Good reasons for good castings

Quality, availability, traceability

Benefit from holistic solutions that can be perfectly integrated into your existing foundry or can be part of your new green field foundry and open up new efficiency potentials for your processes - starting with a concept that is geared towards your individual requirements.

Holistic competence

In our history of nearly 70 years, we have realized numerous major projects as general contractor or EPC contractor for our international customers. These include new construction as well as modernization projects for jobbing and automobile foundries, as well as specialists in heavy large and centrifugal casting.

This expertise has been greatly enhanced by participations and acquisitions of specialized foundry equipment suppliers. These include the GHW for Cupola Technology, the centrifugal casting departments of DÜKER ironworks, and most recently the SAVELLI for green sand foundries and the IMF do Brasil today known as Küttner No bake solutions.

International Teamwork

Our specialist teams are accustomed to working independently, but also together to realize large projects. Thus, we are flexible in order to handle small and large purchase orders in the most important international foundry markets always with the same quality and reliability.
Detailed planning, solid implementation

Küttner and Savelli offer tailor-made, innovative complete solutions – for planning and implementation of new construction projects, as well as modernization of existing sites.

Engineering with the state of the art tools

Using great digital tools we develop tailored concepts at good detail – always from a Team.

- Cadison P&ID-Designer
- Fluids CFD Simulation
- AutoCad Inventor
- EPLAN
- Microsoft Teams
- 3D Animation

EPC: Schedule – and performance – oriented project implementation

As EPC contractor, we offer integrated planning and implementation models based on the individual requirements of your foundry location.

- Fastest type of project execution: Planning, Awarding plus Implementation Time
- Allows the client to contribute to the technical concept and the selection of suppliers with their own ideas during the engineering phase
- Fully transfers responsibility for deadlines, execution and budget compliance to the contractor
Green Sand Molding

Holistic solutions for your foundry

At the center of our competence is SAVELLI Form-press – a molding process well established over the years, with high repeatability, adjustable at high level of strength, produced by final squeezing of the pattern side. The purely mechanical compaction process is extremely energy efficient and achieves the highest capacities with lowest operating costs. As a plant builder, we integrate the return sand transport, the sand cooling, the treatment and the molding material supply. We also supply the solutions for casting / sand separation, casting cooling with connection to sorting and shot blasting systems. We also take about the infrastructure with automatic process cranes, noise and dust insulations and industrial ventilation systems. Küttner and Savelli have an impressive reference list in the area of large series foundries and perfectly complement their product range and service locations.

Sand Preparation
Complete solution with return sand conveyors, cooling, conditioning and molding material processing

Casting Cooler
Shake-out conveyors, Casting cooler connection to shot blasting and sorting

In-mold cooling
Cooling house in flasks or flaskless in jackets

Molding Line
Formpress® molding - high pressure double squeezing
▶ Flask sizes up to 2,000 x 3,500mm (78” x 138”)
▶ Up to 280 flask/hour complete molds/hour

Mixed Sand Reclamation
Systems for separating core and bentonite sand, fragmentation and regeneration from mixed sand up to 30 t/h

Pouring
Ladle transport systems and automatic pouring systems

El-Mecs
Electro-mechanic indexing and lifting drives

Not illustrated:

200
Green sand Preparation

150
Automatic molding lines
Using proven components to achieve top results

The selection of foundry equipment focuses on their effectiveness and energy efficiency. Küttner Savelli offers concepts with maximum effectiveness (overall equipment effectiveness, OEE) for producing sophisticated molds. The high-performance molding process, dependable plant components and integrated automation ensure maximum production reliability.

