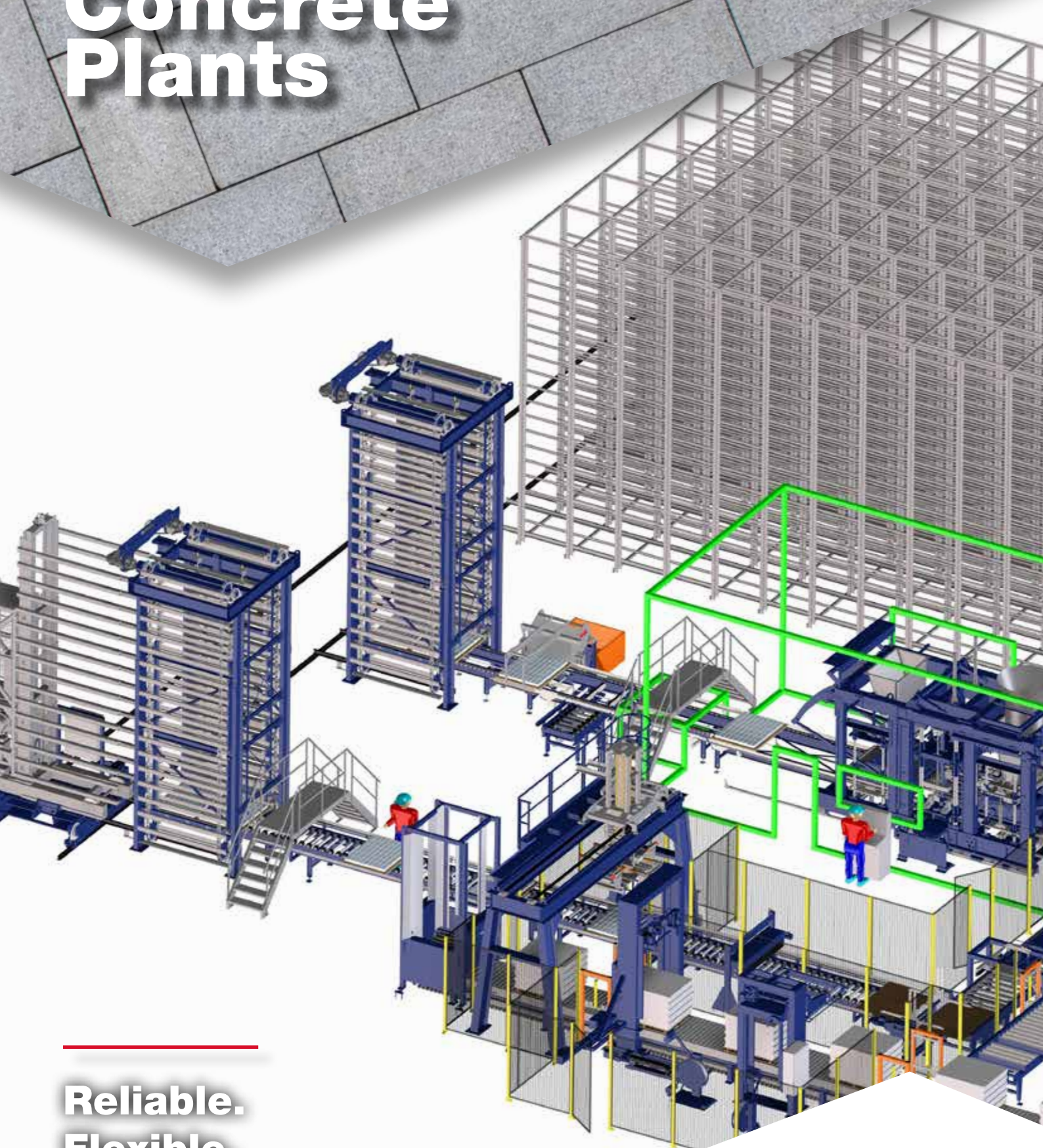


# KVM Concrete Plants

DE  
EN  
DK



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**Reliable.  
Flexible.  
Available.**





# ➤ KVM concrete plants

## KVM concrete plant

KVM has more than 65 years of experience in the concrete production plant sector and is renowned as a reliable, flexible and available partner. With focus on experience, flexibility, quality service and close dialogue with our customers, KVM is one of the leading manufacturers of concrete production plants.

The KVM head office is situated on the mainland of Jutland in Denmark with subsidiary companies operating in our main markets. Individual solutions make KVM flexible in adapting to different local market requirements.

## One supplier - One partner

KVM engineering skills cover all levels from traditional craftsmanship to state-of-the-art technology. Your business is our business, and no matter which solution you need – a single machine or turnkey concrete plants – KVM has the resources, the experience, and the technology to

provide the best possible solution. This makes KVM your best source of robust and high-performance equipment for concrete products.

## Versatility and service

KVM is renowned around the world as a reliable and loyal partner who stands by its customers before, during and after delivery of either a single machine or a complete turnkey plant. Successful concrete production is achieved by means of close dialogue and cooperation from the initial phase with discussions about design, production and commissioning through to service, training and on-going support.

A partnership with KVM can be summarized in our three core values:

**Reliable. Flexible. Available.**



# ➤ KVM concrete plant

A KVM concrete products plant is centered around the block machine and the central control system. All KVM concrete plants are characterized by ease of operation, easy access for service, simple operation and can be customized to suit almost any existing or new production building.

