



*UNICOMPACT*: Honeycomb Bar Storage and Retrieval System for large storage quantities with shortest cycle times to deliver bar stock, sheet metal, pallets and much more.

## UNICOMPACT: For Large and Largest Storage Quantities.

Application in many industries.

A KASTO Honeycomb Storage and Retrieval System, *UNICOMPACT* or *UNIGRIP*, designed as a one or double-sided storage system, starts from approx. 400 storage locations and accepts loads up to max. 8.000 kg (17,600 lbs) per storage location on loading units (cassettes, slave pallets, pallets etc.).

These storage systems can be designed as rack-supported buildings with roof and walls or as stand-alone storage units inside existing buildings. The possibility to handle and store bar stock as well as sheet metal and pallets in one system provides flexibility for a variety of different applications.

Performance comes from passion.

Different loading and unloading station designs allow an individual tailoring to each material flow situation as well as a variable number of logical locations to buffer and restore.

Fully automatic commissioning stations with manipulators (automatic bundle units, sheet separators etc.) are available.

The "Material to Operator" design ensures automatic, fast and ergonomic handling of orders.

Inside view of the rack construction of a Honeycomb Storage System.





UNICOMPACT in an aluminum extrusion facility.



UNICOMPACT at a plastic extruder.



UNIGRIP in a lumber yard.



Honeycomb Storage System at a steel distributor.



Honeycomb Storage System with saw cell as logistics center for bar stock, sheet metal, Euro pallets.



Honeycomb Storage System with integrated saws.

## Applications in Distribution and Production.

### Summary of Advantages:

- Superior space utilization for highest storage density on smallest footprint.
- Fast cassette cycles in fully automatic operation guarantee shortest processing times with minimized manpower.
- Clear material arrangement guarantees increased safety and better planning.
- Optimum inventory control due to perpetual inventory.
- Fully automatic handling means faster and more cost-effective commissioning of orders of all kinds.
- Fast and economic adaptation to changing requirements due to the modular design of the storage system.

# Honeycomb Storage Systems for Bar Stock in Steel Distribution.

Three dimensions mean economic benefits.

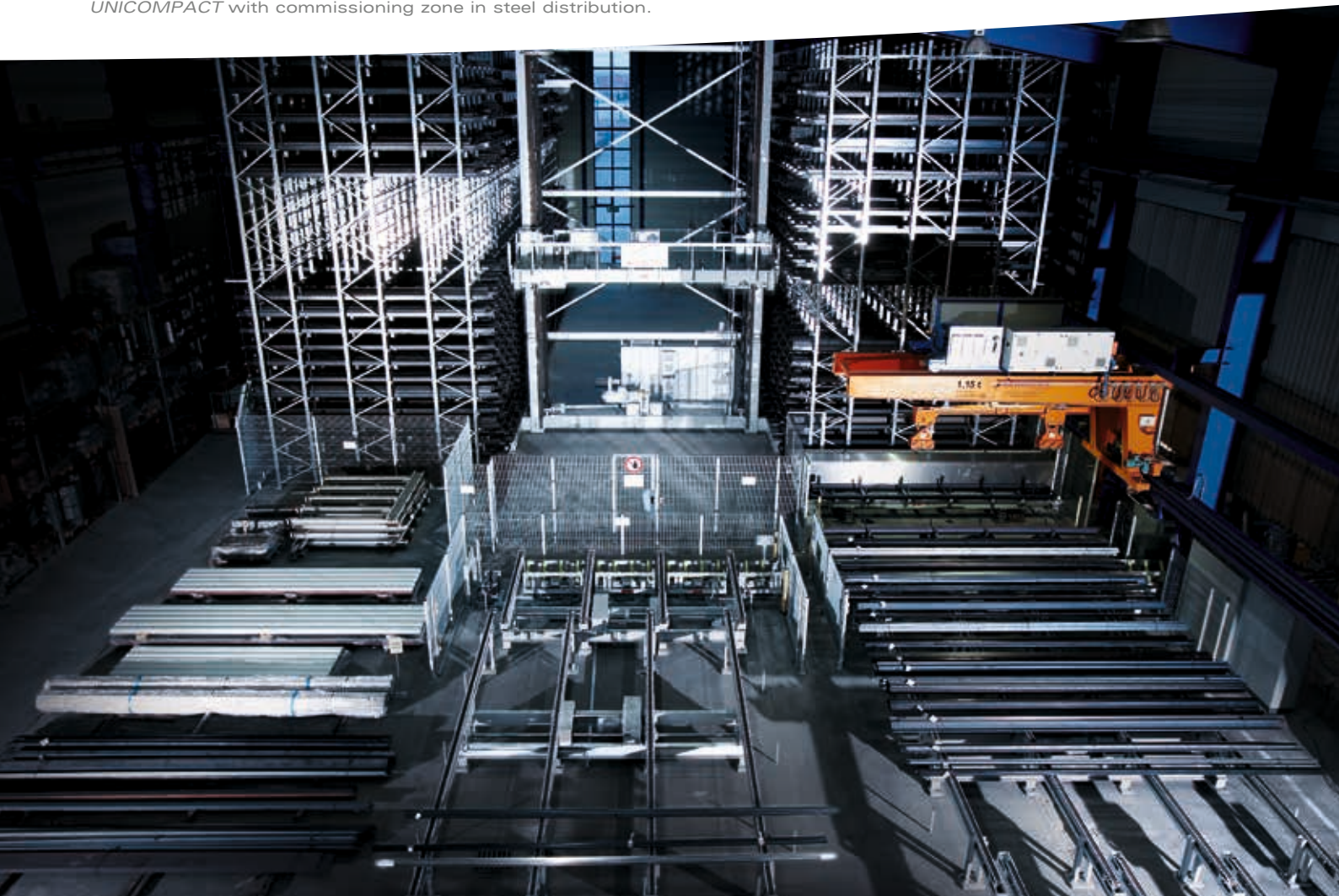
KASTO ensures excellent space utilization with Honeycomb Storage Systems even when installed in existing buildings, for example, in typical steel service centers.

The tight dimensions of the operating gantry crane guarantee that as much space as possible is used for storage.

Space-saving, fast and cost-effective.

Fast delivery of the requested materials to the proper stations is the result of the "Material to Operator" design, a trademark of the KASTO Honeycomb systems *UNICOMPACT* and *UNIGRIP*. An extensive array of work stations increases efficiency of cutting and commissioning tasks for solids or shapes of steel, aluminum, plastic or non-ferrous metals.

*UNICOMPACT* with commissioning zone in steel distribution.





Manual bundle unit with material bundle conveyor (plastic lined).



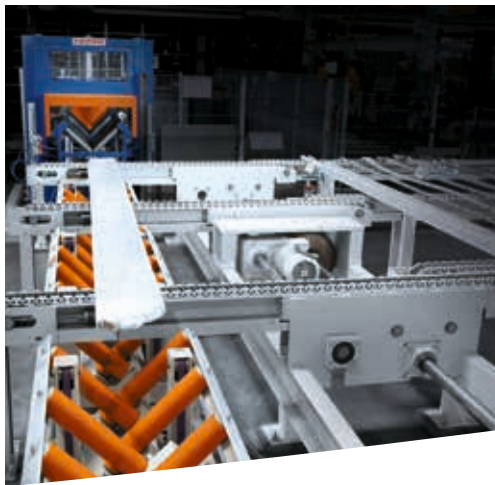
KASTO commissioning unit with magnet system.



Cassette at rotary station with protective cover.



Material bundle conveyor with commissioning unit.



Wrapping machine at commissioning station with rise and fall V-roller conveyor, accumulating conveyor and material bundle conveyor (plastic lined).



Commissioning unit with vacuum traverse for non-magnetic bar stock.

## Extensive Additional Program for Efficient Material Handling.

Reliable, proven components for all applications:

- Material bundle conveyor with or without plastic lining.
- Material troughs and bundle units.
- Commissioning units with magnet, vacuum traverse or crane hook.
- Horizontal or V-roller conveyors for longitudinal transport between material bundle conveyor systems.
- Integration of bundle or wrapping machines.

