



i-Cube™

3D DYNAMIC BUFFER



2018 V1.0

Damon
Damon Simplifies Logistics

APPLICATIONS

The three dimensional dynamic storage system i-Cube designed to store and handle an extensive range of products and is applicable in various environments and industries as fastmoving consuming goods, electronics, fashion, automotive and tires. All based on special functional needs.

DISTRIBUTION

- Case and item picking in retail and E-commerce
- Consolidation buffering

MANUFACTURING

- Intermediate buffering
- Assembly buffering
- Finished product storage

POSTAL

- Pre sorting buffer
- Route consolidation

MODULAR UNIVERSAL DESIGN

STORAGE TYPES: Tray 600x400 mm
Tray 640x425 mm
Tray 600x800mm
Tote 600x400x various heights
Stacks of totes

Special types:	Size on demand
Max product height:	600 mm Max
Max weight incl.tray:	50 kg Max
Max size i-collector:	15x15x12m Max (L x W x H)

ICS - CONTROL SOFTWARE

The included special i-Cube PC Control Software manages the registration of trays on dynamic locations in the system and provide an optimal choice of algorithms for moving trays in and out the system.

The software has an interface manager which connects to all type of other systems easily (f.e. ERP/WMS, WCS, terminals, remote control, HMI, Android/Mac)



MACHINE CONTROLS CONCEPT

The mechatronic modular design offers a high level of system reliability and maximum flexibility. HMI and remote control are provided to facilitate ease of operation and fast recovery procedures.

PLC	Lenze
Network:	Ethernet
Fieldbus:	Ethercat
Servo drives:	Lenze

GENERAL DATA

Main voltage

China:	380V, 50Hz+PE
Europe:	400V, 50Hz+N+PE
USA:	480V, 60Hz+PE
Control voltage:	24VDC
Installed power:	50 kVa (first estimate)

Environment

Min temperature : 0 degrees Celcius
Max temperature : 45 degrees Celcius

CONFIGURATIONS

- Plug and play module with single or double devices
- Single or double depends on required capacity
- Transfer devices have one to three tray positions
- Vertical pitch is max product height +130 mm
- Horizontal pitch is tray length (lsl) + 140 mm
- Split level i/o
- I/o system works in a closed tray loop
- Storage strategy can be organised and/or random
- Tracking and tracing of trays by barcode or tags
- Cycles of batch in-and output and / or mixed in and batch
- Out are possible

OPTIONAL

- Automatic inbound and outbound (i/o) connection with agv, transport trays between systems by agv
- Automatic tray loading and unloading
- Interface with intelligent palletizing software (mixed palletizing and packing shipping cartons)
- Remote observer and - dashboards
- Coldstore

UNIQUE SELLING POINTS

- Not only an automatic buffer, also an intelligent sequencer
- High storage density
- Easy size adjustment to fit in any existing building
- Proven technology and simplicity
- Low cost of ownership



STANDARD SIZES AND CAPACITIES (trays/hour)

Tote Dimension	600x400x300mm		25KG per Tote		
Channel depth(z)	6		12		18
Columns(x)	12	18	12	18	18
Locations(storage)	1500	2250	3000	4500	6750

RBS through put					
RBS	300	275	250	230	200

OBS through put					
Batch IN and OUT	500	480	500	480	480
Mixed IN/ Batch OUT	350	340	350	340	340

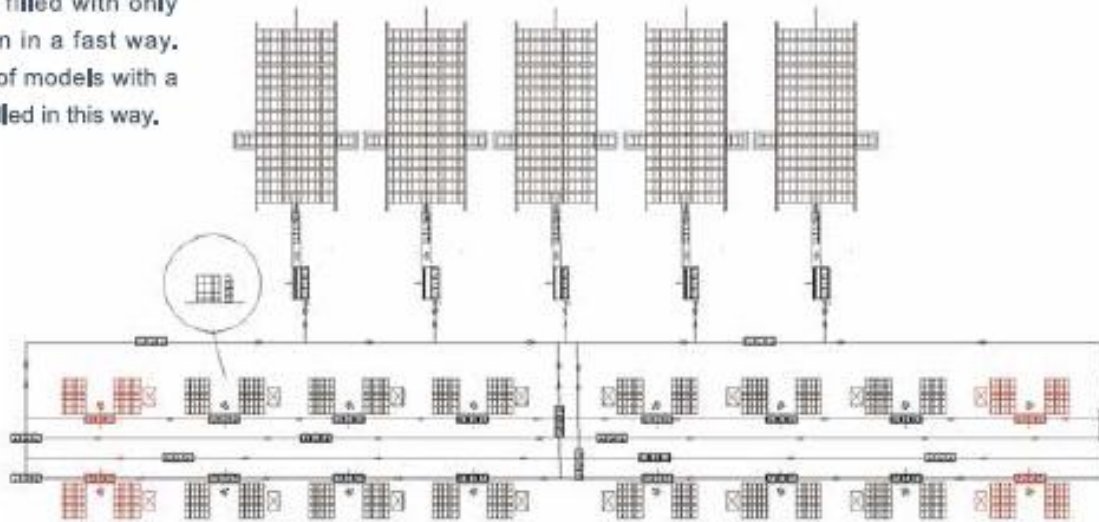


CONCEPT FASHION ITEM PICKING

Automatic storage of cartons with items on trays stored in i-Collectors. Trays will be sorted by model in the i-Collector lanes. Picking is done at decentral located stations. AGV's bring special picking racks in which SKU of models are stored to these picking-packing stations.

