

KÜNKELWAGNER®

MADE IN
GERMANY

SINCE 1907

Everything for your production process

KÜNKEL WAGNER.

-  **MOULDING PLANTS**
-  **POURING MACHINES**
-  **SAND PREPARATION**
-  **SERVICE**

KW®

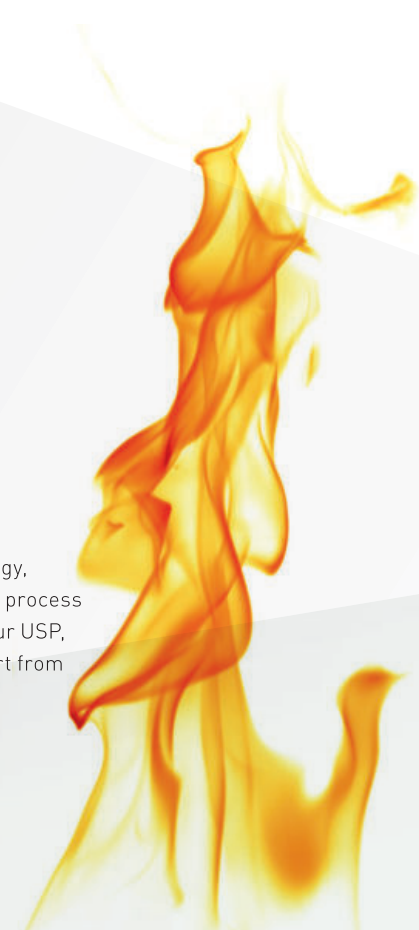
WEITER DENKEN.

www.kuenkel-wagner.com

For foundries of the future

Thinking ahead.

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Thinking ahead:
Product technology,
development and process
knowledge are our USP,
which set us apart from
our competitors.



KW is your perfect partner when the situation demands economical, first-rate technology “made in Germany”. Robust, dependable plant and equipment reaffirms our worldwide reputation for over 110 years. We shall continue this journey of shaping the future of this industry since we believe in thinking ahead.

Foundry professionals value the over 110 years of innovation and top-level competence displayed by staff at KÜNKEL WAGNER. Technology, precision, efficiency, functionality and product quality are all reflected in the development and production of turnkey foundry solutions, modular systems and their components. This includes everything from an automatic moulding plant to

sand preparation, reclamation, pouring equipment along with enhancing process technology. While the above is true the only standard we apply is the one set by our customers. Our competence spans across various sectors; being the best yardstick to measure success. Make your capability a reality: with KÜNKEL WAGNER. For foundries of the future.

The power to shape

Moulding plants.

Everything for your production process.

MADE IN
GERMANY

SINCE 1907

KW®

WEITER DENKEN.

Impressive performance

We ensure perfection.



MOULDING PLANTS

The railway and automotive industry demands production from equipment that efficiently channelises resources and energy towards improving one's own competitiveness. This calls for an intelligent plant system – provided by innovative machines by KW.

At KÜNKEL WAGNER our focus is on your goals: the optimum for you with respect to investment and process workflow, along with mould quality from the very start.

Greatest possible production reliability through high repeatability.

Today's globalised market demands greater productivity using state-of-the-art machinery that must be met to exceed previous productivity standards. Components are becoming more complex and tolerances are increasingly narrower. This competitive environment required companies to gear up and pre-empt the future.

The alternative: Take advantage of the strong competence at KW. On the one hand, a comprehensive offer of the most innovative moulding machines, and beyond that the full range of know-how in sand preparation co-ordinated precisely to match.

Series production with increased capacity at optimal costs.

This reduces compatibility risks right from the start while giving you a significant lead in technology versus competitors at a low rate of dimensional fluctuation and narrow weight tolerance.



Each moulding plant from KÜNKEL WAGNER is one-of-a-kind: as multifaceted as our customers' standards.



They just keep on running: Plant longevity is the trademark at KW.

KW Moulding Plant Benefits

- Generous dimensioning & rigidity for extremely long service life
- High precision, short downtimes
- Greatest possible moulding quality and dependability requiring least time & effort of personnel
- Operator-friendly, easy to maintain
- Modular systems for incremental investments
- Optional moulding material testing mechanisms

The KW concept of 'the complete plant' underscores our pursuit of technological leadership: to provide you with meticulously thought-out systems to meet your specific requirements. Our modular components are particularly characterised by their high degree of process reliability, availability and low maintenance & operation costs.

A question of technology

Compaction.

MOULD COMPACTION PROCESSES

Each moulding machine from KW can be equipped or retrofitted with different compaction processes.

Equipped with the best ideas: Depending on the range of their products our customers can use different technologies for the production of homogeneous sand moulds. The essential step towards the economic manufacture of high quality castings.

Faster, better, more efficient than ever for the hardest sand mould experience: pre-compaction using TWINPRESSplus. Here the pattern presses the sand upwards against the rams from below, causing an increased density in the vicinity of the pattern plates and allowing utilisation of the pattern plate edges. This is followed by final compaction from above. Completely new thereby is the patent-pending stroke adjustability.

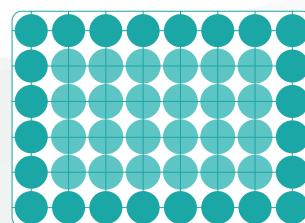
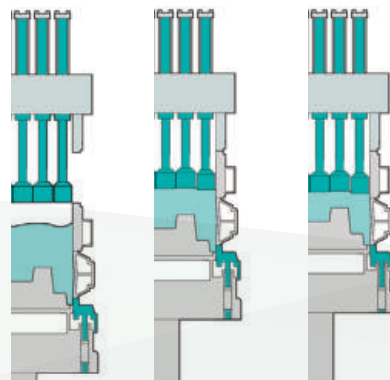
Our best pre-compaction: KW-TWINPRESSplus

Complex pattern contours are depicted in the best possible manner and display the same strength for all flask formats: The outcome is convincing.

Compaction with the KW multi-piston squeeze system.

Divided into individual pressure circuits, this method offers freedom in the parameterisation of the squeeze forces and time lag between the different pressure circuits. The moulding machine can be set differently depending on

Ready for the future:
KW-TWINPRESSplus -
Adapt contours, self-
regulated pressing-in
of supporting cylinders,
final compaction
in the most modern
form.

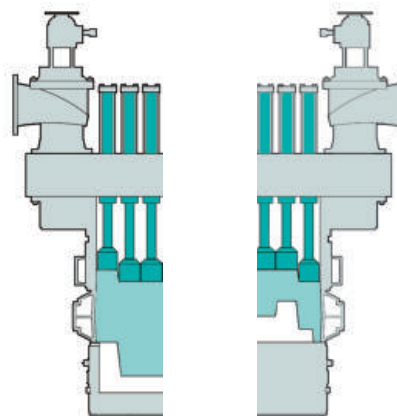


Put the pressure on:
Variable pressure
circuits induced by the
multi-piston squeeze
head mould quality.



What counts is the mould: AIRPRESSplus technology from KW.

Illustration of different pattern contours: Hydraulic interconnection of the individual pistons provides for an evenly distributed compaction result.



the pattern contour. In the case of a recessed pattern, the pistons advance rapidly from the centre; in the case of a raised pattern, those at the edge. For the majority of applications, the use of this compaction stage alone ensures an optimum mould.

Pre-compaction using AIRPRESSplus technology from KW.

When the situation deals with intricate moulding patterns, for instance patterns with considerable differences in height along with complex contour, heavy sand risers, KW AIRPRESSplus technology has proven itself extremely well on an international scale. A strong air pulse is applied to the sand, leading to a compaction front through the sand to the pattern plate. This kind of compaction 'in a flash' is available only at KÜNKEL WAGNER.

KW Mould Compaction Benefits

- **KW TWINPRESSplus** Innovative, interactive, stroke-adjustable, for utilisation of extreme edges of pattern plates, precise guidance concept safeguards position tolerances
- **KW Multi-piston squeeze head** Freedom in squeeze-force parameterisation, freedom in time lags between individual pressure circuits, rules out horizontal sand shifts
- **KW-AIRPRESSplus** Targeted pre-compaction via air pulse, especially for negative patterns
- **KW Moulding machines** Can be equipped with both pre-compaction processes or available ready for retrofitting

Moulding machine KW MASTER Eco

The perfect combination.

Our “green highlight” for foundries of the future: the modular KW MASTER Eco turntable moulding machine for up to 150 moulds per hour (1000 x 800 mm). The start of a new era in energy savings at moulding plants!

Production is ‘going green’ – in our industry with topics such as resource conservation, environmental impacts and energy efficiency. That’s how the core idea arose at KÜNKEL WAGNER to develop a machine constructed on a modular basis in a unique way. A machine that can be retrofitted, saves energy and delivers high moulding quality with a high degree of efficiency, even in the basic version.

