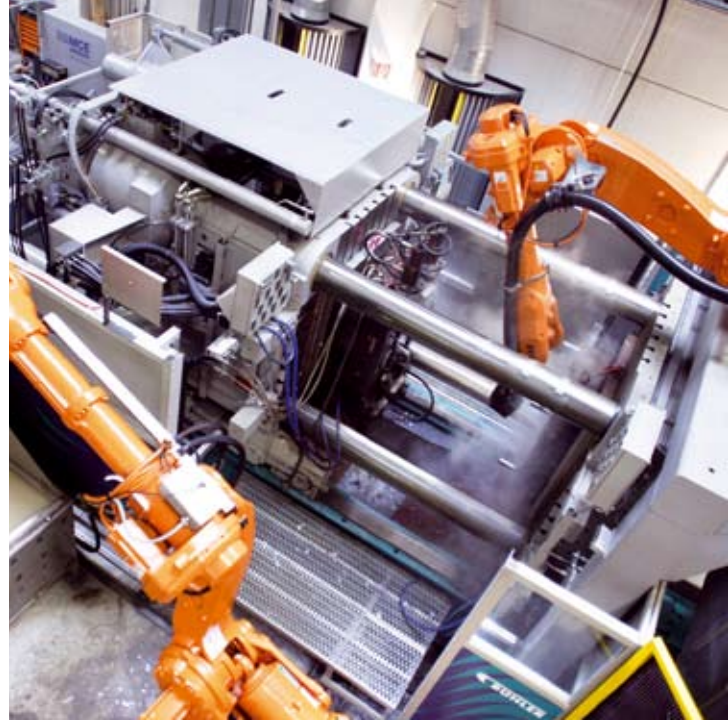


Case Story.

Carat 130



Case Story.

Carat – A new machine goes into successful production right from the start.

Knowing the future market requirements is a prerequisite for developing successful products. The new Carat machine series from Buhler is the response to this challenge.

What does the market demand today, and what will it require tomorrow? A number of surveys have shown us the value drivers in the die casting industry: The most important characteristics desired of a casting cell include high machine uptime, global service availability, rugged and low-maintenance operation, and increased specific casting capacity of the machine (footprint).

The result: The modular Carat two-platen machine series with locking forces ranging from 10,500 to 44,000 kN. Its modular design allows every die closing unit to be combined with any of three casting units of different size, called “lean, compact, extended.”

The two-platen machine does not have a toggle system like conventional machine designs. The locking forces are applied through four hydraulic clamping cylinders on the tie bars. The advantage: An appreciable reduction in the machine length, which in turn increases the specific casting capacity. Improved locking force distribution and automatic compensation of dimensional inaccuracies of the die reduce the creation of flash and the scrap rate while increasing the service life of the die.

The crucial benefit of the Buhler Carat design is that all mechanical components of the hydraulic clamping system are encapsulated and therefore protected from the rough foundry atmosphere. The clamping system was successfully tested on a test bench with over four million load cycles and without any failure of the seals or damage to the clamping and running surfaces. This equals a period of production service of about



12 years – a major contribution to increasing the service life of the elements involved!

The prototype machine was set up in our company in mid-2006 and tested during several months. The first system for tough industrial service has been installed at the site of our customer TCG Kirchdorf in Austria.

Since its start-up, this commercial system has been applied for 12 weeks now as a combined casting cell for producing aluminum and magnesium components. The first period of industrial service of 10 weeks was devoted to the production of aluminum parts. The striking characteristics noticed during this period included the fast platen motions, the good sealing action between the die halves, and the low-noise hydraulic drive. The system is operated in three work shifts on six days a week.

Since early June 2007, production has been switched to magnesium casting. Again, the die sealing action has been found to be exceptional, and almost without breaking the plunger – which travels at a velocity of 5.5 m/s – during injection of the magnesium. This means that it will be possible in the future to apply the cell either for aluminum or for magnesium casting using two dosing furnaces and without requiring any retooling. This contribution to production planning flexibility is not to be underestimated.

Eduard Hatzenbichler, Manufacturing Engineering TCG Unitech, comments his first impressions and the initial experience gained with the new cell:

“What I appreciate particularly about this new machine is its shorter overall length. This is a great benefit for me as a planner, since we permanently face a shortage of space in a plant such as ours, which has grown ‘organically’ over the years. Our casters are enthusiastic about the Carat’s capability of compensating for the non-parallelism of old or worn dies by its four die locking cylinders. With this machine, I have never remarked the ‘flashing’ commonly encountered when using such dies. Then, regarding the die closing and locking characteristics of the Carat, I find that the new design quite generally keeps the dies more reliably locked than a rigid toggle system will.



Eduard Hatzenbichler is enthusiastic about his Carat 130.

One great quality is the larger variable die opening stroke, which allows simultaneous spraying of the fixed die half during extraction of the component. As for occupational safety, the redesigned hydraulic system is felt to be quieter than the conventional variable-delivery pump design.

This machine offers us a super combination system for casting magnesium as well as aluminum components.”

Eduard Hatzenbichler, May 30, 2007

To conclude, here is a small success story about the installation and start-up of this casting system. The machine with a weight of about 60 tons left Uzwil on March 1, 2007 and arrived in Kirchdorf on March 2. Normally, the installation of a new machine will require somewhat more time than usual. But not in this case! The smooth collaboration with the customer allowed the system – the machine and the peripheral equipment – to be installed and started up within 12 workdays. The die casting machine on its own was up and running within three days. On March 20, the first component was cast in the manual mode, followed the next day at 11 a.m. by the first fully automatic casting cycle. The very same day, the shift team took over the machine for commercial production. The machine has been running ever since without a glitch and to the customer’s entire satisfaction.

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