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## CASE STUDY

### **New cut-to-length line improves performance at Alfun**

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**Heinrich Georg Maschinenfabrik recently commissioned a hybrid cut-to-length line for aluminum, steel and stainless steel strip at the Alfun Metal Service Center located in Bruntál in the Czech Republic. The new line includes a high-precision side trimming unit. The high degree of automation and numerous other advanced design features achieve exceptionally high productivity.**

Alfun Metal Service Center, founded in 1999, supplies a wide range of flat and long aluminum, stainless steel, steel and copper products. Automotive sheets, which have to meet the most exacting surface quality requirements, form a significant part of what Alfun supplies. Apart from products for the automotive sector, the company produces stainless steel sheets for the white goods industry, for washing machine and tumble dryer drums, for example. These applications require high-precision cut edges and exact rectangularity of the cut sheets.

Since 2015, Alfun has been operating a cut-to-length line from GEORG for 0.3 to 3.0 mm thick and up to 2,000 mm wide strip. This machine can cut sheets of up to 6,000 mm in length.

With the number of incoming orders increasing all the time, it became necessary to boost the production capacity of the service center. To achieve maximum flexibility and productivity, the new machine was to be designed as a hybrid side-trimming and cut-to-length unit for steel and aluminum strip.

A key criterion for choosing the new line was the quality of the cut edges because customers often use laser welding to join the cut sheets from Alfun.

#### **A high degree of automation assures high quality and high productivity**

Due to the excellent experience with and durability of the first GEORG machine, management at Alfun again decided in favor of GEORG as the machine supplier. The new machine is designed for top performance: The highly automated machine side-trims and cuts to length aluminum strip of up to 2,300 mm and stainless steel strip up to 2,050 mm wide at processing speeds of up to 60 m/min.

In contrast to the first GEORG machine, the new line is equipped with a turnstile for four coils. This provides more flexibility in production, as the coils do not have to be processed in the same order as they are delivered.

Automatic strip threading up to the leveler relieves the operators of this task and saves time. The bar codes attached to the delivered coils are scanned and combined with the order data. Based on this information, the process control system automatically sets the parameters for the downstream line units all the way down to the stacking unit. An example of a parameter here is the width of the knife gap, which is set depending on the strength of the material and the thickness and width of the strip.

As the machine processes aluminum, steel and stainless steel, GEORG supplied three cassettes for the high-performance leveler. These cassettes are specifically designed for the mechanical and surface properties of the respective material. Cassette changing takes just a few minutes and is performed automatically at the touch of a button.



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The side-trimmer of the cut-to-length line comes with GEORG's Shimless Tooling technology. This technology significantly reduces the downtime required for a knife change, as it dispenses with the need to insert shims while the knives are being reground.

GEORG supplied a continuously operating eccentric shear to achieve transverse cuts of excellent quality. The contour of the knife has been adapted to guarantee the highest cutting precision, especially when processing highly sensitive stainless steel strip.

At the line run-out, the cut sheets can be stacked either in a single stack or on two pallets. While single-stack forming is possible for sheets up to 6,000 mm long, stacking on two pallets is available for sheets with a maximum length of 3,000 mm. Changing between these stacking modes is possible on the fly at full line speed without interrupting the process or having to make any adjustments. This not only reduces unproductive times, it also avoids the formation of spots or roller marks during leveling, which might make it necessary to stop the line. This is an important aspect, particularly when processing high-gloss stainless steel.

### **Experience after one-and-a-half years of operation**

The new line went on stream in the summer of 2019, after comprehensive operator training at the GEORG academy in Kreuztal. As the intuitive operator guidance of the new machine is very similar to that of the existing one, it did not take long for the operators to familiarize themselves with the new systems.

Apart from a Christmas break, the line has been in continuous two-shift operation since its commissioning. Throughout this period, there have been no production incidents caused by the machine.

All project objectives have been achieved: The new line operates extremely precisely and reliably, while achieving the high productivity targets. This shows, among other things, in the low operating costs. "Excellently leveled" and "perfectly cut" – these quality features combined guarantee that sheet products supplied by Alfun fully meet the customers' expectations in terms of dimensional accuracy, cut edge precision and surface quality.

The comprehensive automation has resulted in a significant productivity boost compared to the other facilities in use at the service center. On the basis of the order data, the process control system automatically adjusts the parameter setting of the entire line to the requirements of the specific material being processed. This helps assure the consistently high quality of the delivered sheets – day in day out, whichever the shift.

The automatic knife clamping system of the eccentric shear has proved very successful, too. At the touch of a button, the knife holder moves into the knife changing position. The knife can be changed with ease, without having to release any traction or pressure screws or remove any other components. Production resumes in less than ten minutes. Before, a knife change with similar shears used to cause standstills of about half a shift.

Integrating the vacuum stacker into the process control system contributes significantly to the low energy requirement of the new line: Based on information on the thickness, width and length of the sheets and the material properties, the process control system calculates the degree of vacuum necessary to lift the sheets. This guarantees that only the vacuum needed to safely lift the sheet is applied in each case. Consequently, the sheets are moved extremely gently and with utmost care without wasting any energy on higher suction forces than are absolutely necessary. Noise emissions are low not only because the hydraulic unit is enclosed but also because it often does not have to operate at full power.

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The high productivity of the new line shows, among other things, in the lower personnel requirement: Compared to the first GEORG machine, the new one requires about 20% less operator capacity.

### Outlook

With the new line, Alfun is very well positioned to meet the future demands of its customers and tap into new market segments. Even now, provisions have already been made to add a surface inspection system, an electrostatic oiling machine and further foiling stations at a later stage.

### Figures and captions




<p><b>Fig. 1:</b> As the machine processes aluminum, steel and stainless steel, GEORG supplied three cassettes for the high-performance leveler.</p> <p>File name: Georg_Alfun_Richtmaschine.jpg</p>	
<p><b>Fig. 2:</b> The side-trimmer of the cut-to-length line comes with GEORG's Shimless Tooling technology, it significantly reduces the downtime required for a knife change.</p> <p>File name: Georg_Alfun_Besäumschere.jpg</p>	
<p><b>Fig. 3:</b> The contour of the knife of the eccentric shear has been adapted to guarantee the highest cutting precision.</p> <p>File name: Georg_Alfun_Querteilschere.jpg</p>	

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