At the picking station orders will be picked batchwise. The picking racks with Trays will automatic be loaded and unloaded at the I/O loop of each i-Collector.

For efficient picking out of the racks the i-Collector is capable to organise the trays needed for a pick station in separate lanes, so racks can be filled with only Trays of one pickstation in a fast way. Especially the products of models with a low turn over can be handled in this way.



SYSTEM

- 5 i-Collectors total 2.000 lanes and 30.000 Tray locations, type Organized Buffer System [OBS]
- Tray dimension 640x425mm, SKU cartons on top of tray
- 32 AGV's to move mobile picking racks to pick- pack and replenishment stations
- 40 Mobile picking racks
- 12 - 16 Pick/ Packstations for Pick to Light batchpicking
- Floorspace about 2.000 m²
- Height 12 mtr.

FACTS

- 4.500 SKU 600 to 800 Models
- 300 - 400 Store Deliveries a day
- 5.000 Ecom Orders a day, 1.500 return orders a day
- 75.000 to 85.000 lines a day
- Average 1.90 Piece per Line



BENEFITS

- Optimal usage of floorspace
- Efficient zone picking
- Easily Integration Ecom flow
- Modular and scalable storage and simple AGV use
- Simplicity of the system
- High productivity order pickers
- Pay Back less than 3 years
- Low cost of ownership

SYSTEM DESCRIPTION

The customer needed a buffer system in a separate chilled store between the production area of meat bowls and the packaging despatch area. Blanc meat bowls (sealed without a label), not yet assigned to a specific customer order, are stored in the i-Collector.

For the major part the production is done by forecast and therefore no longer order related. During the day the forecasted quantities are efficiently arranged in the i-Collector. In the afternoon the forecast for the next day will be produced. In the morning the articles will be produced of which the amount was too low forecasted according to the effective ordered volume. Through this method the production is more evenly and less chaotic which gives a big advantage to the productivity.

The meat bowls are stored in a highly efficient way on trays. On demand the trays come out of the i-Collector towards robot pickers. The needed bowls for the order are picked from the trays completely and the partially filled trays are brought back in the i-Collector, waiting for the next order.

In this way a specific mixed customer order can be very quickly delivered to the outbound despatch area.

FACTS

- Max. weight on one tray 10 kg
- 6 different bowls with 18 different heights
- Capacity 385 trays IN & OUT p/hr
- In working 16 hours p/day and 5 days p/week
- Temperature from 0 up to +2 degrees Celcius



SYSTEM

- 1 i-Collector total 451 lanes and 1.804 Tray locations, type Random Buffer System [RBS]
- Tray dimension 800x600mm (double Transfer Device)
- 4 Trays in one lane
- 4 trays on the Transfer Device
- i-Collector dimension:
 - L 11,7 x W 5,6 x H 7,7 mtr
 - Floorspace about 66 m²