Ingeniously compact modular principle for drastic cost-savings, upgradeable at any time.

With a KW MASTER Eco your investments can be steered intelligently. Instead of having a big production line built all at once, now have a choice at hand on a modular scale: to what extent you develop your plant further, and how far you incorporate directly into your existing plant facilities. The low initial investment allows you sufficient leeway for other plans. As a result KW conforms perfectly to the wishes of many foundries to have a realistic alternative for updating their plant technology. It’s never been easier to opt for achieving your energy efficiency targets without having to give up top performance.



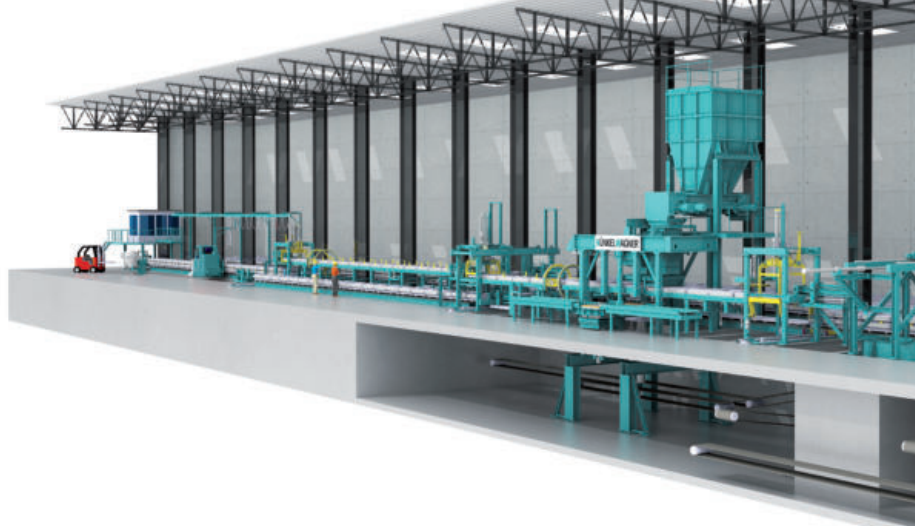
up to
**30%
ENERGY
SAVINGS**

The time is ripe to take your best decision: KÜNKEL WAGNER.

Experience at KÜNKEL WAGNER is found in every one of our moulding machines. In combination with the moulding plant components conceived to suit the respective application, what emerges is highly productive plant technology specific to the customer: you.

KW MASTER Eco Benefits

- Perfected modular system
- Low initial investment
- High energy efficiency
- High speed, top performance
- Upgradeable at any time
- Control of processes/ quality parameters
- Made in Germany for high-grade, quality casting



All you have to do is inform KW of your requirements and we'll find the right moulding machine for you in terms of speed, pattern accessibility, price and headroom.

It's the lessons learnt and ideas that make a product successful.

KÜNKEL WAGNER provides different series of single and twin-type moulding machines. Our production programme includes precisely what you need. Whether for 20 or 330 moulds per hour, for flasks from 600 x 600 to 3.200 x 1.800 our machines are suitable for your performance requirements and your specific work profile. The machines from each series differ in their working sequences and production output rates. The compaction processes and mould results are not dependent on the type of machine.

The common denominator for all moulding machines from KW is their reliability and functionality, as well as the high mould strength that leads to narrow, achievable tolerances for cast parts, and to optimised weights. The greater expense for a qualitatively superior and technically innovative plant system for light-alloy/iron/steel casting amortises itself in a short time: with the best recommendations.

Overview of KW Moulding Machines:

KW	Single moulding machines		Twin-type moulding machines
Model	KW MASTER E	KW MASTER Eco	KW MASTER Eco Z
Type	Single moulding machine	Turntable moulding machine	High-performance moulding machine
Production rate in flasks/h*	75	150	240
Characteristics	Floor-level, pitless installation	Modular, retrofittable, energy-saving	High mould production rates via two turntables
Model	KW MASTER A	KW MASTER H	KW MASTER HZ
Type	Mould stripping machine	High-performance moulding machine	High-performance moulding machine
Production rate in flasks/h*	100	180	330
Characteristics	Best moulding, even for small series	For high mould production rate	Our fastest flasked moulding machine
Special features	Different types of pattern changing, good sand distribution, economical, state-of-the-art compaction processes, Freely accessible pattern configuration for turntable moulding machines, electronically reliable monitored process workflow.		Simultaneous filling and compacting with KW MASTER HZ, state-of-the-art compaction processes, electronically reliable monitored process workflow

* for flask format 1,000 x 800 x 300/300 mm



Layout variations for moulding plants

Individualised solutions.

PLANT CONCEPTS

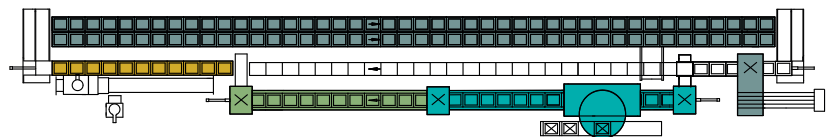
Our examples of layouts for moulding plants orient themselves in relation to potential requirements in the areas of pattern accessibility and the core setting line.

They form the basis for layout design alongside additional adaptations stemming from user-specific circumstances. These aspects are:

moulding line level (floor/below-floor), core setting level (low/high), line arrangement (jointly/separated) and pallet support (with/without).

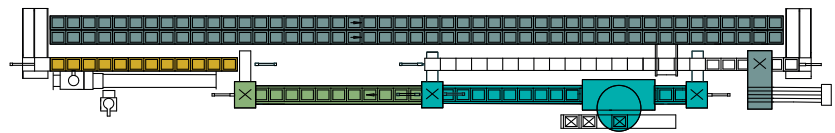
Layout 1

For small core weights, suitable up to medium-sized flasks.



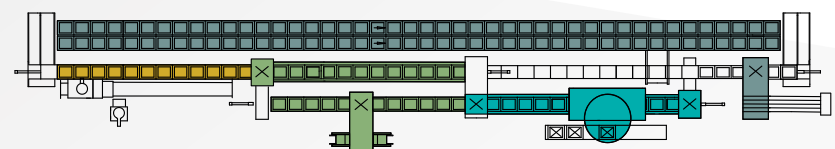
Layout 2

Like layout 1, but for heavy cores with pallet support. Cope and drag flasks are sequenced successively.



Layout 3

The "classic" – designed for heavily cored castings.



■ Moulding Line |
 ■ Core Setting Line |
 ■ Pouring Line |
 ■ Cooling Line



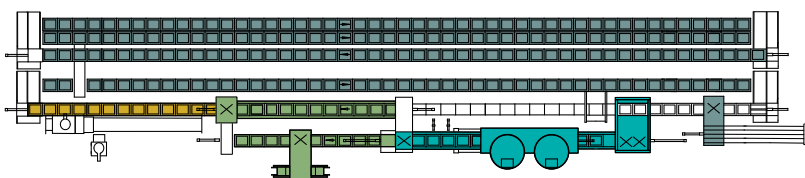
Convincing plant concepts and users' positive experiences: We take pride in our knowledge of process technology and plant construction. What can we do for you?

In addition to the well-known Künkel Wagner quality features different layout variants are the basis of a coherent plant concept. The

design concept is tailored to each customer and every application.

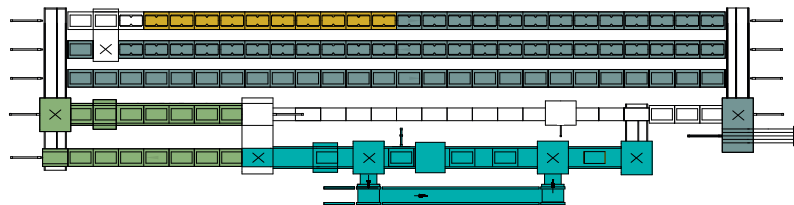
Layout 4

The counterpart to layout 3, but with distinctly higher production rate due to the use of two moulding machines.



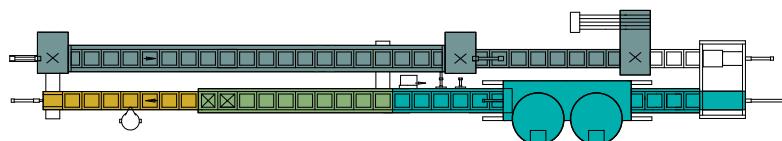
Layout 5

When dealing with gigantic dimensions e. g. in steel castings: Layout for discontinuous moulding. KW has the most references in the XXL segment.



Layout 6

Particularly space-saving, economical layout, adapted to municipal drainage casting requirements. Optimised flask transport using a minimum of equipment.



■ Moulding Line |
 ■ Core Setting Line |
 ■ Pouring Line |
 ■ Cooling Line



We quickly mould your needs

When performance is decisive.

