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MATERIALS AND DEVELOPMENTS OF THE COMPANY HEINRICH WAGNER SINTO MASCHINENFABRIK GMBH

*HEINRICH WAGNER, Sinto Maschinenfabrik GmbH (HWS), Bahnhofstr. 101-57334 Bad Laasphe – Germany.
E-mail: www.wagner-sinto.de*

The company Kutes Metall equips its foundry with a SEIATSU molding plant manufactured by Heinrich Wagner Sinto. The special feature of this molding plant. The SEIATSU.plus compaction process which enables different compaction techniques and combinations depending on requirements. In particular, with an occupancy up to the edge of the molding box optimum pressure values and consequently good casting qualities are achieved.

Keywords. *Compaction process, casting quality, molding process.*

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МАТЕРИАЛЫ И РАЗРАБОТКИ ФИРМЫ HEINRICH WAGNER SINTO MASCHINENFABRIK GMBH

*HEINRICH WAGNER Sinto Maschinenfabrik GmbH (HWS). Представитель в РФ: TBH Technic.
E-mail: info@tbh-technic.com*

Предприятие Kutes Metall (Турция) оснастило свой литейный цех формовочной линией СЕИАТЦУ, изготовленной фирмой Heinrich Wagner Sinto (Германия). Особенность этой формовочной линии – процесс уплотнения СЕИАТЦУ.плюс, который в зависимости от потребностей позволяет применять различные технику и комбинации уплотнения форм.

Таким образом, достигается оптимальное уплотнение и соответственно хорошее качество отливок особенно при расположении моделей на плите с небольшим расстоянием до стенки формовочной опоки.

Ключевые слова. *Процесс уплотнения, качество отливок, процесс формовки.*

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A modern new iron foundry for Kutes Metal

Turkey has achieved very high economic growth during recent decades, and its technical level in many sectors is now at a level comparable to that of producers in advanced industrial nations. This also applies for key industrial sectors such as automotive and machine construction – and their suppliers, including the foundry industry.

The investment level is also high, thanks to the thriving economy and policies that identify growth as a public service for the population. Cutting-edge technologies are considered very important when selecting suppliers for capital goods, so German producers are highly esteemed.

Kutes Metal is an SME (Small to Medium Enterprise) iron foundry in Çorlu, Turkey, with current net annual production of about 21,000 tonnes. A wide range of cast iron types with lamellar (GJL) or spheroidal graphite (GJS) is used within a weight range of 1.5 to 85 kg, whereby the ratio is about 60% GJL to 40% GJS. The new investments detailed below will increase annual production to about 45,000 tonnes of castings per year. The company complies with modern industrial standards and is TÜV-certified with ISO/TS 16949:2009, ISO 9001:2008 and ISO 14001:2004, as well as having approvals from Lloyds Register and Germany's national railway company Deutsche Bahn. Customers come from numerous sectors, such as automotive, pump and railway equipment producers; the construction industry; the agricultural sector; and mechanical engineering in general. There are currently about 40 major customers, for whom a range of more than 800 cast components are actively produced.



Figure 1. The EFA-SD SEIATSU mold plant from HWS (Photo: HWS)

Kutes Metal will have completed a new state-of-the-art foundry in Çorlu (in the province of Tekirdag) by late 2018, if all goes as planned. This is expected to more than double current capacity, and will enable expansion of the product portfolio.

HWS molding plant

The centerpiece is an EFA-SD greensand molding line from Heinrich Wagner Sinto Maschinenfabrik. (Figure 1). The flask molding plant works with the familiar two-stage SEIATSU compaction process that achieves excellent and even compaction of the molding material, even in critical areas with large projections or closely arranged ribs. In order to enhance the result of the SEIATSU flow of air during the first stage, the compaction process is furthered using a so-called multi-anvil press. This combined technology is particularly recommended for jobbing foundries, because they can use the system for molding very complex pattern geometries with great accuracy, and they can ensure that the forming material has a high level of compaction (and thus strength) even with difficult batches. The molding box dimensions are 900×700×300/300 mm³; plant performance is 120 complete molds per hour.

The molding plant is equipped with a system for automatic pattern exchange which increases flexibility by speeding up product changes for short production runs. The pouring line has been designed to accommodate an automatic casting machine at a later date. In addition to the molding plant, the Kutes foundry has invested in a fully automatic Type P 10S pouring machine from HWS Heinrich Wagner Sinto Maschinenfabrik. The pouring automat has a ladle volume of up to 1,400 kg and is equipped with two independently operating inoculating systems, enabling treatment of the melt during the pouring process. The pouring automat travels alongside the box as it moves along the casting line. This ensures that the casting process can be carried out independently of the molding plant cycle. The pouring automat, constructed on weighing cells, has automatic pouring control – which regulates the pouring process via pouring parameters that are specifically adjusted for each pattern. Constant weighing, and monitoring of the pouring process via cameras (which, among other things, monitor the filling level of the pouring funnel) support optimum mold filling. Use of the pouring machine ensures that modern demands regarding quality and repeat accuracy are met while maintaining compliance with safety aspects.