## ➤ MIXING PLANT



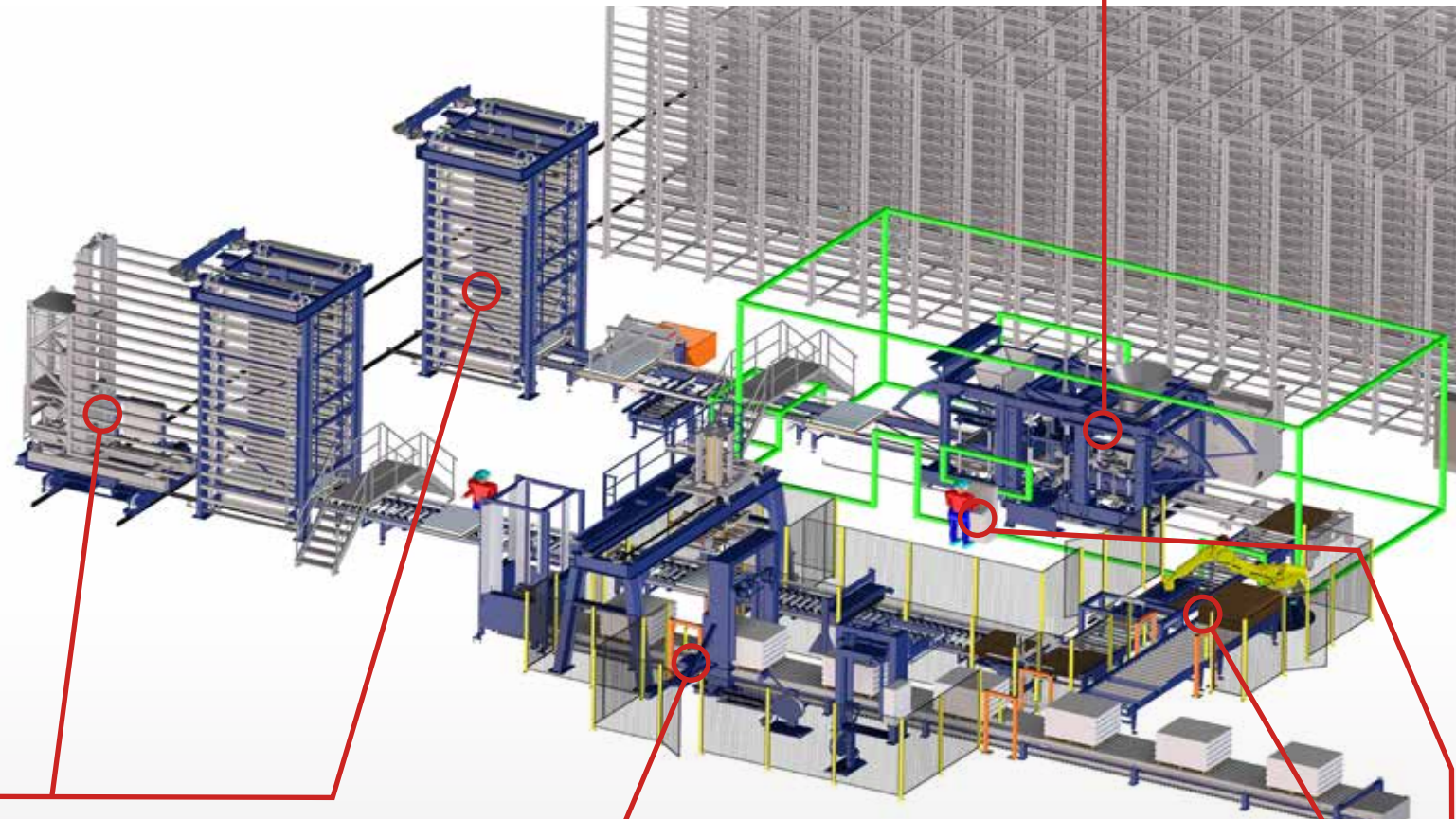
KVM design and integrate mixing plants into the remaining concrete products plant and the common control system ensures the best possible usage of materials and machinery.

## HANDLING SYSTEM



There are several very different types of automatic handling systems for transporting pallets with concrete products from the block machine via a curing system and back to palletizing.

- Basic – semiautomatic forklift-based handling system.
- Intermediate – automatic KFA crane-based handling system
- High end – automatic Finger Car-based system with enclosed curing system.



## BLOCK MACHINE

KVM block machines are available in various models depending on the required capacity and features. The block machines are characterized by their:

- High efficiency and precision
- Simplicity and ease of operation
- Durability and longevity
- Low energy consumption



## ➤ SECONDARY PROCESSING



KVM supplies a range of fully automatic high-end systems for upgrading and enhancing concrete products.

Wet side systems include

- Surface washing with adjustable pressure
- Coating of product surfaces

Dry side systems include

- Product splitting with automatic stacking
- Tumbling in rubber-lined drums with automatic stacking
- Curling, polishing and hammering of product surfaces
- Coating of product surfaces

## CONTROL SYSTEM

The centrally positioned control center for the entire system from which the operator runs the entire plant, from the mixer system to the block machine, handling and curing systems.



## CUBING SYSTEM



KVM supplies a number of systems for automatic packing of cured concrete products in a package that is ready for delivery to the customer.

## RETURN LINE



Fully automatic systems for cleaning, stacking, accumulating and returning empty production boards from the cubing system to the block machine.



# Block Machine

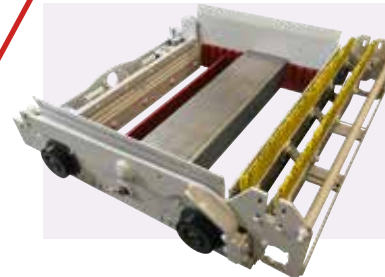
The KVM Block Machines are characterized by a large variation in the production of concrete products. The machine is designed to provide a high degree of versatility in products from thin tiles to paving stones and curbs, all with high quality and large volume. The block machines are available in various models depending on requirements for capacity and features.

## VIBRATION SYSTEM



With the KVM variable vibration system it is possible to freely and independently adjust both frequency and amplitude during both the filling and compacting cycles. The vibration table bearings are oil lubricated giving long life and high serviceability.

## FILLING SYSTEM



The unique KVM filling system is based on utilizing the correct type of filling box and controlling the amount of concrete delivered into the filling box. This ensures a precise filling and uniform product density, height and surface quality.

## HYDRAULIC STATION



The highly efficient KVM hydraulic system is equipped with proportional valves for high precision control and movement of relevant blockmachine components. The hydraulic system uses minimal power and ensures that a KVM block machine is the most energy efficient unit available.

## KVM MOULD

KVM moulds are designed for long life and ease of operation. Non wear parts are cast and come with a million cycles guarantee. Clever design ensures quick and easy replacement of wear parts.



## CONTROL SYSTEM



The KVM designed PC/PLC based block machine control system can operate the entire factory, from mixing system to out feed line. The user-friendly interface is optimized to make the operator job as easy and intuitive as possible.

## MACHINE FRAME



The main machine frame is a welded construction. Heavy plates are used to form a deep horizontal box under the whole machine to ensure optimum rigidity and fatigue resistance. This supports the RHS columns and vibration table.

The machine is mounted on a sub frame isolated from the main frame by isolation dampers designed to absorb up to 95% of the vibrations.

## ROBOT SYSTEM

Robot systems implemented at the block machine's workstations replace a wide range of manual work tasks, heavy lifts and monotonous movement, thereby ensuring a good working environment for the operator and significantly reducing cycle time.





# Handling system

## FINGER CAR



High end – fully automatic KVM Finger Car-based system with enclosed curing area. The Finger Car gently transports production boards with concrete products to a rack unit and back to the curing system.

## FORKLIFT TRUCK HANDLING



Basic – semiautomatic KVM forklift-based handling system. The production boards are stacked and transported to the curing area and back to the curing system by an operator using a forklift.

The system is used by producers requiring a basic, economical and flexible handling system that can fit into constricted sites.

