



ICAM
INTELLIGENT SPACE SOLUTIONS



SILO², THE TAILOR-MADE MULTI-COLUMN VERTICAL STORAGE SYSTEM

SILO² is our automatic multi-column vertical lift system that offers maximum adaptability to real storage needs, a faster ergonomic solution for picking and refilling operations. Its modular design allows for the creation of storage systems, which fulfil any space or weight requirements.



A TAILOR-MADE STORAGE SYSTEM



A TAILOR-MADE STORAGE SYSTEM, WITH OVER ONE BILLION POSSIBLE CONFIGURATIONS, AS STANDARD

SILO² is a **vertical storage system with shifting trays**, which operates according to the **"goods-to-person" picking principle**. The system is driven via an onboard PC, or via any mobile device on which the ICAM ICON™ software has been installed, for the management and control of operation lists. Thanks to the internal vertical shift system which operates along three axes, vertical (Y), horizontal (X) and tray storage and retrieval (Z), materials are automatically taken to the access opening, positioned at an ergonomic height, where a warehouse operator can retrieve or store items, in total comfort and security.

SILO² is able to **exploit all the available space, not only vertically but also horizontally**, allowing for the creation of storage systems and facilitating installation in any type of environment (low-roofed premises, basements, multi-level premises, areas with pillars and with a complex layout), or even **outdoors**.

Unique in its kind for modularity and dimensional flexibility, it can be configured in **multi-column versions, from 2 to 7 storage columns**, making the creation of storage systems **up to 15 meters high and 7 meters wide** possible, and offering over one billion possible configurations, as standard.



BENEFITS AT A GLANCE

- Maximum exploitation of all available space both vertically and horizontally
- Best price / storage capacity ratio (€ / m³)
- High versatility in application and wide range of specific weights per tray
- Unprecedented operational continuity and flexibility
- Proper identification, security and traceability of stored materials
- Improved ergonomics, safety and comfort for operators

A MODULAR, FLEXIBLE, RELIABLE STRUCTURE

SILO² is made up of **shifting trays arranged on both sides of the storage system** (front and back), between which an **elevator** moves vertically. This device is equipped with an **automated retrieval system**, which allows the trays to be retrieved and brought to the access opening, and then subsequently repositioned in their storage locations inside the structure.

Operation of the SILO² storage system can be accomplished using an **incorporated PC**, located adjacent to the access opening, or via **any mobile device on which the ICAM ICON™** vertical storage system management software has been installed.

Multi-ray photoelectric light curtains and an automatic shutter door allow the warehouse operator to **work in complete safety** during handling operations at the access opening.

Emergency push buttons on the front of the storage system enable the machine to be stopped immediately at any time.



■ TECHNICAL DATA

TRAY	
Maximum load	250 / 400 kg
Useful width	653 ÷ 1,953 mm
Useful depth	612 / 707 / 802 / 897 / 1,003 / 1,098 / 1,193 / 1,288* mm
Height	41 mm
Maximum loading height	675 mm
Incremental positioning pitch	25 mm (Fixed configuration) 50 mm (Automatic configuration)
Minimum tray spacing	75 mm
STORAGE SYSTEM	
Maximum load capacity per column	60 t
Width	2,335 ÷ 7,085 mm
Depth with internal access opening	2,421 ÷ 4,467 mm
Depth with external access opening	3,321 ÷ 6,067 mm
Height	2,800 ÷ 15,000 mm
No. of columns	2 ÷ 7
Module height pitch	100 mm
Working environment operating temperature	0 ÷ 40° C
Relative humidity**	50 ÷ 85%
MAX. SPEED	
Vertical (Y axis)	1 m/s
Horizontal (X axis)	1 m/s
Tray storage or retrieval (Z axis)	0.5 m/s

■ WIDTH OF THE MACHINE (mm) BASED ON QUANTITY AND DIMENSIONS OF THE COLUMNS

		No. of Columns					
		2	3	4	5	6	7
Tray width (mm)	653	2,335	3,185	4,035	4,885	5,735	6,585
	753	2,535	3,485	4,435	5,385	6,335	-
	853	2,735	3,785	4,835	5,885	6,935	-
	953	2,935	4,085	5,235	6,385	-	-
	1,053	3,135	4,385	5,635	6,885	-	-
	1,153	3,335	4,685	6,035	-	-	-
	1,253	3,535	4,985	6,435	-	-	-
	1,353	3,735	5,285	6,835	-	-	-
	1,453	3,935	5,585	-	-	-	-
	1,553	4,135	5,885	-	-	-	-
	1,653	4,335	6,185	-	-	-	-
	1,753	4,535	6,485	-	-	-	-
	1,853	4,735	6,785	-	-	-	-
	1,953	4,935	7,085	-	-	-	-

* The 1,288 mm deep tray is only available on machines up to 5 m wide.

** On request it is possible to equip the storage system with components able to withstanding climatic conditions which exceed these limits

HIGH
PRODUCTIVITY
AND
MINIMUM
FOOTPRINT

FROM
2
COLUMNS



TO
7
COLUMNS

THE RIGHT TRAY, TO SUIT ANY NEEDS

The ability to perfectly organise items within each tray enables the available space in the storage system to be exploited to the full, providing a high level of accuracy and reducing access times.

The combination of **two types of capacity (250 and 400 kg)**, **different tray dimensions** (varying in width from 653 to 1,953 mm; in depth from 612 to 1,288 mm and in height from 41 to 400 mm thanks to side extensions) and a **wide range of accessories for internal division** (side extensions, removable dividers of various heights, sides and containers), allows the management of various types of items, even those with a very high specific weight (from 99.4 to 1,001 kg /m²), providing maximum versatility in application and **load capacity adapted to the actual loads**.