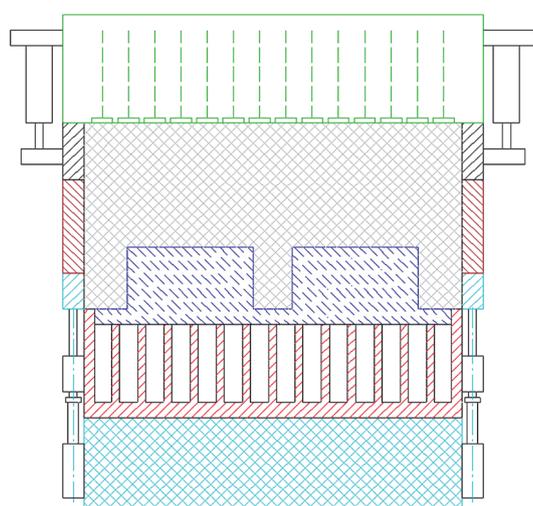


Figure 3. Starting position

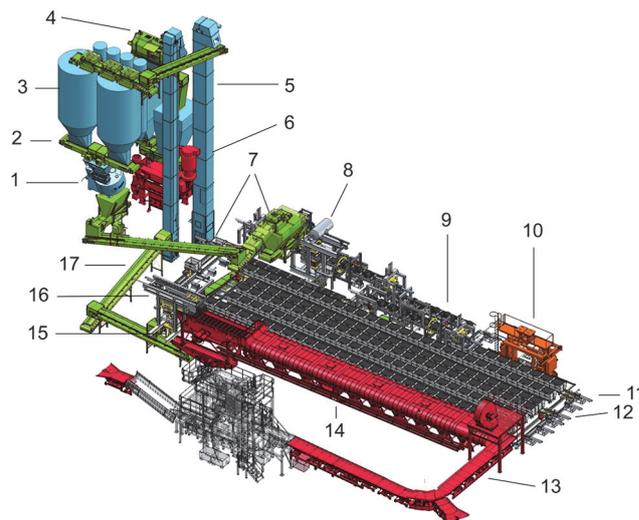


Figure 2. Complete overview of the new foundry plant: 1 – molding sand mixer; 2 – discharge and dosing belt conveyors; 3 – return sand silos; 4 – polygonal sieve; 5 – bucket elevator; 6 – return sand cooler; 7 – ready-to-use molding sand with sand silo above molding machine; 8 – seiatsu molding machine with mold line; 9 – separate upper and lower box line; 10 – (optional) automatic casting machine; 11 – cooling line; 12 – transfer trolley with pusher unit; 13 – sorting and transfer channel; 14 – casting cooler; 15 – discharge channel; 16 – ejector; 17 – return sand transport system

All process-relevant data can be assigned to the individual casting process and, if required, transferred to a higher-ranking IT system. In addition to displaying current status information, the pouring control system offers users a range of statistical functions, as well as analyses of problems and downtimes.

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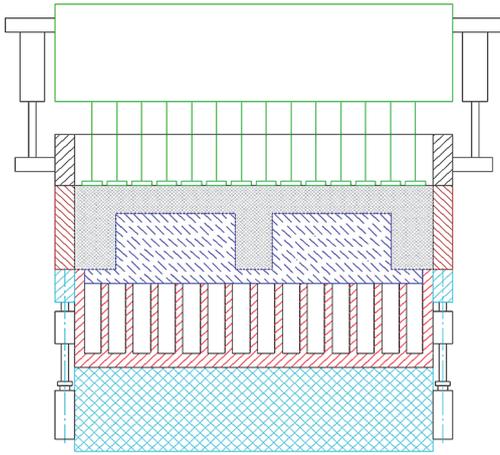


Figure 4. Compaction

After detailed consulting, Kutes Metal decided to use the SEI-ATSU.*plus* process. The 'plus' variant includes an auto-level frame as supplementary equipment, improving compaction of the pattern sides. This substantially increases mold strength, particularly at the mold's edges.

The compaction process

Active pressing on the sand by pressing cylinders from above (Figure 3). After reaching the preset pressing power of the cylinders, the filling frame and the molding box are lowered by cylinders. The pressing by means of the cylinders is continued without interruption. The filling frame is pressed down into the lower position (position below is set mechanically) Final compaction by active pressing from above by means of the cylinders (Figure 4).

SEIATSU.*plus* enables a flexible choice of different compaction variants. Depending on the pattern it can be chosen from the possible variants and combined individually.

The options:

1. Pressing.
2. Pressing mit airflow.
3. Pressing with pressing from the pattern side.
4. Pressing with airflow and pressing from the pattern side.