

# Putting Turbulence to Work

**H**ere's one of those wish-I'd-thought-of-it-first products that turns a liability into an asset. Steven Carpenter, an engineer with extensive experience in the foundry industry and an owner and partner at Grand Northern Products, has developed a process that puts turbulence to work—cleaning difficult-to-reach passages and highly-cored and deep components. “When I worked in foundries, first as a chief engineer and then as a plant manager, we found a common problem when cleaning interior passages, especially small I.D.s with long and/or irregular sections,” said Mr. Carpenter. “In an effort to create turbulence that could be controlled, we tried introducing blast streams from opposing ends with some amazing results,” he added.

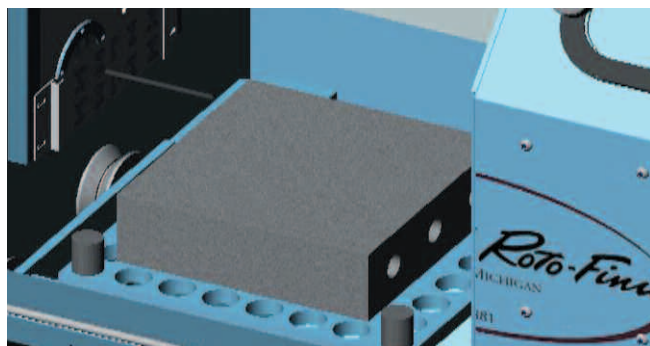
Mr. Carpenter developed the process until it was ideal for working internal features. In simple terms, the process uses two (2) or more opposing blast nozzles to impart reflective random energy to the blasting media at a chosen area. The process is capable of aggressively removing internal burrs, burned on/in sand, and leftover mold and core materials. “With a conventional lance, much energy is lost because the abrasive is forced to turn an abrupt corner at the nozzle tip which decelerates the material. However, two opposing nozzles create a mushroom effect and gives the added benefit of a 360° pattern, if desired,” he explained. “We also proved that the nozzles do not have to be opposing in our process. This is advantageous where the part configurations don't allow opposing nozzles such as water jacket passages and oil galleries in engine blocks and turbo charger housings,” he said.

Mr. Carpenter patented the process and has sold the marketing rights to Hammond Roto-Finish. Hammond Roto-Finish incorporated the process into a reciprocating blast system called Recipro-Blast™.

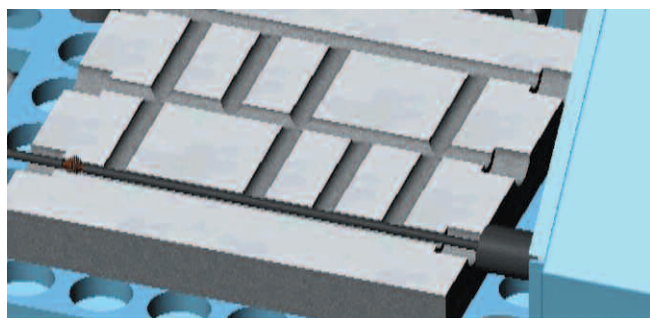
Hammond Roto-Finish has several of the systems in operation and is marketing the process to manufacturers of hydraulic/pneumatic manifolds, valve/fitting bodies, and transmission components. With Recipro-Blast, customers can address internal conditions inexpensively and effectively. “One of our customers is enjoying a significant savings in cleaning costs. Recipro-Blast replaced labor-intensive hand-cleaning, molten salt cleaning, and rotary brushes. The equipment paid for itself in a few months,” said Mr. Carpenter.

Hammond Roto-Finish is finalizing a peening system based on controlling turbulence. Currently, most peening work in internal areas utilizes lances with some type of angle-hole configuration. A controlled-turbulence system will have greatly increased flow levels and a more favorable angle of impingement, thereby increasing peening efficiency. A specific application is for a springs manufacturer. Recipro-Blast works well for this customer because it eliminates the over-peening of the O.D. while achieving the desired results on the I.D.

