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No burr – no splash

Deburred, blunt and splashfree stainless steel sheet metal parts in one operation



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Deburred and blunt stainless steel sheet metal free of splash in one operation

NO BURR – NO SPLASH

By Günter Kögel. There are two things, that Hobart cannot accept on the sheet metal parts of his industrial dishwashers: splash and raw edges. For over a year now a new machine from the Ernst company with a combination of a deburring cylinder and rotating brushes has been making sure, that all laser cut stainless steel sheet metal parts in one run are cleaned from both once and for all.

More than many other sheet metal fabricators, Hobart – leading producer of industrial dishwashers – sets great store on perfectly rounded edges. This is the only reliable injury prevention for personnel. Alex Beck, member of the board of the Hobart GmbH says, "With only three machines all sheet metal parts for the outer contour are laser cut. Laser cut parts normally don't have burrs, but extremely sharp edges.

For many machines these edges are not problematic, because they appear in areas, where personell has no access. Our dishwashers are different: The staff

works in moist areas which makes the skin very sensitive and vulnerable. Therefore all sheet metal parts within reach of the staff have to fulfill very high requirements of being free of burrs."

And on top of that there are high requirements at Hobart concerning splash. Dieter Schweiß, Production manager says, "the parts are handled in bending centers. The splash that can appear during the laser cutting stick to the sheet metal which leads to dents and thus to substandard. The common solution for both problems Hubart

found at the Paul Ernst Maschinenfabrik GmbH in Eschelbronn: A grinding and deburring machine, that according to Dieter Schweiß, "reliably removes all splash and simultaneously deburrs the edges."

This is a great advantage in comparison with the former solution with two separate machines, that were out of date and worn after several years of two and three shift operation and therefore had to be replaced: The new machine occupies much less room which is crucial in the factory in Offenbach and – which is even more important – the parts have to be treated



For deburring and edgerounding with the Ernst machine, the employees do not need to handle the parts twice, but just one time . Therefor instead of four, only two operators are necessary per shift. At the same time the lifetime of the abrasive was doubled.

only once. This is possible due to the combination of two production steps in one machine.

Markus Lindörfer, managing partner of the Paul Ernst Maschinenfabrik says, "we have integrated two work steps in one system, and so we can reliably remove splash and possible primary burrs. And on top of that we round the cutting edges at the same time." According to Lindörfer a primary burr can appear due to faulty materials or a

bad focusing of the laser optics and consists of dross with flown metal at the rear side of the sheet metal. This can be prevented by exact adjustment of the parameters, but splash due to reflections of the laserbeam at the support grid are not avoidable even with ideal parameters.

The Ernst solution: primary burr and splash are removed reliably by grinding the parts with a special deburring cylinder. Then the sharp edges are rounded in a second process with a

starlike rotorhead with eight abrasive lamella brushes. This way at Hobart all parts bigger than 10 cm² will be deburred before further treatment – and this completely in one operation. The sheet thickness varies from 0.8 mm to 6.0 mm whereas 80 per cent of the sheet metal have a thickness of 1.25 mm or less.

Markus Lindörfer about the technical specifics, "Our deburring cylinder is the only device on the market that operates without endless abrasive belts and that doesn't grind on the surface, but only where burrs appear, at the edges of the sheet metal parts. The deburring cylinder has a diameter of 420 mm and is mounted so softly that it spreads over the edges of the parts, where it grinds with more pressure. The machines of the competition work with contact drum units, known from wood processing with a idle roller on top and a fix drum below."

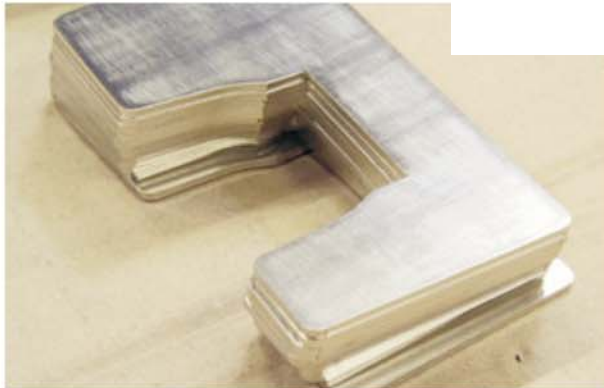
If the lower drum is adjusted 2/10 mm too deep, it tries to grind off these 2/10 mm off the material. This doesn't only cost an exceptional amount of abrasive material, it also leads to a change in the thickness of the sheet metal which will result in wrong bending angles. On top of that the material will be warped on the upper side and is not flat anymore."

Another advantage of the soft deburring cylinder from Ernst: With the system it is possible to work very well with distorted sheet metal parts, which is very important for Hobart. At Hobart

Stenogramm Hobart

Hobart is a branch of the listed US-Company ITW, with a turnover of 16 billion US-Dollars, thereof 2 billion in the food equipment branch, to which Hobart belongs. Hobart Germany supplies Europe and Asia with industrial dishwashers in different sizes – from small under-table-equipment for 2000 € to custom made machines that can cost up to 10 million € per unit. For the construction of the dishwashers Hobart needs 3000 tons of stainless steel sheet metal per annum – mostly 1.4301, in exceptional cases 1.4571. Hobart has a total of 950 employees, with 450 working in Offenburg.

www.hobart.de



The deburring cylinder is so soft, that it covers the sheet metal part and only the edge is grinded. This shows on the processed parts: The bright processing marks are limited to the area of the edges



Alex Beck, Management of Hobart (left), and Dieter Schweiß, production manager at Hobart, "all splash is reliably removed and the edges are rounded accurately." Below: For industrial dishwashers from Hobart, here a rather small modell, apply strict quality measures for the surfaces and edges of the stainless steel sheet metal parts .





