



ADDING
VALUE

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BRIQUETTING SYSTEMS

From high-volume aluminium swarf to compact briquettes

Ruf briquetting machines help Trumpf increase output in laser component manufacturing.

In order to ensure the highest possible output and productivity when machining aluminium, for the last two-and-a-half years Trumpf's laser components production unit has been operating as a fully-automated machining centre. It can operate unmanned for up to 60 hours, but to do this it needs both robots and a sophisticated system for dealing with swarf. This latter problem has been handled from the outset by a tailored RUF RAP 4/2600/80x40 Integration Press which processes waste aluminium into practical briquettes and - along the way - increases the value of this raw material.

The high-tech company Trumpf Machine Tools is internationally renowned for its high-quality and reliable products and services. This is based on highly-efficient processes which have been fully taken on board by all the company's staff and management through the firm's own "Synchro" production system. In this way, it is just as important for internal supply departments to deliver "just in time" as it is for external competitors.

Alexander Wassmer, section leader of around 30 staff in Trumpf's laser component production unit, explains what this means: "We manufacture various aluminium components for core assemblies which are used in the beam generators of CO₂ lasers. We are competing directly with external manufacturing plants and so always have to be able to supply at low prices and within a strict time frame."

The laser components production unit often has to deal with small lot sizes, even as low as a single piece, as the Trumpf beam generator assembly area does not hold any stock. As a result, just-in-time delivery is critical, which requires high levels of flexibility and productivity in machining operations. To achieve this, a decision was taken at Trumpf two-and-a-half years ago to invest in a robot-controlled, fully-automated five-axis milling centre: "Our main aim was to be able to run the plant unmanned for a whole weekend if necessary", explains Alexander Wassmer, adding: "We realised that the huge amounts of aluminium swarf produced would be a challenge, as they could not be disposed of if weekend shifts were running unmanned. So we had to find a solution to this problem."

Various ideas were gathered and discussed, and in the end it came down to using a macerator or a briquetting machine. The decision was pretty easy to make, because briquetting offers significantly better volume reduction while at the same time increasing the value of the swarf. The decision-making was also helped by finding a medium-sized company like Ruf which could fulfil all of Trumpf's technical and commercial

expectations and requirements with its compact Ruf Integration Press RAP 4/2600/80x40

The Ruf briquetting press soon paid for itself

After two-and-a-half years of using the machine, Alexander Wassmer is still firmly convinced they made the right decision: "The machine works just perfectly. We have even operated it unmanned for up to 60 hours in our complex milling centre operation without any problems at all. This alone means that it paid for itself in no time at all." There are also many other advantages. The compacted aluminium swarf can be sold at a much higher price, while taking up much less space and simplifying downstream processes.

Trumpf's fully-automated five-axis milling centre produces around 20 tonnes of metal swarf per year. Around 80 percent of this consists of the expensive aluminium alloys: AlMg45Mn and AlMgSi1 (also as Si0.7 and Si0.5). The remaining 20 percent is made up of swarf from steel, stainless steel and copper. The swarf produced can also vary greatly: some types are short and several millimetres thick, others are only one-tenth of a millimetre thick and very long. But this is not an issue for Alexander Wassmer, because "the RAP handles all kinds of swarf without any problems, turning wet, high-volume waste into small, compacted briquettes which on average only take up one-twelfth of the original space requirement."

Save on valuable working time

All swarf is processed in the same way in the state-of-the-art production centre thanks to the integration press which has been customized to meet its exact requirements. A hopper collects the swarf at the back of the machine and it is then transported by screw conveyor to a pre-compressor where it is compacted, discharged and transported to a nearby container via a special small conveyor. Technician Thomas Krayner operates the automated machining equipment and also looks after the swarf disposal.



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He explains: "The briquettes are incredibly practical because they take up so much less space. As a result we have to empty the container much less often compared to other machines, which saves us valuable working time which we can use for other more productive activities."