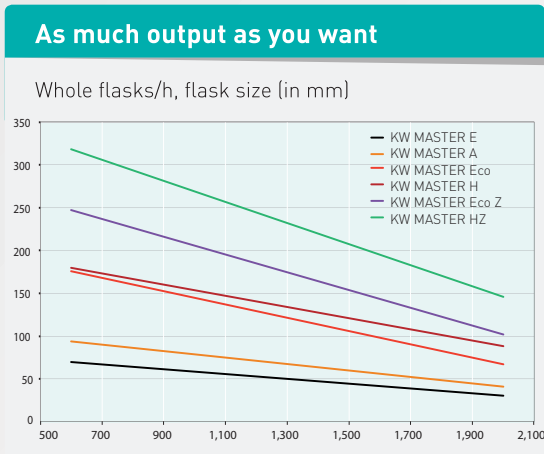


The moulding plant that you need must not only meet your current requirements but must also make your production process sustainable.

Output is usually defined as work performed per time interval: How many moulds per hour shall the new moulding plant produce and provide for pouring? Which performance is required? Apart from these considerations the required or desired flask size is the first step towards the selection of a suitable single or twin-type moulding machine. To reach the maximum and to be cost-efficient while

maintaining the same level of quality.

Our table provides an overview of the performance levels that can be reached by the different machine types depending on their flask size. In addition, the selected mould compaction process will also influence the output. The values indicated in the table refer to a simple compaction with the KW multi-piston squeeze head.





Control, operate, visualise

Everything under control.

Control KÜNKEL WAGNER plants, machines and processes conveniently using PLCs from leading manufacturers Siemens and Allen Bradley. Many processes are controlled and coordinated in real time via bus and network systems.

You are appreciably more flexible in your production as a result because you have a direct view of time, quality, costs, resource deployment or energy expenses.

Created to meet your challenges. No matter how large.

Our control system has a modular structure and offers a variety of additional function modules displaying open, standardised interfaces in the hardware and software. Proven in 'hard as nails' practical operation. Designed on a multilingual basis. For upkeep and maintenance – including an option for worldwide remote maintenance. For a decentralised periphery, programming hydraulic control systems, process integration etc. All key process information, malfunction reports, plant system parameters, problem-solvers and so forth are retrievable in a matter of seconds.



User-friendly visualisation in tune with the times. The plant control system can also be configured with customer-specific databases.

For state-of-the-art performance in all of your segments. With KÜNKEL WAGNER.

For more information:
www.kuenkel-wagner.com

Highest process reliability

Pouring machines.

 **Metal pouring made easy.**



KW[®]
WEITER DENKEN.



Substantial cost reductions and process benefits

State-of-the-art pouring.

POURING MACHINES

KW pouring machines, moulding plants, sand preparation systems: our unique systems expertise and interdisciplinary know-how are yours to profit from.

Metal pouring is an indispensable part of modern manufacturing – and use of the right pouring machines is equally important. Fully automated pouring machines from KÜNKEL WAGNER is the key to success for foundries of the future: clear-cut process benefits providing improved bottom-line results.

Processing and casting of metals must be done using in-depth and extensive know-how to satisfy highest quality standards. Cost-effective, trailblazing ideas are required which go beyond conventional approaches.

More innovation, higher quality, less scrap production.

KW pouring machines are known in the industry for their process-friendly automation available in various system configurations. Metal savings and reduced scrap production are realised by smart solutions, for example KW's fully automated optical control system providing controlled, uniform and clean pouring. For example: weight-defined cut-off at the end of the pouring cycle and compact-sized pouring cups to reduce generation of recycle material. High reproducibility in series

manufacturing. Tundish cover processes. Dosing units for crystallisation of inoculants. And many other expertly engineered features and options in our machines ensuring optimum pouring and long service life in your foundry operations. For highly automated, precisely controlled casting processes providing uniform finished-product properties. For clean melt streams, extremely low-turbulence mould filling and outstanding cast-part quality – with superb cost efficiency.

Maximum performance. With MAXPOUR. From KW.

Our pouring machines are ideally suited for use with flaked and flaskless moulding plants of all makes, whether indexed or continuously driven. For pouring of grey and spheroidal iron, steel and aluminium.



Attaining perfection in dynamic processes:
KÜNKEL WAGNER MX pouring machines.

Understanding your processes and requirements, we respond by developing solutions for a better future:
KÜNKEL WAGNER.

KW Pouring Machines Benefits

- Fully automated pouring systems with convincing benefits in price and performance
- Easy to integrate in existing moulding plants for enhanced throughput and technical performance
- Easy change of alloy, less work thanks to an easy ladle changing system, no interruption of production
- Full control flexibility and reproducibility in every pouring cycle
- Compact-sized pouring cup for efficient material usage, reduced melt weight, reduced cleaning costs
- Precision pouring technology for metals of various types with outstanding cost efficiency
- Rugged and highly reliable, compact, space-saving design
- Continuous data logging for quality documentation



„Innovation, expert knowledge and experience are our areas of key focus. KW moulding machines comply with the highest quality standards.“

MX 10, MX 20 und MX 30

Clearly better.

Building pouring machines is something many can do, but replicating KÜNKEL WAGNER's expert know-how and experience is quite a different story. So it's no surprise that MX pouring machines have held their leading position in the industry for many years. They provide users convincing advantages: performance and superb engineering down to the smallest detail.

Three times unique: KW pouring machines type MX 10, MX 20 and MX 30. They all provide the outstanding casting quality you expect. And beyond that: they are available with add-on features and components including various degrees of automation creating ideal conditions for precise, loss-free pouring in your specific process.

Innovative features for the next level in pouring machine technology.

Select the right machine with a suitable ladle capacity for your application. And select the degree of automation required, from manual operation over pre-pouring up to our most popular fully automated system which incorporates smart pouring sensors providing weight-defined flow cut-off. An established technology with proven reliability, MAXPOUR systems maximise uptime for highest productivity and profit potential. They radically reduce scrap production, amortising the purchase investment with shortest payback time.

The complete pouring system with systematic dependability



1. MX 10, MX 20 or MX 30, pouring machines, available with different degrees of automation.



2. Reliable function, sturdy construction: ladle with tilting device for smooth, uniform pouring.



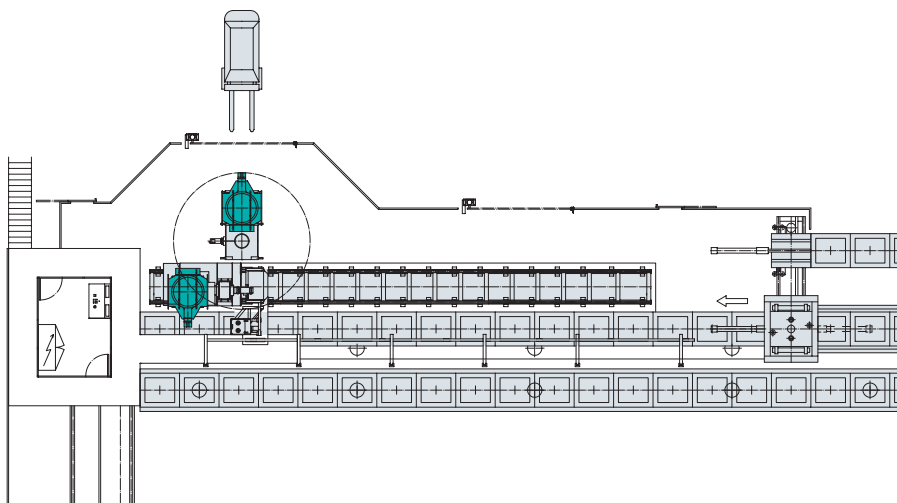
3. Ladle change on the pouring machine or stationary turntable for ladle changeover.

Ladle capacity of KW pouring machines

■ MX 10	200 kg–700 kg
■ MX 20	700 kg–1,600 kg
■ MX 30	1,600 kg–2,800 kg



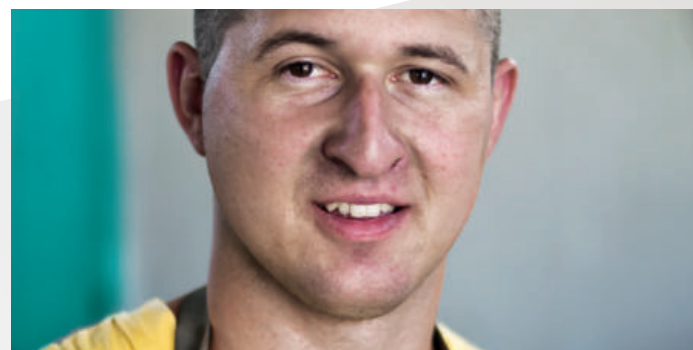
Expert know-how, advanced technologies and true passion for metal pouring can be expressed by two letters: KW.



