



ADDING
VALUE

RUF.
BRIQUETTING SYSTEMS

Engine part production department of MAN Diesel improves its productivity

RUF briquetting presses contribute to the success

The powerful ship engines and power generators of the MAN Diesel Group are renowned for their reliability all over the world. Given the full order books, the future of the company looks very bright. To cater for the continued growth, the company is extending its production facilities in Germany on an on-going basis, thus further increasing its productivity. The engine part production plant at the company's headquarters in Augsburg, Germany, is proud of its highly motivated workforce and modern machinery. An integral part of its production equipment are the briquetting systems of Ruf GmbH & Co. KG.

After the highly successful business year of 2006, with a turnover of more than € 1.8 billion and a workforce of 6800, the MAN Diesel Group improved its performance in 2007: At the end of the year, the company employed around 7300 people, and its sales rose to € 2.179 billion. Nearly half the workforce is employed at the main plant in Augsburg. Although wages and social contributions costs in Germany are considerable, the group still values southern Germany as a manufacturing base. This is well illustrated by the engine parts production division headed by Jürgen Schönberger. According to Schönberger, a highly skilled, motivated and flexible workforce is the key to success (see box). "In our production workshops, up to 90 percent of all workers are trained specialist technicians. As we produce only small series, workers must be able to tackle new challenges on a daily basis," says Schönberger.

The target of an increase in productivity by 20 percent set in 2005 was reached within only two years. **Apart from a motivated team**, Jürgen Schönberger has identified another success factor, namely modern production machines. In his division alone, there are about 100 production units in operation, of which around 60 are CNC-controlled. They are used for the machining of a range of metals and alloys, including aluminium, various steel grades and cast iron. "When purchasing a new machine, we always draw up a requirement specification that must be met by the supplier. One key element is thereby a maximum pay-back time of two years," explains the Schönberger.

RUF briquetting system pay for themselves in no time

These requirements applied of course also when the RUF briquetting systems were purchased in 2003 and 2005 respectively. Jürgen Schönberger remembers: "At the time, I was not directly involved in the purchase of the two machines. From our experience to date, I can however confirm that my predecessor made an excellent choice. The two briquetting units had paid for themselves within about 18 months. There have not been any significant problems, as none were ever brought to my attention." The foreman in charge of the RUF machines Wilhelm Merckle confirms this: "The machines run exactly as we expected - without any problems whatsoever."

The latest acquisition is the RUF 15 unit attached to a large-scale vertical machining centre where heavy-weight grey cast cylinders are milled. The chips are transferred by a conveyor belt to the collecting bin of the briquetting press. Particularly large volumes of chips are produced during the roughing, while less material is removed during the finishing process. To ensure that the briquetting unit is always operated at optimum load, cast chips from other milling and turning centres are added to the abraded particles, if necessary.

The chips drop from the collecting bin into the press cylinder operated by a 15 kW hydraulic unit that generates a pressure of more than 3700 kg/cm². The RUF briquetting unit thereby processes up to 750 kg of cast chips per hour, producing briquettes that are easy to handle. "The briquettes are about 10 cm in diameter and length and weigh roughly six to seven kilograms each. This is just the right size and weight for further processing," explains Wilhelm Merckle. "They can be



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easily transferred to the foundry, where they are taken up with magnets and lowered into the melting crucible. As magnets cannot be used to transport loose metal chips, we can save time and money by first compacting the material into briquettes."

Key criteria: quality, reliability and after-sales service

When assessing bids, MAN Diesel does not just pick the offer with the lowest price. The persons making the decision are rather interested in obtaining the equipment with the best price/performance ratio. Quality and reliability are thereby key criteria, as the company cannot afford downtimes - especially at the large vertical machining centre to which the RUF briquetting system is connected.

Although they were aware of the excellent reputation of the RUF solutions, the engineers did not want to take any risks here. The press had to be designed in such a way that a temporary breakdown - as improbable as it is - would not result in a complete standstill of the machining centre. Jürgen Schönberger explains: "The loss arising to us from a downtime of the machining centre would just be too high. That is why we have teamed up with RUF to develop a contingency solution. If necessary, the operator can press a button to divert the waste material to a standard scrap container. As we expected, we never needed this option yet."