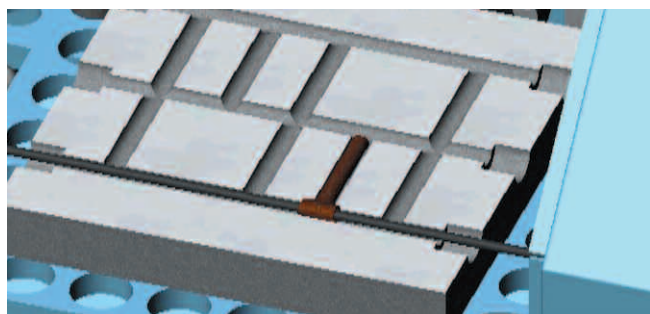
For more information on the Recipro-Blast, contact Steve Carpenter at Grand Northern Products:  
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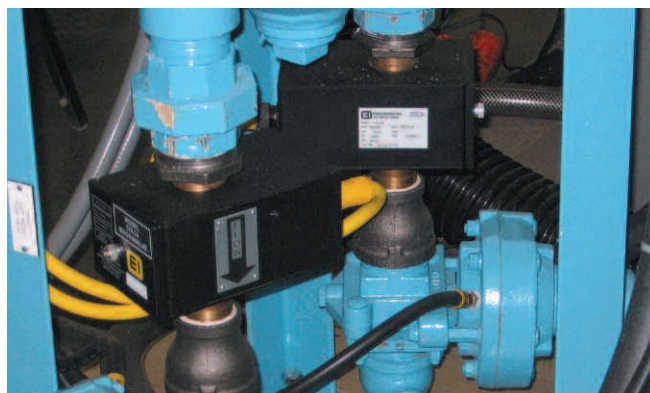
*A component in the machine*



*Opposing nozzles create 360° blast pattern  
(cross-section of component for illustration purposes)*

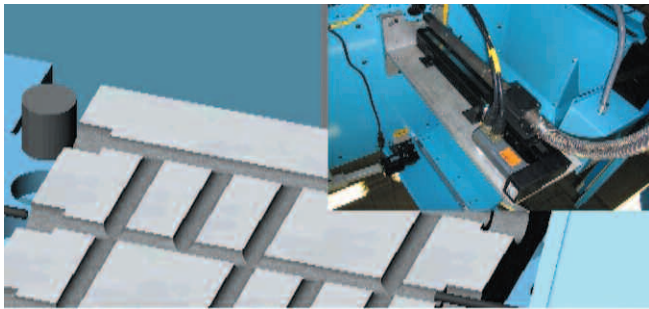


*Blast pattern flows through intersecting passageways  
(cross-section of component for illustration purposes)*

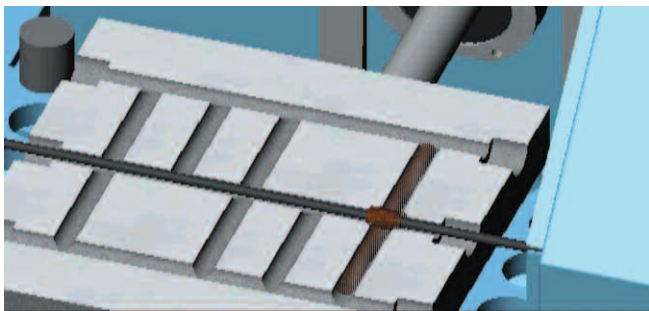


*Blast media is controlled by magnetic flow valves*

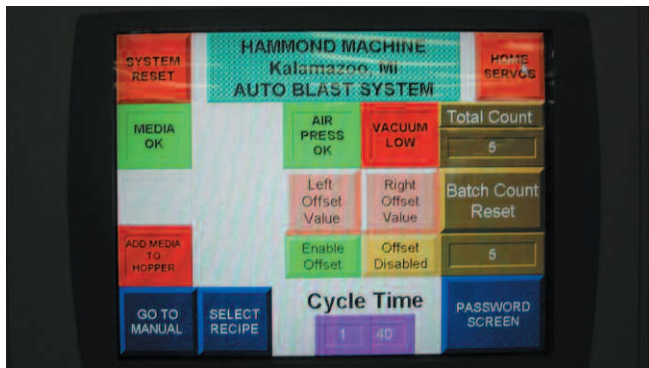




*Servo-controlled nozzles and part movement  
(cross-section of component for illustration purposes)*



