



## Cascade Techniques Slashes Fettling Times

*Cascade method of deburring solved the awkward problem of fettling and deburring castings for hydraulic equipment, reducing processing times from 45 min down to 10-12min.*

Founded 30 years ago Newcastle, UK-based Rotary Power, part of the British Engines group, is a market-leading manufacturer of hydraulic pumps and motors equipment. Its wide range of products is aimed at a diverse group of demanding applications and includes pumps and motors with up to 125cm<sup>3</sup> displacements for the chemical and processing industries through to hydraulic motors used in heavy industry with capacities up to 16,000cm<sup>3</sup> displacements. For Rotary Power, the quality of the finished item is paramount and the removal of burrs and other sharp edges is seen as vitally important to the manufacturing process. The traditional method of removing these features was to hand-fettle, which is both time consuming and inconsistent. "Due to the nature of some of our castings and the complexity of the cast cavities it could take up to 45 minutes to deburr one component," says Steve Holt, Rotary Power's Production Manager, "We also ran the risk of damaging components and, worse still, scrapping a part and losing all the value added up to that point." This situation was compounded in recent years by the increased volumes and the greater complexity that was being designed into the pumps and motors.

A solution had to be found and after numerous options were investigated, including water and chemical deburring methods, Christchurch, Dorset, UK-based Ellesco provided the answer to the problem. As the UK agent for Iowa Engineered Processes Corp (IEPC), Ellesco proposed the use of its Cascade method of deburring. This patented Cascade process combines a controlled flow of media, liquid cleaning compound and high frequency oscillations to produce a mix of burnishing, peening and shearing actions to deburr components. The media, usually case hardened steel balls or pins, flows through and around the component(s) while being vibrated at a frequency between 2300 and 2900 cycles per minute, at an amplitude of between 4 and 7mm. This action creates peak accelerations of 29 G and the result is a smooth finish, free of any burrs. The machine installed at rotary power is the 1300 model, which can deburr large components weighing up to 0.6 tonne inclusive of fixture and media.

'During the evaluation process it became immediately apparent that this was the right process for us,' confirms Holt. The machine has had an immediate impact on our business with productivity increasing dramatically and the previous bottleneck, caused by manual deburring, has disappeared completely. Quality has also benefited, with not one part being rejected since the machine was installed. We are now confident to issue parts from the Cascade machine directly to assembly. Throughout the evaluation process the key issues were quality and consistency, the dramatic reduction in cycle times being an added bonus."

The previous 45 minutes required to hand deburr has now been reduced to between 10 and 12 minutes, which includes the integral washing process and load and unload; although cycle times can be as low as five minutes, depending on component and process requirements. A further benefit, that also improves component throughput, is the fact that multiple components can be loaded to the simple, fabricated, fixtures.

Initially developed for high volume applications, the Cascade system has proved itself ideally suited to the medium volumes encountered at Rotary Power. This is due in part to the simplicity of the set-up and programming of the machine. Components are mounted on fixtures, a process that can be manual or automated with robots; this fixture is then enclosed and the cycle commences with the deburring media being released and the oscillations set for a pre-determined time cycle. A plc unit controls all of this and individual elements, such as deburring, washing, and vibration frequency, are easily controlled and pre-programmed. Standard method sheets with photographic memory aids are also used at Rotary Power to make setting both quicker and easier. The result is a process that provides repeatable and predictable cycle times, irrespective of the loading of the machine, while at the same time eliminating part-to-part contact and, unlike other processes, it is ideal for large, heavy and low-value components. **Article site:** <http://www.manufacturingtalk.com/news/ell/ell102.html>