Where before two machines were needed, today one is sufficient. The EG M/ Rotation by Ernst combines deburring cylinder and rotor head with abrasive lamella brushes.

parts distorted by laser cutting can be levelled with a drum leveling machine. Splash and burrs could damage the levelling drums, and had to be removed before the levelling process. For the machine by Ernst this is no problem. Because in the experience of Dieter Schweiß also distorted parts can be deburred and cleaned of splash. Markus Lindörfer gives the explanation, "while other machines try to remove material at the highest point of the distorted parts, our drum is mounted so softly, that the sheet metal part is covered and only grinded at the edges.

This is visible with the naked eye: the bright treatment marks is are limited to the edges." A speciality is also the following brush unit, because it works totally smooth. Due to the eight brushes arranged side by side and rotating over the whole width longitudinal and transverse edges are equally well rounded which leads to a measured treatment. Dieter Schweiß can confirm that the combination of these two methods also in practice keeps the promises, it makes in theory, "due to its operational principal for me the machine by Ernst

is the best system currently available, because on the one hand it reliably removes splash and burrs and on the other hand it rounds the edges very well."

Because of the good experiences with the Ernst company Axel Beck is very optimistic, that these qualities will remain for a very long time, "over the years we made very good experiences. The quality and reliability of the machines and the service by Ernst were the crucial reasons for the acquisition. We depend on the stability and reliability of the machines, because if the deburring machine fails sooner or later the whole production will be disrupted, because by hand this amount of parts can't be deburred."

Treated are sheet metal parts of a pregrinded and polished type, protected from damage by layers.

The specialty of the Ernst-machine: Even the side with the layer can be rounded without grinding off the layer. The edge becomes round but the layer remains. Moreover, according to Markus Lindörfer: "during the laser cutting the layer is burnt off but rests of glue remain which makes a clean cutting harder. After the rounding process with our machines the



The deburring cylinder with a diameter of 420 mm is so soft, that it covers the edges of the sheet metal parts and therefore grinds with more pressure in these areas.





The programming is limited to the entering of the material thickness, which doesn't take more than two or three seconds.

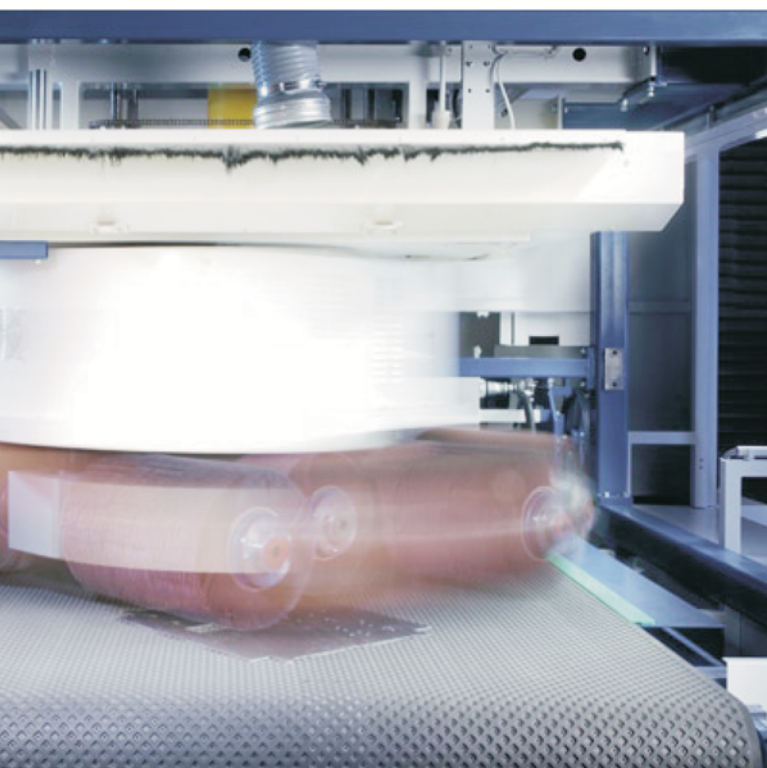
protection at the edges is gone and the layer can be removed without residues. But not only the dirt at the cutting edge are removed but also other impurities.

The experience of Dieter Schweiß, "the parts leave the machine in a clean condition, and don't need further cleaning." A very positive aspect is also the cost balance for two main reasons: compared to the previous systems the machine operators have to move the parts not twice but only once. That halves the number of workers per shift from four

to two. At the same time Hobart could more than double the durability of the abrasive materials. According to the evaluation of Dieter Schweiß the tool costs add up to two Euro per hour due to the deburring cylinders, an amount that according to the production manager is below the costs for manual deburrin



www.hobart.de
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