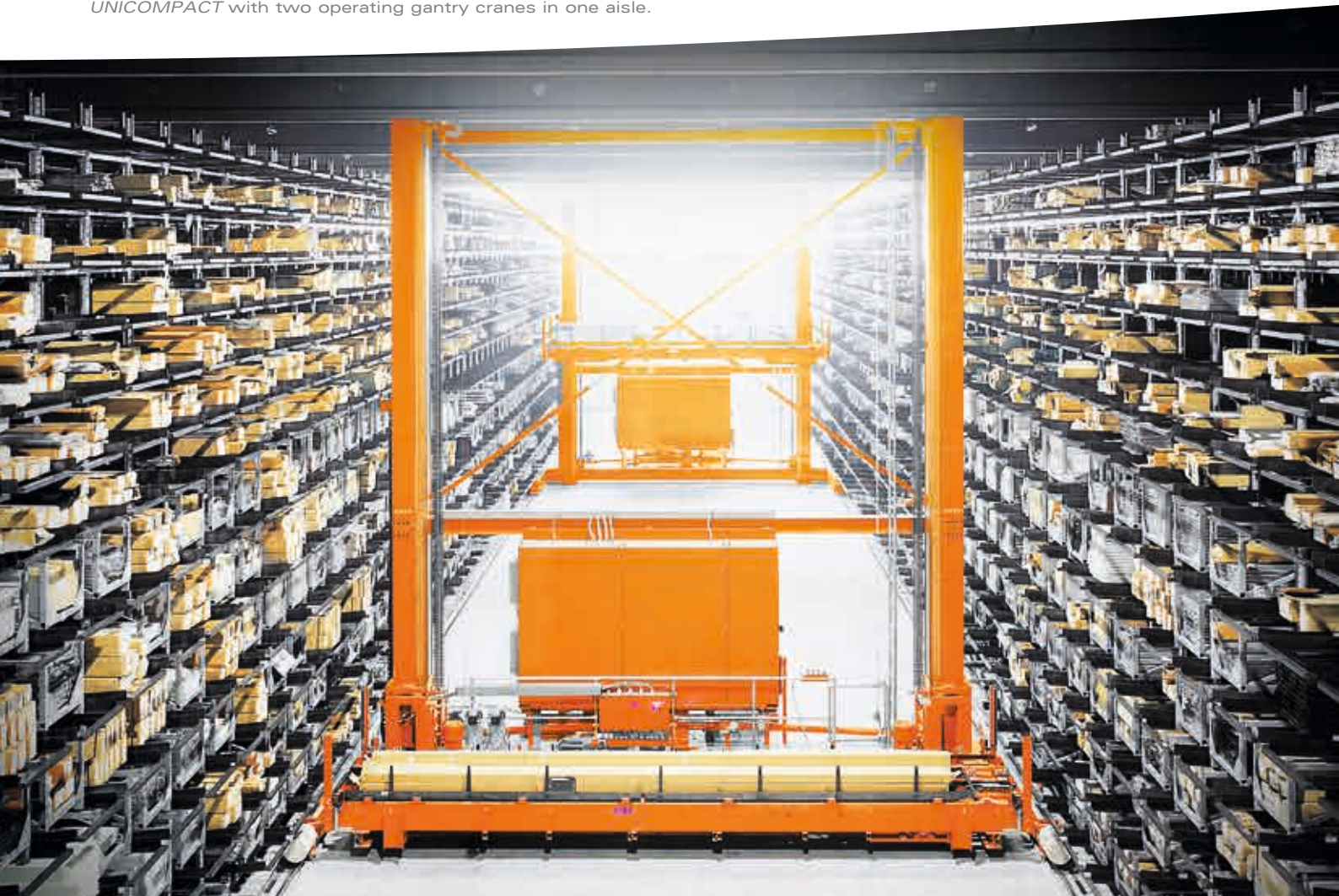
# Configuration Levels in Honeycomb Storage Technology.

Simply unbeatable  
and effective.

Honeycomb Storage Systems are often customized to fulfill special requirements, for example:

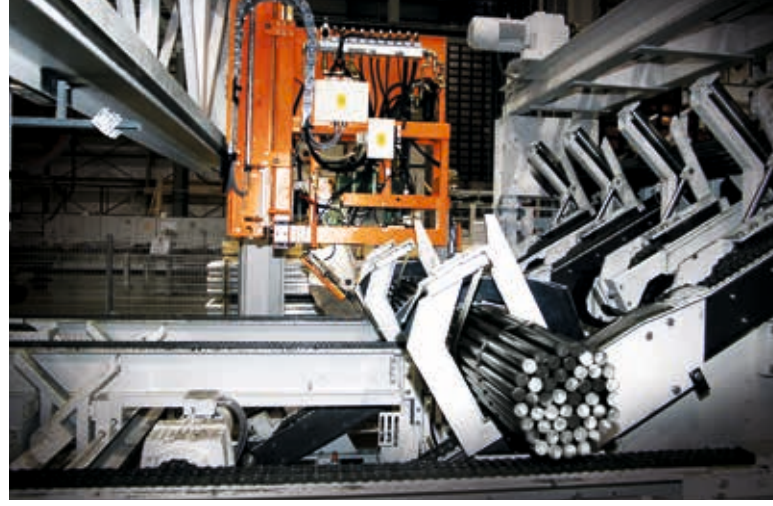
- Systems with more than two blocks.
- Systems with more than one operating gantry crane per aisle.
- Systems with access of several operating gantry cranes to one station.
- Transfer stations for cassette exchange between several shelf blocks.
- Integration of required fire protection units such as sprinkler systems or smoke detectors.
- Longer station exits to extend the cassette buffer capacity or for material transport to other buildings.
- Turn stations to change material flow.
- Fully automatic commissioning: from material removal out of a cassette to a finished bundle ready to ship.

*UNICOMPACT* with two operating gantry cranes in one aisle.





Station over several floors.



Fully automatic commissioning station with bundle unit.



UNICOMPACT with three shelf blocks and two operating gantry cranes.



Station with integrated roller conveyor.

## Customized Solutions.

**“Nothing is Impossible”.**

With hundreds of installed systems, KASTO’s know-how mastered some very special applications. A few examples are:

- Fully automatic, unmanned commissioning of bar stock out of a cassette with automatic bundling, automatic labeling and material bundle conveyor units for highest demands in commissioning.
- Fully automatic loading and unloading of packaged extrusions from a cassette.
- Integration of sprinkler systems when flammable material is stored.
- Fully automatic saw cell with horizontal or vertical bar separation and automatic bar feed into fully integrated sawing machines.

# Honeycomb Storage System with Integrated Saw Cell, KASTO-*sawcell*.

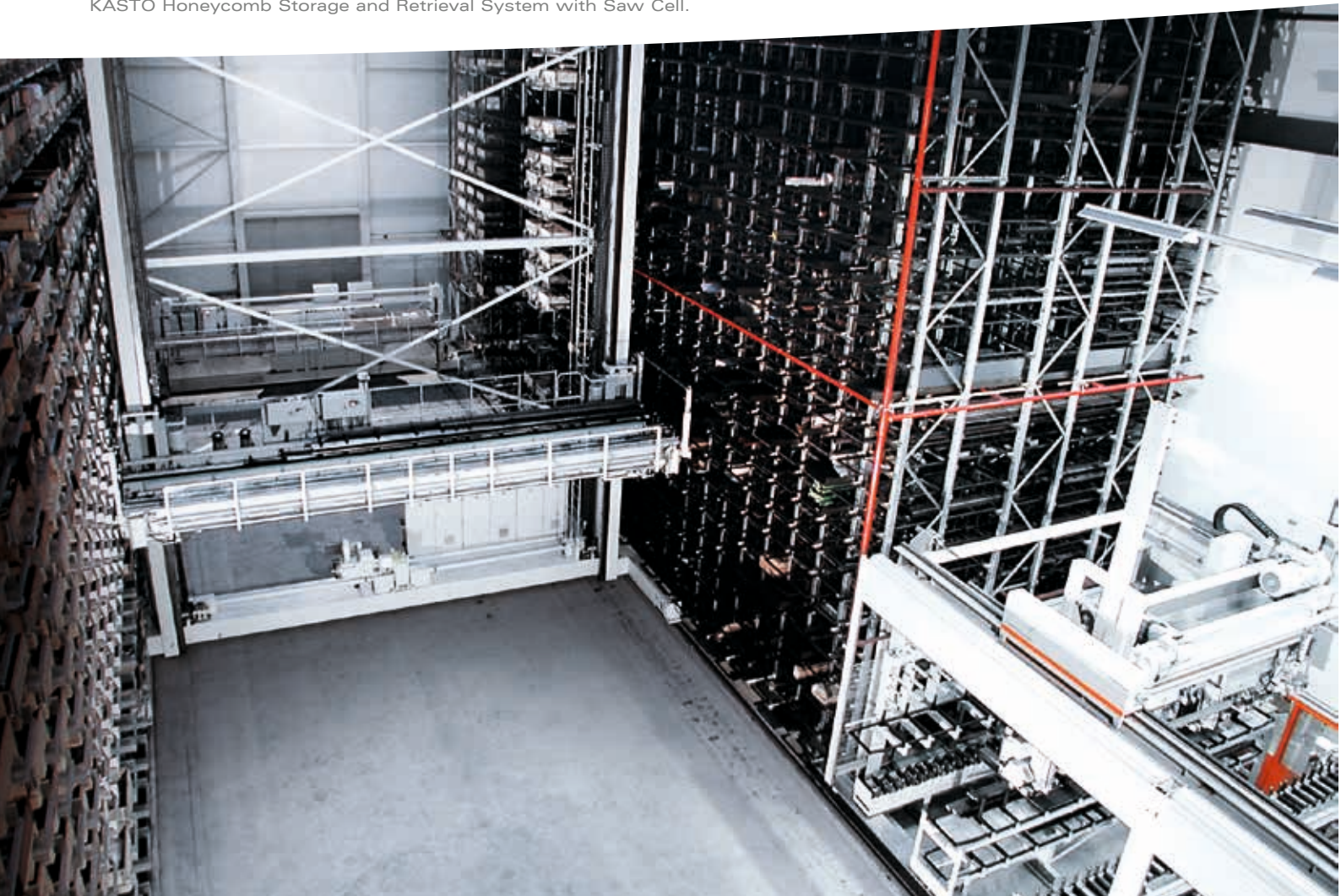
## Sawing, Storing, More.