## KFA SYSTEM



Intermediate – automatic KVM KFA crane-based handling system. The KFA system handles transport to and from the curing area using an automatic, self-propelled portal traverse crane equipped with a shear-controlled clamp.

The system is used by producers requiring a fully automatic and economical handling system.

KVM design and supply complete handling and curing systems consisting of semi or fully automatic units for transporting concrete products from the block machine to a curing area and back to palletizing.

The flexible solutions can be adapted to suit both new and existing buildings.

## RACK SYSTEM

Rack systems can be designed in a standalone building or inside an existing building and can be installed as an enclosed curing chamber with automatic climate control for the best possible hardening process.



## SCRAP EJECTOR

The KVM scrap ejector can both automatically and manually empty a production board of scrap material or default products. The board is returned to the wet side conveyor after emptying without interrupting production.

## PRODUCT HEIGHT CONTROL

The KVM automatic height and quality control system can both weigh and measure the product height and send the results to both the operator and to the automatic block machine control system.

## QUALITY INSPECTION

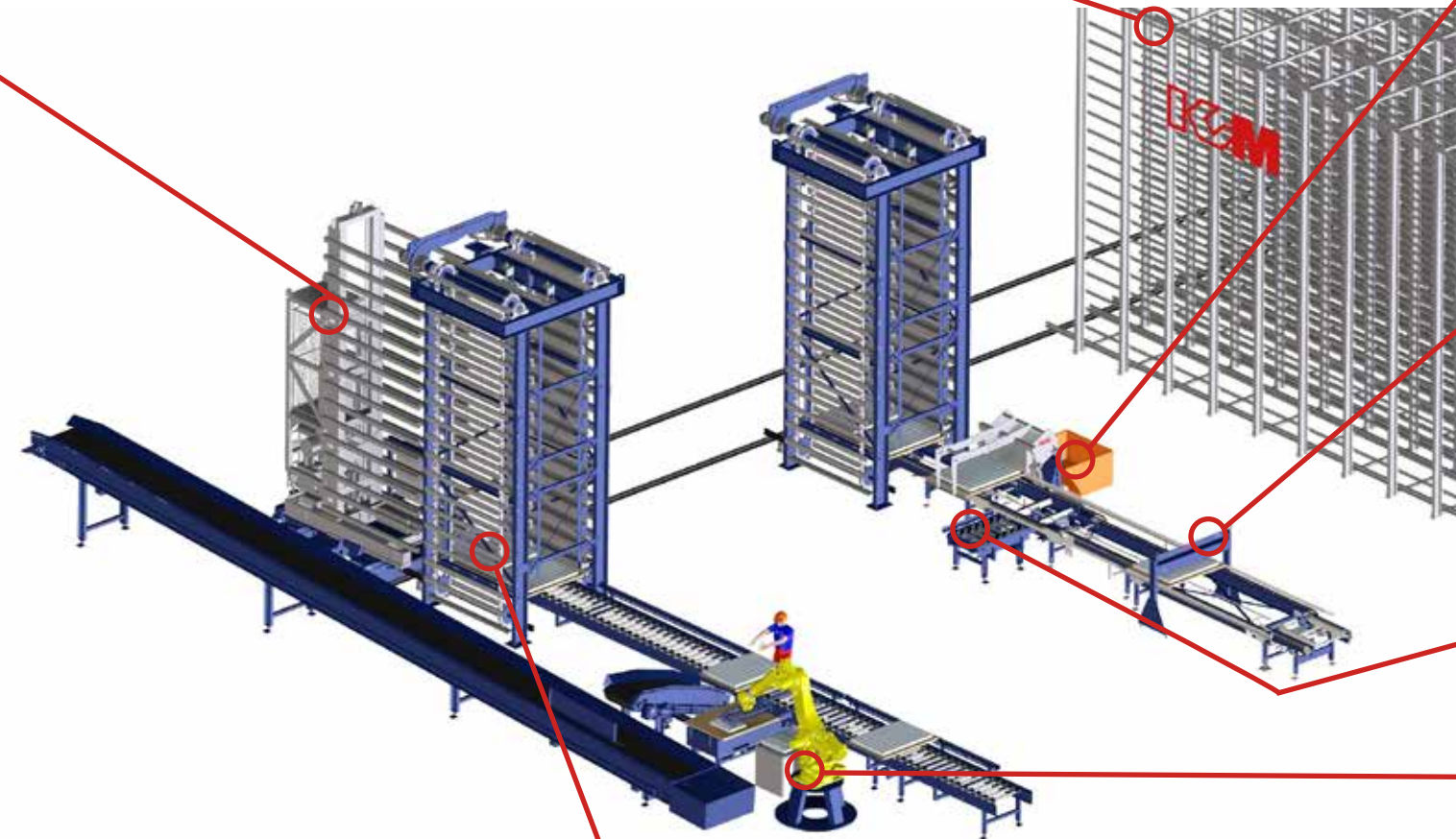
The KVM quality control system takes a production board with product from the wet-side conveyor for manual quality control. The board is returned to the wet side conveyor after inspection without interrupting production.

## AUTOMATIC QUALITY CONTROL

The KVM dry side automatic quality control system identifies reject products and automatically replaces these with acceptable stored products. The products are replaced using a robot fitted with a vacuum clamp. The scrapped products can automatically be transported from the production line to outside the building.

## ELEVATOR / LEVERATOR

KVM uses double elevator/lowerators to ensure maximum capacity, fast operation and the least possible wear. Elevators/lowerators can be fitted with service platforms and a system for automatic lubrication of chains. Automatic buffers can be installed on both the wet and dry sides.





