interlake MECALUX news

VOL. 1 NO. 4

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Centralizing success

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Word of mouth spells success

THE GUIDING FORCE WITHIN:
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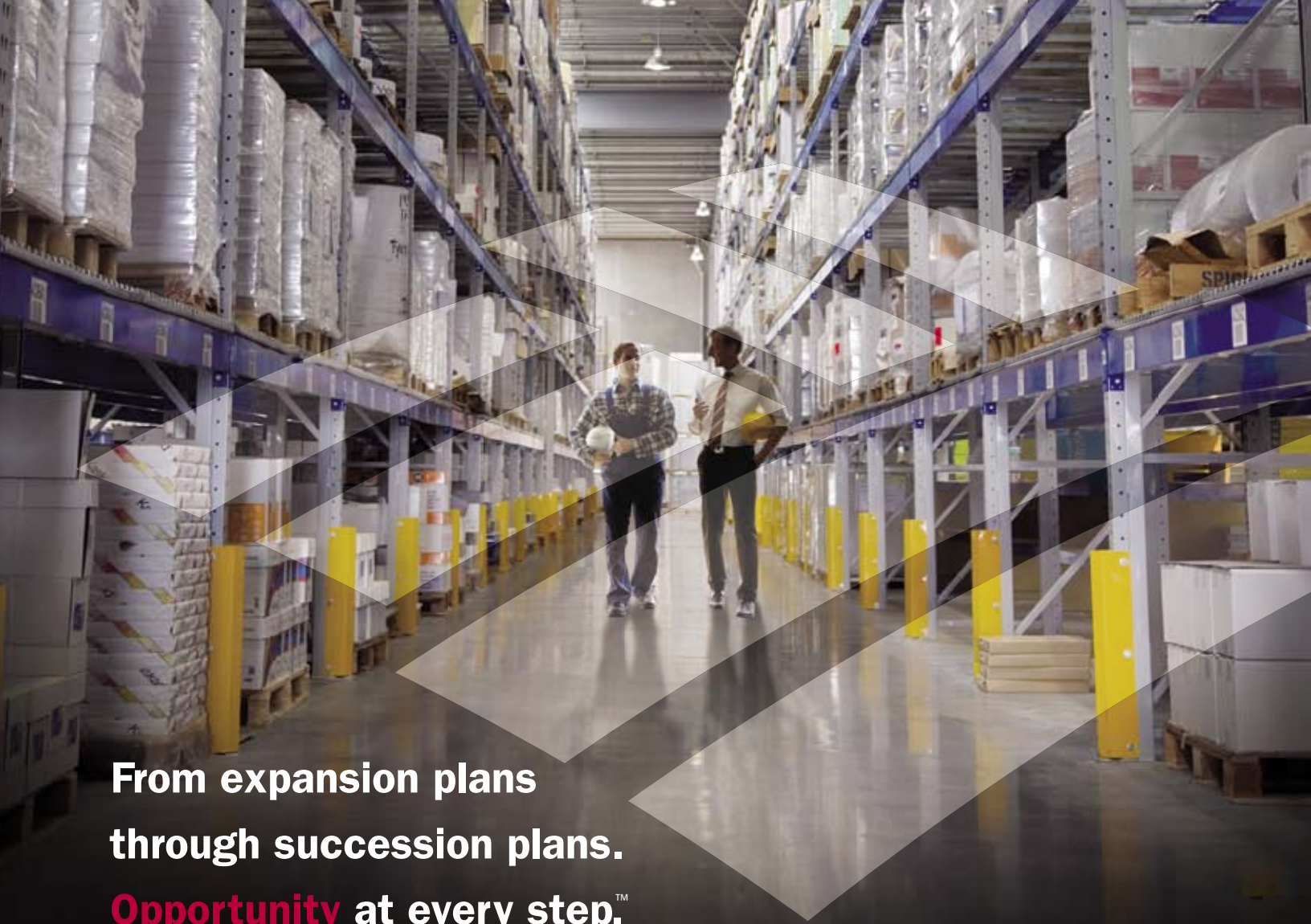

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Interlake Mecalux News
is published by Interlake Mecalux.
Vol. 1 - No. 4. 2011,
Publication Number ISSN:
2159-0575 print
2159-0583 web

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Survival of the Smartest

Whether immediately impactful or dormant in the short-term, companies make daily decisions that shape its future. Businesses flourish or flop based on these choices, making the intelligence of each company's workforce more important than its size. A good business invests in bright minds that fit within its corporate structure. A great business structures its corporation to fit the industry's brightest minds. Great companies simply get out of the way of their most innovative personnel, a luxury that becomes an advantage during times of economic recession.

Globalized outsourcing has maligned portions of European and U.S. manufacturing for the better part of a decade. Fifteen years ago, China graduated just a third of the engineering and technology master's students as the United States. A decade later, China nearly quintupled its number and eclipsed the U.S. The reason for this is simple: countries that support innovation attract innovative personnel. Businesses in countries like Brazil and Germany have embraced the practice of allowing innovative minds to maneuver freely. Cost-cutting measures in stagflated countries like the U.S. and Spain have stripped research and development, watered down new production and entered into a holding pattern of simple order fulfillment. The businesses are there, but not the opportunity. The seeds have been planted, but companies can't avoid trampling the flower bed. By most equations, Mecalux should have fallen into this trap. Instead, it has expanded, acting the part of contrarian to the global recession and has continuously doubled its industry footprint every five years.

It hasn't been easy - growth never is. The question is no longer what materials need handling but how customers prefer they be handled. Expanding the Mecalux product line and integrating each arm of it into a turnkey service provider has been one of several developments borne from research, raised through intelligence and survived by a growing customer base.

This company's workforce has invested in the research that propels innovation. We've invested in the technological advancements driving the industry forward. We've done it cautiously and we've done it intelligently. If we hadn't, we wouldn't be here to tell you we had.

Javier A. Carrillo
President
Interlake Mecalux

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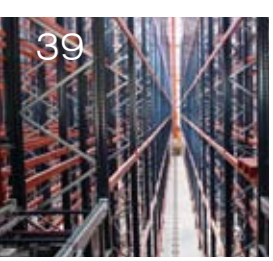


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In the Wake of the Quake

After one of the world's strongest earthquakes obliterated half of Iron Mountain's Chilean campus, the archiving giant rebuilt with the help of the company left standing tallest: Mecalux.

by Adam Shafer

For over 60 years, Iron Mountain has stored and protected archives and records for businesses around the globe. Some of the company's largest racking projects are being developed throughout the Americas, including Chile, where it has secured a tight clamp on the commercial market. First setting up stakes in a six-building plot of land in Lampa, Santiago, in 1996, the company acquired storage rival Storbox seven years later. Today, the dual campuses separated by almost two miles (3 km) assist over 1,200 customers with the storage of their records and archives.

Both campuses as they are constructed today are high-height record management facilities with large selective rack systems used to store massive quantities of paper documents. The structures that are not records management buildings are used as either vaults for multi-media storage or as large scanning facilities known as document management system (DMS) buildings. In these smaller structures, over 70 personnel members scan paper documents committing them to digital files for safe backup and quick retrieval access.

Day-To-Day

When an Iron Mountain client transfers archive or storage files to the facility, they are cataloged into the system through an online protection program called Safekeeper PLUS. Through the program, the goods are not only inventoried, but also assigned a storage location based on security variables and how often the product will be accessed.

The scanned goods are manually moved to their location by warehouse personnel. Space assignments are managed logistically throughout the warehouse, meaning that each level has varying degrees of turnaround and access depending upon the assigned location. Essentially, the farther back from the aisle entrances, the less frequently the archive is accessed. The walkways on each level of the warehouse signify a logistical break in the turnover of the stored items. If a client's goods are on the opposite end of the walkway, it means they don't visit often.

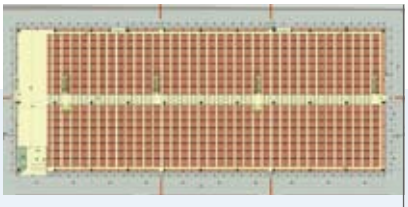
Iron Mountain Chile Timeline

1996 — *Iron Mountain established in Chile*

2005 — *Iron Mountain acquires Storbox*

September 2009 — *Iron Mountain contracts Mecalux to build Warehouse 11*

December 2009 — *Mecalux begins Phase 1 installation of Warehouse 11*



May 2010 — *Phase 1 installation of Warehouse 11 complete*
Total capacity: 720,000 Boxes
Stairs Number: 4 levels
Frame Height: 12,600 mm

February 2010 — *Size 8.8 earthquake strikes Maule and Biobio*

May 2010 — *Iron Mountain office personnel displaced to temporary trailers begin 1 year lease, Mecalux begins Phase 2 installation of Warehouse11*

Once the items have been taken to their proper location, logistical errors are almost completely avoided by a barcode scan match. First the goods are placed in the assigned location on the rack and both the storage tote and rack location are scanned and matched accordingly – the same general method used in libraries, only with the added assistance of multi-point scans recording the item's location. When a client accesses their items, the process resets and the goods are sent to another location. For security purposes, the box never returns to the exact same location.

Iron Mountain's successful Chilean operation nearly came – quite literally – crumbling to the ground in 2010 when the sixth largest earthquake in recorded history erupted on February 27 between the Maule and Biobio regions. The tremors rattled the racks throughout many of the larger buildings while decimating most of the smaller office spaces. Ultimately, much of Iron Mountain's rack was rendered unsafe and warranted demolition. Between the two campuses, Iron Mountain took down half of its facilities (seven in total) and the racking systems inside each. It was only in the wake of the eruption that it became clear how to recover the capacity with new racks: call Mecalux. Doug Berry, Iron Mountain's director of construction and facilities, remarked that none of the seven destroyed buildings were Mecalux systems. "At the time of the earthquake," Berry said, "there was only one Mecalux facility and it stood the test of time. It stood the test of an earthquake."

Five months before the 'quake, Iron Mountain contracted Mecalux to build the 1.4 million box capacity-loaded Warehouse 11. The multi-leveled, high-density rack installation was scheduled to begin in December 2009 and complete its first phase in May – and it did, despite an earthquake serrating the campus two months into the project. Nelson Campos, Mecalux's GM in Chile, credited

November 2010

Phase 2 installation of
Warehouse 11 complete
Total capacity: 480,000 Boxes
Stairs Number: 2 levels
Frame Height: 12,600 mm

January 2010

Mecalux begins
installation of
Warehouse 12

May 2010

Warehouse 77 Complete
Total capacity: 823,000 Boxes
Stairs Number: 4 levels
Frame Height: 13,000 mm

December 2010

Mecalux begins
installation of
Warehouse 77

June 2010

Warehouse 12 Complete
Total capacity: 980,000 Boxes
Stairs Number: 4 levels
Frame Height: 13,000 mm

the extensive pre-processing work designed by both sides with the ability to stay on deadline. In this case, the pre-processing started a long-trend of strong communication between both Iron Mountain and Mecalux.