The highly available operating gantry crane moves standard cassettes to commissioning stations where operators handle full length bars as well as automatic cassettes with vertical partitioning or cantilever arms in the KASTO*sawcell*.

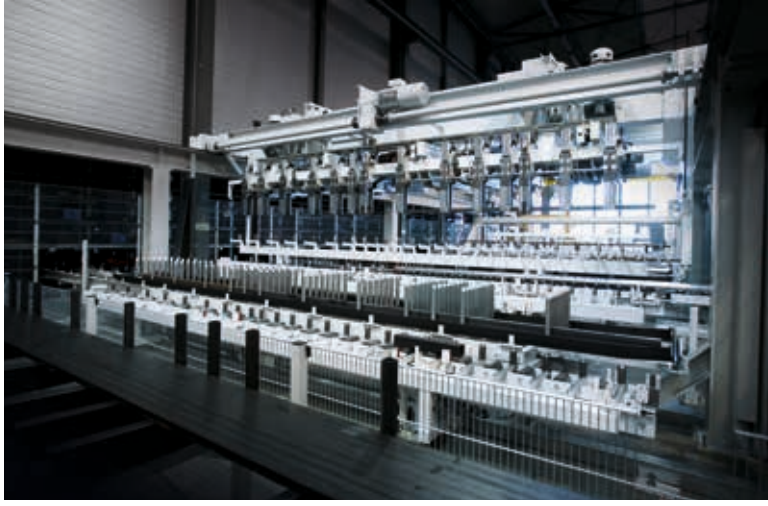
The KASTO*sawcell* manipulator retrieves a single bar from an automatic cassette and delivers it to fully integrated saws. After the cutting process is complete, the re-usable remnant is automatically restored into a bar stock cassette.

The high degree of automation allows unmanned sawing, marking and labeling of cut pieces. A robot, together with container management, can then sort and stack them into different sized boxes, containers or pallets.

KASTO Honeycomb Storage and Retrieval System with Saw Cell.







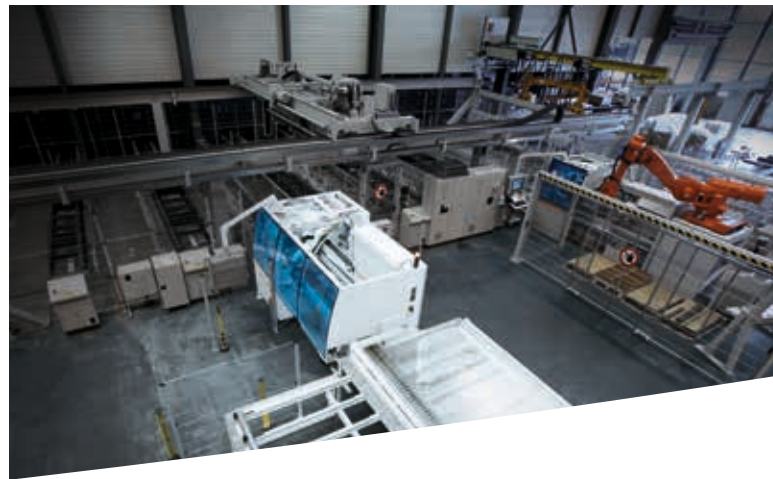
KASTO single bar manipulator with different buffer stations.



View of the Honeycomb steel structure with cassettes for mixed operation (automatic and standard cassettes).



KASTO single bar manipulator retrieving a bar from a cassette from above.



Integrated saw cell KASTOsawcell with UNICOMPACT and two integrated KASTOvariospeed circular saws at a steel distributor.

## Efficient and Economic Sawing from a Honeycomb System in Manufacturing and Distribution.

### **KASTOsawcell:**

- Separation and quick change stations, buffer locations and aligning roller conveyors in different versions.
- Manipulator with fast travel speeds for usable loads up to 4 tons (for example individual bar manipulator).
- Fully integrated saws, KASTOvariospeed or KASTOtec, with cut-piece sorting, robot handling and container management.
- Horizontal and vertical bar separation and bar infeed to fully integrated sawing systems.

# Everything Begins With the Right Storage Location.

## Customized solutions.

In the Honeycomb storage technology, bar stock is moved and stored in load carriers, the so-called system cassettes or pallets.

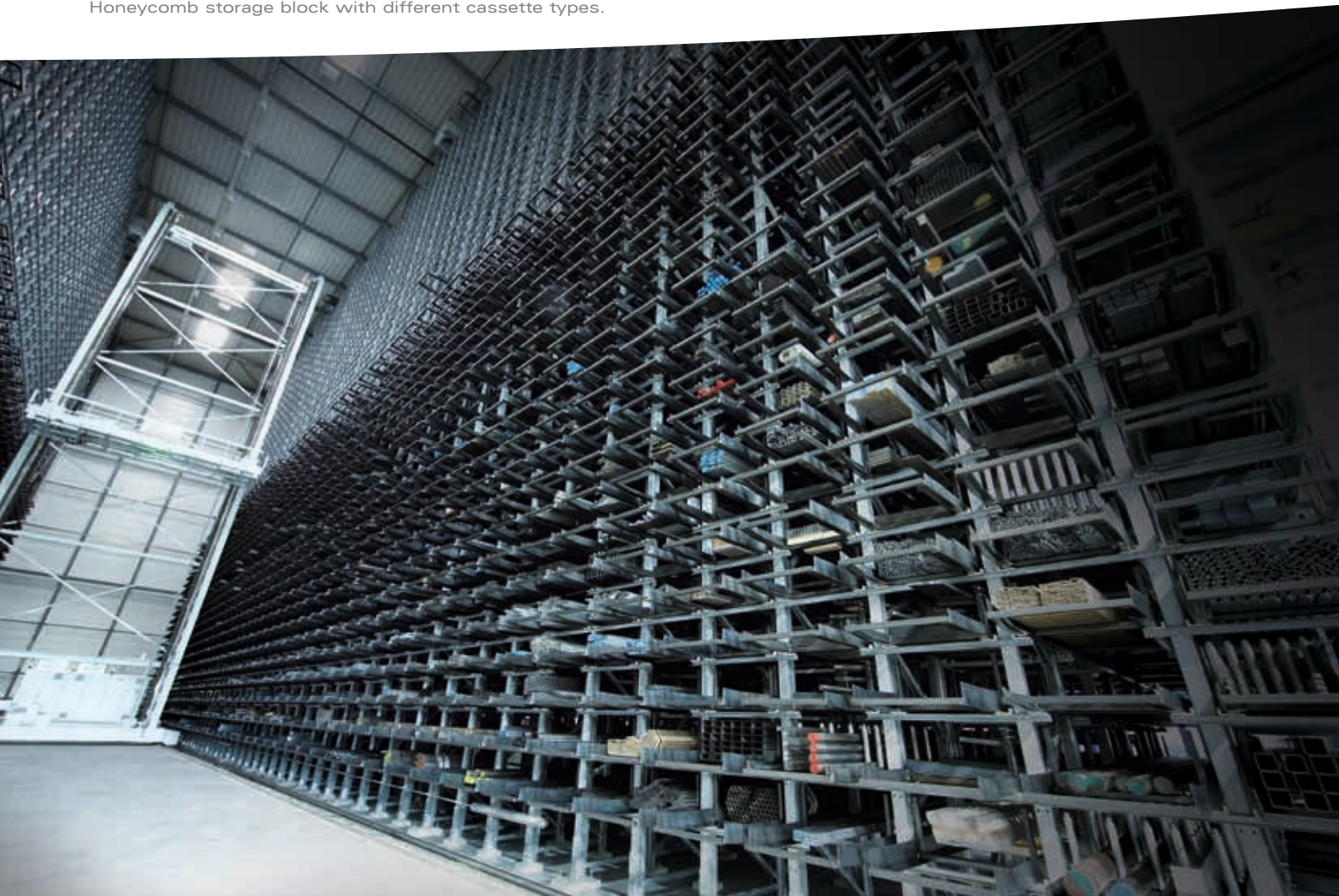
Typically, these suitably sized load carriers are engineered exclusively for the requirements of the Honeycomb Storage System; they are not self-supporting.