The innovative and strong construction of the machine means that the RAP, like all of RUF's briquetting machinery, guarantees top performance and reliability while taking up very little space. Thomas Krayer agrees: "In two-and-a-half years we have only had very minor glitches with the machinery. And it wasn't a problem because we received the spare parts straight away and could replace them very quickly."

Ruf offers its customers the possibility of selecting a machine which is exactly suited to their needs. The Ditzingen-based high-tech company Trumpf decided on the small RAP 4/2600/80x40 which produces briquettes measuring 80 mm x 40 mm. The modern 4 kW hydraulic power unit achieves an output of around 36 kg/h for aluminium swarf (depending on the particular material and swarf type). Combined with electric motors in the IE2 efficiency class, the briquetting press also displays particularly low electricity consumption.

Production capacity can be expanded

As a result of the positive trend in Trumpf's business and the high degree of utilisation in the laser component production unit, the RAP could soon be getting some company. "We need to expand our production capacity to cope with increasing demand", explains Alexander Wassmer. It is highly likely that a fully-automated machining centre will be put into operation. The section leader thinks this is the only way that the plant can if necessary operate multiple unmanned shifts. It hasn't yet been decided how to deal with the swarf problem in this case, but Wassmer says that Ruf machines will be on the short-list of solutions thanks to the good experiences they have had with them so far.

Ruf is always ready to help, and would be pleased to work with Trumpf once again, as is stressed by Roland Ruf, one of Ruf's directors: "We would be very happy if we could once again tailor a briquetting machine to suit their particular requirements. If they need higher output, then of course we have suitable options. We have modular briquetting machines in different performance grades going up to our huge RUF 90." This machine has a 90 kW hydraulic power unit to achieve an output of up to 3,000 kg/h and it can be customised using a range of different attachments.

The TRUMPF Group ...

... is a world leader in production technology with turnover of € 2,025 billion and 8,550 employees (provisional figures for the financial year 2010/11). Three business divisions - Machine Tools/Power Tools, Laser Technology/Electronics and Medical Technology come together under the umbrella of the Holding company. Its core business is machine tools for flexible sheet metal processing for punching and shaping, laser processing and bending. With its headquarters in Ditzingen near Stuttgart, the company is a global market leader in the area of industrial lasers and laser system technology.

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CAPTIONS



B1

The fully-automated five-axis milling centre in Trumpf's aluminium production area means that manufacturing can continue unmanned for up to 60 hours. Ruf's RAP 4/2600/80x40 briquetting machine looks after the huge volume of aluminium swarf which is produced during this time.

Images: Ruf GmbH & Co.KG



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B2

Alexander Wassmer, section leader in TRUMPF's laser components production unit, explains: "The Ruf briquetting machine used in our automated production facility has proved to be extremely important and very valuable."

compared to other machines, freeing us up for other more productive activities."

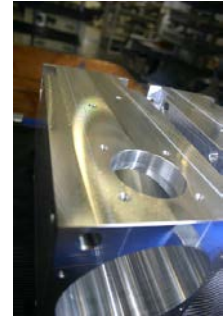
B3a



B3b



B5a



B5b

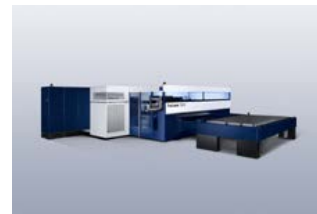


B3c



B6

The RAP machine from Ruf reliably compresses all the aluminium swarf produced in Trumpf's laser components production unit and compacts it to around one-twelfth of its original volume.



B7

The laser components production unit manufactures various aluminium components for core assemblies (B05a and B05b), which are destined for use in the beam generators (B06) of Trumpf laser equipment (B07). In this way the Trumpf production unit is competing directly with external manufacturing plants and so always has to be able to supply at low prices and within a strict time frame.



B4a



B4b

Technician Thomas Kraye programmes and operates the automated machining equipment and also looks after the swarf disposal. He explains: "The briquettes are incredibly practical because they take up so much less space. As a result we have to empty the container much less often