



CASE STUDY: Buddy Bar Casting - Robotic Gate and Runner Removal

Due to increased volume, Buddy Bar Casting (BBC), South Gate, Calif., investigated a solution for the large amount of manual work required for aluminum railcar service and emergency brake valves. Each set of trucks on a railcar requires a service valve and an emergency valve.

The valves were made from a BBC-designed core package consisting of 21 shell cores. The cores were manually produced and assembled using gauges throughout the process. Castings were molded on an automatic matchplate line at 100 molds per hour, then degated and deburred by several workers on a two-shift operation requiring 100 hours per day. The manual operation used band saws to remove the runners and risers, deburring for the parting line and a belt sander for remaining areas. Bill Fell, BBC

president, contacted Rimrock in mid-2006 to evaluate the possibility of using robotics.

Rimrock Corp., Columbus, Ohio, developed a solution for BBC that involves taking the new casting after shakeout and readying it for shipment. The finishing cell consists of an ABB 6400 foundry robot with dual part grippers, a Rimrock 30 HP saw, and two deburring spindles. The castings are introduced into the cell on a turntable with fixtures 180 degrees apart, enabling the operator to load one casting while another is being finished in the cell. The finished castings also are returned to the turntable, keeping the operator in one location, thereby reducing cycle time. Each casting has to be gripped once to saw off the gates and risers, then gripped again to completely debur the casting.

The service brake valve is a two-on casting, requiring a dual gripper end-of-arm tool attached to the robot. The first gripper is used to saw the runners and risers and separate the castings. The second gripper presents each casting individually to the deburring spindle for removal of excess flash. The operator loads a new casting, removes the finished casting, performs minor manual grinding when necessary and loads the heat treat basket, all within the cycle time of the cell.

The service brake valve is processed in 240 seconds, producing approximately 30 finished castings per hour, or 600 per day. The emergency brake valve is processed in 200 seconds, producing about 18 finished castings per hour, or 360 per day. The finishing cell is operated by one person with a



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second person working a half shift to remove the downsprue from the service casting if necessary. With automation, all of the brake valves can be finished in four days with the capacity to finish other castings as needed. The payback for the capital expense of the cell due to labor savings was one year.

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