Certain industries, however, utilize their own load carriers for their entire logistics (internal and external).

To avoid restoring, those customer's load carriers are stored in the Honeycomb System with or without system cassettes.

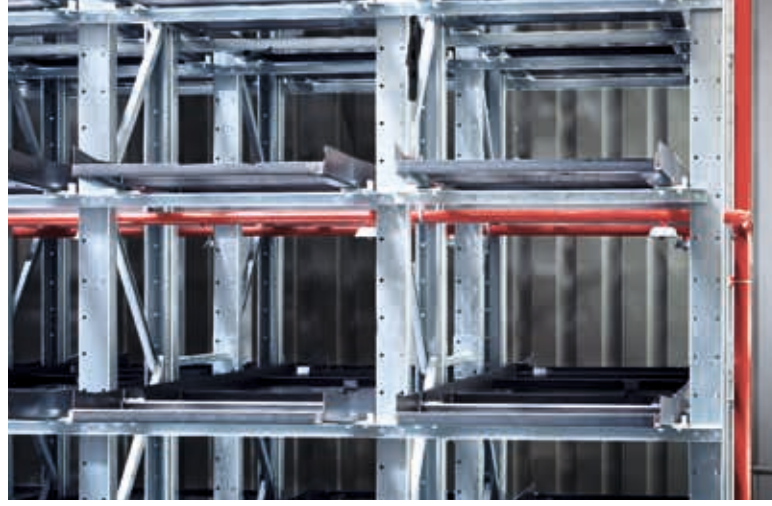
Using customer's carriers without system cassettes requires certain design prerequisites such as the ability to slide and dimensional accuracy.

Honeycomb storage block with different cassette types.





KASTO standard Honeycomb storage cassette on a station.



Steel structure with KASTO slave pallets and integrated sprinkler system.



KASTO slave pallets with customer rack.



Customer-owned bar stock cradle inside Honeycomb steel structure.

## Factors to Define the Storage Location Design.

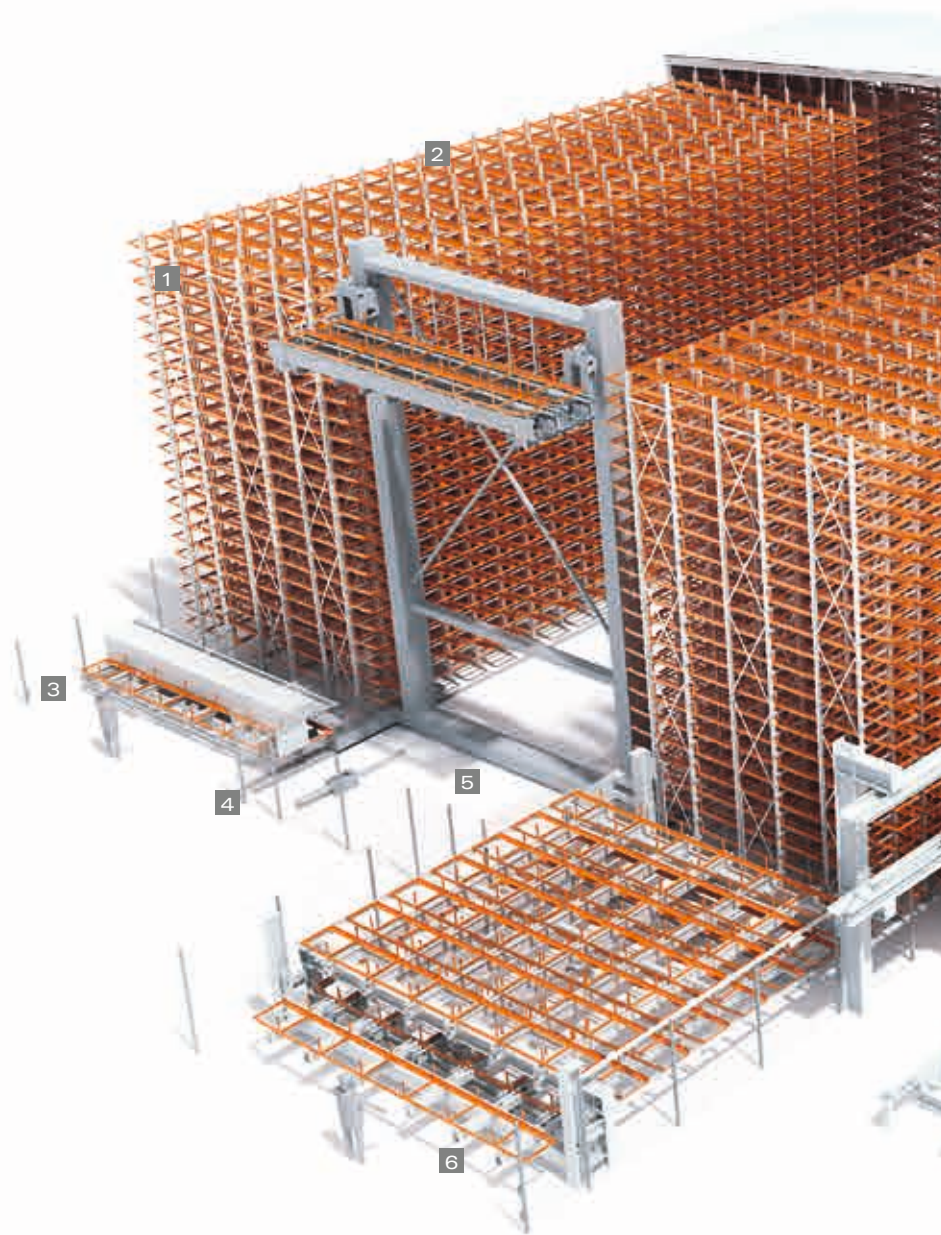
### Function and design decide.

In addition to the constructional design, a main criterion is proper functioning. The dimensions of the goods to be stored together with the following factors decide the size of the storage location:

- Storage location with or without load carriers.
- Design with or without integrated fire protection (i.e. sprinkler, smoke detector, zone formation).
- Differently sized storage locations.

# KASTO Honeycomb Storage and Retrieval Systems – Smart Station Solutions – Custom Designed for All Applications.

- 1 Shelf block
- 2 Cassettes
- 3 Rotary station at front of system with two logical locations
- 4 Rails with end buffer
- 5 Operating gantry crane with two cassette pulling units
- 6 Vertical rotary station with ten logical locations
- 7 Material bundle conveyor with commissioning trough
- 8 Rotary station at longitudinal side with four logical locations
- 9 Commissioning unit with magnet system
- 10 Rotary station at longitudinal side with six logical locations
- 11 Buffer station with six logical locations
- 12 Single longitudinal station, with one logical location
- 13 Shelf end block
- 14 Steel base construction with roof and walls



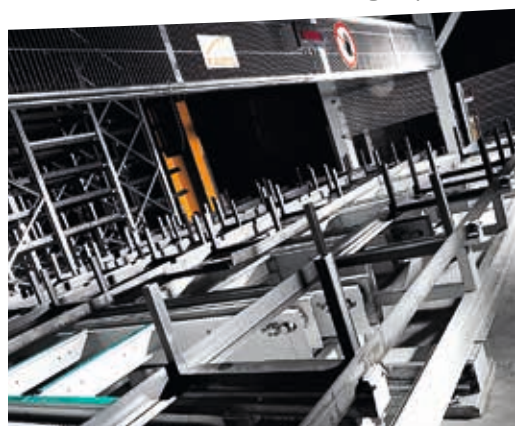
KASTO saws at a buffer station.



Manual access zone at longitudinal storage side.