High-tech manufacturing foundry: typical layout of MX 30 pouring machine, fully automated version.

MX 10, MX 20 and MX 30 Benefits

- Precise, reliable pouring system with independent axes and single-side ladle support
- Freely programmable pouring curve, virtual spout swivel axis
- Optical sensor-based, closed-loop control of pouring process
- Long spout for low pouring heights or distant pouring locations
- Modular design provides loss-free ladle changeover in stationary or mobile operation
- Expertly engineered pouring ladles, turbulence-free transfer, substantially reduced temperature drop
- Integrated quality control with automatic process data acquisition from each pouring cycle
- Newest-generation servomotors and CNC technology



„Custom designed by KW: pouring technology with state-of-the-art MX machines you can depend on fully.“

Dimensions of MX 10: 3,200 x 1,400 x 2,300 mm (LxWxH), MX 20: 4,150 x 1,700 x 3,400 mm (LxWxH), MX 30: 4,600 x 2,150 x 4,000 mm (LxWxH).



Fully automated, expertly engineered, versatile

Exceeding your expectations.

APPLICATIONS AND OPTIONS

By deciding to purchase a KÜNKEL WAGNER pouring machine, you have taken the first step on a path to state-of-the-art metal processing tailored for your specific needs. A wide range of equipment designs and options – including innovative ancillary and add-on modules as well as multiple-machine combinations – can be used to create the system which best fits your requirements.

Looking to speed up your casting cycle? Utilise the benefits of our rapid, loss-free ladle changeover. Looking for accurate, contact-free measurement of pouring temperature? Our two-colour pyrometer gauge with user-friendly data display will do the job nicely.

Flexible machinery architecture adaptable to your process needs.

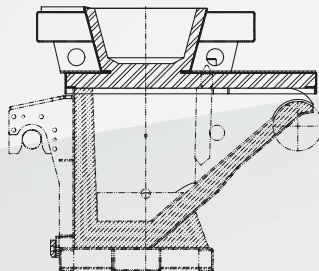
Whether you need flask tracking and management systems, online data exchange and/or process monitoring and control of parameters such as pouring time, inoculation



time, charge I.D., temperature and shot weight, our pouring machines provide the unique combination of technologies to do the job right.

Our service-proven designs and the performance spectrum they provide define the state of the art in foundry practice. Whether your application requires one MX 10, MX 20 or MX 30 or several in combination: we will solve the problem at hand. Supplying just the pouring machine would not be consistent with our holistic systems approach. Let us know your visions and exact requirements; we will propose the best solution for you.

Retrofittable know-how: tundish treatment in MX pouring ladle.



Controlled crystallisation, highest casting quality
For your alloys.

MX pouring machine + MX-i inoculant dosing unit:
 your formula for highest quality and controlled
 morphology in metal castings.

Crystallisation nuclei must be present in the melt stream before and during casting in exact amounts to achieve the desired casting quality. Fully integrated in the process control system, the MX-i inoculant dosing unit performs this crucial task with workhorse dependability.

To control the morphology attained during solidification of the particular alloy processed the inoculation is important. The KÜNKEL WAGNER inoculant dosing unit offers established and time-proven technology for controlled casting morphology.

Highest precision and reliability.

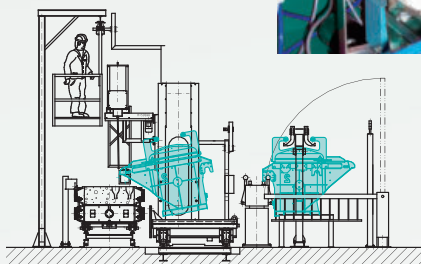
The unit provides precise automated dosing and optimum distribution of any desired inoculants directly into the poured melt stream. Direct addition into the molten metal stream provides highly uniform distribution without fading, therefore maximising

the inoculation effect. This improves the metallurgic quality of the casting produced – while reducing usage of costly inoculants. An integrated on-line scale monitors the melt stream for closedloop correction of the dosage rate in accordance with the selected setpoint. Go with KW - for benefits you won't want to do without.

MX-i Inoculant Dosing Unit

- Automatic high-precision inoculant dosing with outstanding process reliability
- No wear & tear, low maintenance, easy to assemble and install
- Suited for various inoculating agents and wide range of targeted grain sizes
- Closed-loop process control via on-line weighing system with continuous data logging
- Specially designed injector nozzles for optimum inoculant flow and distribution
- Continuous monitoring of filling heights, throughputs and blockages, various calibration and test functions
- Optional features including sensorbased melt stream detection, various warning signals and alarms

High precision, low maintenance, outstanding reliability: the MX-i inoculant dosing unit.





Your safety is our concern

Safety first.

SAFETY SYSTEMS

A great benefit for your safety: our pouring machines with triple emergency protection.

Safety requirements to pouring machines are high. In case of an emergency any hazards can be avoided or reduced to a far reaching extent. Whenever such a situation arises it must be resolved quickly.

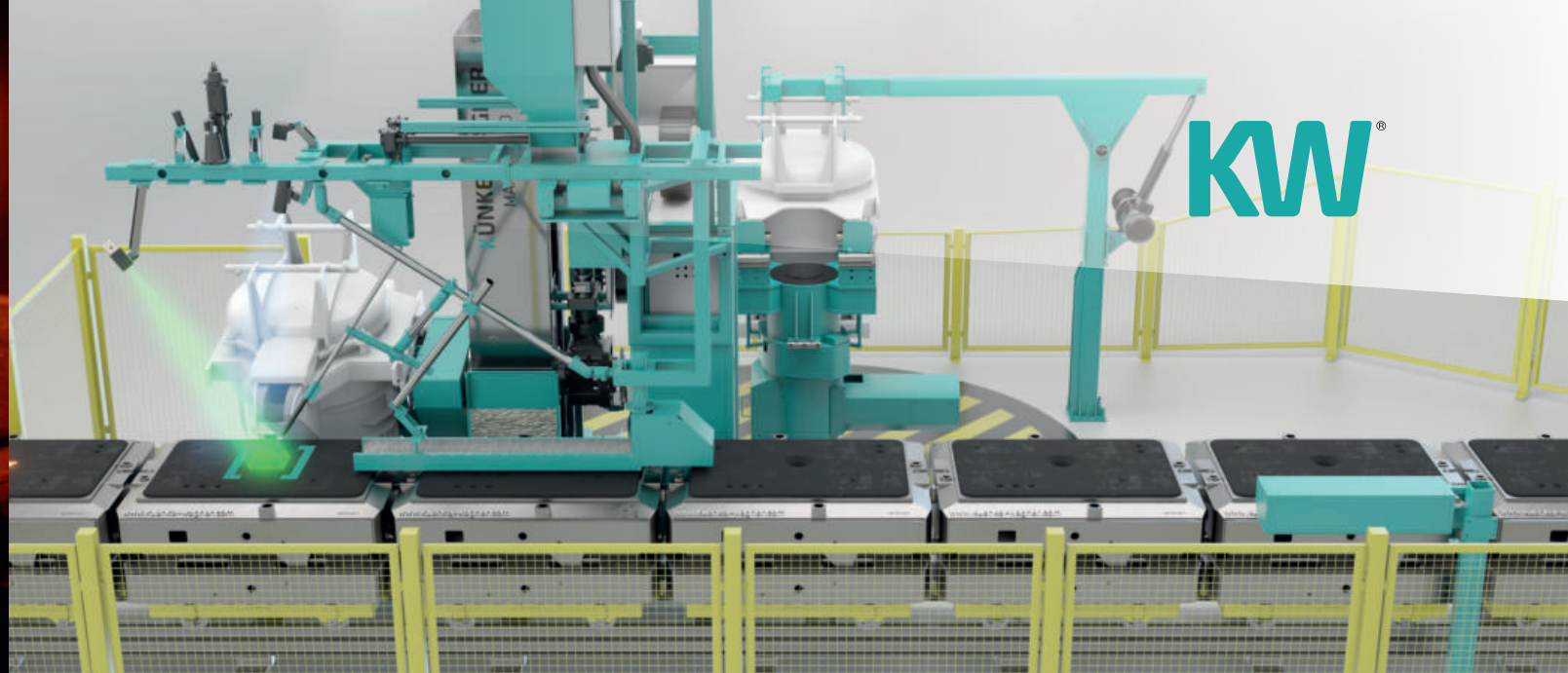
KÜNKEL WAGNER provides a triple protection for the case of an emergency. Our intelligent design includes the use of exchangeable pouring ladles. This benefit extends both to an intended change of the alloy as well as to unintended disturbances and interruptions that might happen in the core shop or in the melting shop.

Changeable pouring ladles: prepared for everything – even for the unprepared.