In this way, SILO² is the ideal solution for the automatic storage of all types of product, from light materials such as plastics, clothing-accessories, pharmaceuticals, electronic components to much heavier ones like steel moulds, nuts and bolts and mechanical components, etc...

Within SILO² it is possible to handle trays with **fixed load heights (fixed configuration)** or **variable height (automatic configuration)**.



from **99.4** —————> to **1,001 kg/m²**

Specific load-bearing capacity (kg/m ²) per tray with a maximum load of 250 kg														
Tray depth (mm)	Tray width (mm)													
	653	753	853	953	1,053	1,153	1,253	1,353	1,453	1,553	1,653	1,753	1,853	1,953
	612	626	542	479	429	388	354	326	302	281	263	247	233	209
	707	542	470	415	371	336	307	282	261	243	228	214	202	181
	802	477	414	365	327	296	270	249	230	215	201	189	178	160
	897	427	370	327	292	265	242	222	206	192	179	169	159	143
	1,003	382	331	292	262	237	216	199	184	172	160	151	142	128
	1,098	349	302	267	239	216	197	182	168	157	147	138	130	117
	1,193	321	278	246	220	199	182	167	155	144	135	127	120	107
	1,288	297	258	228	204	184	168	155	143	134	125	117	111	99,4

Specific load-bearing capacity (kg/m ²) per tray with a maximum load of 400 kg														
Tray depth (mm)	Tray width (mm)													
	653	753	853	953	1,053	1,153	1,253	1,353	1,453	1,553	1,653	1,753	1,853	1,953
	612	1,001	868	766	686	621	567	522	483	450	421	395	373	335
	707	866	751	663	594	537	491	452	418	389	364	342	323	290
	802	764	662	585	523	474	433	398	369	343	321	302	285	255
	897	683	592	523	468	423	387	356	330	307	287	270	254	228
	1,003	611	530	468	418	379	346	318	295	274	257	241	227	204
	1,098	558	484	427	382	346	316	291	269	251	235	220	208	187
	1,193	513	445	393	352	318	291	268	248	231	216	203	191	172
	1,288	476	412	364	326	295	269	248	230	214	200	188	177	159

Key

kg/m ²	0-200	201-300	301-400	401-600	601-1,000	≥ 1,001
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UNPRECEDENTED OPERATIONAL CONTINUITY AND FLEXIBILITY

Designed according to ergonomic and safety principles, the access openings, available as **internal**, **external** or **telescopic version**, allow the accurate, safe and ergonomic picking and refilling of materials.

The automatic tray extractor facilitates the handling of heavy and/or bulky loads, whose removal requires servo systems and/or machines (cranes, pneumatic manipulators, robots, etc. ...), avoiding any possible risky and dangerous operations for staff.

Each system can be equipped with a minimum of one and a maximum of eight access openings. The possibility of positioning **multiple access openings, one next to another**, helps to increase speed and efficiency in the picking and refilling process: while the operator is involved in picking or refilling operations in one access opening, the shuttle continues with its next handling mission in the adjacent access opening, reducing or even eliminating the waiting time of the operator.

The access openings can be positioned either on the **same level**, on **different levels** and/or **opposite** each other. **Fully-automatic Pick&Place stations** to automate repetitive and less ergonomic tasks can be implemented with the help of collaborative robots.



PRECISION, EFFICIENCY AND PROFITABILITY THROUGH INTELLIGENT STOCK MANAGEMENT.

New standards of usability, accuracy and productivity are achieved with the available command and inventory control options.

Everything is under control with **ICON™**. This **web-based software**, designed and developed entirely by ICAM, enables the management and control of the entire range of ICAM storage systems and much more.

Designed in accordance with the latest technological standards, **ICON™** meets the storage and picking needs of the most important commercial and industrial sectors, providing **greater flexibility of interface with the most popular WMS and ERP management software**.

Designed with the Microsoft.NET framework 4.5, **ICON™** was developed in C# with the development tools for Visual Studio.

The PC is Microsoft Windows 10 embedded and equipped with a network interface, a software package developed by ICAM, and a database server program (SQL Server Express Edition).



KEY FEATURES AT A GLANCE

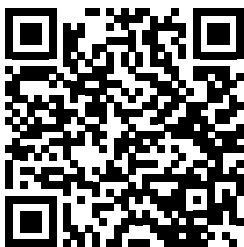
- Touch screen console
- Windows-based intuitive graphic interface
- Modular structure and versatile options
- Multiple inventory management strategies
- Multilingual and multiple-machine management
- Quick response times and optimized processing pathways
- Assignment of specific authorization profiles for individual users



IRIDE™, the innovative interactive control system* makes storage and retrieval faster, more accurate and more intuitive using a digital environment, fully-integrated with both the storage system itself and our management software, **ICON™** and has 4 main functions:

- **Light Picking Guide**
Guidance on picking operations through coloured light beams that identify the right locations containing the material to manage.
- **Head-up Digital Dashboard**
Digital dashboard with relevant handling information brought directly into the operator's line of sight.
- **Adaptive Interior Lightning**
Integrated lighting system and light signaling of alarm situations (activation of safety barriers, downtime, etc...).
- **Active Control**
Feature, which allows the operator to interact in real time with the information, projected onto the 'Head-up Digital Dashboard', without needing to change workstation.

*IRIDE is available only for trays with a maximum depth of 897 mm.



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