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A step into a new era

At bauma 2004 The Hess Group introduced the "linear Concept" to the concrete block making industry. This machine was truly a concept machine, a vision of the future from one of the major block machine manufacturers. This was the first time that a concrete block machine manufacturing company has gone public on their technical aims and aspirations. The machine's pallet size was based on the standard American block machine producing 6 - 4 inch (100 mm) blocks on a steel production pallet. After bauma the machine was displayed at several other shows before it came back to the Hess headquarters for further development, dry test runs and production trials. The next stage in development came in 2007. Forticrete Limited (part of the CRH group) in Thornley, (in the North East of England), was in need to replace their machine, and Hess needed a partner to operate the machine in a production environment. The decision was taken to install the Hess linear concept in Thornley. The challenge was to install a genuine prototype which had worked well, but only in test conditions, in a demanding production environment. The, already, close working relationship between Forticrete and Hess was an important element in the project. At Thornley Forticrete makes close textured colored architectural blocks, many of which are shot blasted or polished afterwards. These processes are unforgiving and expose any flaws in the productions. Much useful information for subsequent machine development was gained from this corporation.

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At bauma 2010 The Hess Group showed of the results of 6 years of concept development, with the Hess Multimat RH760. The Multimat RH760 is a real crossover between the European block machine and a traditional American block machine. The pallet size is identical to the standard American 660 x 470 mm (26 x 181/2 inch) block machine. When the Multimat RH760 replaces an American machine it can operate with moulds from the American machines (with only small modifications to the moulds).

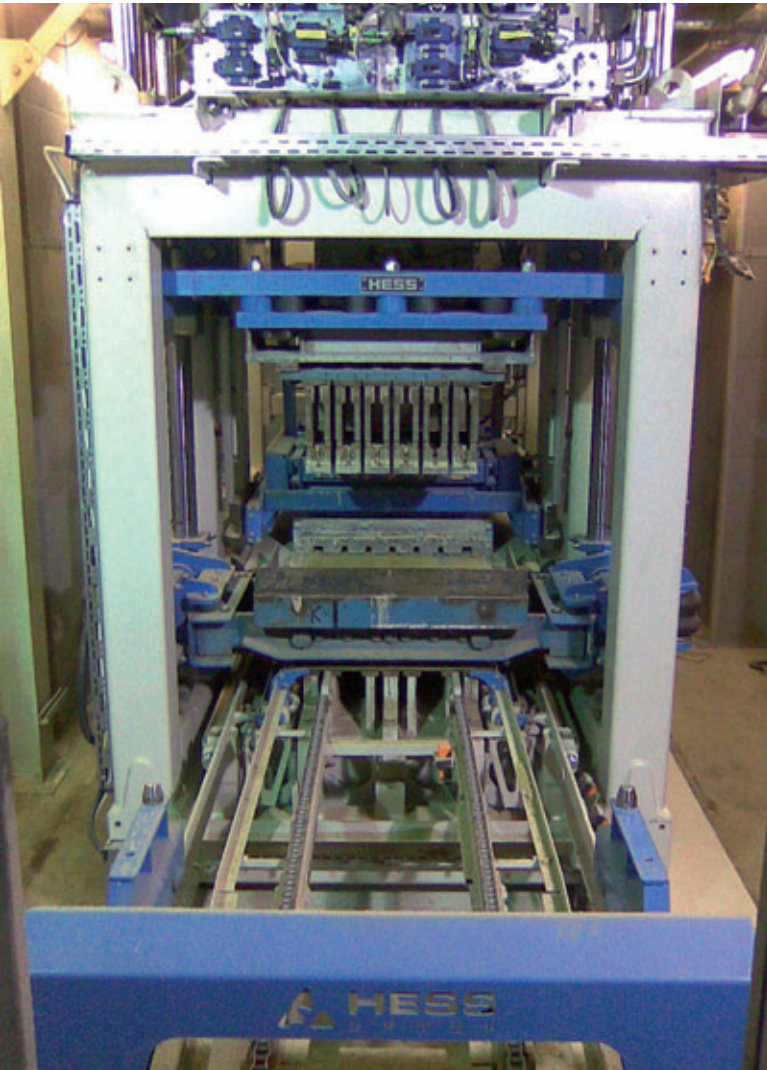
In summary, Hess uses the steel pallets, moulds, and pallet handling system (if desired) from the replaced machine. Hess enhances and improves production by allowing consistent accurate heights of product, product versatility, and technology needed for future products. The production range goes from the 1 inch paver (25 mm), up to blocks 12 inch (305 mm) high. Basically every product that can be made on a single pallet machine can be made on the Hess Multimat RH760 i.e. as blocks, block paving, retaining wall units, curbstones, etc. The machine is designed according to the well-known Hess philosophy, strong, sturdy and stable. The machine is equipped with the Variotronic vibration table with oil bath.