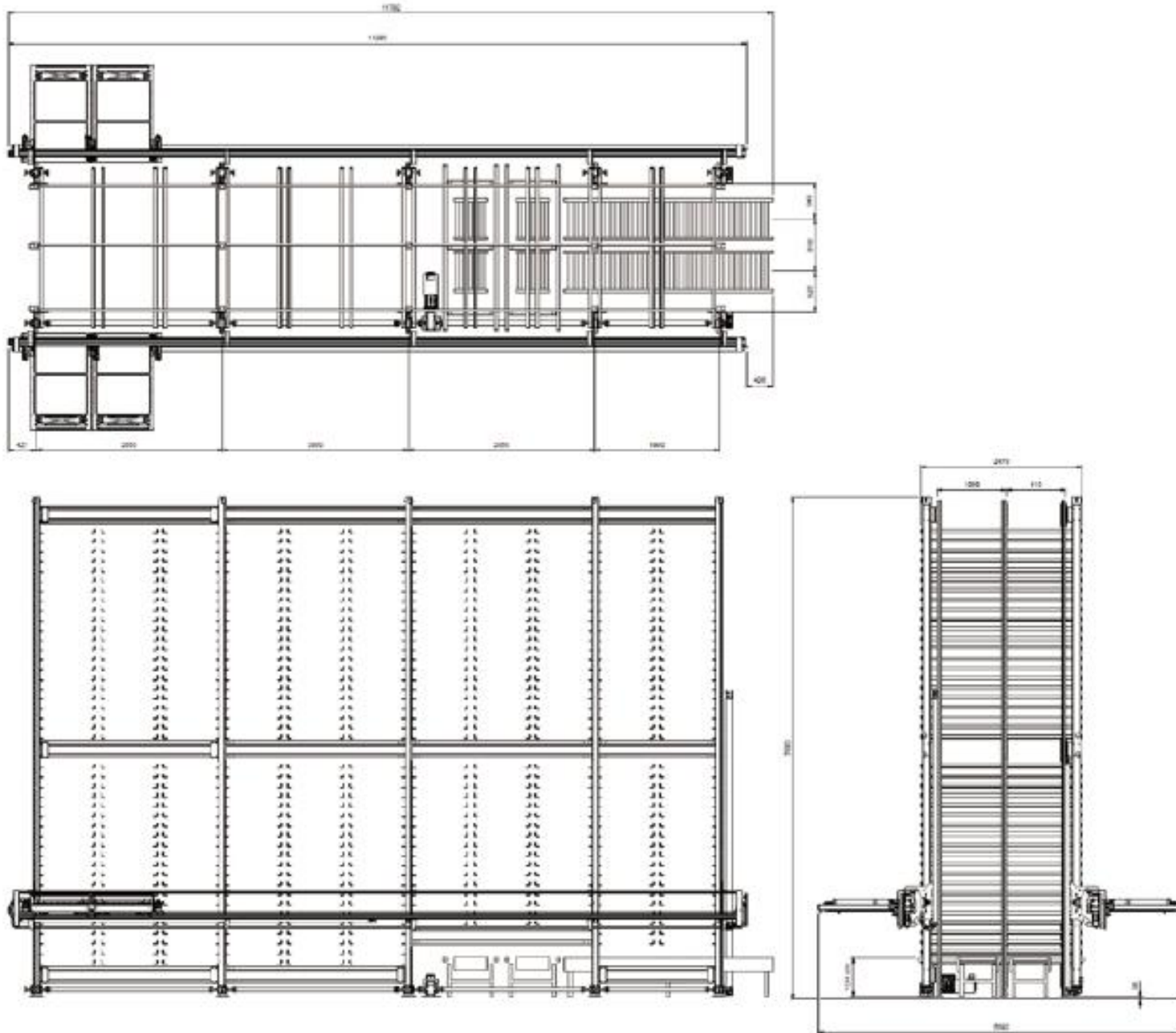
BENEFITS

- Most optimal usage of floorspace
- Proven Technology
- Modular and scalable storage
- Simplicity of the system
- High productivity
- Pay Back less than 3 years
- Low cost of ownership



MEAT PRODUCTION BUFFER

SYSTEM DESCRIPTION



Big Data Services for Industrial Machines

SMART SERVICE & SUPPORT

Whenever a new i-Cube installation goes in production i-Cube BV **always** stays **fully** committed to provide you the best return on investments (ROI) as possible.

Parallel to the development of the i-Collector we developed our own a special smart service & support concept around it, based on state-of-the-art BIG DATA techniques, continuously analysing your machine-data for the sole purpose of providing you with the highest possible level of service and support.

Because we are **fully** aware of the fact that the i-Cube is **always** running in a **business critical** environment. Therefore avoiding unexpected downtime is paramount in **all** our service and support efforts.



Actual state



In case of an incident, fast response, knowing what and where to fix and reducing the **time-to-fix** is **essential** to our customers and therefore to us. In any 24x7 hours **business critical** environment a **high-level** of service and support is **essential** for protecting your ROI. And this can only be achieved by continuously monitoring the actual state and performance of your installation(s), **all** the time.

Historical metrics

Beside knowing the actual state and performance of your installation(s) it has proven to be very valuable to do statistical analyses (BIG DATA) on the collected machine-data over time on your installation(s). Producing status and performance trends and metrics (KPI' s), i.e. based on the FEM9.222 directives, provides you valuable operational insights and the highest possible ROI on you installation(s).

this_year	weeknumber	runhours	avg_p56
2017	13	87	13.40
2017	12	199	21.80
2017	11	76	15.20
2017	10	103	23.60
2017	09	98	19.80
2017	08	191	20.20
2017	07	90	18.00
2017	06	91	18.20
2017	05	76	15.20
2017	04	80	16.00
2017	03	80	17.60
2017	02	95	19.20



Damon, a listed company on the Beijing Stock Exchange (stock code: 830805 Damon Science and Technology), is a leading intelligent logistics system and equipment provider in China. Damon focuses on intelligent logistics conveying and sorting systems including product research and development, manufacturing and project services. Damon serves the e-commerce, courier, clothing, pharmaceutical, manufacturing and other various industries to improve the competitiveness of our customer's logistics systems which always receives wide acclaim.

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