## Return line



### KVM RETURN TYPE 1

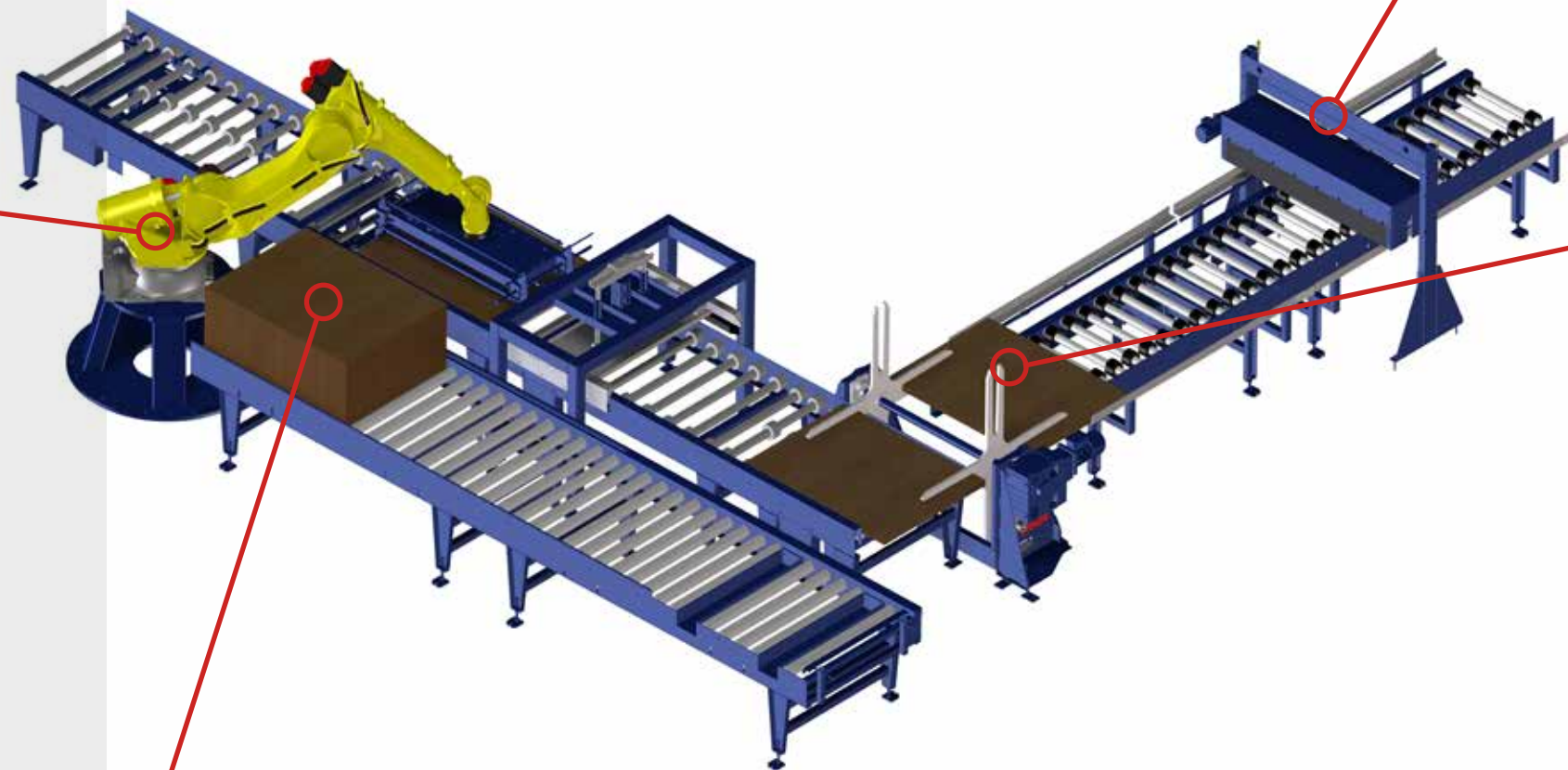
This model stacks all production boards and transports these to the block machine. A transport wagon allows for forklift and walkway passage to the center area between the wet and dry sides. The system can be combined with several types of production board buffering variants.

### KVM RETURN TYPE 2



This model will stack all production boards and transport these to the blockmachine. A transport wagon allows for forklift and walkway passage to the center area between wet and dry sides. The system can be combined with several types of production board buffering variants.

The KVM production board return lines transport the boards from cubing back to the block machine. The return lines are designed to be as simple as possible and at the same time provide the required flexibility and buffering capacity while consuming the least possible energy.



### BUFFERING OF PRODUCTION BOARDS

KVM supplies several models for buffering the required number of production boards depending on the needed capacity. The most basic solution with a few stacks provides an intermediate buffer capacity which can be enhanced with a forklift. The intermediate solution can stack up to 1200 boards in an automatic system and the large system features a crane unit for accumulating up to 5000 boards or more.



### PALLET CLEANING

KVM systems for cleaning production boards are designed according to the utilized board type, i.e. steel, wood, plywood, plastic etc. Brush types are designed similarly and are fitted for dust extraction. The pallets can be sprayed with a number of different solutions for optimal usage on the top or bottom surface.

### PALLET TURNER



KVM pallet turners come in a variation of models designed to suit the specific plant and situation.



# ➤ Cubing system

KVM cubing systems are designed for maximum versatility and can handle products from all types of block machines.

The combination of the powerful construction and the thoroughly tested hydraulic or electric drive systems produces a very precise and durable palletizer.

Standard cubers or robots are chosen according to the specific situation and product program.

## PALLET MAGAZINE

KVM transport pallet magazines are designed according to customer specifications and can hold up to 25 pallets.



## ROBOT CUBING SYSTEM

KVM robot systems are designed for cubing and palletizing special concrete products, which are not suitable for clamping by a standard KVM cuber.

A KVM robot can be used for a multitude of jobs such as

- Standard cubing of concrete products
- Special format cubing
- Stacking slabs on edge
- Creation of special product formats



## PACKING

KVM can integrate any type of strapper or wrapper into our outfeed lines and design the conveyor system accordingly.