This vibration system allows a step-less (or continuously) variable frequency and vibration power (by flyweight angle settings). The Variotronic system was developed by Hess and it has been extensively used with great success for over 15 years. It is currently used by almost every major block machine manufacturer all over the world.

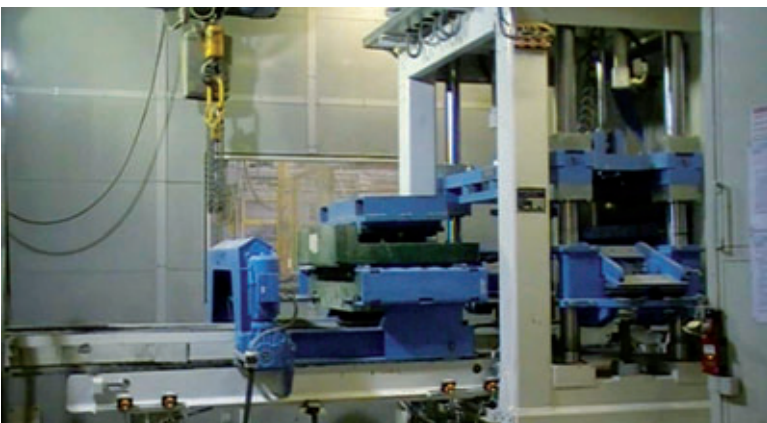
Unique to Hess machines, and also used in the Multimat RH760, are servo-hydraulics. This system has been tested since 2007 in many countries in various conditions but was formally introduced to the concrete block industry at bauma 2010. Servo-hydraulics is a new development that makes hydraulic movements in block machines very fast and



Concrete block machine

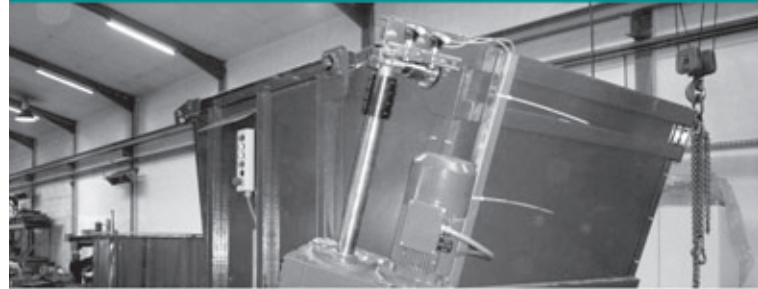


Front view



Mould clamping system

very accurate. With servo-hydraulics the hydraulic cylinders of the filler box, mould and tamper head are controlled by a separate PLC. Every cylinder is connected to a linear encoder for very precise positioning. This system controls the movement of every hydraulic cylinder with tolerances of less than 1 mm. This accuracy in movement is directly related to the product height, the Hess Multimat RH760 makes blocks within a height tolerance of 1 mm. The tamper head is controlled by two cylinders each with its own hydraulic valve and linear encoder. The system always keeps the tamper head level by regulating the relative pressures of the two cylinders. Even if the tam-



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per head is blocked on one side nothing will be damaged. The position of the tamper head is recorded by linear encoders. To keep the tamper head level valves will reduce the pressure on the side with the least resistance. This always results in an excellent repetitive product quality, even with extreme product height range possible with the Multimat RH760.

The power pack is dynamic. It has two hydraulic accumulators to provide the high volumes required for the machine to achieve the fast cycle times. The machine may be fitted with a drawplate (often a necessity when making retaining wall units). The drawplate is also hydraulically driven and controlled by the servo-hydraulic PLC. Another big advantage is that the separate PLC is only receiving the position "to go to" from the operator. All the other usual parameters (such as acceleration, deceleration, etc.) are computed by the PLC.

This makes operation of this block machine very simple. Only a small number of input parameters are necessary to run the machine. Visualization has made the controls really simple to operate and they can be mastered in only a few hours.

The visualization system and the use of a servo-hydraulic PLC take the controls of the machine up to another level of user friendliness. Very often the argument is used that



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block machines are difficult to operate because so many parameters have to be set.

