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Additive Manufacturing with Metal

How Company “Edelstahl Mechanik” cleanly and economically separates 3D-Printed Metal Parts from the Base Plate

Metal 3D printing has experienced rapid growth in recent years. The 3D printing process allows a high degree of flexibility in the planning and construction of the various components. The components themselves have a high stability, functionality, and durability.

A key question in the overall process is: How are the metal parts cleanly separated from the base plate after 3D printing to have high-quality parts in the end? One possibility is the cost-intensive process of wire EDM. Another alternative is the manual separation of the parts, so to speak "with hammer and chisel". Edelstahl-Mechanik GmbH, a specialist in additive manufacturing, has found another solution for this work step: the MEBA 3D 335 band saw machine. Managing Director and owner of Edelstahl-Mechanik, Josef Eisele, reports: "The additively manufactured components can be cleanly separated from the base plate with the MEBA band saw. Neither components nor base plate are damaged. We are very satisfied with the results."

Success through Modern Machines and Production Processes

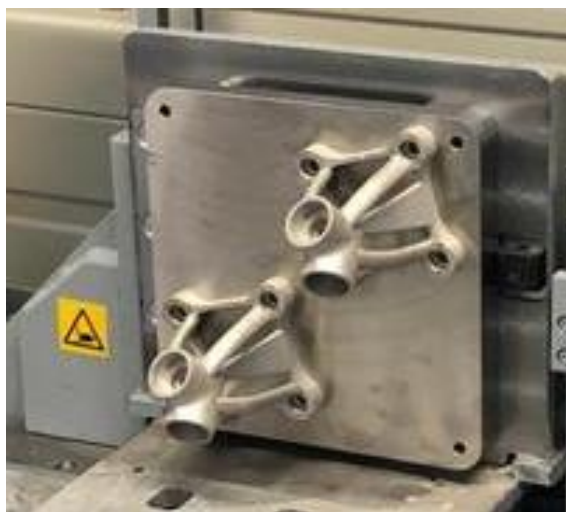
Edelstahl-Mechanik can look back on more than 30 years of company history and competence in stainless steel processing. The company's portfolio begins with the development and application of laser cutting processes, the mechanical processing of metals of all kinds, welding and apparatus construction to the production and distribution of stainless-steel products. Josef Eisele: "Our company has always been characterized by reliability, professionalism and flexibility. From the very beginning, we have seen ourselves as a partner to our customers, for whom we not only want to be a manufacturing company, but above all a professional consultant and service provider in the areas of development and design. It is the combination of technical know-how and customer proximity that makes up the special quality and that is consciously cultivated by us as management." To achieve these goals, it is important for the company that the machinery at all company locations is state-of-the-art. Most recently, the stainless-steel professionals have expanded this to include additive manufacturing. As a result, they achieve the highest level of vertical integration and, according to their own statements, are among the leading companies in the industry. With the entry into additive manufacturing, those responsible in the company thought about how to separate the components from the base plate in an optimal, contemporary, and economical way. Since stainless steel mechanics have been working very satisfactorily with MEBA band saws for 20 years and MEBA was able to supply a special saw for 3D printing, Josef Eisele says, "no other product came into question for us." For those responsible at Stainless Steel Mechanics, the arguments for the band saw seemed logical and have been confirmed in practice. The additively manufactured components are separated from the base plate with the saw in a time- and resource-saving manner. The costs and time required are significantly lower than with wire EDM or manual separation.



Managing Director Josef Eisele

Quality and Fine Technology

The idea that parts are often manufactured with the latest technology, in the SLM or DMLS process, but then separated manually, as in the past, spurred the MEBA developers to find a better solution - an economical and up-to-date solution. As a result, MEBA has incorporated long-term, sophisticated band saw technology into the 3D saw, whereby 3D-printed workpieces are separated precisely and without damage from the 3D metal base plate. The MEBA 3D 335 is based on the straight-cut model MEBAeco 335, which is equipped with feed monitoring and a frequency-controlled ball screw drive. It is equipped with a special clamping device for holding 3D metal printing base plates. This base plate can be moved as desired via linear guides and can be precisely aligned. The MEBA 3D solution works with a 2-column guided saw frame that is infinitely driven. Cutting and feed speed can thus be adjusted very finely. In combination with the right selection of band saw blades for the respective material to be separated, even filigree parts can be separated very precisely. According to its own information, the stainless-steel mechanism has not yet encountered components for which there were problems with separation. On the contrary: The company manufactures many different, often filigree parts, orients itself on the MEBA cutting data computer, which was delivered with the saw, and thus achieves the best results. Josef Eisele confirms: "The practical clamping system and the precise work of the band saw are convincing throughout. Compared to alternative solutions for separating the components, the MEBA saw is not only time- and resource-efficient, but also cost-effective. In addition, the components have a very high quality in the end."



The MEBAeco 3D for the additive manufacturing of 3D printed parts

The focus is on the user

In today's production world, it is important to keep systems and machines as uncomplicated as possible. This includes their simple operation and handling. The MEBA 3D saw can be operated intuitively, so that employees can be instructed on the saw at short notice. The handling as a whole or the conversion and cleaning of the machine is also child's play in a few simple steps. For Josef Eisele, this was another argument for the MEBA 3D saw: "Machine operators are very quickly trained on the saw, an important aspect in times of shortage of skilled workers.," says Eisele. "Also, the clamping of the base plate by only one screw works very pleasantly and quickly."

In addition to easy handling, the MEBA 3D saw also easily meets the occupational health and safety criteria. Equipped with the protective enclosure and an industrial vacuum cleaner for removing coarse dusts, the MEBA 3D saw provides a clean working environment. The machine operator does not inhale powder and it does not get on his skin.

The question of amortization

Of course, those responsible for stainless steel mechanics asked themselves whether an additional saw for separating the 3D-manufactured components is worthwhile. But this was quickly answered. For the 3D specialists, the aim was to optimize the overall additive manufacturing process: 3D printing, reliable separation of the parts from the base plate, cost-effectiveness, and high-quality end results. The investment in the 3D saw is small compared to the 3D printer. The long service life of the band saw blade also keeps the costs low. Not to forget the manageable personnel effort compared to other procedures. Utilization and amortization of the saw are additionally favored by the fact that MEBA3D 335 saws can also be used for standard sawing work with a low conversion effort. Josef Eisele is satisfied with his decision: "We needed a solution to remove the 3D-printed parts from the base plate. As a further positive side effect, the saw can also be used for standard sawing tasks and is therefore the perfect complement to the 3D printer in the overall package. "The separation with a technically highly developed band saw brought the desired results in terms of quality, time and manpower for the company Edelstahl-Mechanik.

Highlights MEBA 3D Saw		
OPTIMAL PRICE- PERFORMANCE RATIO:		Low acquisition costs, low maintenance costs, high productivity
EXACT SAWING:		No reworking of the parts
FAST:		Short set-up times, fast sawing times, time, and cost savings
SIMPLE:		Setting up, operating, cleaning
PROCESS:		Exact alignment, cutting channel and feed monitoring
FLEXIBILITY:		Use of the saw also for classic sawing tasks
COMPATIBILITY:		3D system in many cases compatible with existing band saws, upgrade possible