## OUTLET CONVEYOR



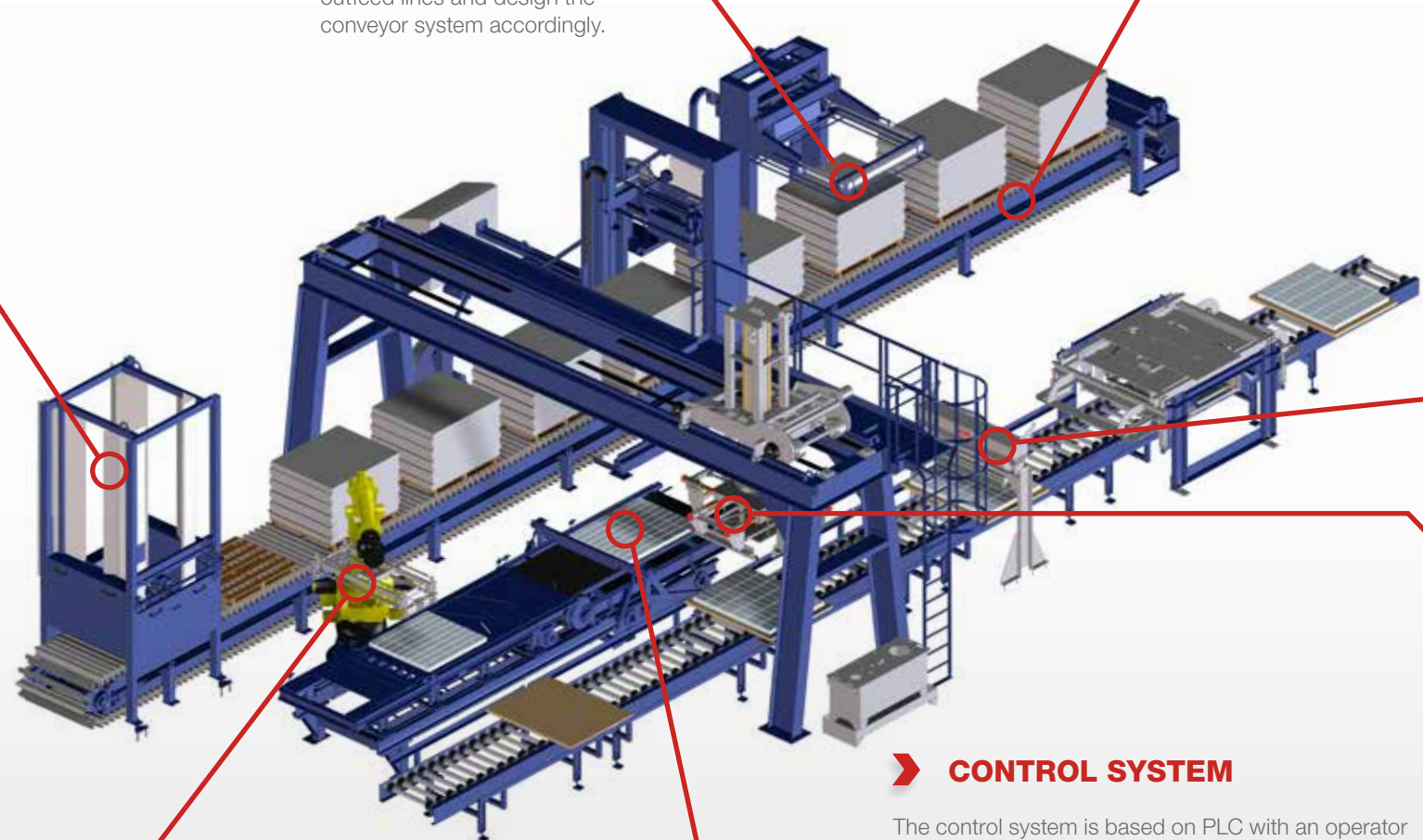
KVM supplies a number of outfeed conveyor systems. Choosing the relevant type depends on the product type, use of strapping or wrapping and the design of transport pallets or strapping without transport pallets. Most common types are

- Stack roller conveyors
- Stack chain conveyors
- Slat conveyors
- Belt conveyors
- Steel pallet circulating systems

## SAND FEEDER AND BIT DISPENSER



KVM offers several systems for protecting product surfaces against scratches and efflorescence. The KVM Sand Feeder will dispense a layer of sand or other small size particles over any type of paving product. The bit dispenser can carefully place a square piece of material on all four corners of any type of concrete slab.



## FORMATTING SYSTEMS



KVM supplies a number of product formatting systems used to reshape product formats from the block machine to the desired shipping package format. Formatting systems are fully electrical and are designed for fast and careful handling of all product types.

## ➤ CONTROL SYSTEM

The control system is based on PLC with an operator terminal for operator communication and integrated into the blockplant control system.

An Internet connection enables remote service from KVM service center 24 hours 7 days week.



## STANDARD CUBERS

KVM cubers can be supplied both as fully hydraulic or as fully electric units or a combination of both. The KVM designed four-sided clamps are based on utilizing hardened chrome steel columns for the longest possible trouble-free service life. This clamp allows the cuber to pick up products with a height of between 25mm and 500mm. All cubers are fitted with a service platform for easy maintenance.





## ➤ Secondary Processing

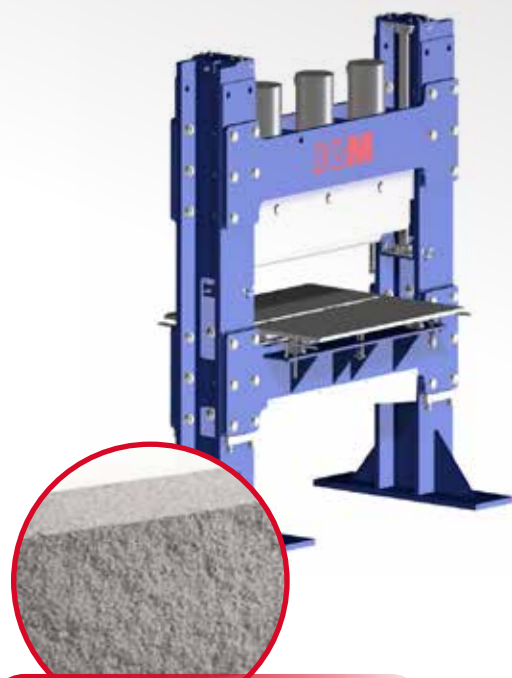


**WET PROCESSING**

### KVM WASHING SYSTEMS

A KVM product surface washing system is an integrated part of the wet side handling system.

- Single or double pallet application
- Pitch of tilted pallet during washing is fully adjustable
- Water pressure and travel speed is adjustable
- Individual nozzle setting is possible – individually adjustable nozzles
- Nozzle bars with oscillation during washing
- Rinse function for removal of residues
- Washing water blow-off function included
- Tool-free nozzle replacement
- A waste treatment system can be combined with the washing unit to ensure 100% recycling of both water and materials.



**DRY PROCESSING**

### KVM SPLITTING SYSTEMS

A KVM splitting line can be supplied as both as an inline and offline application.

- The splitter works from bottom to top to ensure the best product quality.
- The splitter can be integrated into a system with automatic feeding and packing of the finished product.
- Servo-operated feeding system to ensure precision and smooth operation.
- Automatic handling of waste materials.

### KVM TUMBLING SYSTEMS

KVM supplies both inline as well as offline product tumbling systems. The KVM Tumbling Systems are characterized by their:

- High output
- Simple operation
- Easy product change
- Automatic quality sorting

The systems handle all types of pavers, big blocks and split faced products.

Products are tumbled in heavy duty drums with a rubber lining.

Inline systems can be adapted to handle products directly from an inline splitting system, producing a unique product with minimal need for operators.



**DRY PROCESSING**

The KVM offline system is used by producers with the highest demands regarding quality and flexibility. The offline system makes it possible to mix pavers with up to four different colors with customized variations.