The suspended ladles are identified by the pouring machine through electromechanical coding. As the ladles are not heated they can be supplied at any time. A maximum deviation of 0,3% between the different castings means a first-rate repeatability from the first to the last casting. This will improve the quality, simplify the planning, reduce the recycle material and save a lot of energy. Positioning of the pouring spout towards the flask pouring gate is ensured in two ways: by laser (defining the position of the pouring machine towards the moulding plant) and by camera – with a view to the pouring gate position.

Triple security in case of an emergency

- Emergency stop:
 - automatic reverse tilting mode of the ladle
 - immediate stop of liquid iron pouring
- Power failure:
 - energy supply to the respective axles
 - reverse tilting mode of the ladle
- Protection against over-pour:
 - light sensor monitoring of iron jet, temperature and funnel
 - return of the ladle to its original position if the system stops



EXPANSION STAGES

The suitable solution for your individual requirements: MAXPOUR pouring machines made by KW.

The pouring machines type MX 10 – MX 30 have a modular design and are extremely robust and durable – typically KÜNKEL WAGNER.

The control system is realized with Siemens TIA Portal und allows full access to the entire digitalized automation. The machines are extremely flexible and can be adjusted to the most diverse applications in different expansion stages. A majority of constructive details, such as a backlash-free drive and the robust ladle supporting device speak for

themselves. Every MX pouring machine can be used independently or integrated into a moulding plant.

Degrees of automation of the KÜNKEL WAGNER pouring machines, type MX			
	Manually	Pre-pouring system	Fully automatic
Pre-pouring	manually by joystick	automatically according to pre-selectable characteristics	automatically according to pre-selectable characteristics
Pouring	manually by joystick	manually by joystick	automatically over bath level control
End of pouring	manually by joystick	manually at the touch of a button, reverse tilting of the ladle over a fixed rotation angle	switch-off depending on pouring weight
Synchronous pouring	./.	available	available

For outstanding mould compound quality

Sand preparation.

 The perfect mix.

MADE IN
GERMANY

SINCE 1907

KW®

WEITER DENKEN.

State-of-the-art plants, products and solutions

Sand at its best.





SAND PREPARATION

Sand preparation processes must be expertly conceived & conducted to permit reliable, cost-effective and environment-friendly manufacturing. The sand quality achieved depends on the specific processing technologies used.

What is the key to successful sand preparation? The right equipment for the job: high performance sand processing plants from KÜNKEL WAGNER.

Meeting highest standards for moulding sand properties, casting precision and environmental protection.

KW Sand Preparation Benefits

- Leaders in core and green sand separation, specialists in sand treatment
- Cross-process know-how
- High-performance components, assured quality
- High efficiency, high degree of mulling
- Extremely reliable, easy to operate, maintenance friendly
- Trailblazing innovation in new and ongoing development
- Add-on components available as options

Foundries of the future benefit from our multifaceted expertise. We know all interfaces between the casting manufacturing processes, moulding sand and sand preparation processes. We understand how to utilise them effectively to set up fully automated, problemfree operation for years to come.

KW offers a full know-how package in all process sectors required for reliable sand preparation. KW sand preparation technologies incorporate modular design for adaptability in accordance with the requirements at hand, paving the way for optimum results. Turnkey sand preparation plants are offered as well as individual system components, creating a full range of options. Included are KW process configurations for separation of green sand and core sand, preparation concepts, ideas for saving raw material consumption as well as strategies for quality control, monitoring and online process data management.

Personalised designs and features

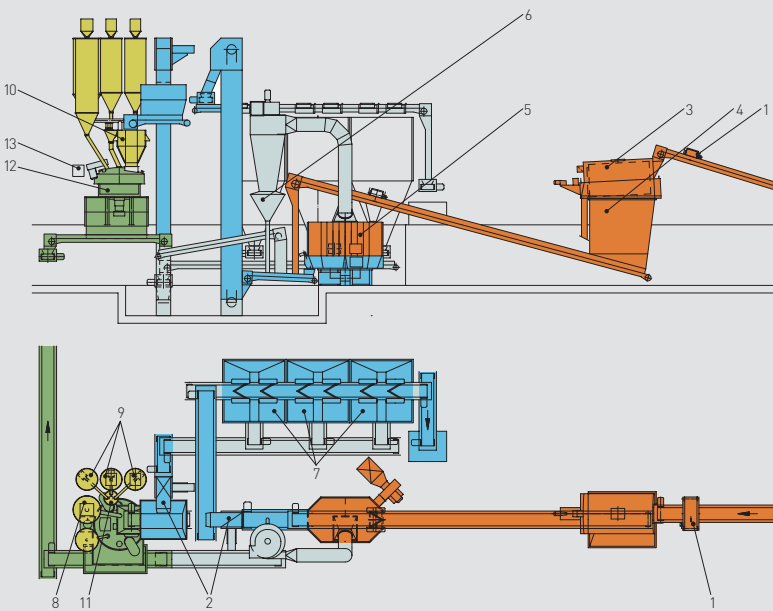
Ideas tailored to your needs.

TURNKEY PLANTS

Whether the plant supplied is a tower design or configured to fit under existing building heights: our systems provide KW quality without compromises regardless of on-site space availability and climate conditions.

Layout/typical flat configuration

side view, top view



Legend:

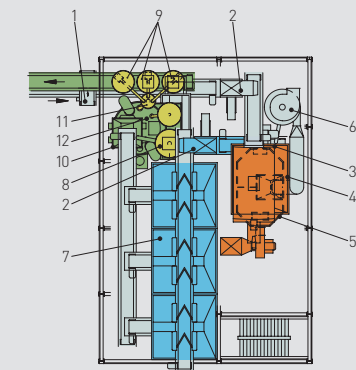
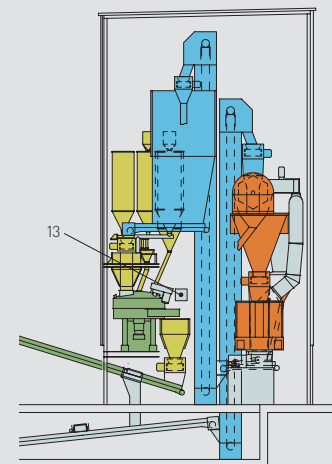
- 1 Magnetic separator
- 2 Bucket elevators
- 3 Polygonal screen
- 4 Intermediate hopper
- 5 ASK return sand conditioner cooler-mixer

- 6 Centrifugal pre-separator
- 7 Return sand hoppers
- 8 New sand hoppers
- 9 Additive hoppers
- 10 Sand weighing device
- 11 Additive weighing device
- 12 WM mixer
- 13 Online sand compaction testing device

return sand/warm | return sand/cooled | additives | prepared sand

Layout/typical tower configuration

side view, top view



KW Polygonal Screen

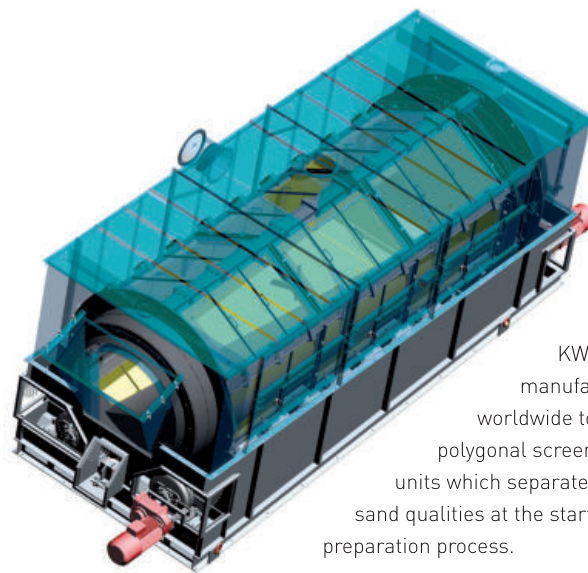
Intelligent Screening.

Our patented moulding sand separation process utilise polygonal screens to separate core sand and green sand as soon as possible, ensuring high efficiency.

Immediately after removal from the casting, the used moulding sand passes through magnetic separators and is transferred onward for reclamation. The sand then undergoes granulometric processing by the KW polygonal screening unit which breaks up and removes agglomerates. The polygonal screening unit incorporates an innovative geometric design providing maximum physical strength for the rigorous screening process without need for internal supports.

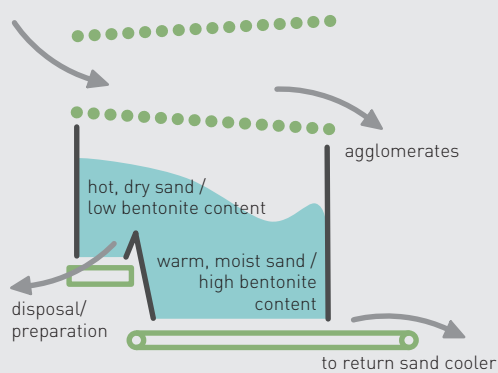
Substantial reductions attainable in additive contents.

