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US report on Thermal Deburring.

A US expert on deburring has conclude that TEM (the thermal energy method) is the most economical process. He rated chemical at 2.6 times the cost, vibratory at 5.3 times and hand deburring at a whopping 60 times the cost of thermal deburring. His meticulous calculations took in such variables as capital costs, depreciation, consumables, maintenance, labour, cycle time, energy, waste, cleaning, supervision etc.

Now while this isn't conclusive evidence for all components in all situations, it does highlight TEM's poor press over the years. The UK rarely consider the process and in a recent survey it was revealed that a fair number of engineers have never heard of thermal deburring. Which is hardly surprising as it is 50 times more common in the States. Many machines are used in-house, deburring mass produced components en mass which is where it gains its cost effectiveness, but there is also a thriving sub contract market built upon it's versatility to readily swap between types of components (with little cost implication) and also its speed of deburring. Cycle times for a batch firing can be less than one minute.

The process is particularly appropriate for high production applications where deburring departments struggle to keep pace. It instantaneously deburrs a large number of intersecting holes, threads and hard-to-reach areas in a flash, literally in 20 milli seconds, as a shock wave evaporates the burrs in passing. It's ability to fire multiple components at the same time increases its capacity and cost effectiveness enormously.

The reason why the surface of the component is not affected is that the amount of heat released in the explosion barely raises the components' bulk temperature to 150ºC, but the burrs, particles and contaminants (which have a high surface to mass ratio) are unable to dissipate the heat quick enough and surpass their flash point and oxidize.

This very selective effect is one of the main reasons why this process is on the increase. Burrs and particles are removed with the guarantee that none are missed whilst at the same time not affecting the dimensions of the piece in any way. TEM has proved especially beneficial with fine holes where the size of bores are left untouched, unlike other processes that use an abrasive media where bores have to be produced undersized to allow for the surface erosion when removing burrs.