Formimpress®
The Formimpress® process uses short strokes of the pattern side compressed against the press head. This concept enables short cycle times and high production rates, as well as:
- Uniform mold hardness at an adjustable high level
- Silent running molding process
- Energy savings up to 30%
- Performance increases up to 25%

Vision Systems
In molding lines are considered for a variety of applications, such as:
- Online quality control
- Shape, size, and dimensional accuracy
- Check of location
- Detection of core and form errors
- Detecting casting defects
- Code detection

Vision Systems

El-Mec - Drives
In addition to traditional hydraulic drives, Küttner Savelli specializes in electro-mechanical drives. They can be used in almost all areas within the molding line, for vertical as well as horizontal feeds, with the advantages of:
- Energy saving
- High flexibility

Cooling houses
are designed individually for the application / cooling times. A number of variants and designs are available:
- FIFO or flexible cooling times
- In flask cooling
- Flaskless cooling
- Cooling houses extensions

Standard Equipment
For the molding line, a whole range of standard equipment can be selected, such as:
- Flask closing
- Cross-transfer
- Flask / pallet cleaning
- Flask rollover
- Sprue cup milling
- Vent drilling
- Marking
- Core setting

Casting / Sand Separation
With the use of well-proven technology from Küttner Schwingtechnik, such as:
- Variable shake-out conveyors
- Casting coolers
- Selective separation of casting – bentonite sand – core sand

Green Sand Molding

Optical inspection with laser measurement
Perfect green sand preparation for high quality castings

Essential features of the sand preparation:
- Mixer or fluidized bed coolers with the respective advantages for homogenization or cooling
- Premixer for balancing bentonite, carbon and filter dust losses for highly variable, core-intensive casting program
- Intensive mixer with control of the green sand properties as compactability and compressive strength
- Return sand moisture measurement and Sand tester with integrated calibration routines
- Conveyor belt systems and bucket elevators in foundry-like design
- Material balance

Fluctuation of molding properties is still the biggest cause of casting defects. Most processing plants still follow the general standards without taking into account the specific needs of each application. A particularly consistent sand can be achieved if:
- the model data is available at the mixer and the recipe is adapted preventively to the product data;
- the model data is available at the shake-out and the burned components are added early in a premixer.

Predictive Sand Control
As part of the SMART foundry approach, the trend for predicting sand quality is based on data-driven models. This means that the plant learns independently on the basis of the input variables how these affect the sand quality.

Screening
Return sand is crushed and remaining lumps are separated. Specially designed polygonal screens without continuous shafts enable long, low-maintenance operation. Multideck screens (sizers) are also used.
- Polygonal screens 5P
- Vibrating screens

Cooling
Küttner and Savelli basically offer both cooling principles with their respective advantages.
- Mixer cooler SK from 45 – 350 t/h
- Fluidized bed from 14 – 350 t/h

Mixing
With the SGMT series, a complete range of vortex mixers are available, with the appropriate accessories and sensors.
- Batches of 1,000 – 6,000 kg
- Humidity and temperature control “Aquatest”
- Compactability and compression strength test
- Sand control

Mixed Sand Reclamation
Material recovery from bentonite sands
Modular system with a cleaning principle based on the airlift technology. It is operated on demand with hot air to embrittle the bentonite binding agent shells and remove them more effectively. The recovered regenerate can be used as a new sand substitute in core production or sand processing.
Sophisticated logistics even for the heaviest casting

Küttner has significantly expanded its product portfolio in heavy castings by acquiring IMF do Brasil today Küttner No-Bake Solutions. As a result, complete solutions for heavy castings with melting operations and automatic molding lines, as well as shake-out and all types of reclamation systems (mechanical, pneumatic, thermal) are now offered. Küttner has experience with all common sand systems - from no bake to phenol resin, Pep, and AlphaSet.

Sand logistics
Belt / pneumatic conveyors
Silo / storage plants

No-Bake Molding

Shake-out station
Shake-out grid, hot sand transport, Fe-separation, noise / sound enclosure

Continuous whirl mixer
Stationary, movable, height adjustable
3 types of sand, up to 1000 t/h

Molding line
Mixing and filling
Mold / pattern handling

Reclamation
No bake, Phenol resin, AlphaSet, PepSet ... mechanico - thermal
Chromite sand separation

200
Shake-out stations

20
No-bake loops
Examples of successful applications

As a machine and plant manufacturer, Küttner offers solutions that take into account both the logistics required and the lifting equipment. Matching the design to a flexible production program is often the challenge.