The sand in the screening unit is agitated by rotation powered by an externally mounted drive unit. Fine acceptable particles fall through the screen openings whereas coarse particles and lumps are retained and conveyed out. Hot and dry sand is transferred to the sand reconditioning cooler-mixer to be blended with water only and conveyed to storage hoppers whereas moist sand with high bentonite content by-passes the sand cooler. Upgrade the efficiency of your sand preparation process: not a problem – for KW polygonal screening units.



KW is the first manufacturer worldwide to offer polygonal screening units which separate defined sand qualities at the start of the preparation process.

KW separation technologies: return sand processing



Know-how at work: KÜNKEL WAGNER polygonal screening units are the most advanced in their category.



KW return sand coolers/continuous-operation homogenisers

Optimum cooling.

RETURN SAND CONDITIONING

Particularly in operations with mould capacity bottle-necks and long cooling times, used sand must be cooled from approx. 200 °C to below 40 °C as quickly as possible.

Hot sand affects almost every aspect of casting operations, leading to losses in quality, efficiency and bottom-line profits. The solution: KW's return sand coolers and their cutting-edge conditioning technology.

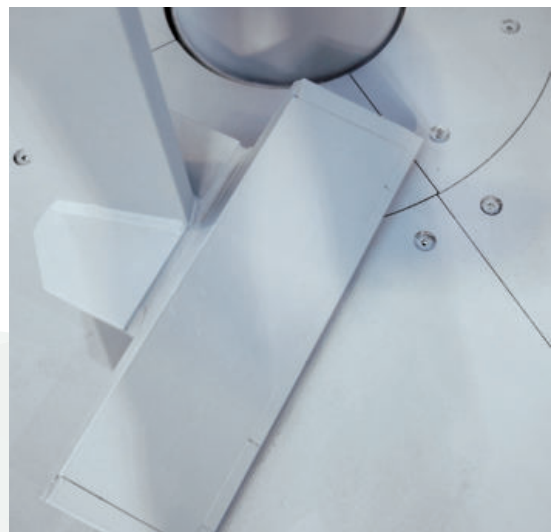
KÜNKEL WAGNER return sand coolers contribute significantly to optimum sand preparation with top-notch technical benefits and outstanding performance. Although the basic technological principles utilised – transport and mixing, moisture addition, cooling by water evaporation, vacuum removal – have been the same for decades, KW's solutions provide convincing benefits with innovative features and expert engineering.

Successful process technologies – the result of long-standing R&D expertise.

The special materials of construction used in both mixing tools and the cooling chamber floor as well as optimum dimensioning of the sand bed, moistening system and mixing chamber ensure timely moisture addition,

sufficient residence time and minimum fines extraction. The measurable difference: roughly 5 °C lower outlet temperature is achieved as compared to conventional coolers. But that's not all: KÜNKEL WAGNER sand coolers provide other benefits including maintenance-friendly design and long service life of mixing tooling as well as optional features providing automated infeed of suspension-based additives during the cooling process.

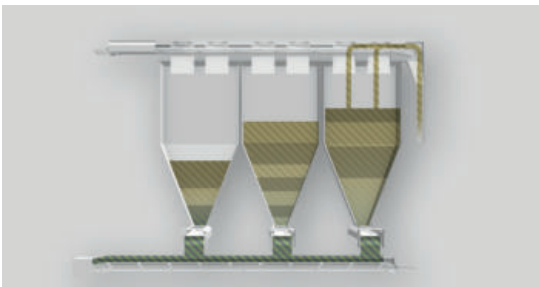
KW return sand coolers: your first choice for efficient cooling and personalised optimisation potential.





Synergies in research, development and innovation lead to trailblazing ideas.

Expertly conceived hopper storage provides blending of individual used sand batches for improved mould properties.



Let KW return sand coolers make life easy for you.

KW return sand coolers offer high throughputs up to 250 t/h, advanced technology with a proven track record in the industry, integrated user-friendly operating controls and many other tangible advantages. By ensuring constant temperature and moisture content of outlet sand, they provide best possible conditions for subsequent process steps. As a result, the process runs smoothly, providing high-quality castings with outstanding cost efficiency.

Superb quality powered by smart engineering. From the people with a passion for sand and a name known throughout the industry: KÜNKEL WAGNER.

KW Return Sand Cooler Benefits

- High throughput capacities, maximum cooling rates
- Efficient water metering with precision of $\pm 0.2\%$
- Highly reliable homogenisation
- Electronically controlled sand output gate
- Stabilised sand output rate, constant volume of sand in cooler
- Integrated fully automated control system
- Maintenance-friendly design
- Special dosage processes available as optional features

KW rotary mixers

The perfect mix.

KW rotary mixers: for simple, fast and reliable intensive mixing.

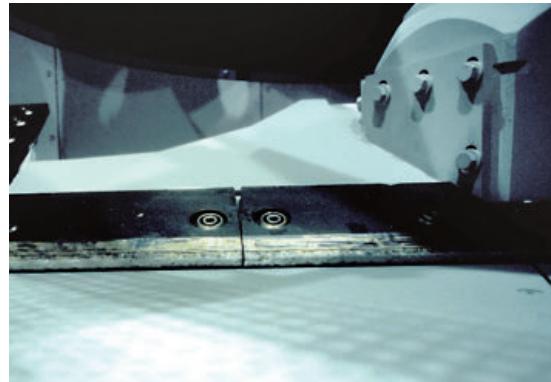
Our high-performance batch rotary mixers are cost-efficient. They are the best available in their field and the KEY component in sand preparation plants. And here's why:

Our high-performance sand preparation technology has a recipe for success: the mixer. Not just any mixer. The KW rotary mixer, designed to provide superb performance and rugged reliability in manufacturing practice, day in and day out. The 250 mixers we have supplied to foundries worldwide over the last 25 years are our best calling cards.

The KÜNKEL WAGNER name stands for expertly processed moulding sand and extensive know-how in pre-mixing, homogenisation, testing and correction of moisture content, final mixing and discharge. When the outlet gate is opened, the compounded moulding sand is ready for use – with optimum flow properties, homogeneity and lump-free consistency.

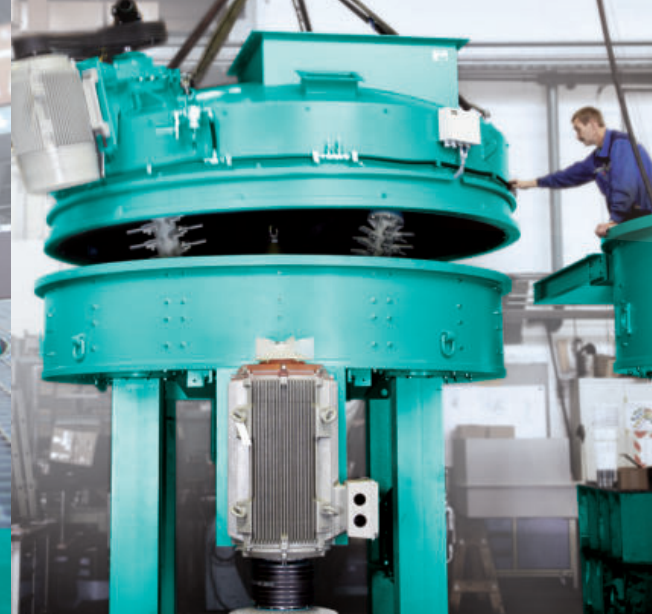
Discharging the mixer will make you happy. And rightfully so.

When the next mixing cycle begins, KW mixing technology answers the call again, continuing to prove its cost efficiency and reliability in long-term operation.



Durable, easy-to-change components are used in all areas subject to abrasive wear.

With virtually simultaneous sand infeed and water addition for substantial time savings. With rapid mixing with high-speed impeller tooling. With controlled infeed of additives. With wall-and-floor scrapers ensuring homogeneous mixing and preventing localised dead spots. With high-RPM disagglomeration providing accelerated binder dispersion throughout the blend.



Rugged construction, clear-cut design.
Proven reliability in foundries worldwide.

Intensive mixing is a complex process involving continuous rerouting of circumferential sand flow as well as cyclical shear, compression and decompression. In contrast, the results provided by KW mixers are simple: loose, free-flowing sand without lumps. The high standards we set for our mixers are your assurance of optimum performance – day in and day out – at your plant.

KW Rotary Mixer Benefits

- Mixing capacities of 15–180 t/h
- Intensive mixing process
- Batch operation with low operating costs
- High degree of mulling: greater than 95 %
- Uniform, optimum quality of compounded moulding sand
- Integrated process control
- Rugged, service-proven design

Wide range of equipment available for foundries of all sizes.