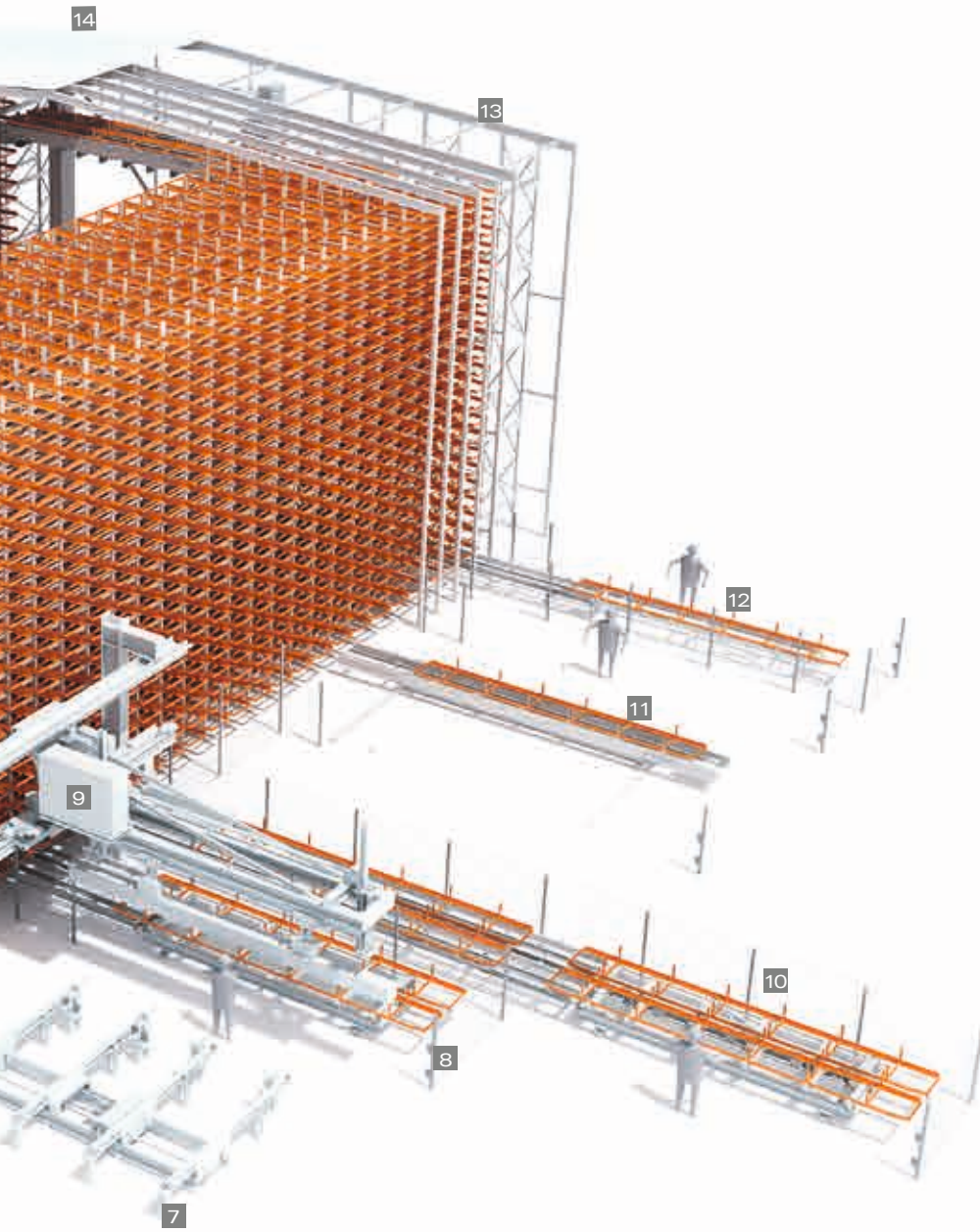


Carousel station at front of storage system.



Buffer station at longitudinal side with 14 buffer locations.





Rotary station at longitudinal side of storage system with protective cover for cassette change during material removal.



Scissors lift station at longitudinal side of storage system with four logical locations.



Rotary station at longitudinal side of storage system with wrapping unit and material bundle conveyor.



Vertical rotary station at front of storage system with ten logical locations.



Rotary station at front of storage system with protective cover for cassette change during material removal.



Input station with lift unit and stop portal for easy storage of customer-own bar stock cradles via forklift.



# Rack Supported Buildings: KASTO Honeycomb Storage System

## Use the advantages.

When planning large, high-rise Honeycomb storage systems, their integration into existing buildings is often not economical.

If high-rise buildings are not possible, putting the system into a pit might be an alternative.

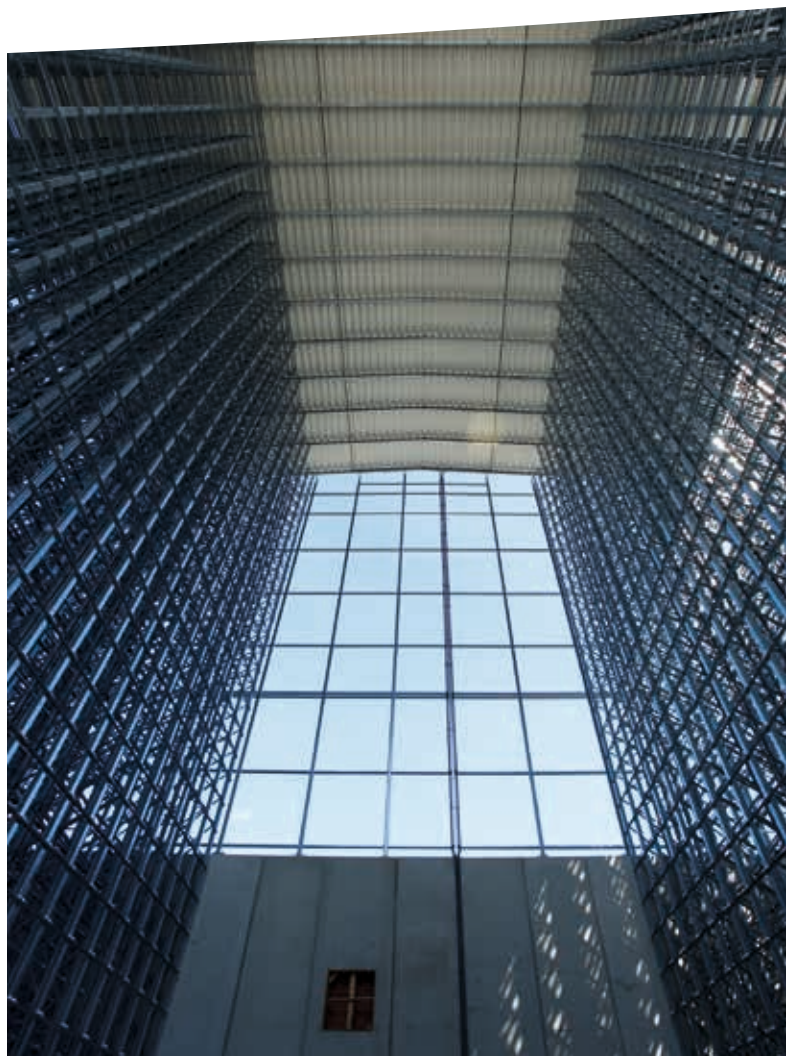
## Go Vertical!

Often, however, rack-supported buildings are designed, where the KASTO Honeycomb supports roofs and walls and fulfills the structural requirements for outer load impact.

If the installation site is located in an earthquake zone, shelf block and foundation are designed accordingly.

The foundation has to be designed to match the existing storage loads and soil conditions.

*UNICOMPACT* rack supported building during installation.

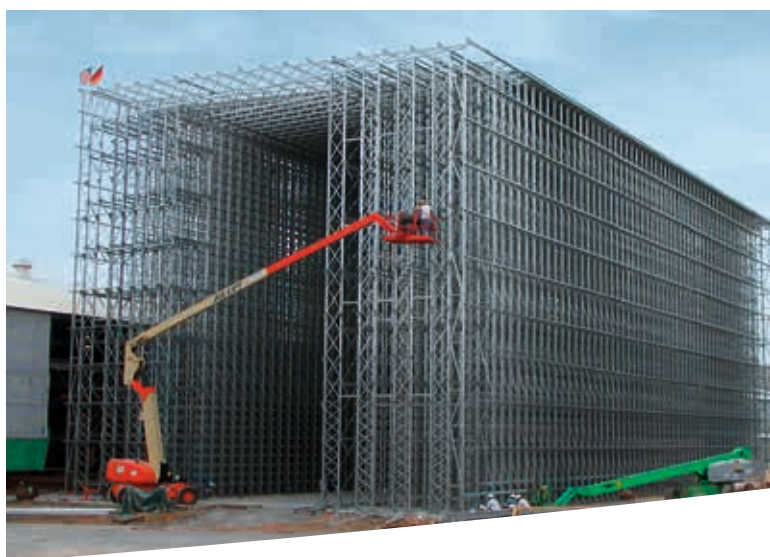




UNICOMPACT shelf block with roof and wall connection.



Honeycomb storage system in a pit.



Completion of a Honeycomb steel structure with roof and wall connection.



Roof connection of Honeycomb shelf block.