One Size Fits All

Before assembly could begin on Warehouse 11, the racks first went through a preliminary layout. The shelving units inside the Iron Mountain facilities are all the same size, unlike storage options in multi-purpose warehouses, which usually carry a number of varied systems to match the variety of goods being stored. Because of this, the entirety of Warehouse 11, and eventually Warehouses 12 and 77, were designed for 100 percent capacity, meaning that the installed selective pallet racking was designed from the inside out – first with the rack and then with the skin of the building.

Once Mecalux was awarded the bid for Warehouse 11, the layout went through a structural review which took in multiple considerations such as fire protection, electrical, security and the local seismic regulations - a harbinger for what would later prove to be the most important detail of the installation. Each conventional pallet rack structure, which would be accessed on multiple floors by stairs, elevators and catwalks, was engineered with more attention to the seismic construction of the shelves.

CHECKOUT AISLE: Scanned documents ready to be stored are manually transported to their assigned location by warehouse personnel. There, the boxes are scanned and matched to their placement on the rack - similar to a library.

Seismic construction

Iron Mountain utilizes three types of engineer corps in countries requiring seismic engineering. The first group, made up of civil engineers, develops the structural design of the building. The second group of consulting engineers from the country manufacturing the rack (in this instance, Mexico) develops the structural design of the storage systems. The final group is the reviewing engineers who determine the strength and reliability of both the facility and the structures inside it in the event of seismic activity.

Structural engineer Rodrigo Concha, who owns RCP Engineering Company Ltd., a company dedicated to the development and regulation of civil engineering projects, served as the reviewing engineer on this installation.

Concha unsurprisingly classified the land upon which Warehouse 11 was built as being Type 3 – the highest risk for earthquake damage. He also classified the Central Valley zone, inside which both campuses were built, as being intermediate Type 2. In both

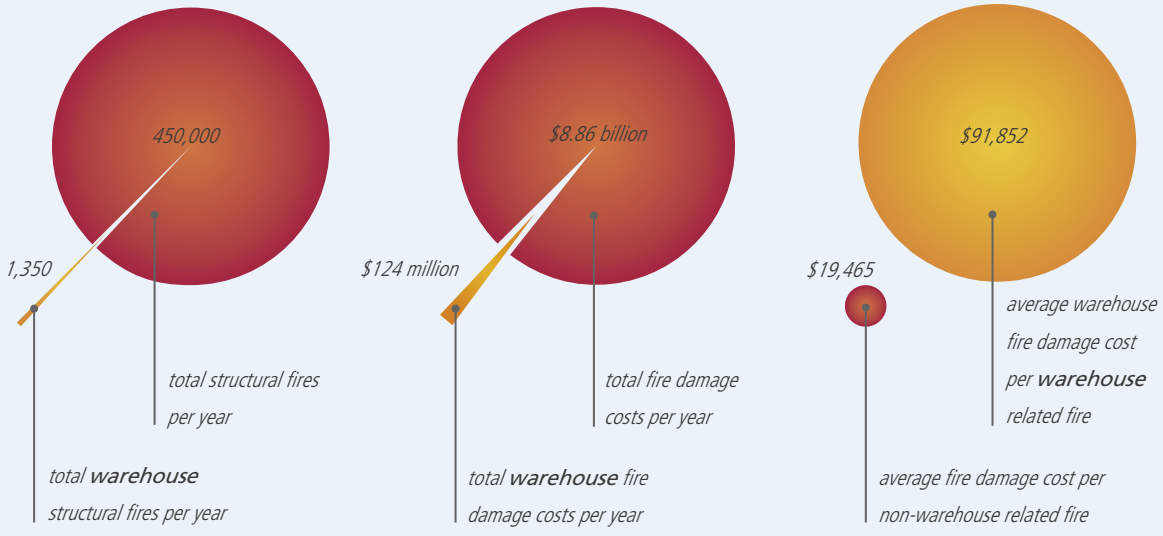
Engineering Solutions

What happens if part of Iron Mountain's documents catches fire and traditional sprinklers won't cut it? Simple. Build a tighter sprinkler and chimneys that inhale fire instead of holding it.

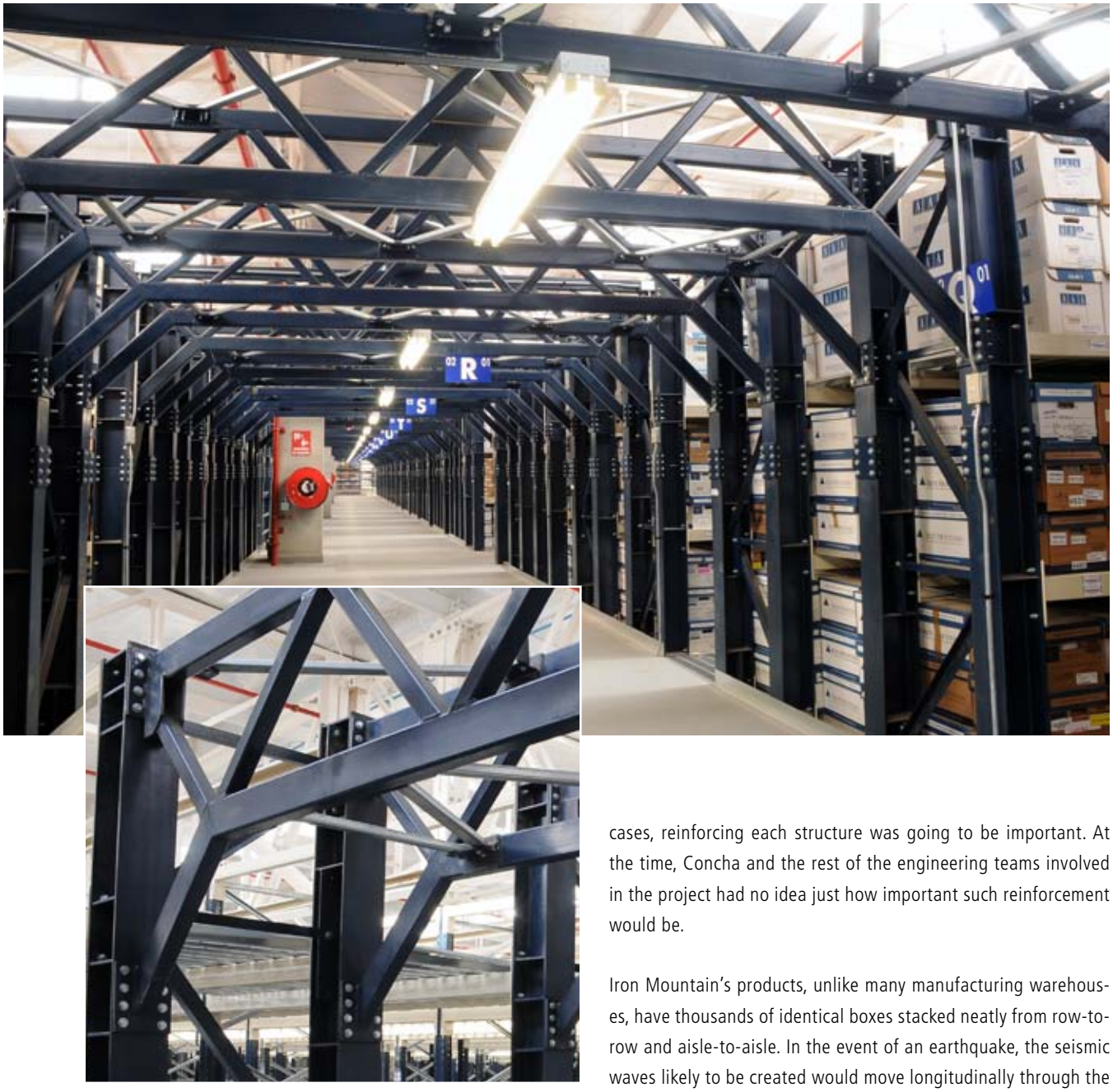
To ensure as little fire damage as possible to the millions of files in each of Iron Mountain's warehouse facilities, the buildings and the more than 2,000 boxes located within have been engineered to extinguish in just a few minutes. As the rack systems are designed to hold a maximum density, extinguishing a product fire with traditional automatic sprinkler systems that douse the entire facility with water could prove disastrous, as the added water weight of the soaked boxes would risk overloading the shelves and collapsing the system.

The innovative solution was a series of transversal chimneys that give passage to fire directing it away from the product of the facility while triggering only the specific sprinklers (located in aisles and inside the rack) for a controlled dousing of a specific point – not an overall wetting of the entire facility.

How much damage is caused in warehouse structure fires



SOURCE: Bureau of Labor Statistics, U.S. Department of Labor.



WALKWAY EMPIRE: The Logistically managed space assigns degrees of availability to the facility. Goods accessed frequently remain on the first two levels. The walkways (pictured here) provide quick access to a large number of stored products.

cases, reinforcing each structure was going to be important. At the time, Concha and the rest of the engineering teams involved in the project had no idea just how important such reinforcement would be.

Iron Mountain's products, unlike many manufacturing warehouses, have thousands of identical boxes stacked neatly from row-to-row and aisle-to-aisle. In the event of an earthquake, the seismic waves likely to be created would move longitudinally through the rack system like waves against a rock. And like a rock not secured into the sediment, such force would either uproot the structure or cause it to fracture. The goal of seismically engineered rack is not just to make it thicker or heavier (the density of the product sitting on the shelves already ensured that they would be weighted down in this case), the goal is to make the rigid rack more absorbent of the traumatic shock a seismic event would cause.

Normally longitudinal bracing would be installed across the back of the rack system, but because Iron Mountain's densely-stored goods rarely move, implementing continuous rear-bracing systems

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in addition to bracing trays would have been impossible without diminishing the storage and interfering with the sprinklers installed inside the rack. Instead, the longitudinal rigid frames were installed with connections between beams and reinforced columns. Campos described the 13-foot (4 meter) central walkways on each of the four floors that served not only as convenient ergonomic logistical pathways but also load-bearers for the seismically reinforced central points. "The connection resistance should be strong enough to ensure there won't be local failures or instability in case of seismic occurrences," Concha explained, "so the connections have to be designed within a range of elasticity and sufficient over resistance." Adding universal weight to a steel product without mobility would have the same effect as someone tightening their muscles and bracing for impact moments before a car crash. The strength of the bones actually works against the person if met with a significantly more powerful force. Rigidity, in both cases causes the weaker structure to crumple.

