Let's discuss

New perspectives for foundries of the future | Issue 06/2015

TWINPRESS 4.0 moulding process with control loop for mould quality

The smart moulding machine.

The secret to productivity

Innovation for the future.

Smarter, energy-saving mould formation

The new generation of matchplates.

New approaches for sand preparation

Indication of better options.
Now more than ever, productivity and innovation are seen as key attributes of foundries of the future. To remain competitive in the marketplace, industry players must pre-empt and find solutions to tomorrow’s problems. KÜNCKEL WAGNER invites you to exchange ideas and insights on where the industry is headed. Here is a brief overview of the topics foreseen for discussion:

**Thinking ahead**

### Foundries redefined.

#### New approaches in moulding sand preparation

Many product defects in casting processes are sand-related. Hence, it is essential that the quality-relevant characteristics of the moulding sand used are determined via different tests. As granulometry and sediment content in sand can vary, new approaches in sand preparation are required to achieve more reliable quality and broaden the path of safer processes. The sand’s composition must be more clearly characterised and its process capability more precisely defined. The time has come to establish new test characteristics to be monitored. When this is implemented in combination with online storage and retrieval capability of all moulding sand parameters, the way forward will be clear: KW – for the foundry of the future.

#### Moulding sand reclamation

Natural resource conservation is playing an ever-more-decisive role in manufacturing operations. Optimum process material recycling and reclamation are essential since they reduce generation of waste materials requiring landfill disposal, therefore providing substantial cost savings. Reduced procurement of new sand and compounding additives and reduced sand disposal quantities has the potential of saving 70–80%. Along with these cost benefits, KW’s TURBO DRY technology also provides eco-friendly recuperation of airborne dusts for reuse in mould sand production.

#### Matchplates – the next generation

If an established process technology is of discussion, there must be a reason. There is. The flaskless, green sand based horizontal moulding processes used for many years in the industry are a good starting point, but certainly incorporate room for improvement. These applications have been limited to date by existing approaches for ensuring sufficiently long core insertion time. We transcend borders and remake these applications, thereby achieving improved economics in core-intensive casting. This smart solution offers substantial energy saving potential, a good reason to have a closer look at the details involved. Let’s talk!

#### Gantry moulding machines

Imagine having to produce moulds which are anything but small. Really huge moulds – formed with chemically bonded moulding sand which need to be ‘up to scratch’ technically as well as cost-wise. Think outside the box, even if it is a situation you have faced many times before. Use KW’s gantry moulding machine incorporating a compact-sized compression head with 3-axis traversability to progressively compact your flasked moulding sand. The machine is suitable for use with a wide range of flask sizes. No manual processes are involved, ensuring all benefits of automated operation. This machine opens the door to automation and other savings potential in the area of green sand processing. Its generously designed gantry frame is built to order for extra-large flask sizes. Think big – with the new KW PRO BIG.
Self-regulating mould production

Using computerized process simulations, theoretical calculations, numerous tests and extensive plant trials, we have come up with a new mould sand compaction process. The versatile process features self regulated operation as well as faster, better and more efficient compaction providing better mould sand results than ever. TWINPRESS 4.0 is the first process available that monitors the quality of the moulding sand processed and adjusts the compaction by the moulding machine accordingly. All process and quality-relevant parameters are taken into account in automatic control which carries on through subsequent mould cycles. This represents the first step on a path towards new smart machines and processes. The new technology has already shown its outstanding performance in the KW MASTER Eco 150 modular moulding machine, where it achieved 30 % energy savings at high production rates ranging up to 150 moulds per hour*. It will be interesting to see what additional capabilities will follow in the area of smart moulding machine operation ... perfect filling in accordance with the desired mould contours, ... documentation of compacitivity of the entire sand system, ... *

* Flask size = 1200 x 800 mm

TCO savings potential

Cost savings invariably play an important role at foundries. Innovative TCO ideas as well, for instance: How can the service life of a component be prolonged? How can automated maintenance programmes reduce the incidence of upkeep and repair costs? What potential benefits can be realised by means of service and advanced training programmes? How do you approach the ideal of `zero defects and unlimited up-time'? These are problems we analyse on your behalf. Promoting optimisation by ... thinking ahead.

Energy efficiency

The ‘green foundry’ has long been a topic of interest in the foundry business with its energy-intensive manufacturing processes. Whether you’re talking technologies, plant designs, moulding sand preparation, cooling, moulding drive systems, maximum efficiency, reduced CO₂ emissions and sustainable climate protection define the way forward. KÜNKEL WAGNER meets these challenges head-on with state-of-the-art plants, products and solutions for uncompromising environmental protection. Our future optimisation efforts will focus on investment economics as well as energy efficiency. We are presently streamlining our plant technology in this regard by implementing reduced mass flow rates and acceleration rates in processes. Using fully computerised 3D design capabilities, KW is ideally equipped for FEM and other advanced techniques. One thing is certain: drive units with high power consumption will soon be a thing of the past.

Let’s get together and talk about the topics of the future!

Frank Iburg
[Dipl.-Ing.]
Managing Director
KÜNKEL WAGNER Germany GmbH

Gelson Günther Montero
[Dipl.-Ing.]
R&D Manager
KÜNKEL WAGNER Germany GmbH
Core package casting

We foresee greater demand in our role as a systems supplier in the future. This is in line with industry forecasts predicting steadily growing numbers of cast products requiring core package casting as the only viable permissible manufacturing method especially for small and medium quantities. Anticipating this trend, we have already prepared process approaches for implementing reduced core weights and utilisation of initial heat for partial regeneration of used cores. Core packages are not utopian either, as they can be handled by existing logistics systems at green sand foundries effecting complete separation of the different sand types. The thinking on this subject here at KÜNKEL WAGNER might be accurately paraphrased as: ‘smarter = more cost-efficient = more eco-friendly = more energy efficient’. As usual, we’re thinking ahead.