Operators already used to run a traditional American machine will have no problems in getting used to the controls of the Multimat RH760. Only a few parameters have to be set and the operator is guided by the program to set the parameters the first time a new product is to be made. A typical example of ease of use is that the mould dimensions have to be entered in the computer the first time a mould is used and all mould variable parameters will be computed by the controls. Machine setting for each product (and mould) may be stored as recipes to be re-loaded next time the product is made. The diagnostics have been upgraded and improved. In the event of a machine stop a series of different user-friendly diagnostics are displayed to assist in fault finding. A list of the most likely problem(s) is generated in a separate communication box on the screen, together with a written explanation of the problem, what caused it and how to fix it.

The mould clamping system is a unique feature of this machine. The mould is quickly brought to the machine by a small trolley and transferred to the clamping system with a novel locating pin which retains the mould securely. The mould is clamped pneumatically (by scissor clamps). The tamper head is also clamped pneumatically (with a well proved system with mushroom shaped clamps). The filler box runs in U-shape guide rails over the mould. The only part of the feed box in contact with the table plate and the mould is a free floating scraper frame. The feedbox is equipped with an electrically driven agitator. The agitator is easily exchangeable so different profiles may be used for different products. The concrete level in the feed box is controlled by a laser probe. This system has been very successful for many years in other Hess Multimat models.

Limited maintenance is required on the Multimat RH760. All susceptible parts have been installed in locations so as to avoid accidental damage by operators, production boards or concrete. There are fewer greasing points than in previous models and a reasonably experienced fitter can easily maintain the machine.

The hydraulic system is kept simple but supported by sophisticated controls. It is important to fully understand the electrical system. Back up from the Hess hotline is available via the internet (or modem).

A very important feature of the Multimat RH760 is that it fits exactly on the foot print of the traditional American block machine. This makes a machine exchanges very simple and opens up a completely new market for the Hess Group. The Multimat RH760 will prove to be a new and viable, alternative to the American block machines.

The machine can be supplied with Alan Bradley controls (often used in the American market) or with Siemens S7 controls (often used in the European market). The strength of the blocks which are made with this machine meets the US standard C1372 (Standard specification for dry-cast segmental retaining wall units). Even higher strength values demanded by some US States can be obtained, e.g. 5500 psi required by NCDOTS.

At bauma 2010 Forticrete saw the Multimat RH760 for the first time, although they had already had some prior notice. Many features of this machine were incorporated as a result of Forticrete's feedback during the trials. Soon after bauma, Forticrete placed an order for the Multimat RH760. Again Forticrete got the first machine of a type, but this time the machine would be commercial model and not a prototype. A machine exchange was scheduled over nine days (between the removal of the old machine and start of production of the new machine).

Every block machine is completely tested at the Hess factory before dispatch. Because of the short exchange period this test period was used to train the Forticrete staff to operate the machine (including mould changing). The exact positions of all the external connections were simulated in the Hess factory so that all the cables and hydraulic pipes and hoses were already at the correct length and ready to be fitted at Thornley.

The whole installation sequence was carefully planned and prepared. From the point of arrival on site nothing was left to chance. The old machine was removed carefully and the new machine installed immediately. The electrical cabinets and the hydraulic power pack were offloaded from the delivery truck and immediately placed in position. This made it possible to commence electrical cabling in day two and complete in day 3. Everything worked out as planned. Commissioning of the machine commenced only 4 days after the machine arrived on site. Within a week the plant was back running again. The schedule for the machine exchange was met! This is only possible with a realistic schedule and a motivated team.

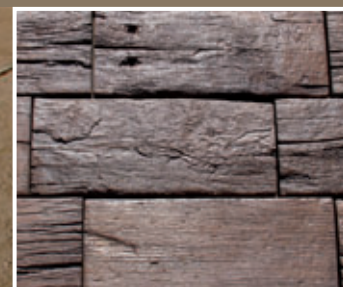


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Two months later the installation and commissioning team returned to site to run a performance and acceptance test. After three days of testing the results were even better than required. The production manager said "we know that the machine will not let us down, if we lose time due to stoppages elsewhere in the plant we know the machine will make it up!", a very nice compliment which proved to be true.

The product quality is excellent; all the quality and performance criteria were met. The cycle time is also faster than specified and the availability of the machine is very high. This project has proven that a close corporation between end user and machine manufacturer not only pays off but also contributes massively to product development.

The Multimat RH760 is ready for the American market, to slot into an existing plant or as a part of complete new production plant. Forticrete is satisfied with the machine and Hess has launched a new machine in the market and has now a good reference within the CRH Group!

FURTHER INFORMATION



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