Any seismic waves traveling longitudinally through the central frame would of course pull on the foundation slabs to which the frame is anchored. Therefore, the derivative forces created from the extra weight of the seismically enhanced anchors and base plates had to be calculated in order to create thicker, more shock absorbent floor slabs.

After the earthquake, and halfway through Mecalux Group's completion of Warehouse 11, Concha was brought in again to investigate the buckled rack. That the Mecalux rack was only halfway through its installation when the earthquake struck didn't phase Concha's assessment that it still would have remained undamaged had it been completed and loaded during the 'quake.

That the half-finished Warehouse 11 rack withstood the pounding of a magnitude 8.8 earthquake was what compelled some at Iron Mountain to recommend Mecalux for the suddenly necessary rebuilding of the multiple destroyed campus buildings. "The shelving collapsed taking with it part of the building structure," Carlos Parada, the project manager with Iron Mountain Chile, said. "We had had to put the 1 million boxes we had lying around on the ground in a new warehouse. We decided to move fast into Phase 2 to be able to put our boxes in a warehouse space." Iron Mountain awarded the Mecalux Group with contracts for two additional maximum-capacity warehouses on the dual campuses. Iron Mountain said it was impressed with the communication and

In the earthquake's aftermath, Iron Mountain found itself to be one of the few businesses remaining productive amidst the devastation.

OFF THE RACK: After the earthquake collapsed much of the shelving, taking with it part of the building structure in some of the facilities, Iron mountain moved quickly into Phase 2 construction of Warehouse 11

teamwork shown by the Mecalux Group and was satisfied that the company's seismic design could be easily reproduced in the design of the new facilities, "If I've heard it once," Berry says today, "I've heard it 10 times from [the management team in Chile] that they say 'thank you for pushing the issue because Mecalux has performed very well.'"

Rebuild or Regress

Mecalux wasn't the only company earning business because of its advanced capabilities. In the earthquake's aftermath, the already successful Iron Mountain found itself to be one of the few businesses remaining productive amidst the devastation. It served as a port in the storm for many new clients looking to relocate their documents to more secure facilities. "Our competition didn't have the robust racking or sprinkler systems that helped us survive the earthquake," Berry said. As a result, the company garnered nearly 100 new clients after the disaster including one of the country's

A Conversation with Carlos Parada

Carlos Parada, a project manager with Iron Mountain Chile, elaborates on the process of working closely with the Mecalux teams from both Mexico and the United States on the installation in Warehouses 11, 12 and 77.

MX: Which factors contributed to Iron Mountain choosing Mecalux for the initial Warehouse 11 project?

CP: There was the level of cooperation and alliance between both companies. Both Iron Mountain and Mecalux wanted

largest banks, which had previously done its own records storage. Such growth borne from such regional turmoil put Iron Mountain in the tricky position of having to rebuild and progress at the same time. Some of the personnel offices on both campuses had been destroyed, relegating a large percentage of the staff to bunker themselves in 25-person capacity trailers while new offices were built for them. With anywhere between 10-14 trailers on each campus, personnel from the DMS, data entry and order entry divisions were divided into specific trailers and forced to work there while the reconstruction of the destroyed buildings was underway. Iron Mountain upgraded the multiple damaged smaller buildings with two new large structures better suited to survive earthquakes; higher ceiling, more efficient use of energy, with more cubic feet to maintain a higher storage capacity. After removing the rubble from the necessary land plots and developing the rack structure layout alongside Mecalux – using similar designs as were used on Warehouse 11 – construction on Warehouse 12 and 77 began at a breakneck pace.

The goal of seismically engineered rack is not just to make it thicker or heavier, the goal is to make the rigid rack more absorbent of the traumatic shock a seismic event would cause.

to do things well. The [seismic storage] system that we were installing in Chile could be replicated in other countries. Mecalux indicated to us that we were more than just another client. So we felt very lucky.

MX: What unique considerations did Iron Mountain make before or during the installation?

CP: We take into consideration all the fire protection systems that determine, for example, that the width of a module cannot be wider than three meters, or that the sprinkler systems placed in aisles have to be at a specific height with respect to the highest box, which is usually six inches [above the highest box]. We also place systems, such as transversal chimneys, to be able to direct a possible source of fire, or to attack it in that moment.

MX: Describe how Iron Mountain and Mecalux interacted in the initial design stage.

CP: When we had the original idea for Warehouse 11, we sent it to Mecalux. Mecalux took it and put together a proposal, strengthened it and returned it. [That] ended up being the final proposal. Mecalux took it and made some pre-calculations and pre-structural designs, then they had to verify if what we wanted to put in the warehouse was possible or not. Mecalux made some very interesting observations regarding lateral rack and other bracing areas that needed to be adjusted.

Not only was it imperative to get the displaced employees back into more permanent office spaces, but meeting the final deadline was equally important in order for Iron Mountain to avoid paying $500,000 in lease renewals for another year on the temporary trailers. "It was critical," Berry said. "It was worth a half-million dollars to us to make sure that every milestone through the process was met. Mecalux partnered with us bringing in the right resources and committing to travel schedules for project managers in the United States and Mexico. That really drove the project."

After fully optimizing the method of communication between the Mecalux project managers and those with Iron Mountain in Phase 1 of the Warehouse 11 installation, there were five more deadlines to meet. First, the completion of Phase 1 in Warehouse 11, daisy chained immediately by the start of Warehouse 11's Phase 2, then the simultaneous construction of the nearby Warehouse 12 and the Warehouse 77 construction completed on the Storbox campus.

At each turn, the quintet of installations, first with the design and logistical planning that provided the bulk of the work in Warehouse 11 and then the copy and paste construction of Warehouses 12 and 77, proved to be an intricate undertaking. Not only were both companies able to communicate their needs through the turmoil of a cataclysmic natural disaster, but they were able to recover immediately and manage the fallout. With the dedication of the Chilean management team, in addition to the Mecalux project managers, the four-part construction of racking systems with an over 3 million box capacity proved to be an installation that occasionally bent, but never broke.

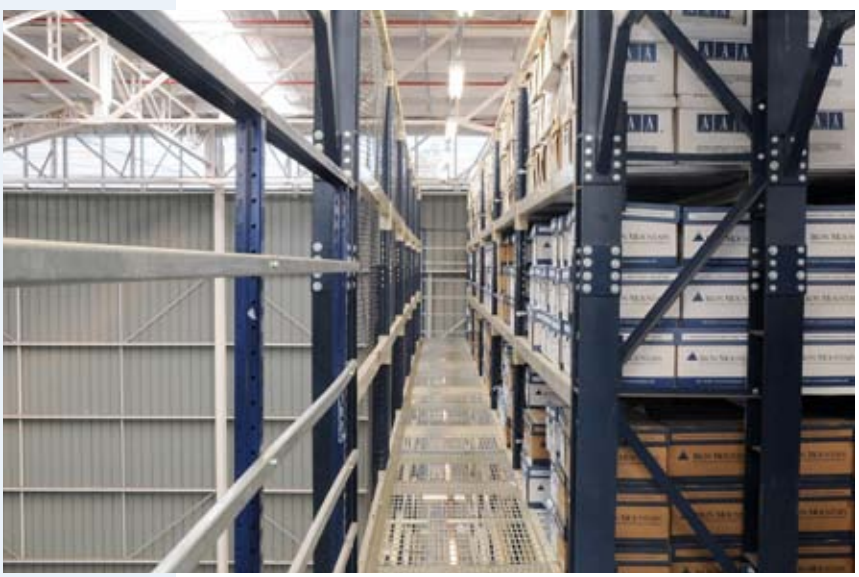
Mecalux in Chile

Chile is nestled in the Pacific Ring of Fire, an area where large numbers of earthquakes and volcanic eruptions occur in the basin of the Pacific Ocean. Despite its hotbed of activity, Chile has developed into one of the Americas' most prosperous democracies.

With companies such as Walmart, Electrolux and Nestle under its belt, Mecalux has had a sustained growth in Chile since its creation and is currently the leader in warehouse logistics with a market participation of 30 percent and a base of 2,000 clients.

In the past two years, the Chilean economy has successfully overcome the effects of the global financial crisis and the economic impact of the February 2010 earthquake. Driven by reconstruction and investment, the Chilean economy is expected to continue to recover reaching an estimated 5.8 per cent growth in 2011, according to the World Bank Organization.

As Mecalux steadily faces the challenges posed by the earthquakes and volcanic eruptions in Chile with its seismic resistant structures, it projects a growth of, at least 35 percent in the national market, consolidating its leadership position in the Chilean material handling industry.



FLOOR ON THE FOUR: The front portion of the floor of Warehouse 11. The goods stored here are viewed by their owners less often then the goods in similar positions two or three floors below.

Novo Mundo's history began 55 years ago in a store barely 861 square feet. Now, there are over 160 stores and more that five thousand employees making more the five million clients smile across north and central Brazil. Nevertheless, Novo Mundo's network does not stop there. In the next months, you will see more people, from more places, smiling with Novo Mundo.

SELTZER HAULER: It took just 10 years for Zbyszko to grow from a small carbonated beverage company in a small Polish town to an expansive business traversing Northeast Poland.

Bubbling Up

A Polish beverage group pours it on with plant expansion

By Joanna Bryndas

Poland's Zbyszko Company, specialists in the production of carbonated beverages and flavored waters, was established by Zbigniew Bojanowicz in 1993. In the small town of Bialobrzegi due to its continued innovativeness, the company became a powerhouse within a decade and was shortlisted among the four most successful domestic manufacturers in the market segment of fizzy beverages and waters.

At the end of 2003, the production potential of the plant tucked in between Warsaw and Radom peaked and it was decided that a second plant with the most innovative production and storage technologies would be built in Radom. Moving to the new facility became the company's priority, which is why the investment was executed in a very short time.

As Mark Algusiewicz, the project manager for Mecalux Poland overseeing the installation, explains, "The automated systems applied in Zbyszko Company's [warehouse] represent the first such project undertaken by Mecalux in Poland. Therefore, specialists from both Poland and Spain were involved in the implementation process. The difficulty was the complexity of the system itself, which impresses even people familiar with this type of storage systems."