*Servos can be programmed for many different parts  
(cross-section of component for illustration purposes)*



*System is controlled with easy-to-use touch screen*

### About Grand Northern Products

A leading international distributor of surface enhancement technology located in Grand Rapids, Michigan, Grand Northern Products specializes in equipment, supplies, processes, systems engineering, and production services to optimize finishing operations.

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### About Hamond Roto-Finish

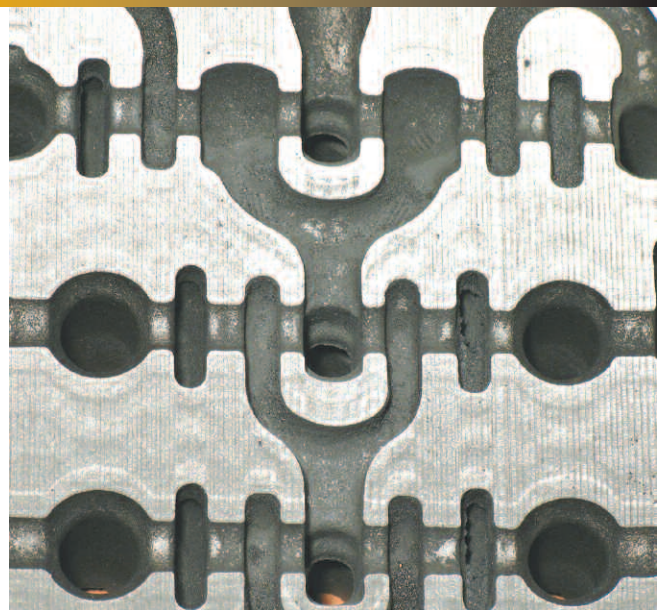
For over 120 years, Hamond Roto-Finish of Kalamazoo, Michigan has provided finishing solutions for automotive, aircraft, aerospace, medical instruments, implants, sporting goods, decorative hardware, jewelry, musical instruments, household appliance, plumbing and firearms industries.

Contact information:

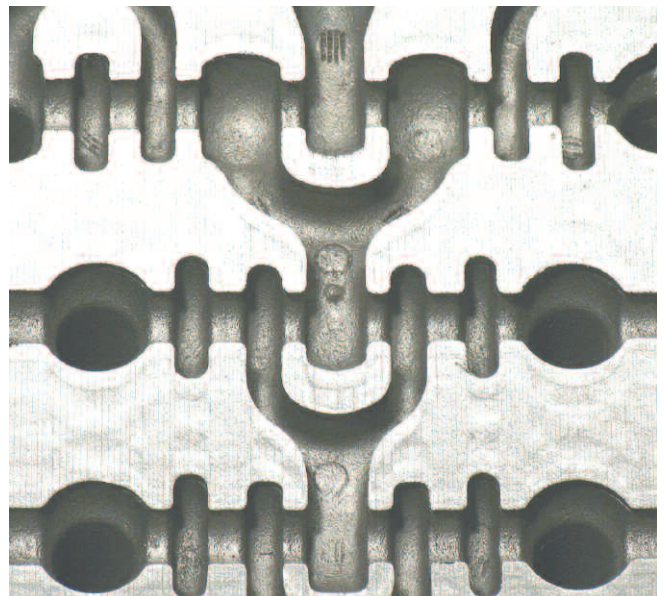
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*An hydraulic valve casting is cut in half to show the typical condition of a valve before cleaning*



*An hydraulic valve casting cut in half after going through the Recipro-Blast process. Note the casting definition of this part. "People have been so amazed by the results that they claim that we cut apart the components, blast clean them, and put them back together," said Steve Carpenter.*



*The Reciprocating Blast System*