Mixing & molding
The product range covers all components, from the single system to the complete molding line:
- Continuous whirl mixer
  - stationary or mobile
  - 1 - 100 t / h
- Turnovers
- Compaction tables
- Simple stations
- Roller conveyors
- Flask transport and handling
- Conveyor belts

Shake-out & Reclamation
Complete systems for mechanical reclamation, customized, with in-house products from the whole group, such as:
- Shake-out grids
- Cabins with exhaust air technology
- Magnetic separators
- Lump crushers
- Classifiers
- Coolers
- Transmitter / conveyors
- Storage
- Filter systems

Core package process
In the core package and stacking process, the entire geometry of the mold is formed by sand cores. The individual cores are put together to form a package or stack. Küttner takes care of the complete handling of these packages / stacks, such as:
> Stack handling
> Automatic casting
> Cooling

Complete plants & modernization
As general contractor or EPC contractor, Küttner plans and realizes complete no-bake foundries through the following steps and disciplines:
> Conception & feasibility study
> Basic Engineering
> Detail engineering
> Project management
> Automation & control room
> Purchasing & Logistics
> Installation commissioning
> Production support
Melt Shops

Intelligent complete solutions for induction furnace systems

For melt shops with induction furnaces, Küttner offers a complete integration package with automatic gantry cranes, alloying and transport systems, as well as charge cars. Integration also includes dedusting and recoring systems.

For the iron metallurgy, Küttner has its own solutions for the magnesium treatment such as shaking ladles, immersion treatment, or wire injection systems. For automatic molding and centrifugal casting machines, heated and unheated pouring units are used.

Scrap & Additives
 Provision of complete, fully automated charging systems:

- Charge cranes
  - Fully automatic / manless
  - Kangaroo cranes
- Charge cars
- Alloying systems
  - Burker system and dosing feeders
  - Weighing units
  - Automatic transport and charge cars
  - Big bag stations

Treatment & Pouring
 Automatic ladle transports from melting furnaces to pouring units and ladle tracking

- RFID ladle tracking
- Manless transport systems for ladles
- Melt treatment
  - Desulphurization
  - Dephosphorization
  - Magnesium treatment
- Fully automatic pouring units
  - Automatic ladle exchange
  - Inoculant dosing
  - Batch tracking

Industrial Automation
 Complete integration of all plant equipment, incl. induction furnaces.

- HMI of the entire system
- Connection to ERP or SCADA systems
- Recipe-, analysis- and protocol management

iIM4 System – Industrial Information System for Industry 4.0
 Certified Siemens Solutions Partner
 Flexible Hard- and Software (e.g. SIEMENS, ALLEN BRADLEY/ROCKWELL, SCHNEIDER …)
State of the art hot blast cupola plants

Küttner builds modern cupola melting plants with highest availability and analytical accuracy.

For melt shops with cupola furnaces, Küttner offers turnkey solutions with automatic charging, hot blast, oxygen applications and long-campaign operation.

Precise charging

Especially in the case of the cupola, it is very difficult to accurately set the analysis of the batch because the metallurgical analysis of the liquid iron is only available long time after charging.

As part of the SMART foundry approach, data-driven models are used which already predict the expected analysis beforehand. An elaborate alloying can thus be omitted.

Dry gas cleaning system

complying with all international environment standards.

Above charge take-off for complete furnace gas extraction

- No dust and gas emissions out of the furnace top
- No odors

Complete combustion of top gas at relatively low temperatures

- Low CO emissions
- Low NOx emissions
- No odors

Additive dosing into exhaust gas

- Low SOx emissions
- Low Dioxine emissions
- Baghouse filter
- Low dust emissions
- No usage of water

Heat recovery, mass and energy balance

Modern cupola systems already use 1/3 of the process heat for generating hot blast. Typically, just over 50% of the process heat is available for further use. Ideal are year-round uses, e.g. for heating of annealing and drying ovens, or for steam generation.

Such combined heat and power systems reduce the consumption of fossil fuels and reduce CO2 emissions.

Energy flow diagram for a 25 t/h cupola

With the current global energy mix, the cupola is still the most efficient melting equipment with the lowest CO2 footprint.
**Special Solutions**

Special machines and plants for your foundry

The centrifugal casting division acquired from Düker in 2014 has been in operation for more than 60 years, with a large number of international references.