Today, the company's original vision of applying the most up-to-date technologies has come to fruition. The 131,000 square foot facility has its own laboratory, where it systematically tests the quality of products and their taste aspects, in addition to the technological lines and the warehouse being fully automated. The main production building produces more than 42,000 gallons of product per hour (160,000 liters) employs over 100 people, and maintains three production lines, including an aseptic line adjusted to the production of preservative-free waters, juices and beverages.

Inside the facility is the production building. The construction of the high-bay warehouse operated by automated stacker cranes occupies a 32,000 square foot section of floor space and is equipped with loading ramps, which enable a dozen trucks per hour to be loaded. Mecalux supplied the comprehensive storage system.

SKIDS ROW: Eleven stacker cranes are put to use in the 32,000 square foot warehouse. Upon product retrieval, they will transport it to a conveyor.

Automated Warehouse

The automated warehouse for pallets has an 18,000 pallet capacity and is operated by 11 fully-automated stacker cranes. "The automated systems applied in Radom guarantee a high level of pallet and load controls," Zbyszko owner Zbigniew Bojanowicz said, "as well as the streamlining of inventorying procedures and all the logistic processes within the plant." The cranes move quickly along their aisles handling pallet loads of up to 2,200 pounds (1,000 kg). Each stacker crane aisle is equipped with two conveyor lines in the warehouse front zone – one used for loading and the other for unloading. The application of a few buffer locations in each case allows the systems to avoid undesirable gridlocks. The relatively large repeatability of the stored articles enables the use of a double storage depth. This method is widely used in case of automated high-bay warehouses, because by sacrificing a comparatively small percentage of productivity, the storage capacity is easily doubled.

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TOP: The Bridge, which sits atop the monorail about 16 feet off the ground floor.

BOTTOM: The monorail loads the product and transports it around the track to the unloading zone about 6 feet across the aisle.

Production area

The loaded pallets with packages of beverages released from the three bottling lines are directed to short roller conveyors, fitted with a comprehensive control system. The system directs the basic dimensions of pallets with loads, at the same time verifying the quality of the pallets (quality of skids and absence of obstructions in manipulation openings). Load units which do not comply with the assumed criteria are instantly discarded onto another conveyor for correction, whereas the acceptable pallets are inserted directly into automated pallet lifts which transports them about 16 feet (5 meter) above. This system receives up to 200 pallets per hour from the production area.

Bridge

The production building is connected to the newly built warehouse by a bridge over 328 feet (100 meters) long, wherein two lines of roller conveyors run next to each other. One line of conveyors transports pallets from the production area to the warehouse, the other runs in the opposite direction. Having passed the bridge, the pallets are inserted into the 5-meter high automated warehouse for pallets.

Mecalux in Poland

Almost 20 years ago, Mecalux opened a sales office in the town of Gliwice in the southern part of Poland. At the time, it was the farthest east Mecalux had expanded its sales territory. Less than a decade later, in 2000, Mecalux added to its Eastern European presence by breaking ground on a then-82,000 square foot production facility. Throughout the decade, the Polish plant grew to nearly 576,000 square feet and proved to be an important building block for the global company. It became and remains one of the company's research and innovation centers, producing all of the Mecalux Group's stacker cranes and other similar automations.

Shipment service

After a shipment order has been generated by Zbyszko's ERP system, Mecalux's warehouse management system, EasyWMS, executes the order automatically. While operating together with the product flow and device control system, Galileo, EasyWMS executes the whole operation of preparing a shipment automatically from the moment all the required pallets have been put out from the warehouse by stacker cranes until they are placed on shipment buffers in the goods shipment area, realized with the use of chain conveyors. Due to the application of ground-attached inductive loops in the extraction area, when a forklift truck moves away with a pallet, the next pallet is automatically brought to be collected. The key component of the goods shipment area is the overhead pallet Monorail transportation system, in which pallets are transported between different loading and unloading stations on special overhead trolleys (the so-called gondolas). "Particular attention should be paid to the Monorail system," Algusiewicz said, "which is crucial to the process of releasing the goods from the warehouse. This system required the creation of a unique algorithm to meet the client's expectations concerning its efficiency."

Each system's track can be uniquely formed using curves, switches, ascending sections, etc. In the case of the design for Zbyszko, due to very high capacity-related requirements, a simple loop with one maintenance station was built. On one side of the loop, pallets are loaded onto trolleys, whereas on the other they are unloaded. The system is operated by 21 individually-controlled vehicles.

Automation of processes within a warehouse ensures effective use of the available storage space. For Zbyszko, the evolution towards an automated storage system was a consequence of its dynamic growth and the need to both modernize and optimize manufacturing and storage processes. The automated systems applied in Radom guarantee a high level of pallet control, pallet load, and a streamlined inventory procedure. IT support and automation of logistic processes contribute to the elimination of errors, failures and losses resulting from hand operation.

Load units which do not comply with the assumed criteria are instantly discarded onto another conveyor for correction

The attractiveness of automated systems is multidimensional. In the face of ever-growing land prices and employment costs, the construction of a warehouse with the use of innovative storage concepts allows reducing investment costs and incurring lower outlays related to the operation of a warehouse during a long period of time. Zbyszko understood this concept and sank its teeth into automated innovation as soon as it could – ensuring none of its bubbles burst for the foreseeable future.

Technical Details

Production Facility: 131,000 square feet	New warehouse: 32,000 square feet
Product turnover: 42,000 gallons per hour	Pallet capacity: 18,000
Pallets received: 200 per hour	Number of stacker cranes: 11
Bridge: 328'	Crane's load capacity: 2,200 lbs

Carton Flow

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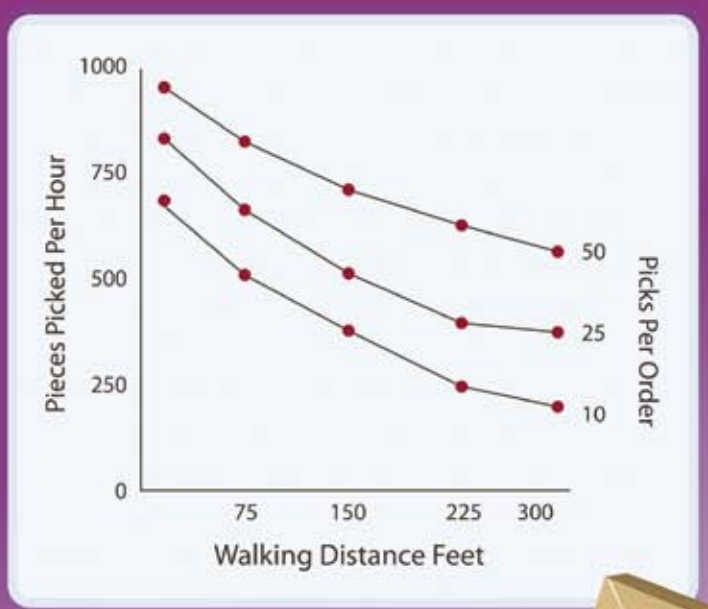

The Track
To Better Picking

UNEX

AUTO HAYAT: As the 120-person work crew approaches the halfway point in the construction of one of the largest logistical facilities in the world, parallel to the assembly and mounting of the rack frames, the AS/RS units are beginning to be installed.

Hayat: The Shape of Things to Come

Halfway into the construction project, Mecalux is rapidly shaping the future of Hayat's logistical behemoth in Turkey

by Marta Jimenez-Lutter

The construction of the Hayat facility in Turkey is in full swing. As Mecalux continues to make gigantic strides forward with the installation of the 41,000 square foot logistics warehouse for the leader in cleaning and household products, the challenge has been to set an appropriate work pace. "Up until now, the biggest difficulty has been mounting the secondary structure into the normal rack structure," said Guillem Clofent, Managing Director for Mecalux, "It's necessary to have the numerous pieces fit into the joints." Despite the engineering challenges, the international 120-person crew has been working relentlessly to meet critical deadlines. Performance management tools have been helping enhance worker productivity by analyzing how crews are carrying out and completing specific tasks. As project manager Asier Fernández said, "They allow us to calculate the work progress by group and type […] recording daily the advancement values for each task and group, and allowing us to quickly identify unwanted tendencies or tasks that need to be reinforced." By monitoring each construction sector's progress, Mecalux has been able to address every issue that potentially impedes productivity.

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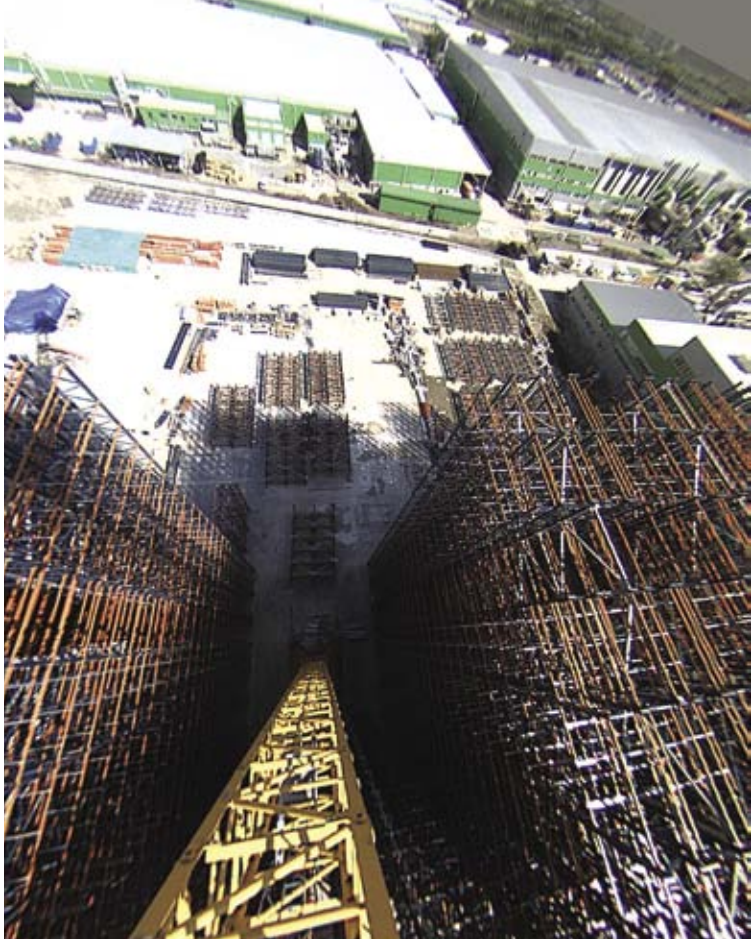

Progression

Up until late July, the installation progress was about 30 percent complete after primarily mounting the frames of the rack supported warehouse. Parallel to that, five of the 15 stacker cranes were assembled and mounted. Unit Load AS/RS units arrived later that month and were installed in August. However, from July until October, Mecalux will have all but three of the 15 cranes installed, including periphery AS/RS devices such as conveyors and crane guide rails systems.