## Use KASTO Planning Expertise.

### Consultation and analysis.

KASTO intensely analyzes your start situation and works together with you on an optimum industry specific solution. To reach the optimum solution, the following planning basics have to be taken into consideration:

- Favorable material and manufacturing flow, linked with the necessary information flow.
- Ergonomic working conditions are the key for an effective and long-term efficiency.
- Excellent space planning together with the appropriate determination of building height are an absolute necessity for cost and production reasons.
- High flexibility in construction systems and facilities such as operating gantry cranes, stations and periphery are prerequisite to allow later modifications to adapt to changes in usage or technical and economical developments.

# KASTO Honeycomb “DUO Systems” to Store Bar Stock and Sheet Metal.

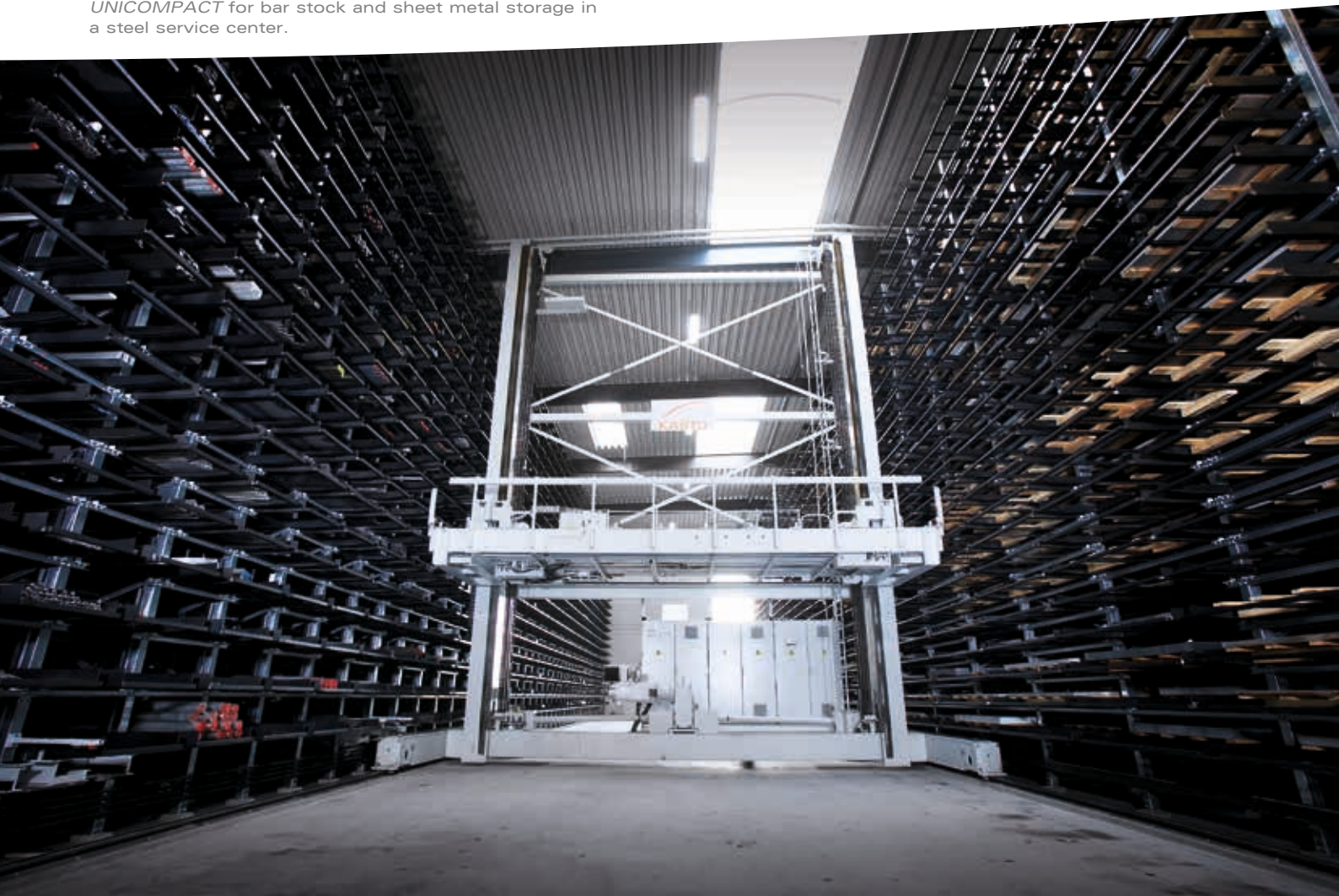
Many individual custom uses.

Honeycomb Storage Systems that store bar stock, sheets and the cassettes and are moved with the same operating gantry crane, are called “DUO systems.”

Storage locations, stations and the operating gantry crane can be tailored to handle different storage goods and are well suited for other heavy and bulky goods.

Due to extremely different storage location widths, the proven KASTO Random Access Principle is used when handling bar stock, while the dedicated location technology is used for sheet metal as a dual storage strategy. KASTO/vr controls all.

*UNICOMPACT* for bar stock and sheet metal storage in a steel service center.







Loading one end of a double deep sheet pallet using a sheet lifter.



View inside a "DUO system" for bar stock/sheets.



Honeycomb system for bar stock/sheets with fully automatic sheet commissioning system.



Sheet turning machine for semi-automatic unpacking of sheet metal packs.

## Extensive Accessories for Effective Sheet Metal Handling.

### Increase efficiency.

The options for sheet storage confronted KASTO with some interesting challenges:

- Loading of cassettes via special crane technology.
- Combined shelf blocks for bar stock and sheet metal storage.
- Sheet metal turning machines for economic and damage-free removal of wooden skids from packs before the space-saving storage into a Honeycomb Storage System.

# KASTO Honeycomb Systems for Sheets and Bulky Goods.

## Dedicated location storage for sheet metal.

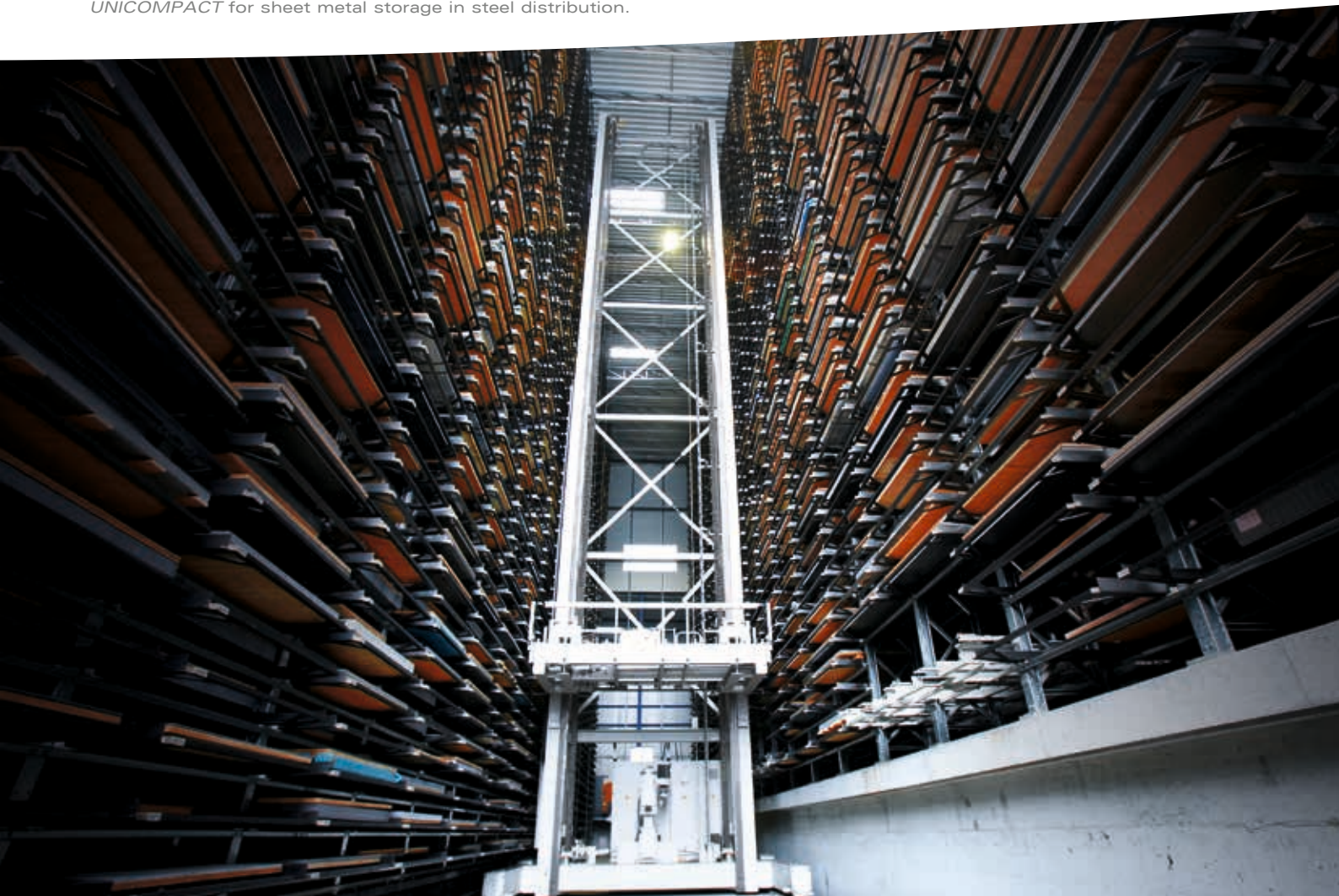
Sheet Honeycomb systems are fundamentally designed the same ways as bar storage systems.