### DRY PROCESSING

### OTHER AVAILABLE SYSTEMS



**Polishing**



**Hammering**



**Curling**

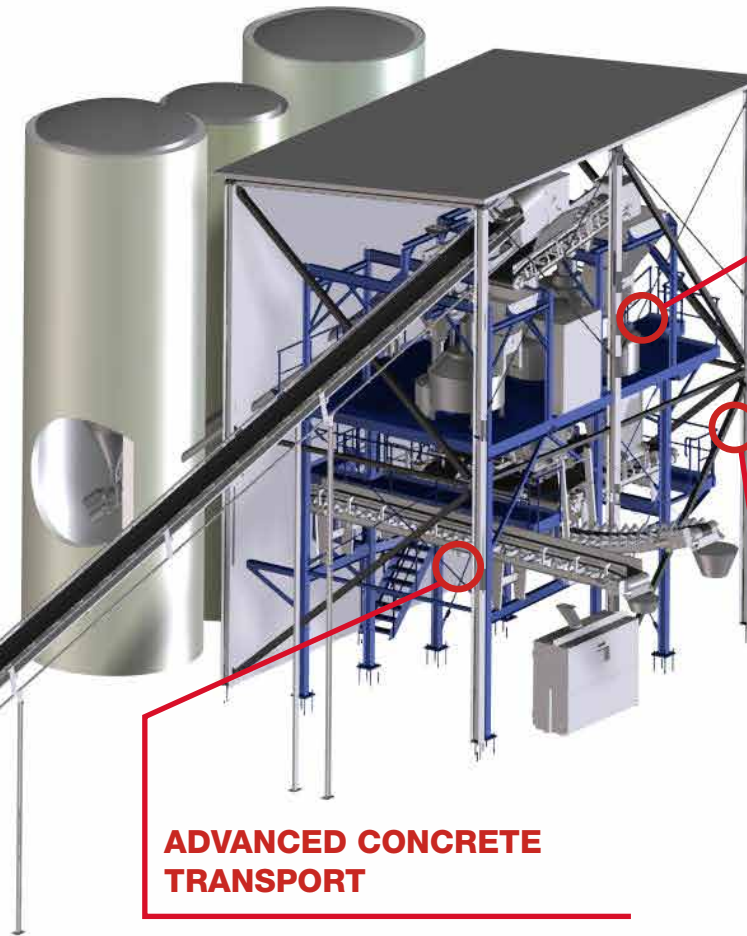
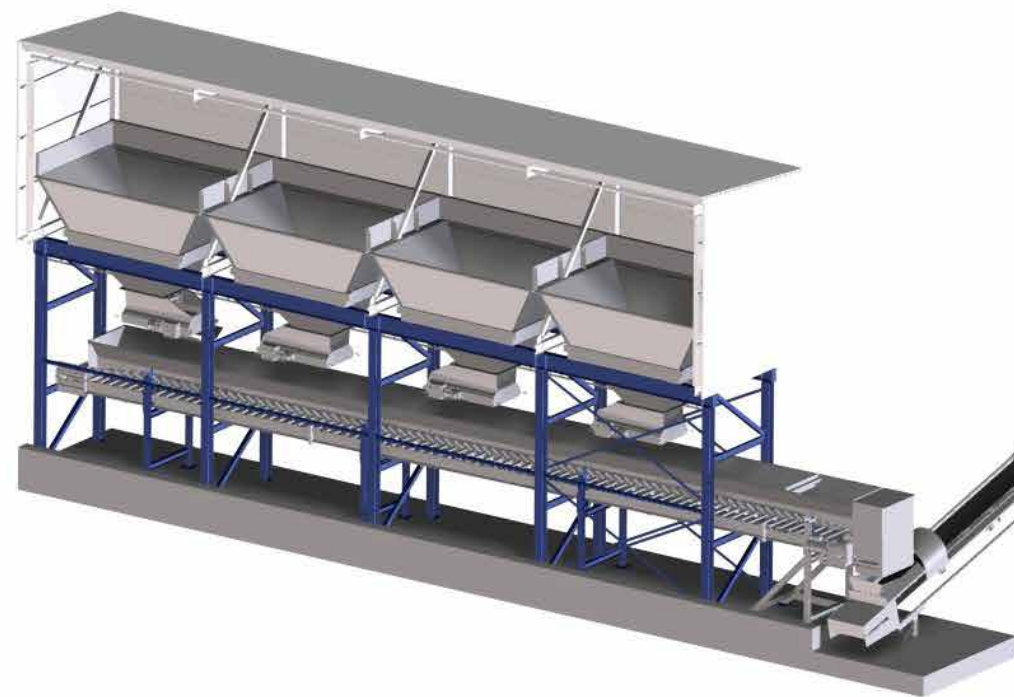


# ➤ Mixing plant integration

## Concrete batching

### Mixing equipment integration

KVM supplies complete batching and mixing plants designed to deliver concrete to a KVM block machine.



### MIXING EQUIPMENT

The batching and mixing plants are constructed around a first-class planetary mixer for the main mix and a face mixer fitted with a special high-speed mixing system.



### ADVANCED CONCRETE TRANSPORT



Advanced concrete transport with intermediate hoppers and distribution with movable belt systems ensures accurate delivery of concrete to the block machine.

### MULTIPLE COLOR COMBINATIONS



Multiple hopper systems enable a wide range of color combinations to be produced in both the main and face mix.



### Control System

KVM designs mixing plants for integration into the rest of the concrete products plant.

The common control system ensures the best possible usage of materials and machinery.



### Visual CPC system

The KVM control system is the brain which ensures an effective production of quality. Simple user interface visualizes the process and secures productivity and reliability.