No Spark, No Fire

A key component to the facility's installation is the incorporation of an oxygen reduction fire suppression system. This kind of system is used when water would be just as damaging to the stored products as fire. The system consists of maintaining an oxygen concentration level below 21 percent (between 14 and 17 percent usually), which contains a fire in case of an emergency. This oxygen level reduction inhibits the flame and limits its ability to spread. In order to reduce the oxygen concentration, almost 71,000 cubic feet (2,000 cubic meters) per hour of nitrogen are injected into the atmosphere, and an additional 35,000 cubic feet (1,000 cubic meters) per hour are pumped in during a fire emergency to ensure protection to the affected area.

The Hayat facility has been an opportunity to overcome challenges and reach new milestones in the quest for total warehouse solutions.

Tale of the Tape

Gradually, the rack supported warehouse is beginning to take shape. At its conclusion, the largest rack supported warehouse in Turkey will be 394 feet long (120 meters) by 328 feet wide (100 meters), and 148 feet high (45 meters); with a nearly 161,000 Europallet capacity. The pallets will be distributed in 15 independent aisles of double depth racks with 24 levels of storage height. Inside the warehouse there will be a selective pallet rack area designated for picking orders and will hold nearly 1,800 pallets.

Now that the project has reached its middle point, the challenge of establishing a regular rate of construction is becoming a more pressing matter. Despite the size of the project, the Hayat facility has been an opportunity to overcome challenges and reach new milestones in the quest for total warehouse solutions.

Mecalux in Turkey

With the new sales office now fully operational in Turkey, Mecalux has cemented its involvement with one of the most upwardly mobile economies in the world. In the last decade, the government reform throughout Turkey, which included privatizing publicly owned industries and reduced government controls on foreign trade and investment, has seen about 8 percent GDP growth in each of the last three years. Mecalux has forged relationships with some of the country's largest companies and continues finding new ways to assist Turkey on its profits climb.

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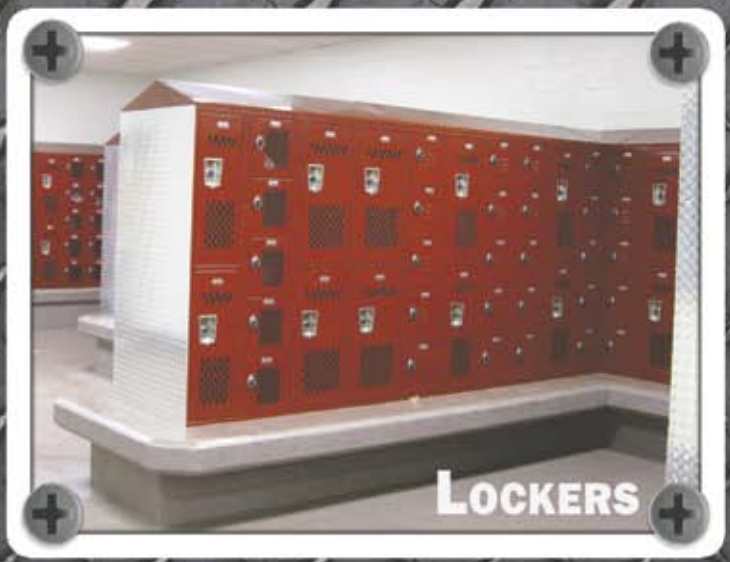
WAREHOUSE EQUIPMENT



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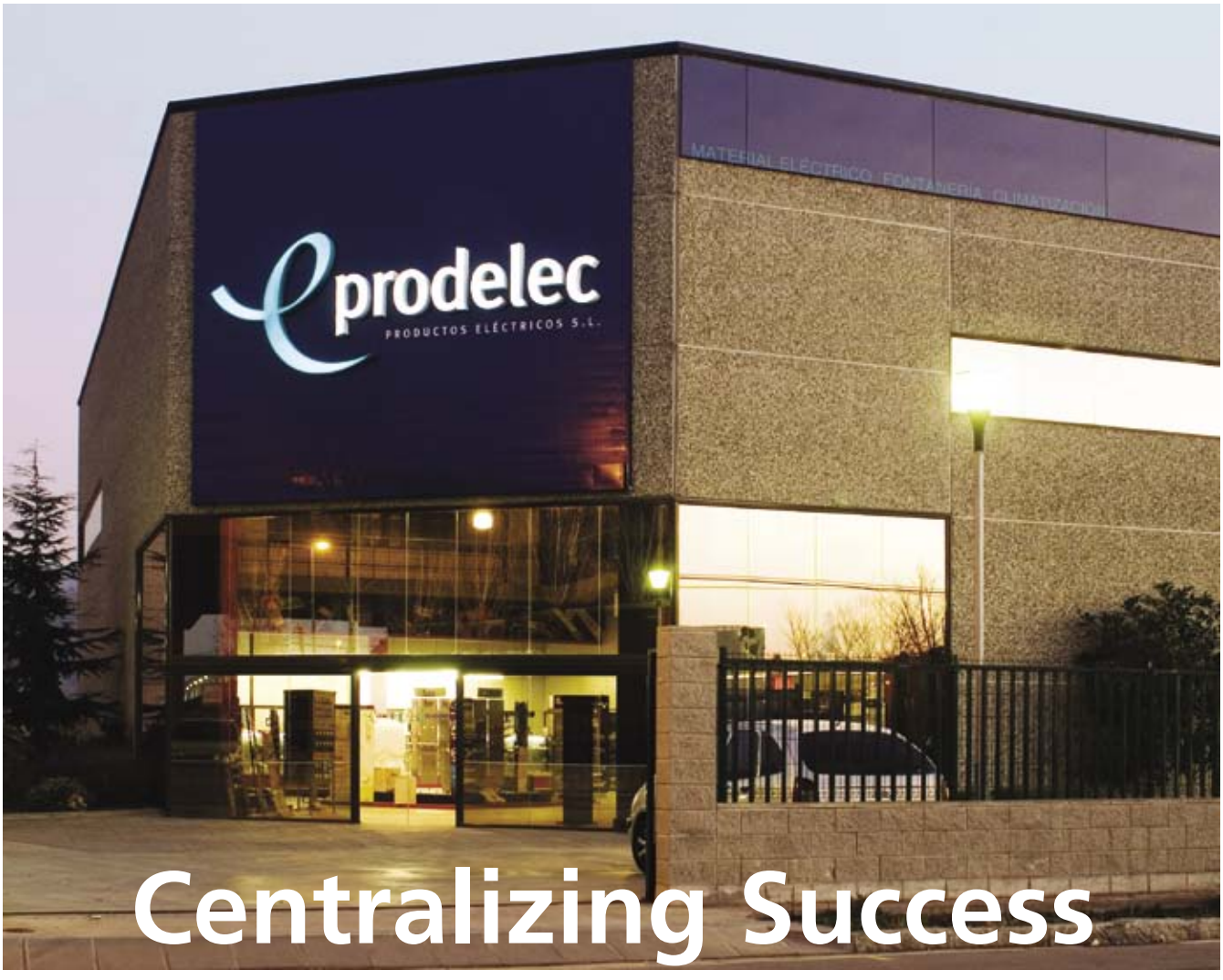

Centralizing Success

EasyWMS helps Barcelona's home solutions material leader find its logistical center of balance

by Edesio Sanchez-Gomez

Joint ventures develop through the shared aspirations and mutual trust of two entities. When Prodelsa and Protelec — two family businesses with more than 70 years of combined experience — merged in 2007, the joint effort was christened Prodelec (Productos Eléctricos, S.L.) and became one of the leading electric material distributors in the Barcelona province, supplying the region with cable, fuses, load centers, circuit breakers, conduits and other such products. That same year, the company moved its headquarters to a 26,900 square foot facility in Mollet del Vallès, some 15 miles outside of Barcelona. The merger also represented an expansion of sales locations and delivery routes, increasing the demand for home improvements solutions. In addition, the company expanded its portfolio, incorporating into its Barcelona distribution line materials for plumbing, HVAC systems, lighting and home appliances. Upon branching out, Prodelec realized it needed to enact a streamlined distribution operation that could efficiently service its clients, prompting

SPOOL THE TWINE: Massive amounts of rack supporting massive twines of electrical materials necessitates a robust warehouse management system–in this case, EasyWMS–to organize the storage warehouse into an efficient, tightly coiled peration.

Technical Details

Type of system:	EasyWMS
Number of positions:	9,921
Number of levels:	6
Height of rack:	19’ 8”
Number of aisles:	44
Aisle width:	3’ 8”
Pallet type:	Europallet
Years installed:	2009-2010

the decision to create a centralized warehouse able to dispense product orders and deliveries. The company quickly found Mecalux and its acclaimed reputation for enhancing warehouse operations. For Prodelec, Mecalux turned out to be the best companion a successful venture could have: a company with storied excellence in providing optimal intralogistical solutions.

According to Óscar Cantaré, managing director for Prodelec, the critical necessity was to integrate the wide range of home installation materials and maximize the warehouse area, since they would be incorporating the stock from other Prodelec sales locations. “We had a business model in which each one of our sales locations had its own stock, its own transportation,” Cantaré said. “We opted to centralize transportation.” The challenge, therefore, was to consolidate operations from four independently functioning locations into the central warehouse in Mollet del Vallès. Starting in November 2009 and ending in May 2010, the company sought the services of Mecalux to help them provide a solution to their constantly rotating stock of 8,000 SKUs, while also consolidating the entirety of their operations from the other sales outlets. “Centralizing our entire transportation meant processing 100 percent of our clients’ orders out of Mollet,” Cantaré remarked, “which meant increasing the number of SKUs and the number of order picking processes, and that’s when we saw that we needed to automate a part of all that process.” The company’s adoption of a hub-and-spoke distribution model meant establishing the Mollet del Vallès warehouse as a central hub from which it would radiate route structures (spokes) throughout the Barcelona metropolitan area. Within this model, EasyWMS became the innovative instrument that helped expedite order prep for shipping from Mollet del Vallès, moreover streamlining delivery schedules and routes. This in turn resulted in reducing its branch warehouse storage areas by half.

Considering that the primary activity of Prodelec is delivering material to its clients, creating an efficient operation to carry this out has been its main objective. At present, Prodelec has 12 routes in the Barcelona metro area, a number it has maintained despite reducing the number of its vehicles by two. EasyWMS enabled the same frequency rate and load level of delivery by providing a combination of more efficient order and shipping preparations, as well as more logical routes and schedules. This increase in productivity has allowed Prodelec to exercise greater control over inbound

STACKED TO GO: Easy WMS organized and determined the eventual location of each shelved item, which improves a storage facility's turn-over efficieny immensley.