Since the sheet pallets are wider than the bar stock cassettes and the operating gantry crane can only have one pulling unit, a dedicated location system is used.

Sequence of a double cycle with KASTO dedicated location technology:

- Operating gantry crane pulls the already commissioned cassette from a station.
- Operating gantry crane travels back to the original location of the cassette and pushes the cassette back in the shelf location.
- Operating gantry crane moves to the shelf location of the next commissioning order.
- Operating gantry crane pulls the requested cassette out.
- Operating gantry crane travels with the cassette to the station and pushes the cassette onto the station.

*UNICOMPACT* for sheet metal storage in steel distribution.





Rotary station with fully automatic sheet metal commissioning.



Fully automatic sheet metal manipulator.



Fully automatic, integrated wrapping unit with conveyor system.



Rotary station with storage table for sheet metal packs to be loaded with forklift or crane.

## Streamlining: Fully Automatic Commissioning of Sheet Metal.

### Fully automatic manipulators.

The periphery of the sheet metal Honeycomb storage system is extremely important due to the comparably large dimensions and the often easy to damage surface.

Depending on the tasks on hand, the loading and unloading stations of sheet metal storage systems can be supplemented and designed to handle and separate sheets automatically. The computer controlled sheet metal commissioning unit adjusts automatically to different sheet sizes and sheet metal qualities.

### Additional equipment.

Vacuum manipulators, fanning magnets for oiled sheets, air blowers to remove the thin paper between the sheets, paper shredders, pallets and cartons are available to separate different sheet metal types, bundle units and conveyor systems and are designed for a fully automatic, flexible and computer controlled commissioning sequence all the way to shipping.

# KASTO/ivr: Control and Management Software for Material and Data Flow.

## Reliable order processing with individual software

KASTO/ivr stands for flexible and time-proven standard software as well as for complex logistical solutions. Main software modules are storage location management, the material master data and order management. Modern hardware concepts and software written in-house by KASTO, using Windows OS, guarantee easy, economic and reliable operation of the systems. To optimize the performance, especially with complex storage systems, state-of-the-art simulation tools can be used.

## Industry-independent interface solutions.

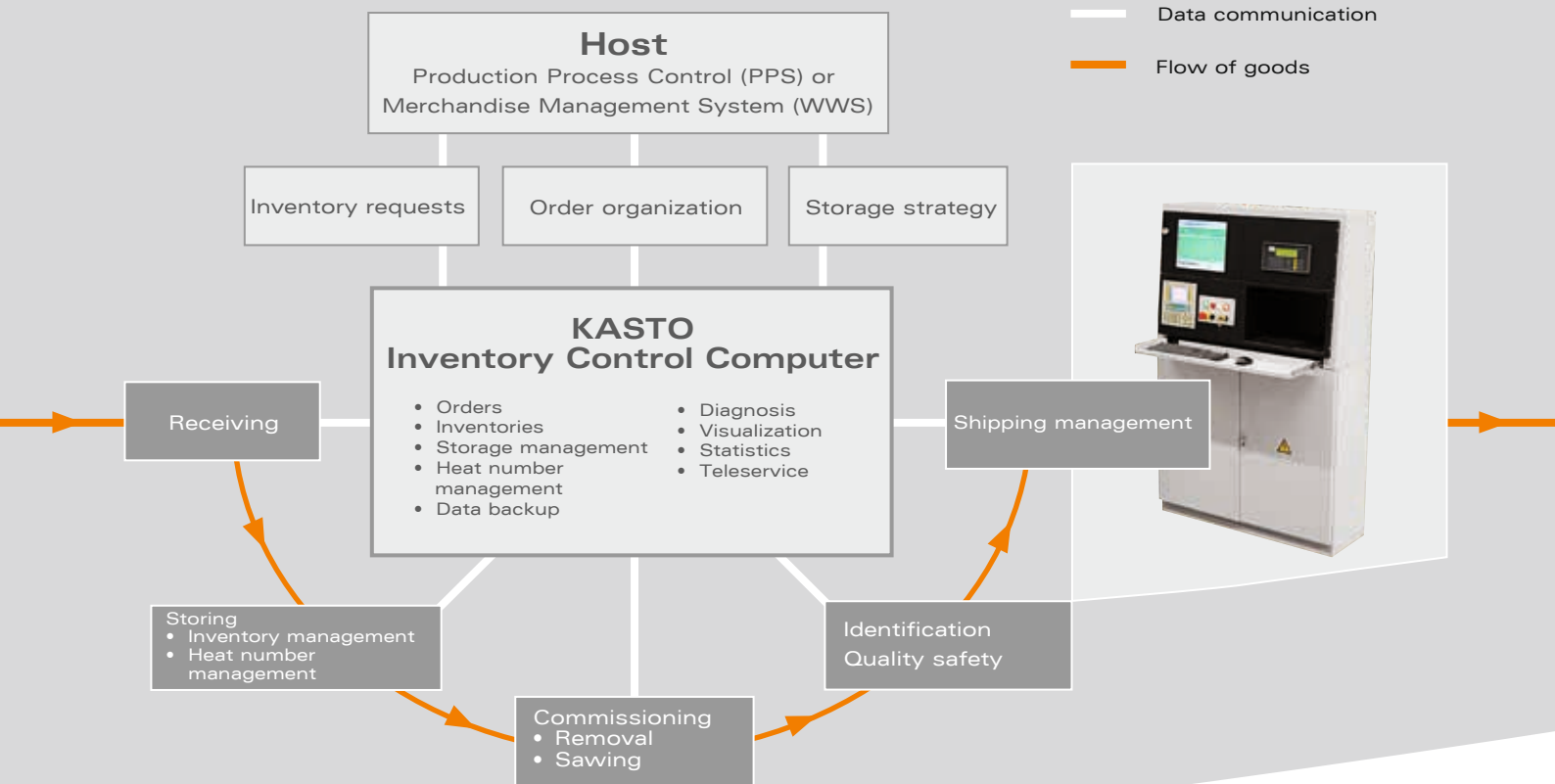
KASTO also links your storage system with the logistics of your inventory management or manufacturing control. An interface of the warehouse management modules of SAP R/3 or other solutions is standard. The main advantages of a computer interface are: Fast paperless data availability at the system; economic order processing and updated and accurate order and inventory information at any time.

## Advantages of the self-developed software:

- Highly customizable.
- Standard software with high flexibility during project execution.
- Customer is partner from start to end of a project.
- Individual project specifications.



# KASTO Inventory Control Computer: Complete Transparency for All Storage Cycles.



Transparency for highest availability:  
Data exchange within customer-owned systems.

KASTO develops the appropriate software in-house according to customer's applications based on proven industry components. In detail, the KASTO-EDP concept contains the following modules:

- High performance hardware.
- Automatic order processing.
- Material master data, inventory control, perpetual inventory.
- WINDOWS Operating system.
- SQL database.
- Integration of inventory management and manufacturing control systems, such as SAP R/3, AMETRAS, WILKEN, NAVISON.
- VPN-diagnosis via internet and teleservice.
- Visualization of system status.
- Maintenance intervals.
- Heat number management.
- Interface software to processing machines, such as sawing and laser technology, robots, manipulator.
- Data backup.
- Radio terminals, touch screen.
- Optimized process technology, such as storage and manufacturing strategies, cutting optimization.
- Large number displays.
- Integration of weighing scales.
- External or virtual storage as well as side loader guidance systems.
- Highest system availability due to stand-by concepts.

