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One solution for many applications  
The flexible vacuum handling device developed by euroTECH for extruded profiles - including steel construction, an overhead travelling crane and a control system

Anyone wanting to move aluminium, light metal or plastic profiles with different cross sections and surfaces with one and the same vacuum application will find that the limitations of standard equipment are quickly exposed. Even more so when the semi-finished products are delivered in a variety of different positional orientations. Based on the vacuum lifting device in the eT-Hover series, euroTECH has developed an integrated solution for TSE Trailer System Engineering that can handle all of the given variations. As a manufacturer of truck superstructures, TSE has thereby been able to ensure that its operational procedures are safer and more protective of health. Employee sick leave has since declined.

Once the eT-Hover vacuum lifting device has been accurately positioned on the narrow and up to 10 metre long aluminium profile, the light metal is drawn in by the application of suction and transported by means of a motor-driven, smooth-running overhead travelling crane, which includes a chain hoist, to the cradle in the long-goods machining centre. In several steps, a system component is produced out of the semi-finished product, which will later become the supporting element of a truck superstructure.

Until recently, the positioning of aluminium profiles was a job for two people.. "With a length of 6 metres and sometimes nearly as much as 10 metres, the bars can weigh up to 60 kilograms. The number of employees complaining of back problems and being absent for a number of days as a consequence increased steadily", says Torsten Ledabil, Project Manager at TSE Trailer System Engineering GmbH & Co. KG. It is also the case that a second employee is always needed for loading the bars into and out of position. For this reason alone, TSE realised that urgent action was needed.

TSE is a subsidiary of Schmitz Cargobull AG, one of the leading manufacturers of truck superstructures in Europe. With around 60 employees at the locations Ratshausen and Dotternhausen near Balingen, the company develops and manufactures those essential and versatile frameworks for truck superstructures that are so much in demand nowadays in the transport and logistics industry. The required raw materials are extruded aluminum profiles. Depending on function and usage, the profiles concerned may have very different cross-sections, surfaces and lengths. For reasons of space and costs, the semi-finished products are delivered in a variety of positional orientations. This places high demands on a high-performance and efficient handling technology.

TSE wanted an application therefore that could be used for any given profile type and positional orientation, without the need for time-consuming modifications and extensions. For reasons of both geometry and limited space in the vicinity of the machining centre, other kinds of handling systems were discounted. Since euroTECH, as a provider of cleverly-conceived vacuum solutions, was already well-known to TSE, the branch of the company in Geislingen in the Zollern-Alb district was approached for a consultation. With a comprehensive range of vacuum systems, components and the euroTECH-typical flexible modular system, the company provides efficient and customer process-specific handling solutions for the metal, glass, wood and plastics industries.

"To start with, we analysed the situation and the general conditions on site, put the task into concrete terms, created a specification together with TSE and presented, as a first step, a solution that could be developed, " says Danny Locher, design engineer and Project Manager at euroTECH. "The aim was to optimally integrate the desired application into the existing process sequence."

A fully-comprehensive solution had to incorporate planning, design, the supporting steel structure with a smooth-running, overhead travelling crane system, the chain hoist and a control system. At the heart of the fully-comprehensive handling solution devised by euroTECH is the vacuum handling device from the eT-Hover series. With this device, the profiles can be lifted horizontally and swivelled through 180°. With the ergonomically-designed remote control, all movements are precisely and intuitively controllable. The handling device has 5 suction plates. Each is equipped with 6 oval flat suction cups in three parallel groups. These are divided into three vacuum circuits. The suction arrangement is designed suchthat the suction plates can be applied to every kind of profile and positional orientation. These suction plates, derived from the extensive euroTECH modular system, were modified for specific tasks, and, by virtue of their internal suction channels, were able to save on external tubing.

How the complex task was solved by euroTECH may be illustrated by the example of the so-called mega-holm profile: This L-shaped semi-finished product, with dimensions of 173 x 97 millimetres and a length up to 10 metres, is delivered at an orientation of 180 degrees to the required processing position. The operator has to draw in the bar by applying suction, swivel it, set it down in an intermediate position, draw it in again through the application of suction and then position it in the machining-centre cradle. Because a u-shaped groove extends on one side over the entire length of the mega-holm profile, the operator sets the central suction line, which remains contactless, via a valve. The remaining two suction circuits form the vacuum. With the support of the crane, the eT-Hover lifts up the aluminum profile. A motorised drive now swivels the longitudinal crossbeam on which the five suction plates are mounted, together with the workpiece, by 180 degrees along the horizontal axis. If the side that was at the top is now at the bottom, the handling device sets the profile down onto the turning device and switches off the vacuum function. The axle swivels back to its original position. The eT-Hover can now apply suction to the side that is to be processed: The semi-finished product travels by crane to the level of the clamping position, and the lifting system and lifting device position the profile in the machining centre clamping jig. The multi-stage machining process of sawing, milling and drilling can now begin.

The handling solution implemented by TSE can accommodate loads of up to 60 kg. In addition to the controls for the vacuum, the electronic chain hoist and the crane drive, the control cabinet also houses two batteries for emergency power. “The decisive factor for us, having had eT-Hover tailored to our needs, is that we can handle all given profiles with a single application, without requiring any time-consuming and costly modifications. And it was a further advantage for us to receive all services, including expert advice, from a single source, i.e. euroTECH.“, says Torsten Ledabil. This definitely represents a sound basis for continued cooperation in the coming years.

Figures: 6,683

Video: <https://youtu.be/syxSEhB6E_o>

Photo material (in any order):



Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Image 7

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