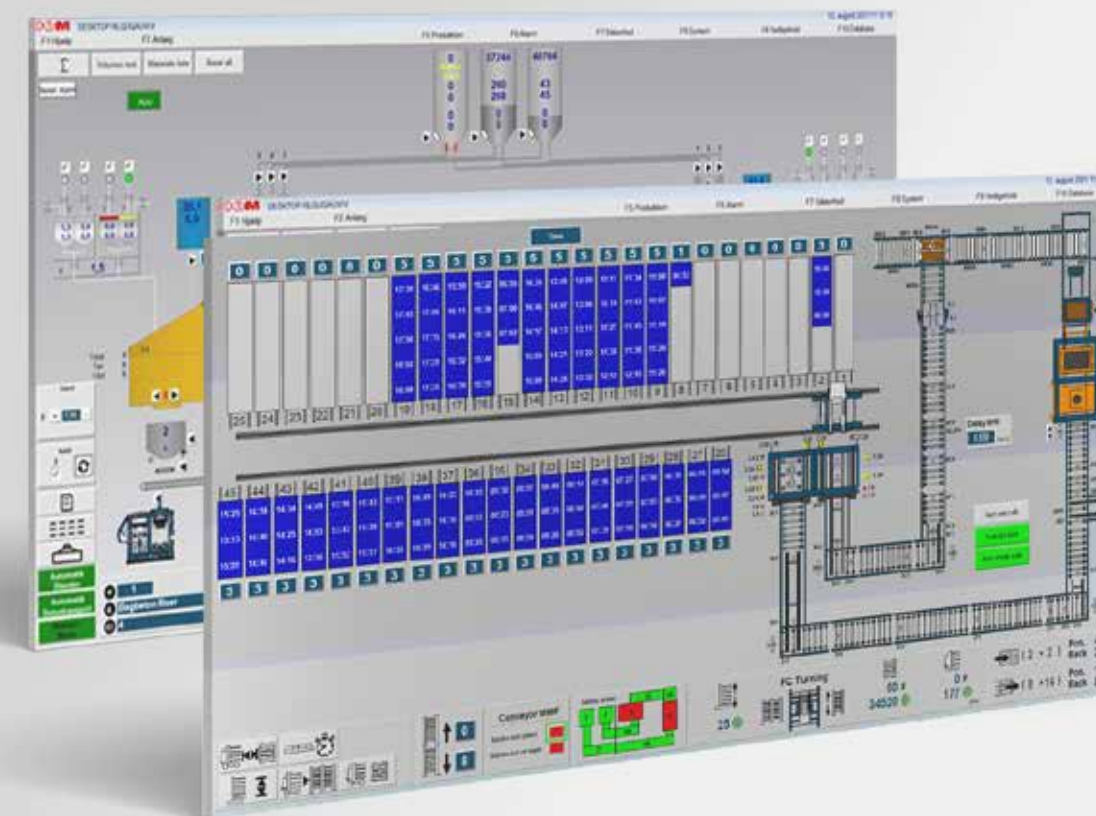
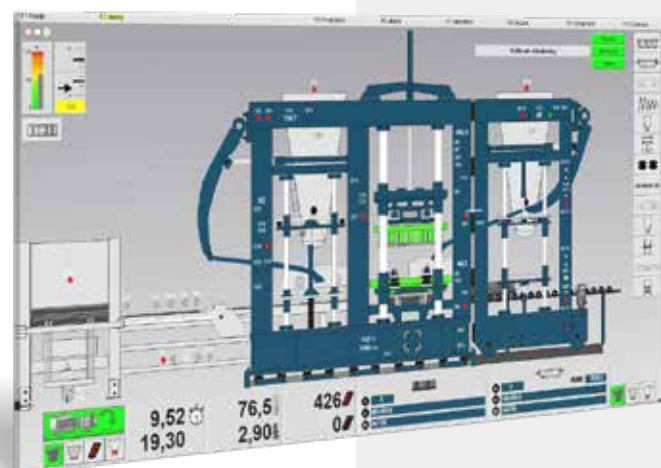
# ➤ Control System

## Inhouse Control Design

The KVM control system is based on a centrally placed PC from which the operator runs the entire plant, from mixer-system to blockmachine, handling and cubing systems.

KVM machines are controlled by KVM designed PLC programs using Allan Bradley / Rockwell PLC equipment.

KVM PLC programmers have more than 30 years of experience in designing, testing, installing and servicing KVM machinery. This ensures a user-friendly operator environment.



*The operator has easy access to all relevant production data giving an overview of the status of relevant parts of the entire plant.*



*The control system will inform the operator when relevant preventative service is due and report the status to the plant manager. Production reports are presented to both machine operator and plant manager.*