The hub-and-spoke distribution model established the Mollet del Vallès warehouse as the company's central distribution center.

stock items destined for storage, even when cross docking is required. EasyWMS can distribute received items, sort, consolidate and ship them to compensate for a greater influx of material that will require rapid shipping without using valuable storage areas. This evasive measure counters an increase in demand that could deplete stock levels and disrupt the supply chain. This allows for the same transportation resources to carry out their deliveries, despite the increase in shipment amounts.

Although the bulk of Prodelec's business is its material delivery and transportation services, the company also provides home improvement solutions through a direct retail service to clients. The adaptation of a centralized distribution model allowed the remainder of the sales outlets to shift their focus more on the company's retail business. "Since they only provide counter service, their stock levels decrease drastically," Cantaré said. This reconfiguration resulted in a stock reduction of 40 percent at all other branch locations, while the warehouse in Mollet del Vallès increased

Warehouse Operations

The warehouse in Mollet del Vallès is divided into different sections, each one storing specific kinds of electrical, plumbing, HVAC and lighting materials. Warehouse operations are carried out by six radio frequency terminals, each fitted with three antennas. With the aid of Easy-WMS, individual tag codes containing logistical information are assigned to each SKU housed in the database server. From there, the client planning database (Enterprise Resource Planning server) automatically inherits the receiving operations. EasyWMS registers this information and translates it into picking orders. The picking order display list will appear on the radio frequency handset terminals, which provides warehouse operators with information about a product (its lot, aisle, position, height, etc.) in which the SKU is stored. Once the product has been located, it is brought to a location where it is prepared and grouped for shipping. Shipping labels and packing slips are created, containing unique SKU barcodes, which will update the stock and engage order tracking prior to departure. Implementing EasyWMS into Prodelec's operations reduced order preparation areas from six terminals to three, and increased the order picking capacity by 30 percent.

its stock levels. "One of the consequences [of a centralized model]," Cantaré said, "is that you'll end up with a greater stock." The Mollet del Vallès location now handles 8,000 active SKUs, supplying each satellite with a limited stock of picking materials. By allowing the other locations to continue thriving as retail outlets, the company has retained its character as a provider of personalized solutions, communicating face-to-face with its clients while still reaching out to customers with large-scale needs.

Creating an efficient operation has been the main objective.

Despite contending with a challenging Spanish economic environment, Prodelec has set its sights on the future by strengthening its technical installation and consulting services. Within the electrical material industry, Prodelec provides energy efficiency and cost-saving consultations to its clients, as well as the materials that help them optimize their energy solutions. The challenge of establishing itself as a one-stop shop is already underway since the company has adopted this hub-and-spoke distribution model, a move that would not have been possible without Mecalux at its side. "Mecalux from the beginning […] considered the Prodelec project as its own," Cantaré said. "They got involved from day one, first by understanding our problem, our unique needs, and addressing them to the fullest extent. The [software] program has allowed us to work in a specific way; they didn't impose the model that EasyWMS proposed and were with us from the get-go." For Mecalux, lending a helping hand also means understanding its clients' history and business. By gaining insight into what makes its client successful, so too has Mecalux come to understand its own success.

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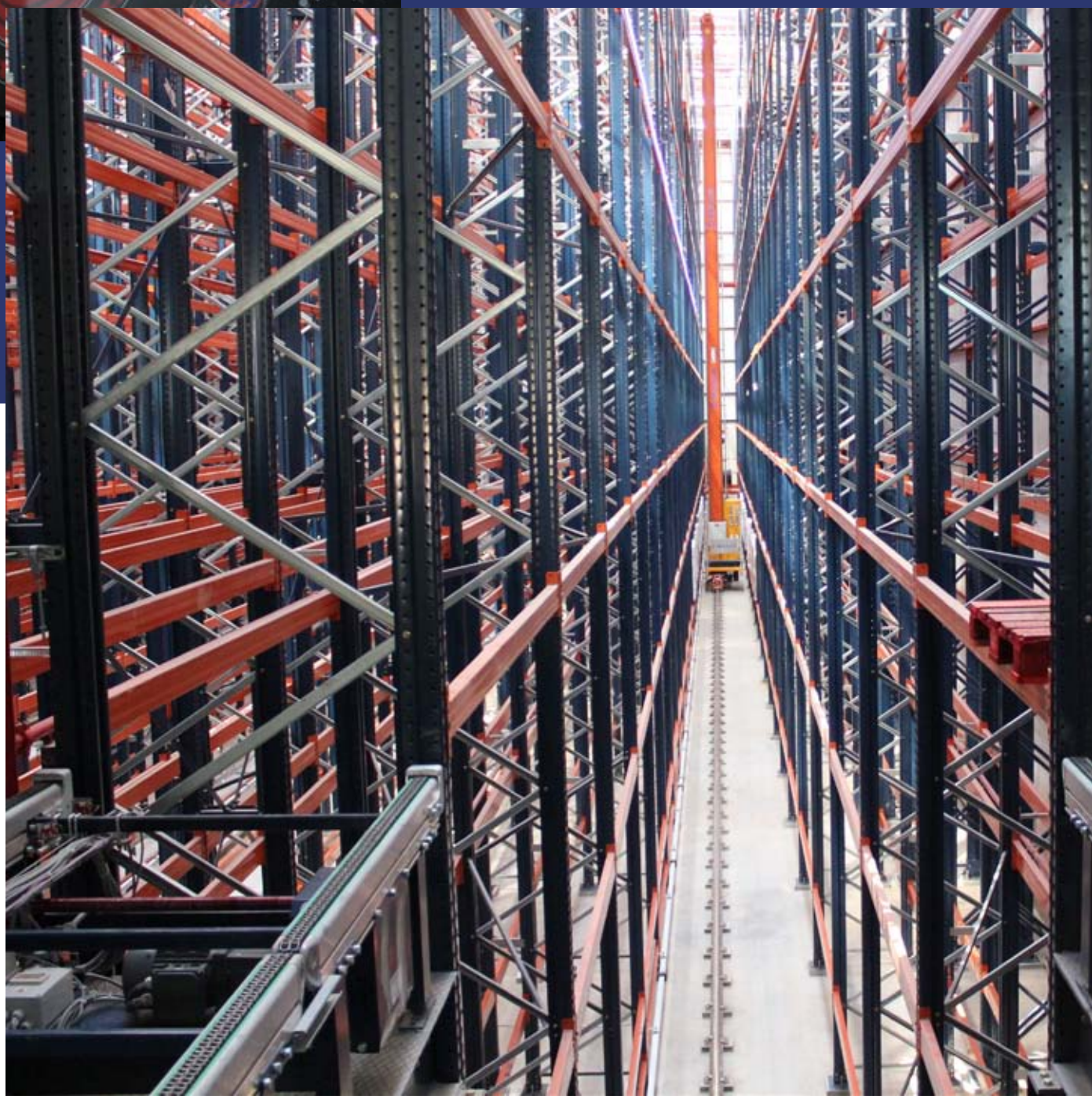
BELOW: The single-mast stacker crane enters and extracts products in one movement



Word of Mouth Spells Success

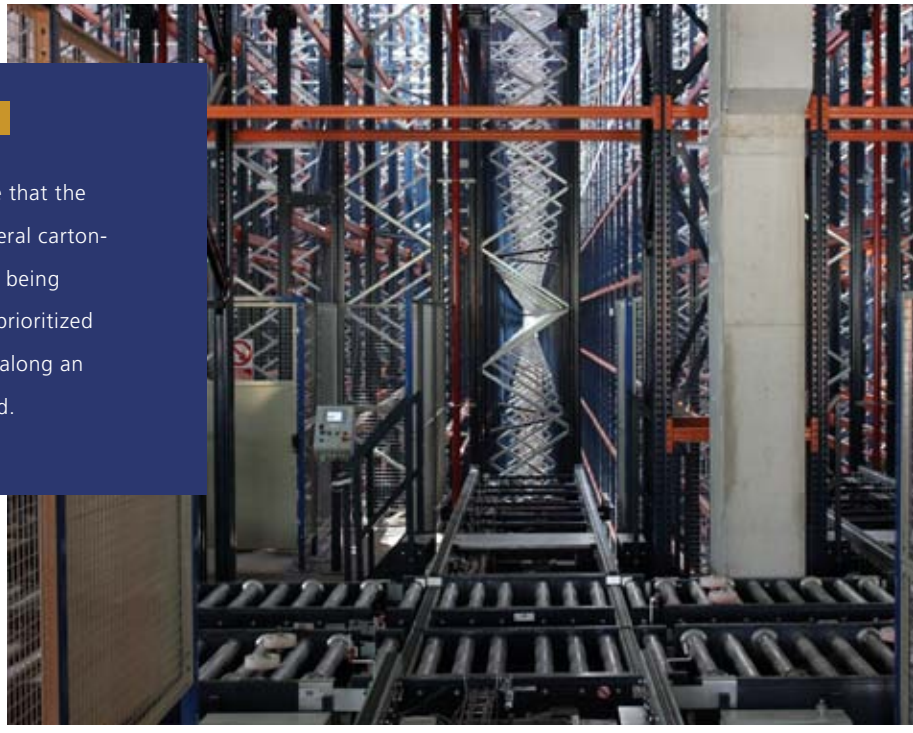
Cleaning Developer installs state-of-the-art, fully automated warehouse to sustain its growth

by Marta Jimenz-Lutter

Located in Canovelles, Barcelona; KH Lloreda is not only a family business but an example of how innovation and reinvention can capture and conquer a national market. Jaume Lloreda created the KH Lloreda line of products almost by accident when he couldn't find appropriate cleaning solutions for jewelry, his occupation at the time. He started developing degreaser formulas and came up with some versatile products that slowly made their way into other uses. In the late 1970s, the company came up with the original formula for its star product KH-7, a grease cutter for multiple applications. By the '90s, the jewelry cleaning business dwindled, and Josep Maria Lloreda, son of the founder, decided to focus on developing cleaning products for kitchens and bathrooms. This decision was a game changer and the company started to advance and expand. Lloreda did not even advertise initially, as word-of-mouth marketing spread quickly enough that the company didn't need to. Lloreda went from the shelves of small businesses to an astounding 60 percent share of the Spanish market and over €40 million ($57.3 million) in profit in 2010.