# UNICOMPACT with the KASTO Random Access Principle Provides a Distinct Time Advantage.

## Automatic Honeycomb system based on the "Material to Operator" principle

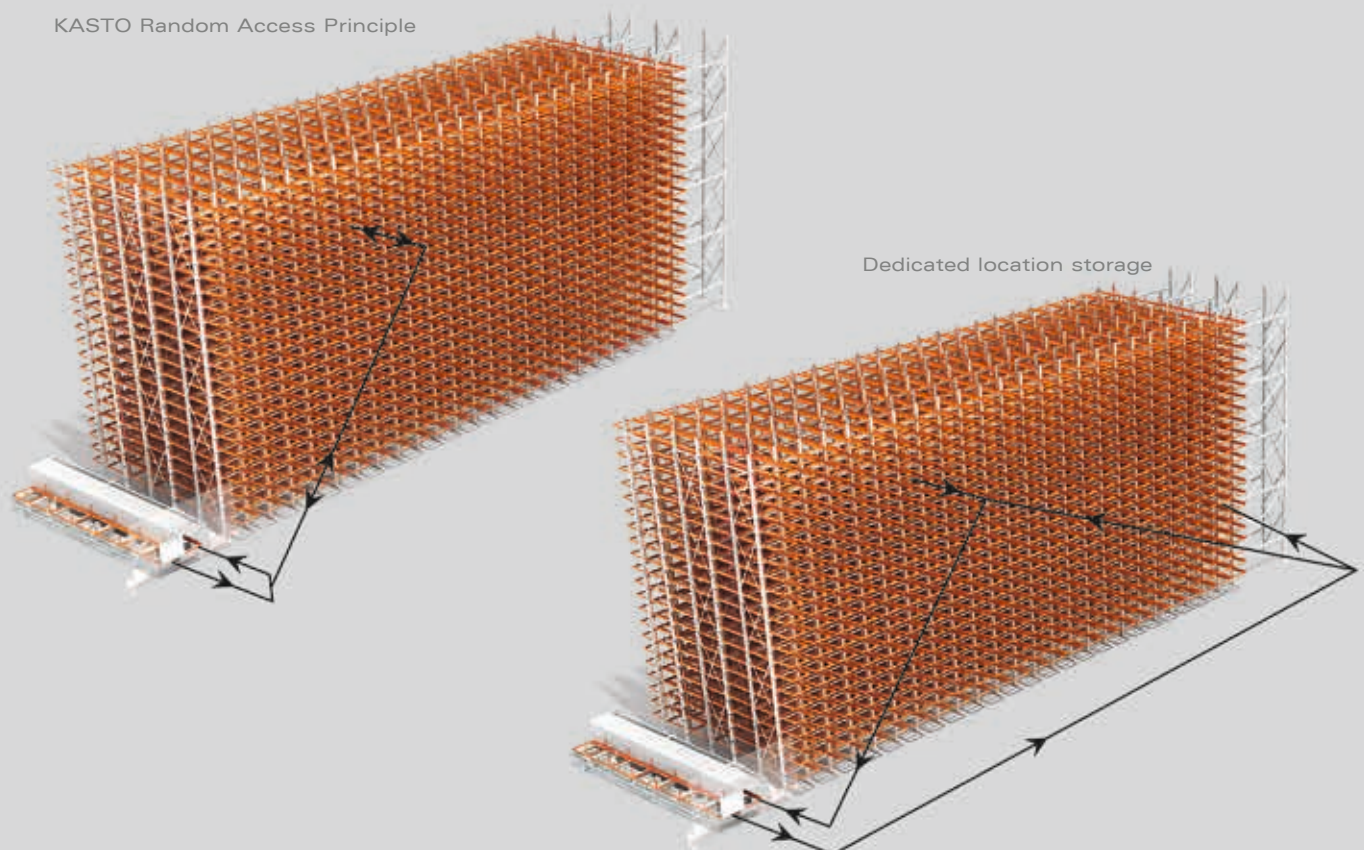
Automatic Honeycomb operating gantry cranes are controlled by the KASTO inventory control computer. The KASTO/ivr controls all crane movements such as pulling cassettes out of shelves, moving to a station, and restoring into the shelf block. The operating gantry crane usually has two pulling units to do double cycles based on the "KASTO Random Access Principle" in chaotic storage systems.

A double cycle, based on the KASTO Random Access Principle, works as follows:

- Operating gantry crane pulls processed cassette from station and pushes new cassette onto station at the same time.
- Operating gantry crane moves with return cassette to the shelf location of the next to be processed cassette and pulls it out.
- Operating gantry crane moves one cassette width aside and pushes the returning cassette into the just emptied shelf location.
- Operating gantry crane moves with the 'new' cassette to a station, pushes the new cassette onto the station while pulling the 'old' cassette from the station at the same time.

The KASTO Random Access Principle is based on a chaotic storage technology, where any cassette can be stored in any shelf location. This storage strategy is reliably controlled by the KASTO/ivr.

Medium double cycle time with dedicated location technology compared to medium double cycle time with chaotic storage technology (KASTO Random Access Principle).



Technical Data			<i>UNICOMPACT bar stock</i>	<i>UNICOMPACT sheet metal</i>	<i>UNIGRIP bar stock/sheet metal</i>
Max. loading capacity per location	t	(lbs)	0,5-8 (1,102-17,637)	0,5-8 (1,102-17,637)	0,5-3 (1,102-6,614)
Max. system height	m	(feet)	bis 25 (up to 82)	bis 25 (up to 82)	bis 12 (up to 39)
Usable storage length	m	(feet)	3-15 (9.84-49.2)	3-15 (9.84-49.2)	3-8 (9.84-26.2)
Usable storage width	mm	(inch)	520-2.360 (20.47-92.9)	1.000-2.360 (39.4-92.9)	520-1.500 (20.47-59)
Usable storage height	mm	(inch)	60-1.500 (2.36-59)	60-1.500 (2.36-59)	60-1.500 (2.36-59)
Lift speed	m/min	(feet/min)	24-70 (78.7-229.6)	24-70 (78.7-229.6)	24-70 (78.7-229.6)
Longitudinal travel speed	m/min	(feet/min)	80-240 (262.4-787.2)	80-240 (262.4-787.2)	80-240 (262.4-787.2)
Pulling speed	m/min	(feet/min)	60-80 (196.8-262.4)	40-80 (131.2-262.4)	60-80 (196.8-262.4)
OGC double cycles / hour	cycles		40-65	30-65	30-65
Rack-supporting			Option	Option	Option
KASTO Inventory Control Computer			Standard	Standard	Standard
Interface to HOST computer			Option	Option	Option
Fully integrated production systems			Yes	Yes	Yes

Special dimensions upon request

## Service is the Key: High Availability with KASTO.

### Safe storage logistics.

The long-lasting efficiency and well-known reliability of KASTO-storage systems are not a coincidence but result of a well thought-out service concept.

### Consulting, Hotline.

Specialists in control and mechanics are available for consultation in our service center.

### Remote diagnosis.

KASTO-tele service allows a direct online connection to a system. This shortens reaction and down times and increases and secures productivity, reduces service costs and minimizes repair hours.

### On-site service.

KASTO provides professional on site assistance by our specially trained and qualified technicians guaranteeing short reaction times and minimizing travel costs.

### Spare parts supply.

We provide immediate deliveries per direct courier. If the order is received by 4 pm, we will ship same day. Since we have more than 35.000 different spare parts in stock, we are able to ship almost all parts immediately.

### Service contract.

A KASTO-service contract ensures regular inspections of the system resulting in highest availability and guarantees continuous online diagnosis as well as access to a service technician within the shortest time!

# The Complete KASTO Program: Economic Sawing and Storing of Metal.

Expertise right  
down the line.

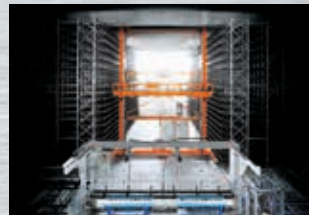
For over 170 years, KASTO has been recognized for quality and innovation, and offers a complete range of metal cutting saws, as well as storage and retrieval systems. Thanks to an ongoing development of new technologies and constant optimization process of machine concepts, KASTO has achieved the status of market leader in sawing and storing of metals.

KASTO's  
Sawing Machines.



From the basic hacksaw to the high-performance automatic bandsaw capable of economically processing bar stock, blocks or plates of all grades, KASTO has the best solution for every challenge: Universal bandsaws and circular saws for light and medium applications, hacksaws employing the pushing-arching-cutting motion originated by KASTO, and production bandsaws and circular saws designed to cut medium to difficult materials.

KASTO's  
Storage Systems.



Rapid access, optimum space utilization, clear and accurate view of stored inventory – KASTO storage systems' excellent features. And there's more! Fully automatic sawing centers, cantilever bar and sheet metal storage systems or cassette storage and commissioning systems, combined sawing and storage systems with integrated inventory control computers. As a one-source supplier, KASTO delivers the complete system, both hardware and software.

KASTO's  
Service.



KASTO's comprehensive service program includes everything: from commissioning and training to maintenance support, service contracts, readily available spare parts and on-site service. KASTO's service incorporates individual consulting and immediate support with well-qualified teleservice. And of course, KASTO service is available worldwide.



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