MAN

OXIDE FILM REMOVAL IMPROVES CORROSION RESISTANCE ON FLAME CUT STEEL PLATES

The leading European supplier of pressed parts and components for the commercial vehicles and private car market has installed a Lissmac Model SBM deburring machine to bring their sheet metal products up to the latest standards. In accordance with the increasing demands from customers for product quality and cost reductions, the company invested in a steel brushing machine and an automatic de-stacking unit made by Lissmac. This is where the sheet metal parts cut out by a laser receive the last “grind” for the immersion painting which follows.

Economic manufacture of lorry frame reinforcements

To obtain an optimal ratio between the load-bearing capacity of a lorry frame and its laden weight, the slim-line frame carriers are reinforced at specific, precisely identified points. The exact dimensioning of such reinforcement panels usually results in unconventional forms. The batch size decides which procedure functions economically. Panels of this type can be pressed or laser cut..

“Whilst we use the highly productive pressing process for the mass production of such reinforcement panels, for smaller production batches we have installed a Bystronic laser cutting centre. With this laser equipment, we can fulfil special requirements from clients at short notice.

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As a rule, the sheets are 4 to 12 millimetres thick, but they can be up to 20 millimetres thick. The cut sheets have a maximum length of four metres and a maximum width of 700 millimetres. In order to combine the laser equipment's high flexibility with high productivity we cut with oxygen. The oxygen leaves a black oxide film and there is a build-up of slag in the vicinity of the cut edges. This oxide layer not only prevents any stable bond from forming between the sheet and corrosion-preventing lacquer coatings, but even with powder coating or galvanizing the material bonds fall below the usual standard."

" We initially ran tests with our parts on the Lissmac SBM machine, lacquered these brushed parts in our cathodic immersion painting equipment and passed them on to our test laboratory. It turned out that the sheet metal was now forming a permanent bond with the paint, even on the laser-cut edges.

At the centre of the ergonomically constructed brushing centre stands the Lissmac "SMB 1000/2-A" steel brushing machine. It operates using an efficient brushing process – contra-rotating brush belt elements with brushes positioned at an angle provide for optimal processing of the cut edges. The sheets run through the machine automatically and are brushed on all sides simultaneously by four brush belt elements positioned opposite one another but offset in just one pass. This generates suitable surfaces for coating on both the external and internal edges.

At the same time, the brushes slightly round off the cut edges which are often sharp. This should very definitely contribute to the avoidance of accidents during manual handling. The maximum width which can be machined by the steel brushing machine illustrated is 1,000 millimetres.

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1,500-mm. wide steel brushing machines of this type also exist.

There are no operating problems. The thickness of the sheet to be processed is centrally set, using a hand wheel. A separate scale gives the operator a reliable indication of the current operating range set. The feed is likewise infinitely variable and can be selected freely over a range of 0 to 10 m./min..

A stacker transfers the sheets to be brushed onto the lifting table, which is installed in front of the brushing machine, on a special pallet. Sufficient space is available for the operator between the brushing machine and the lifting table. The operator manually pushes the long sheets from the lifting table into the brushing machine, which then feeds them on further. For this stage of the operation, the pick-up level must coincide with the working height of the steel brushing machine. To bring this about, the operator moves the lifting table to the required level, using a pedal switch.

The brushing machine pushes each sheet onto a roller conveyor. This roller conveyor takes the brushed sheet metal part up to a stop, the position of which is infinitely variable. For really long sheets, this stop is at the end of the roller conveyor. With the help of a light barrier, which is installed at the start of the roller conveyor, it can be ensured that only one individual sheet is on this conveyor at any one time. This regulation guarantees a reliable transition for automatic stacking. The grid-shaped pick-up unit, the fingers of which wait for the item to be transferred between the rollers of the roller conveyor, must in fact take only one individual sheet on each occasion for safety reasons.

Driven through a chassis and lifting gear, which operate on an area portal, the pick-up unit raises

the sheet metal part until it is securely conveyed over the stop bars of the drag bar on the stacking table. When the pick-up unit has cleared this hurdle, it locates itself and draws back. The brushed sheet metal parts therefore accumulate, little by little, into a stack which is up to 500 millimetres high. To ensure that the pick-up unit can also safely take sheet metal parts which are up to four metres long, it is just as long as the roller conveyor. So the portal needs only the X and Z axes. The stack height is monitored by another light barrier. When the stack reaches the pre-set stack height, the equipment stops operating and the operator receives a signal to empty the stacker table.

Small-format sheet metal parts are supplied in a box pallet and unloaded onto the lifting table. This is now lowered until the operator can comfortably reach into the box pallet to transfer the small sheet metal parts to the brushing machine. After brushing, these small components fall into a pre-positioned box pallet.

So that the box pallet can be positioned on the exit side of the brushing machine, the roller conveyor and the stacker table must first be moved back about 1.5 metres. This can easily be done manually, since both the roller conveyor and the stacker table are mounted on wheels which run on rails. Once they have been moved back, the roller conveyor and the stacker table are stopped and electronically locked. The effect of this is that the pick-up unit can not move and the operator can move in the area, the other machinery in which is not locked, and the steel brushing machine can operate.

photos attached

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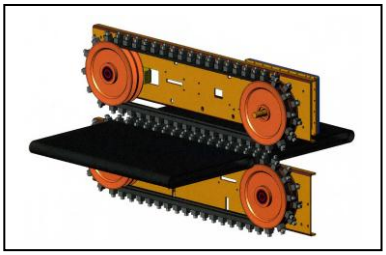
Model SBM-GS with automatic handling system



The principle of cross belt de-slagging

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