Warehouse Operations: **RFID**

The RFID system tracks the loaded merchandise, making sure that the right product is going to the right place. The factory has several carton-filling lines, one of which is automated, with the other three being partially manual. The cartons are stacked on to a pallet and prioritized according to the stability of the load. The pallet then moves along an automated track to a reader where the information is verified.



IF IT CAN BE AUTOMATED, IT WILL BE AUTOMATED: Seventy-six conveyor systems snake throughout the 22,000 square foot space.

By December 2010, while other companies downsized, closed and cut back, KH Lloreda had invested €9 million ($12.9 million) to modernize and automate its center in Barcelona. That year, a fully operational, state-of-the art warehouse and distribution center opened its doors as part of the cleaning products company. The company's president, Josep Lloreda, explained in an interview with Fomento de la Producción, "The economic atmosphere made a lot of products and services much more affordable." It was a great time to invest in modernizing their operation. To ensure that they kept their client base while still being able to develop KH Lloreda, they also froze their merchandise prices in stores.

When it came time to choose a material handling provider, KH Lloreda wanted a company very much like its own: innovative, forward thinking and with a history of success in the field. The high quality of products, proven history and ability to integrate its software systems were among the factors Operations Director Daniel Lancho cited as reasons KH Lloreda chose Mecalux.

Mecalux immediately began working and installed a storage area 68 feet high, 328 feet long and 72 feet wide, all totaling more than 22,000 square feet. Through the entire process, Mecalux maintained Lloreda's basic idea, "Everything that can be automated will be automated. Repetitive tasks that add no value will be eliminated."

Technical Details

Area:	22,304 square feet
Height:	68 feet
Length:	328 feet
Width:	72 feet
Stacker cranes:	3
Conveyor Belts:	76 units
WMS:	EasyWMS, Galileo
Number of Aisles:	3 double depth
Storage levels:	8
Investment:	€ 2.5 million ($3.5million)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As part of the process to achieve this automation, three single-mast stacker cranes were installed. These state-of-the-art machines allow materials to be entered and extracted in the same movement (combined cycle) so storage is fully automated. The productivity of the KH Lloreda installation was increased by reducing the resources (manual labor, time, space and energy) required to operate the facility.

The investment for the Mecalux products was €2.5 million ($3.5 million) and included the single-mast cranes, capacity for 7,000 pallets, eight levels of storage separated by three double-depth aisles and 76 conveyor belt units. All the different systems were integrated using both EasyWMS and Gallileo control software.

The company wanted the first hands that touch a bottle of their product to be the client's.

The company decided to go with an RFID (radio frequency identification) system to accomplish complete automation without manual intervention. According to Lancho, the company wanted "the first hands that touch a bottle of our product to be the client's." The system works seamlessly between their production center, the distribution center and the final retail customer. The company installed stacking automation at the production facility. The stacked pallets then go to the staging area to be loaded into trucks bound for the distribution center. Once at the distribution center, the system automatically removes the pallets from the trucks and stores them until they need to be delivered to a retailer. A robot picker is in charge of removing the necessary boxes from the pallets and stacking them on separate ones. These pallets are then loaded onto trucks and shipped to stores.

With the system data correct, the status of the palleted cartons changes to indicate that they are in transit to the facility. The merchandise is then automatically loaded on the trucks and the software alerts the distribution center that a truck will be arriving. This way, the software can also prepare plans for customer orders, which are sent to a picking robot at the distribution center. The picking robot receives instructions from the software, identifying the cartons required for a particular customer order, and removes cartons from the pallets in storage and loads them onto new ones destined for that customer. Once the pallets are loaded, they travel down automated tracks to a stretch-wrapping station where the orders are verified.

To ensure the optimal unloading sequence, the software determines which pallets have to be loaded in the truck first based on the order, in which the pallets are to be delivered to customers on the driver's route. Every step of the way is designed to achieve maximum efficiency – no wasted resources, no wasted time.

KH Lloreda brand products can be found in 23 percent of Spanish households. "Why aren't we in more homes?" asks Lancho, unsatisfied by his market share. "How can we be in more homes? We have to keep pushing." This spirit of accomplishment is what will ensure the brand continues to expand and grow in unison with a warehouse that will support its progress.

Mecalux in Spain

Having originated in Spain, with a 2,150 square foot workshop in Barcelona in 1966, the Mecalux Group still calls Spain home. Mecalux has expanded its sales offices worldwide, in over 70 countries, offering warehouse solutions to some of the most advanced automated storage solutions on the market. In the 1990s, the Mecalux group opened its 161,500 square foot logistics warehouse in Barcelona and eventually made it the home of the Mecalux 5 showroom, where the company displays its progressive R&D prototypes.

The last decade has been a whirlwind for the company with its expansion into both the software and automation industries in addition to the formation of Interlake Mecalux in the United States, and with plans of setting up new sales offices in untapped regions around the world, slowing is not in sight for the Mecalux Group.

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CONVEYOR TRAFFIC CONTROL: After aquiring the Research and Development division at ThyssenKrupp in 2005, Mecalux immediately began developing its optimized answer to PLCs–what followed was the robust, real-time Galileo.

The Guiding Force Within

The Galileo control software is the man behind the curtain, bringing life to Mecalux AS/RS systems

by Edesio Sanchez-Gomez

A well-tuned warehouse operation is the summation of procedures in line with established parameters and constraints. Every aspect of inventory management must be perfectly implemented to avoid disrupting production flow. Understanding that – and acknowledging that "to err is human" – the adoption of automated warehouses has sought to mitigate such error-prone factors. Automated systems require guidance in order to execute its functions precisely. Guidance entails direct communication, along with the interpretation, delegation and control of orders. The Mecalux Group's Galileo control software may be the sidekick to the Automated Storage/Retrieval Systems (AS/RS), and like any right hand, its reliable presence helps get the job done.

In 1999, automation manufacturer ThyssenKrupp developed control software for automated warehouses using programmable logic controllers (PLC), independent microprocessor-based devices that control automated processes for industrial machinery. When Mecalux acquired ThyssenKrupp's R&D department in 2005, it inherited Galileo and began developing it as an alternative to conventional PLCs, one that would enable a real-time process and incorporate a graphical programming language for PC platforms. In its nascent stages, the control software was developed based on reusable libraries (collections of data and codes used to develop software) used by all automated implements through modules. As the software developed, Galileo incorporated a model that employs a computer language based on data structures known as "objects." This object-oriented programming applies concepts of inheritance (creating functions based on pre-existing objects)

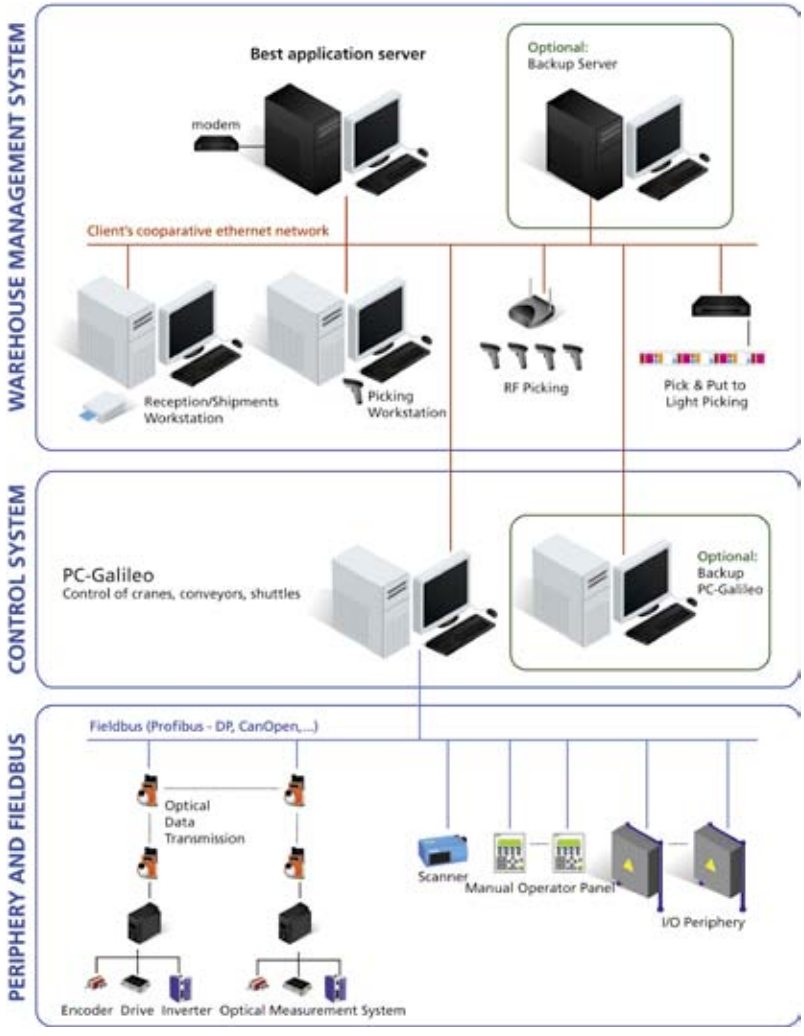
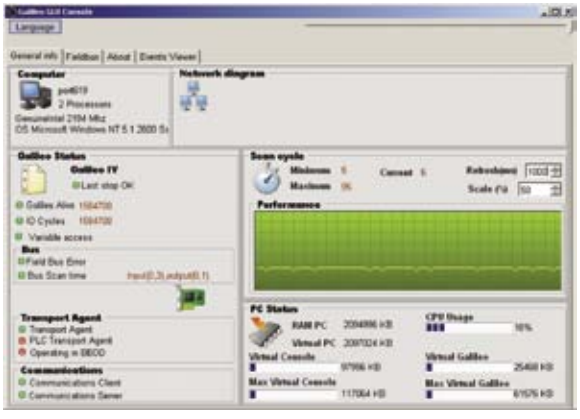


FIGURE 1: Total Control. Galileo plays a major part in parlaying communication with automated devices within a warehouse.

FIGURE 2: Soft PLC provides an easy-to-use GUI console that allows end users to access all AS/RS operation controls.



and polymorphism (the ability to create an object that has one or more forms or functions) to arrange the objects in a type of hierarchy. Employing a graphical programming language allows individual object tasks to be carried out according to their attributes within the hierarchy, so the sequence of actions is based on the active or inactive state of the object and its behavior (the manner in which data is accessed). To provide a practical display of these motions, Mecalux also incorporated a versatile operational screen, or Graphical User Interface (GUI), into Galileo that allows warehouse operators to interact with automated devices with ease.