In addition, special solutions for customer processes were implemented, like equipment in scrap recycling.

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**Centrifugal Casting**

In 2014 Küttner integrated the centrifugal casting technology from Düker, with more than 150 references.

- Fully automatic centrifugal casting machines
- DeLavaud machine - ductile pipe production
- Production of pipes, bushings, bearings, ...

**Centrifugal Sand Casting**

Advantages of two processes, with the good net shape of sand casting and the very good mold filling and feeding of centrifugal casting.

- Sand core handling
- Pouring
- Centrifugal stations horizontal / vertical
- Cooling of core package and casting cooling

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**Scrap Recycling**

Contaminated aluminum scrap from the scrap yard is treated before remelting by:

- Vibrating screen - oversize discharge and even material distribution for charging
- Dryer - mass compensated vibrating conveyor with hood. Heated air dries the aluminum scrap to 0.3% surface moisture
- Eddy current separator - metal separation
- Classifier - Classifying of dried aluminum from mineral components
- Filter system

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**Vibrating equipment**

Küttner Schwingtechnik specializes in the use of vibratory conveying solutions for the foundry.

The rough foundry environment demands robust, heat-resistant and reliable products.

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**For every foundry application and material**

- Conveying
- Dosing
- Screening
- Cooling

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**Trials with your materials and castings in our in-house technical center**

Küttner’s in-house technical center provides has almost every machine in the offered product range. Our test setups allow us to test your material to determine the best solution for your application.
Industrial Automation

Process and control

From process experts

New production processes and flexible process technologies place ever increasing demands on the controls and automation systems. Decisive here is a perfect integration of switchgear, instrumentation and automation. Only in this way, new complex production processes can be mastered and optimized. Based on our broad process know-how, we merge the controls and automation into a complete package tailored to your demands.

Industrial Life Cycle Management

We take care of the complete task:

- Concept development
- Basic and detail engineering
- Programming
- Commissioning
- Production support

Simulation, virtual commissioning, maintenance and documentation

Thanks to specially developed simulation software, we can test your entire system including data flow before commissioning.

Virtual Systems - Digital Twin

- Early testing of the system
- Process optimization and plant expansions without interrupting production
- Increased availability of the system by pre-trained personnel
- Life Cycle App supports during commissioning and later for maintenance

Industrial Information Management iIM4

The link between all processes

Küttner Automation implements the connection and ensures the quality oriented planning and control of all processes, as well as high performance, secure data management. This is how we ensure maximum in integration of production planning, quality control, product tracking and recording in one tool.

Individual and from one source

Your individual SMART solution from Küttner includes planning, electrical and mechanical implementation, installation of the network and computer systems as well as the programming of the controls and database systems, and a final commissioning including after-sales service.

- Less downtime – predictive planning considering available raw materials
- Predictive maintenance – less unplanned downtime – early detection of vulnerabilities
- Resource-saving – less waste and thus less wasted raw materials
- Optimized production flow – dynamic adaptation and thus transfer of complex production steps

Flexible production – as part of highly automated industrialized countries

User-friendly production systems – monitoring of all current and historic relevant data or errors

Web based Visualization

Today, a wide variety of end users with different operating systems, requires the greatest possible flexibility and compatibility of the HMI system.

The web-based HMI is compatible with all relevant browsers and can be displayed on all devices, from the Apple PC to the Android Smartphone.
Foundry

Quality, Availability, Traceability

Benefit from holistic solutions that can be perfectly integrated into your existing foundry and open up new efficiency potentials for your processes - starting with a concept that is based on your requirements.

Iron & Steel

For sustainable ferrous industry

Turnkey solutions for new constructions and renovation projects. From small renovations up to the delivery of complete systems or even the construction of entire process chains, supplemented through special solutions and system integration.

Non Ferrous

Process simulations, holistic solutions, tailor-made plants

We accompany you in partnership with full transparency in technology and costs - from the first process idea all the way through to building your new overall system. We are specialized in raw material recycling as well as in brown field integration projects.

Energy & Environment

Sustainable use of resource

For years we clean process gases and use waste heat from energy-intensive processes. Lately we also deal with water filtration and thermal utilization of sewage sludge.