The willingness and ability of Ruf GmbH & Co. KG to provide such a service further emphasise the customer-focused approach of the company. Commissioning at the MAN Diesel premises took less than a week. All requirements were fulfilled and there has since been no need for any unscheduled services.

Metal briquettes reduce the oxidising loss during smelting

Another great advantage of the RUF presses is the fact that most cooling lubricant residue is eliminated from the material when it is being compacted into briquettes. Such dry and compact metal blocks show considerably less oxidising loss than loose chip material.

Jürgen Schönberger puts it this way: "We have not yet had the opportunity to calculate exactly the loss occurring when melting loose chips. I would however estimate that this loss has been reduced by about 10 percent since we are using metal briquettes in our foundry."

Wilhelm Merkle is delighted with the purchase of the RUF presses, as he has now more space in the workshop for production equipment. Even the rather large RUF 15 unit does not require more than 12 square metres of floor space. The metal briquettes are of course much less bulky than the loose chip material. Even large cast chip material can be compacted to about half its initial volume. This simply means that the company can reduce the number of storage containers at its premises. Roland Ruf, engineer and head of R&D at Ruf GmbH & Co. KG emphasises this point: "For certain types of swarf and chips, for example those produced in light metal machining, briquettes require up to 50 times less space than loose material. This simply means that rental costs for storage areas can be reduced, or that space can be freed up for more productive purposes, for example to extend the production capacity at the site.

The sum of these advantages was the deciding factor for Jürgen Schönberger. "Before purchasing a machine, we always apply of course the proper procedures of assessing the bids according to the requirement specification. I am however convinced that, in the future, we will buy more RUF machines."

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Staff training and retention at MAN Diesel

For the MAN Diesel Group, success in business is essentially based on modern production equipment and qualified staff. To ensure that employees stay with the company, it is necessary to provide a good working environment and to offer initial and further training options on an ongoing basis. Nearly all apprentices who pass their exams successfully are subsequently employed by the company. MAN Diesel has introduced modern management tools such as value-flow analysis, whereby employees are involved from the very start of the implementation. Workers are given the opportunity to attend a range of training sessions and seminars that enable them to taken on additional tasks and responsibilities. These measures contribute to a higher motivation of the staff, which in turn helps make engine part production at MAN Diesel more efficient.



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CAPTIONS



B1

Developers from MAN Diesel and RUF teamed up to design a contingency solution implemented at the RUF 15 briquetting unit: If the press should fail, for whatever reasons, the chips are redirected at the push of a button to a standard waste container. Given the reliability of RUF machines, this option has so far never been used.



B2a

The latest acquisition is the RUF 15 unit attached to a large-scale vertical machining centre where heavy-weight grey cast cylinders are milled.



B2b



B3

The head of the production division Jürgen Schönberger and his foreman Wilhelm Merckle are delighted with the RUF briquetting machines installed at their premises: "The machines run exactly as we expected - without any problems whatsoever."



B4

Jürgen Schönberger, engineer and head of the engine parts production division of MAN Diesel SE, is very happy with the RUF briquetting systems and can well imagine that his company will purchase more of them in the near future: "Until now, the RUF machines have met all requirements laid down in the tender specifications. They are highly reliable and have paid for themselves within the first 18 months of operation."



B5

Wilhelm Merckle, production foreman at MAN Diesel SE explains the process: "The compact metal briquettes can be easily taken up in the foundry with magnets and lowered into the melting crucible. As magnets cannot be used to transport loose metal chips, we can save time and money by first compacting the material into briquettes."



B6

Loose chips and swarf transferred into the collecting container of the RUF machine is compacted into solid metal briquettes. In the foundry, briquettes show 10 percent less oxidising loss than loose chips.



B7

Roland Ruf, engineer and head of the R&D department of Ruf GmbH & Co. KG outlines the capacity of his machines: "For certain types of swarf and chips, for example those produced in light metal machining, briquettes require up to 50 times less space than loose material."



B8



B9



B10

The large MAN Diesel engines are used worldwide in ships and power stations.