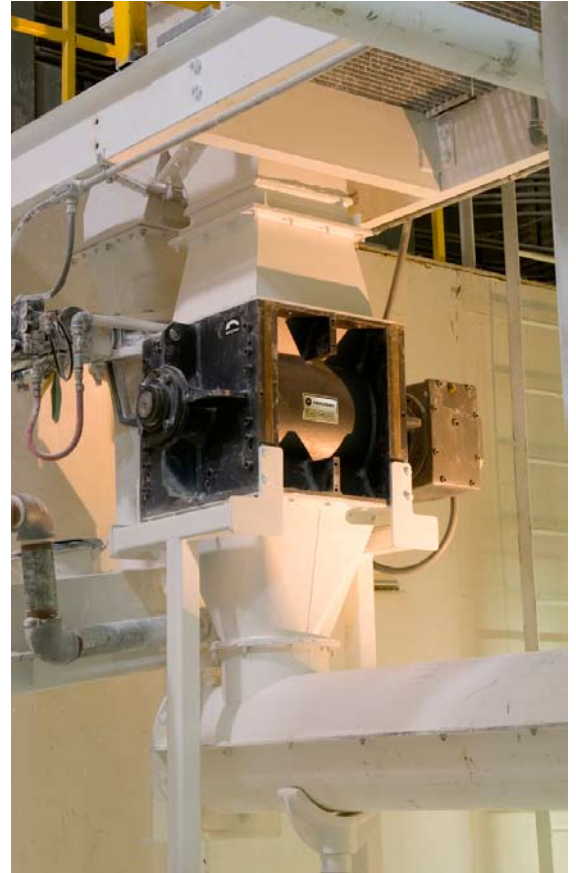
Recently, Precision Machine has been working to design a custom side-entry valve for CRC, which the company believes may solve both lead-time and tolerance problems with a cast unit manufactured by another supplier. With the current side load valves, CRC has had to continually replace the cast housings every 12 to 18 months because they have been experiencing unusual wear at the entrance points. To solve these problems, Precision is developing its own version of the product using its modular machined construction method rather than a casting.

CRC's staff is glad to receive the engineering support from Precision Machine. "We have four mechanical engineers on staff, so we can understand our problems and typically we try to solve our problems ourselves," said CRC Production Manager Knutson. "But, we're thrilled that Precision Machine's team comes to our plant to discuss the technical issues surrounding our problems and offers to modify their standard designs to better meet our needs. Most equipment suppliers wouldn't have this expertise, or if they did, they wouldn't make it available."

As part of its continuing upgrade program, the CRC plant now has six PMV valves installed. "The first Precision Machine rotary valve we installed has been running for about 11,000 hours now, without a hiccup," said Kurt. "And as time goes by, we'll definitely install them in more places throughout the plant."

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