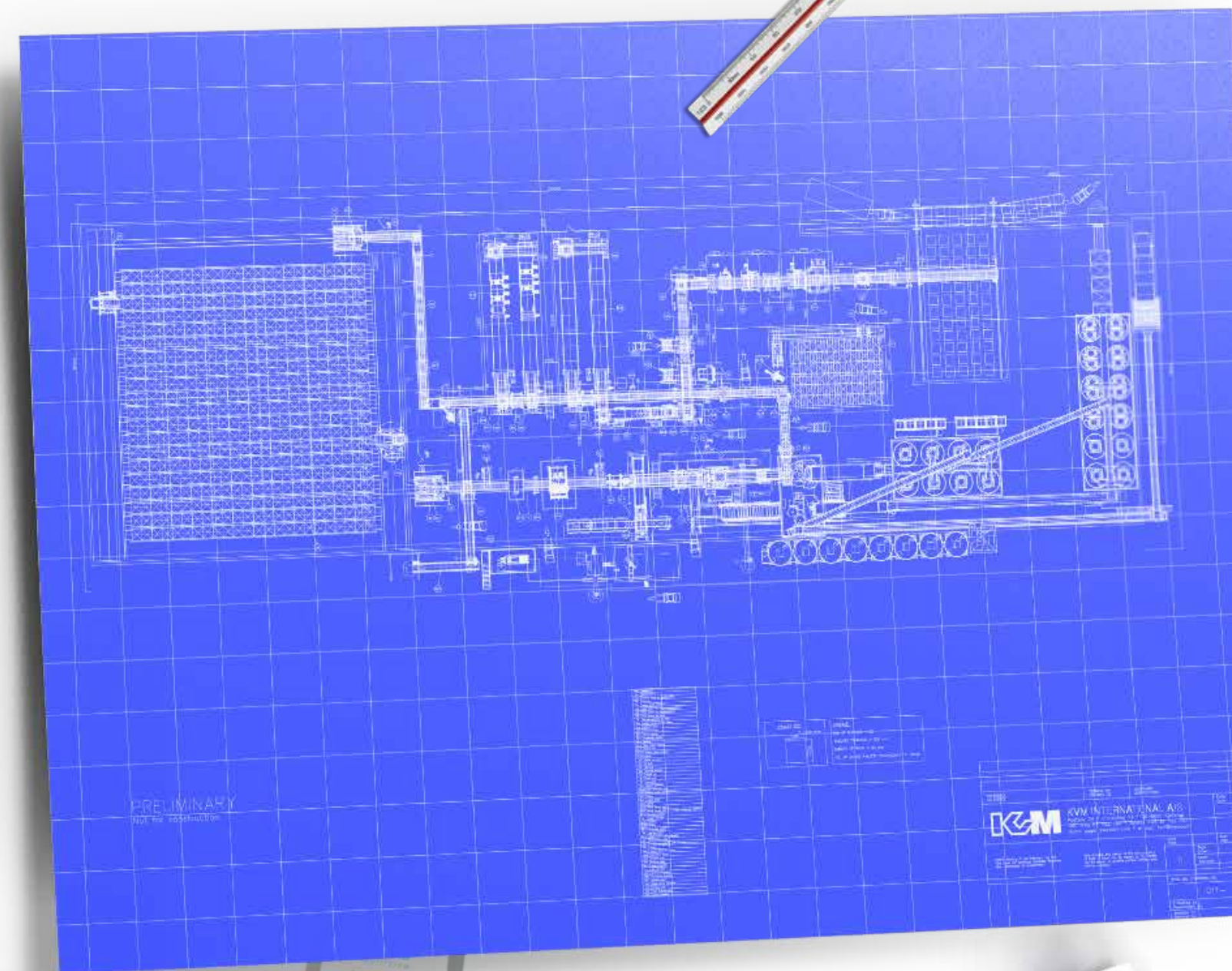


# ➤ KVM Plant Layout

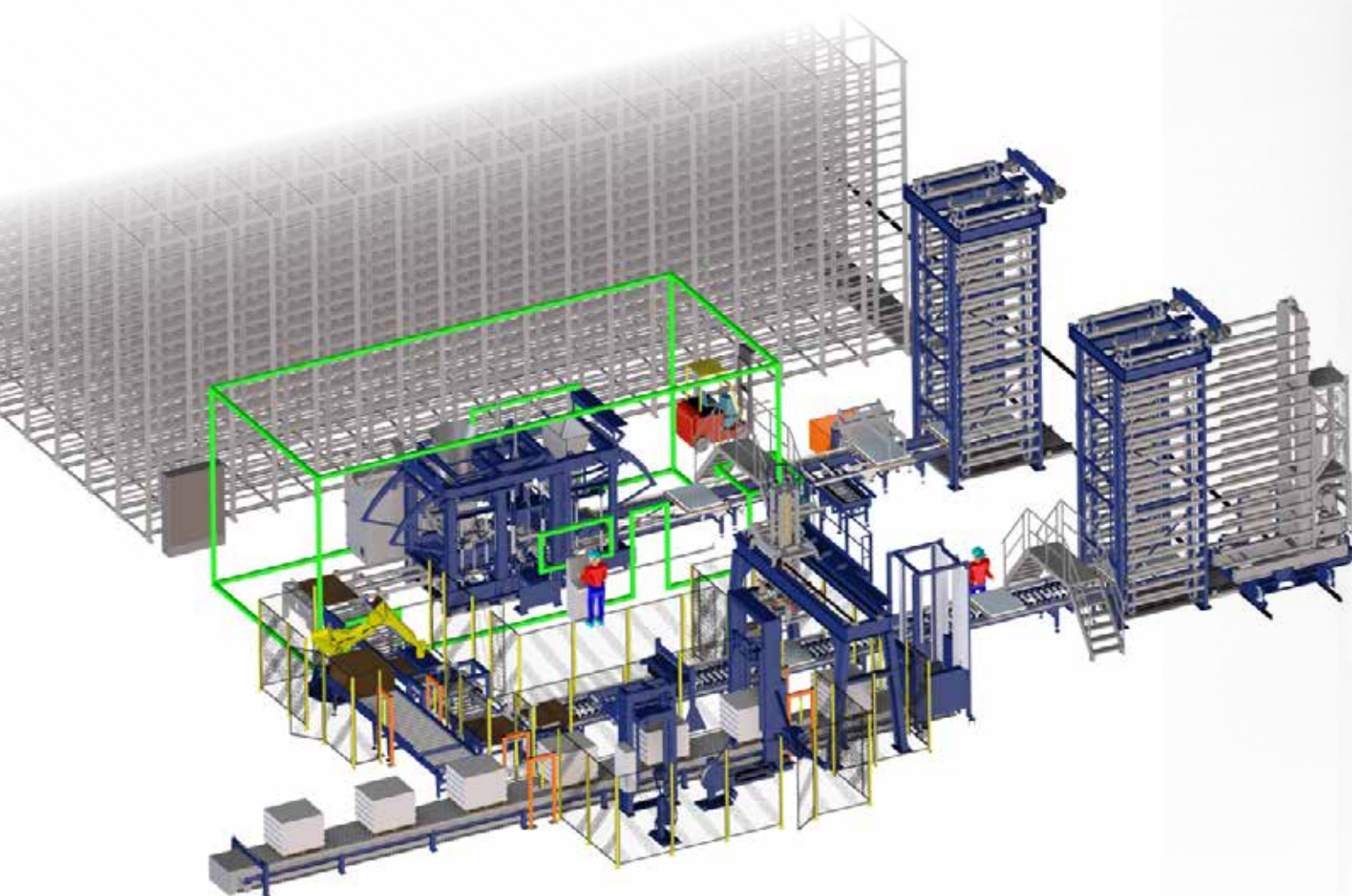
## FORKLIFT PLANT



## CUSTOMISED PLANT



## FINGER CAR PLANT





## ➤ Taking care of man and nature



At KVM we have a strong focus on the work environment which encourages us to design and construct equipment and implement solutions that ensure it is safe for everyone.

This includes:

- Production line designs with optimised operator safety and minimized health hazards.
- Operator housing for protection against dust emissions and noise pollution.
- Employing robots that perform heavy lifting jobs, safeguarding personnel and preventing them working in inappropriate positions.



At KVM we are dedicated to reducing environmental impact.

With the KVM filling concept used in our block machines we aim to move as little concrete as possible, both to save energy but also to ensure fresh concrete for every cycle. The greater concrete handling precision enables a higher moisture content and therefore lower cement consumption.

- Electric drives are used instead of hydraulic and pneumatic units when possible to minimize energy consumption.
- Electric drives on lowerators, cubers etc. are designed to regenerate electricity when breaking and lowering.
- All motors, drives, pumps etc. are programmed to stop automatically as soon as their services are not needed.
- All employed electric motors are the latest energy-saving models.
- All equipment is designed to be as light as possible to reduce energy consumption. (No use of pointless "heavy duty" equipment if not required).

This combined with a general employment of energy-saving technology means that KVM plants produce paving products using approximately 20% less energy than contemporary plants.

KVM molds are the most ecofriendly available as they have a guaranteed service life of 1 mill. cycles for frames and tamperheads and replaceable inserts etc. All materials are fully recycled at the end of their service life. Easy replacement on site by customer personnel reduces transport costs and energy use.

## ➤ KVM Service

**24/7/365 online service**

Tel. +45 87 702 702

### Lifetime service

Service is an important issue for KVM. A long-lasting relationship starts when KVM submits a project offer. In addition KVM is renowned around the world as a loyal and reliable partner who is always at your disposal. No matter which type of equipment is supplied, KVM supports its customers throughout the entire service life.

### Commissioning

Plants or single machines are installed and commissioned by KVM's own team of highly qualified and trained engineers. Operators can take part in commissioning to familiarize themselves with the plant. After a final production test the operators are trained to the run the plant themselves.

### After sales service

The KVM Team offers regular service visits to ensure and maintain a high productivity and plant performance. A KVM service management contract is available upon request.

### 24 hours service line

KVM offers 24/7 online customer service. If there are any interruptions in system production, KVM is always on call for fast expertise to ensure the machinery is soon back in operation.

### Spare parts

With a very efficient logistic network KVM can deliver spare parts quickly to all locations. For each plant KVM recommends a spare part package with components suited to your plant or machine.

### Operator training

To ensure that operators are well-trained to guarantee efficient plant operation, KVM has its own operator training academy. Operators are trained in concrete technology, compacting theory, product quality, machine operation, maintenance, plant performance, troubleshooting and fault location. The training academy gives the operators a theoretical background as well as hands-on experience.



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