Understanding how mixing really works is essential in order to realise the potential in the sand processed. KW knows how to introduce water and additives into used sand – as well as how to deagglomerate bentonite in a way which ensures formation of a uniform bentonite film around every sand particle. KW knows the tools required to do the job: rotating wall/ floor scrapers in conjunction with synchronised high-speed impellers. The more we talk about KW rotary mixers, the clearer things become: the exceptional challenges posed by sand call for exceptional mixing technologies and solutions. Get the best solution for your specific application: contact us by phone or mail.

Sand preparation - dimensions and technical data

Always the right choice.



Whether rotary mixer, polygonal screen or return sand cooler: the individual components of the KÜNKEL WAGNER production programme reevaluate each sand preparation plant. Our extensive range of products includes efficient and cost-effective products for best results.

We are happy to provide entire sand preparation plants. But we also recommend individual KW components and innovative solutions for existing or new sand preparation plants.

What is important here is the performance of the individual components, their weight and

many details, such as: What is the capacity of the polygonal screens? Which exhaust quantity is suitable? How many sand coolers are ideal? Which mixer performance is appropriate? The tables provide an overview – our experts are available for further information.

RETURN SAND COOLER TYPE ASK

type	output [t/h]	installed power [kW] 50 Hz		fresh air max. [m³/h]	exhaust air max. [m³/h]	tare weight [t]	operating weight [t] at 1.2 t/m³
		stirrer	fan				
ASK 30	30	22	15	6,000	9,000	5.50	6.50
ASK 50*	50	30	37	15,000	18,000	9.60	11.00
ASK 60*	60	30	37	15,000	18,000	9.60	11.50
ASK 70	70	30	37	15,000	18,000	9.60	12.00
ASK 80*	80	45	45	18,900	23,000	12.20	15.50
ASK 100	100	45	45	18,900	23,000	12.20	15.90
ASK 120*	120	55	75	30,000	35,000	16.80	22.00
ASK 150	150	75	75	30,000	35,000	16.80	22.60
ASK 180*	180	110	90	37,800	44,000	21.80	29.00
ASK 200	200	132	90	37,800	44,000	21.80	29.90
ASK 220*	220	160	132	48,000	58,000	23.80	33.00
ASK 250	250	160	132	48,000	58,000	23.80	34.00

* reduced filling height



POLYGONAL SCREEN TYPE PS

type	throughput at a mesh size [mm] of [t/h]			drive power [kW] 50 Hz	exhaust capacity [m³/h]	tare weight [t]	operating weight [t] at 1.2 t/m³
	10 x 10	12.5 x 12.5	15 x 15				
PS 1	30–40	35–45	40–50	4.0	2,400	2.30	4.20
PS 2	45–55	55–65	60–70	5.5	3,600	2.85	5.75
PS 3	50–60	70–80	80–100	7.5	4,500	3.50	6.60
PS 4	120–150	130–160	150–170	11.0	5,800	4.25	10.05
PS 5	175–210	190–230	200–250	22.0	7,500	5.50	12.30
PS 6	225–275	250–310	260–350	30.0	9,000	6.50	18.50
PS 7	280–310	320–360	360–400	37.0	9,800	7.00	16.00

ROTARY MIXER TYPE WM


type	capacity [t/h]	batch size [t] (132 s)	installed power [kW] 50 Hz		tare weight [t]
			mixer drive	rotor	
WM 0	15	6.00	37	1 x 18.5	4.50
WM 1	30	1.15	55	1 x 30	6.60
WM 2	50	1.90	110	1 x 45	11.20
WM 2	60	2.25	132	1 x 45	11.30
WM 2	70	2.60	132	2 x 45	11.70
WM 3	80	3.00	132	2 x 55	16.30
WM 3	100	3.75	160	2 x 55	16.40
WM 3	120	4.55	200	2 x 55	16.60
WM 4	130	4.85	200	2 x 55	18.90
WM 4	150	5.60	250	2 x 75	19.10
WM 4.1	180	6.70	250	2 x 90	19.40

KÜNKELWAGNER®

KW®

Available for you at all times

Service.

 In safe hands.

www.kuenkel-wagner.com

MADE IN
GERMANY



SINCE 1907



KW[®]

WEITER DENKEN.



Partners from the beginning

End-to-End Services.

SERVICES

We have enhanced service by fulfilling your wishes: Realize our comprehensive service portfolio.

Those who choose KÜNKEL WAGNER value reliable quality – across the whole lifespan of plant systems and machinery. Our uncompromising customer centric service assures you optimum performance and expertise. At any time. At any place.

Moulding plants, sand preparation/reclamation plants and pouring machines from KW are built keeping in mind the highest quality and precision standards for optimum operations for an average period of 30 years. We endeavour to provide you with a commensurate quality of service for foundry solutions subject to these kinds of workloads.

All to the benefit of unimpeded operation and optimising your plant performance.

The ultimate yardstick for gauging our services is your absolute satisfaction. Our team of highly qualified technicians, seasoned specialists and foundry experts are available to you in the field to service and as back office support from KW across the globe. This includes technical assistance via telephone or remote support, as well as through on-site repair and maintenance servicing. With original

spare parts supply at short notice, measures towards modernisation and retrofitting, as well as training courses for the systems. And when called for, we can be reached at any time via our Support Hotline. You will always be personally advised, personally attended to – for your absolute satisfaction.

KW Service Benefits

- Extensive service programme
- Customised solutions for your plant systems and machinery
- Seasoned specialists on assignments worldwide
- Fastest possible coverage of your need for spare parts
- Professional repairs, modernisations and retrofitting
- Emergency assistance in urgent cases
- Training courses in application technology

Testing, evaluating, optimising plant systems

Everything checked.

Those who choose KÜNKEL WAGNER are justified in setting high quality standards for their plants. Regular servicing and upkeep improve operational safety. Through professionally conducted inspections we keep your options open.

Even the best moulding or sand preparation plant has to 'head for the testing bench' every now and then. To determine any additional need for maintenance. For repairs or optimisations. To restore greater availability. Because the plant is in use the whole time and a great deal is demanded of it in the rugged practices at a foundry. That's when it's time to subject the plant's current level of

performance to a number of inspections and detailed functional checks. Our professionally trained KW service personnel offers you a comprehensive spectrum of different scopes for servicing and testing in order to retain the performance capabilities of your systems technology on a lasting basis.



Keep calm – with KW. And the latest concepts for diagnosis and maintenance.

KW Inspection and Maintenance Benefits

- Regular recording of current condition, reduced risk of downtimes
- Visual/technical inspection of hydraulic and mechanical systems, setting/readjustment of components
- Documentation of analysis and evaluation along with recommended measures for achieving reliable mould quality
- Access to original construction design and production know-how

Regular servicing is the best basis for reliably maintaining proverbial KW quality at its high level, even for decades. Doing so safeguards against unscheduled downtimes involving high subsequent costs.



Absolutely KW: 100 % performance

100 % original.

ORIGINAL SPARE AND WEAR PARTS

There is nothing like the original when it comes to KÜNDEL WAGNER spare and wear parts. Who else guarantees you highest quality, flawless function, tested safety and maximum reliability for a perfect result? Precisely: only the original, only from KW.



As exhibited by the long operating performance of our plants and machines, original spare parts from KW have proven themselves supremely well; including an outstanding cost-benefit ratio. Each original part is designed towards optimising systems while fitting precisely in terms of its function and mode of operation. We promptly transfer each and every improvisation of our product portfolio to the original parts so that the original allows you too to benefit from technical advances. Additionally, innovative construction designs facilitate shorter installation times. Everything matches, fits and functions perfectly. You can rely on our strict quality audits, supported by KW warranty.

Extensive range with system certainty: on call, ready & waiting.

Customer downtimes are short as KW ensures rapid availability of spares by increased alignment towards fast spare-



„The recipe for your foundry’s success: More than ever, quality is decisive and only the original assures accuracy and robustness.“

parts production. Working on state-of-the-art machinery, a large team of employees produce KW quality that is so much in demand. An efficient service network is available, particularly for products needed on a regular basis: We ship worldwide from our warehouse in Alfeld, Germany.



Certainty is certainly better: Original's quality is tested. Supported by made-to-measure service contracts.



This kind of high-grade, original quality is always convincing. After replacement you enjoy the security of not having made any compromises. The field service at KW is glad to advise you individually and joins you in developing the ideal stockpiling plan for critical spare parts when downtimes occur; or in devising the perfect intervals for procuring them on a timely basis.

A computerised management information system (MIS) quickly enables identification of your spare parts according to drawing number, item or article number – even for procuring components for older machines.

Original knowledge, original capability, original parts: for your feeling of assurance.

KW Original Parts Benefits

- Superior quality, tested assurance with precise fit and functionality
- Greatest performance and dependability of state-of-the-art technology
- Trouble-free installation, long lifespan, which includes KW new part warranty
- Maximum availability due to reduced plant down-time
- Quick supply via KW service network, deliverability even after 30 years
- Spare parts delivery for purchased parts no longer available in the market



Moulding things back into shape

General overhaul pays off.



When components are showing signs of wear and tear, it may make sense to repair and maintain them – using our component repair service at KW.

Who says it's old? A component that has been utilised for years doesn't necessarily have to be replaced with a new one. If the underlying components are sustainable, 'crunching the numbers' can do the trick: At around 40 to 60% of the costs for a new part, it can be more than worthwhile to put a gearbox, as just one example, in the masterful hands of the general overhaul unit at KÜNKEL WAGNER. The component is completely overhauled in our own workshop. That way you deploy your capital sensibly and keep production costs down.

When a new purchase is merely the second-best solution, it's time for basic renewal.

If the need arises, the component is revitalised using modern, efficient original spare parts from KW. A nearly good-as-new condition can be achieved through work we implement professionally. After a general overhaul the component is again productive, dependable, able to withstand stress and fully ready for use. We even give that to you in writing – via certificate and quality warranty.

Component overhauls safeguard the value retention of your production plant in the long term.

Replace, update, profit

Plant update.

MODERNISATION AND RETROFITTING

You gain competitive advantages by modernising your plant technology.

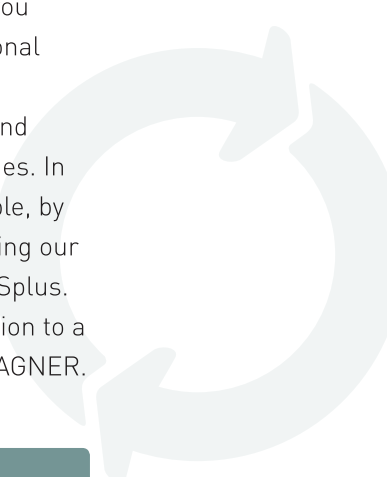
The boom of progress: operational needs and markets change, pave way for technologies making it necessary to adapt your plant technology. Gear up for the future: with KW.

Not every measure taken towards modernisation is automatically coupled with investment in a new plant system. A clever alternative is ready & waiting: KÜNKEL WAGNER modernisation and retrofitting for all areas of a plant.

It's not just that a lot of things could be changed at a plant – they should be.

Today there are a number of technological options; for instance towards improving or

increasing output and volumes. Towards compliance with current environmental regulations. Towards conserving costly resources and energy or towards reducing downtime risk. By replacing individual components you increase your plant potential. The same applies for retrofitting. The unique experience found at KW helps you to get there. We take over the professional replacement of outdated components and provide high-quality, field-tested and precedent-setting facilities and upgrades. In the case of moulding plants, for example, by renovating compression technology using our best pre-compression: KW TWINPRESSplus. A good reason to take your modernisation to a completely new level: with KÜNKEL WAGNER. We're ready when you are.



KW Plant Update - Advantages

- Modernisation of control system
- Prolonged cooling time
- Improved compression process
- Longer core-setting line or modified pouring line
- Installation of core sand separation

„A convincing concept: Make use of the existing plant but modernise it to meet new challenges.“





Strength in service

Strong team.

Teamwork represents passion. Because happiness is already found in the path towards the goal. By simply giving our utmost for our customers: the best ideas and solutions point the way ahead; Along with service that surely can't be more competent and personal.



KÜNKEL WAGNER is an established name in the industry, and the key factor at the company are the men and women as staff who stand behind our services with their knowhow – your contacts! That's why we'd like to delight you through our kind of service, which we have expanded and developed so that you experience the difference. Whenever you get in touch with us. Whenever you need any kind of support or would like to have more details about our products and business units.

We're motivated, committed, available worldwide.

With the new 24/7 Support Hotline we address customers' needs with the aim of first-class services round the clock and worldwide.

The quality of both the work carried out and the service workflows involved forms the focal point of our overall service that our customers encounter daily. Because committed service is a part of our deeply rooted conviction and, as a result, a part of KW product performance, too.

When standard is not an option for you.

We want to provide our customers with additional value through our unparalleled service. That's what our customers expect from KÜNKEL WAGNER, 'thinking ahead' in every respect for the ultimate result - customer delight.

We're a phone call away...

■ 24/7 KW-SUPPORT-HOTLINE

for technical support:
+49 (0) 5181 78-800

- Fast problem-solving without 'red tape'
- Competent contacts
- Constant availability

Your Contacts

■ Service:

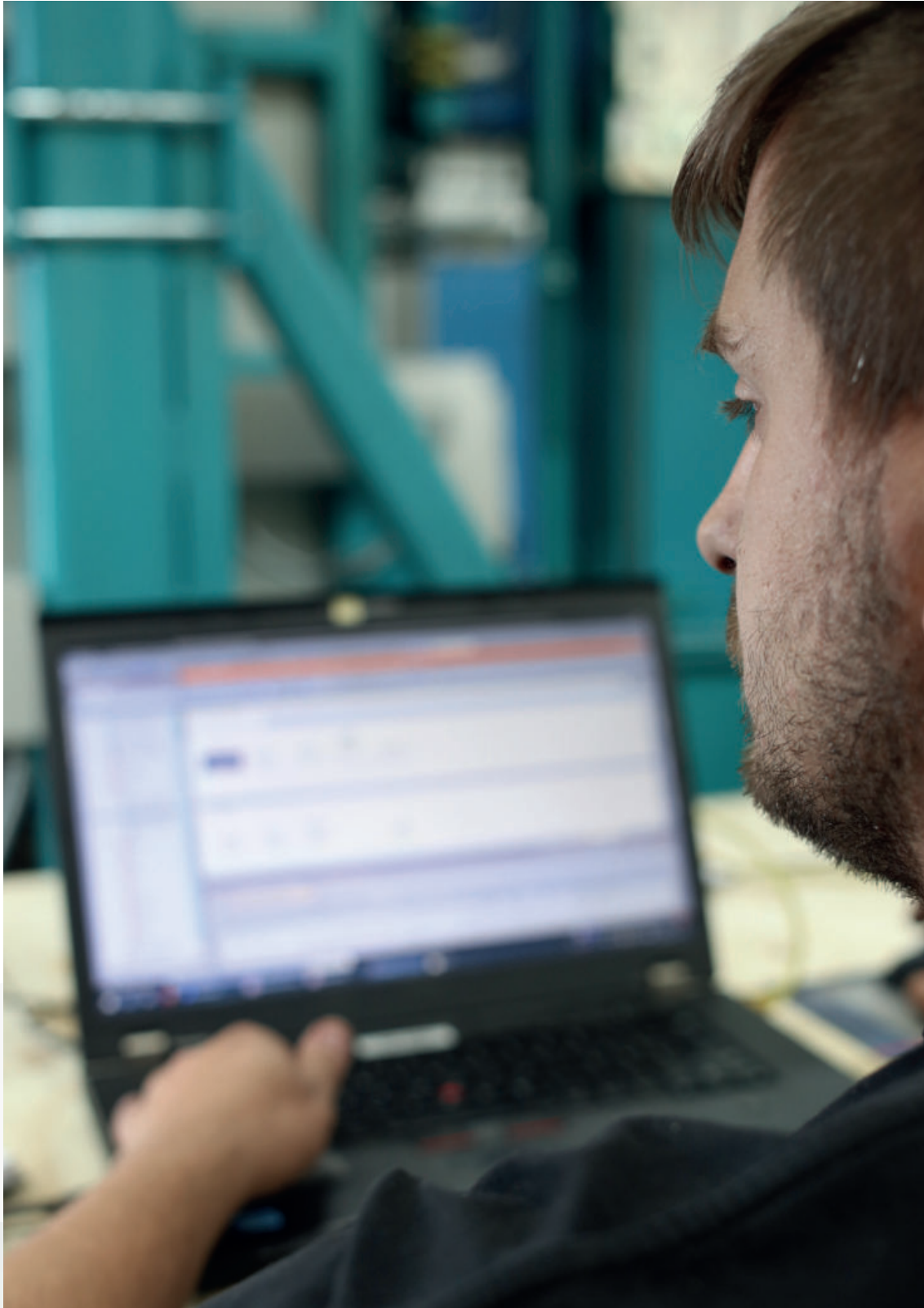
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■ Spare Parts:

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S.Kuester@kuenkel-wagner.com

■ New Plants/Modernisation/ Retrofitting:

Clemens Korhammer +49 (0) 5181 78-286
C.Korhammer@kuenkel-wagner.com





We're available to you anywhere in the world – with production sites in Germany, India and China. Our highly acknowledged specialists are glad to support you with comprehensive service at all times: You can reach us round the clock, 7 days a week via our Support Hotline.

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