Three Tiers for WCS

Within a Warehouse Control System (WCS), Galileo acts as a general coordinator, establishing a control hierarchy enabling AS/RS units to carry out their tasks according to the protocols established by the Warehouse Managing System (WMS). Like an air traffic controller, each object function is an individual airplane ready to take off. The WMS — such as the Mecalux Group's EasyWMS — assigns a series of orders to Galileo, which helps it determine a take-off order (object hierarchy) and regulates the object task once they are in the air. From executing hardware operation to streamlining communication with the WMS, Galileo instructs each object how it must carry out its tasks. Therefore, the combination of EasyWMS and Galileo commands integrate all warehouse operations through a multi-tiered function system (Figure 1). Located on the top tier is the ERP/HOST server, which integrates the WMS and serves as the logistical hub for picking and shipment tasks to be carried out. Once orders have been issued, the second tier is reserved for WCS tasks. From this location, Galileo controls AS/RS tasks in real-time through a fieldbus – a network structure that relays protocol commands to the operation machines. The last tier corresponds to fieldbus and periphery I/O devices such as barcode scanners, as well as AS/RS devices that actually carry out the tasks ordered by the WMS. Once orders have been completed, Galileo informs the WMS of the order status and its performance.

All for One

As a comprehensive multi-tasking program, Galileo is comprised of four control applications that provide specific internal actions and their sum total encompasses all AS/RS device communication, system monitor and motion control elements. These applications are highly versatile and configurable, so end users can customize Galileo to meet their warehouse's unique needs. Galileo is made up of the following:

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SoftPLC This corresponds to the control program execution and functions as a Programmable Automation Controller (PAC), combining PLC features with PC-based capabilities (Figure 2). The PC platform will order all devices within its network through a fieldbus that links the automated devices to it. A GUI console allows operators to access the different function events, monitor AS/RS performance and network connectivity, enable workflow and configure specific tasks.

Simplified Control

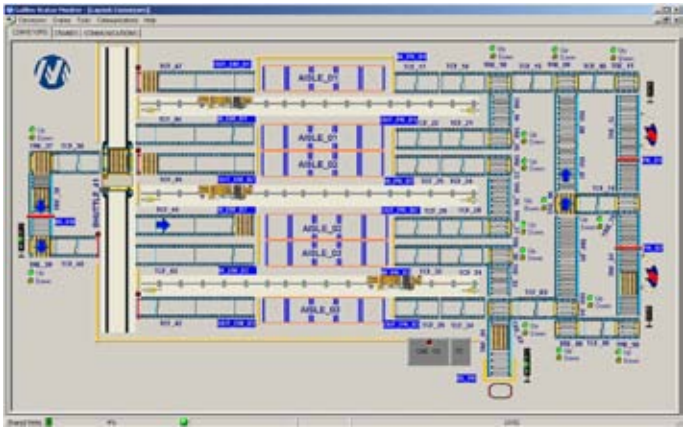
Since its inception, the Mecalux R&D department has continuously developed innovative solutions that resulted in simplifying warehouse operations. Although Galileo is still reaching new milestones as part of its ceaseless evolution of warehouse control systems, each released version is just an additional turn of the screw on the Galileo machine. "We continue to advance," said José Luis Santiago, IT manager for Mecalux.

FIGURE 3: The Integrated Development Environment allows end users to configure and develop protective applications to prevent malfunction. FIGURE 4: Status Monitor helps keep an eye on automated operations and can quickly pinpoint malfunctions.

Designer From this application, the user programs machine logic at a given facility and performs the communication configuration with the hardware elements and the WMS. Designer provides a "work space" deemed the Integrated Development Environment (IDE), wherein an operator can edit and program the written text (source code) that constitutes the programming language, as well as interpret the instructions given by the WMS. As a development environment, it allows end users to configure and develop applications such as a debugger in cases when malfunctions occur (Figure 3). Designer establishes a class hierarchy, denoting what each object's function will be via its relationship with other objects, as well as a vertical path of function sequences. Each object will be highlighted as it carries out its function, allowing users to pinpoint malfunctions and monitor tasks.

Status Monitor This is the Supervisory Control and Data Acquisition (SCADA) system monitor and problem diagnosis module that accounts for quality control of operations (Figure 4). The highly customizable Status Monitor provides a visual layout that allows operators to observe the function progress and locate any malfunction that may occur. This module allows warehouse operators to interact with facility operations and determine manual or automatic operations.

Transport agent This module is in charge of enabling communication between the control software and the WMS. The transport agent delivers data and manages orders issued by the facility devices to the WMS, confirms the operation status and when tasks have been completed. The newest version of the Galileo software supports a TCP/IP model, which facilitates third-party network connection to the WMS.



"We had improved Galileo's internal process to make it faster and now we're updating the IDE. We want to make the interface look better for the end user."

Ultimately, Galileo has taken the road less traveled in order to ensure ease of use at minimal expense to the customer. Programmable logic controllers are certainly the standard among industry AS/RS, but are far more expensive and harder to adapt to new or integrated systems. The intuitive design of the PC-based Galileo program is familiar to almost everybody and guarantees users a reliable program designed to do many jobs. PLCs adversely function almost exclusively as one-task-at-a-time-based controllers – a debit not to be overlooked in an industry that covets convenience second only to cost. For Mecalux, simplifying automated solutions is bestowing the material handling world greater control over its success.

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industrial size
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TYP F 8 LF 2
Euro size
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TYP F 64
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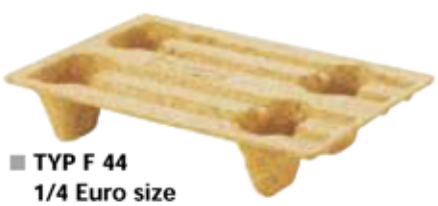

TYP F 44
1/4 Euro size
400 x 600 mm

type	size mm	*max. dynymic load capacity	
		standard	heavy
F 44/46	400 x 600	250 kg	
F 36	400 x 800	500 kg	1000 kg
F 64/66	600 x 800	500 kg	1000 kg
F 76	760 x 1140	900 kg	1250 kg
F 86	800 x 1200	250 kg	
F 8 LF 1/LF 2	800 x 1200	900 kg	1250 kg
F 10	1000 x 1200	900 kg	1250 kg
F 11	1140 x 1140	900 kg	1250 kg

*These specifications are a theoretical maximum load capacity, which is based on the "modulus of rupture", detected in quality checks in our laboratories under certain test conditions. The load is defined as a compact load. It's weight is well distributed over the whole pallet's surface (no point loads). We recommend to test pallets for individual applications.

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Never Make Secondhand the First Option

Understanding the benefits of new storage racks and challenges of old

by Marta Jimenez-Lutter and Adam Shafer

All cars are not created equal. A pre-owned Yugo with 100,000 miles sits on the lot screaming probable disaster. It's not a costly vehicle and would likely get you to where you're going. But for how long? It certainly isn't a good bet to outlast a new car and how comfortable can a customer possibly feel consistently wondering if today is the day the Yugo breaks down completely and leaves them stranded? Outfitting a warehouse with rack is a similar process to buying a car, albeit more complex and not without plenty of challenges.

Price is usually the determining factor when buying pre-owned warehouse equipment. Smaller companies in the United States and some neighboring countries see the used market as their first option when outfitting storage installations. And while used rack might make sense if the components are in sublime condition, there is never a guarantee of a used rack's calculated strength. To be able to safely and effectively install a warehouse system, one must know the specifications of the rack being charged. Is it made to sustain 2,500 lbs or 5,000 lbs? Are all the components

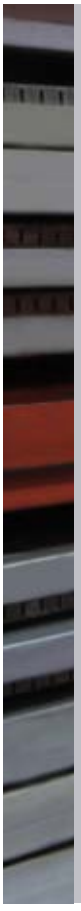
rated for the same load capacity? What if the safety mechanism is damaged or missing from the end plate on the beam? What if the end connector is not appropriate? These specifications are not only important, they are essential due to new building codes and certification requirements. The Rack Manufacturers Institute, the American Iron and Steel Institute and the American Institute of Steel Construction each publish a steel design specification. All racking systems must comply with these specifications along with local building and fire codes.

The structural strength of the components has certainly changed over time. The steel specifications used for rack in new warehouses have been modified over the years. The yield strength, measured in psi (the amount of pressure exerted on an area of a square inch), has gone from 35,000 psi in older installations to a yield of 55,000 psi in newer ones. This makes the rack significantly stronger and carries with it the possibility of building taller structures with greater capacity and more seismic resistance. Seismic map specifications also affect the material handling industry. Not long ago only a few areas required seismic certification. Now the requirements are stricter and they are tied, not to a zone only, but to a specific physical address. A rack designed for northern California might not pass the requirements for southern California. Seismic calculations and help with necessary permits can be included in the price for new installations. New racking design will be calculated to meet current seismic requirements. Used machinery dealers cannot guarantee the calculations done to their rack or what they were originally designed to support. Testing and consulting fees might prove penny wise and pound foolish, offsetting the costs of going with used. Think of it this way: one wouldn't gamble the life of their child on the reliability of a used car seat, why would warehouse owners risk their livelihood gambling on the stability of refurbished rack?

Why would warehouse owners risk their livelihood gambling on the stability of refurbished rack?

The difficulty in selling used and refurbished rack in large bulk is that the odds of having matching specialized systems with unified components are slim. Storage systems done correctly are intricate and synergize within one another. It's just not likely any used seller would have a unified system that also happens to fit perfectly within your warehouse space. The money warehouse owners save going with pre-owned rack is likely to cost them later on with what they forfeit in efficiency.

Some used companies tout their shorter lead times, but even the shorter lead times as compared to new rack manufacturers is debatable. Plant distribution dictates much of the speed issue. If a California customer buys used rack, the distributor of that rack is less likely to cover the logistical outlets around the geographical area. New rack manufacturers and distributors are more likely to cover a larger area. For warehouse owners, used rack distributors may have shorter lead times, but it's likely dictated by geographical



New Rack Advantages

- Specific weight capacities
- Complies with new siesmic certifications
- Can be built according to load capacity
- Nice cosmetic appearance
- Essential weight capacity knowledge

Used Rack Advantages

- Priced right IF in good condition
- More readily available with shorter lead times
- Transportation savings with local provider
- Better for the environment

region. They're lead times are short as long as shipping distances are short. If the options for quality used storage systems were slim when taking an entire national scope into consideration, imagine the odds when only considering a specific region?

Installing new rack in a warehouse has many benefits: better rack quality, more control and beam fit, and higher efficiency which results in a reduction in maintenance costs. Greg Hajdus, engineer for Interlake Mecalux, explains, "New rack has more advantages than used; you know exactly the capacity of the product." Hajdus added, "Installation is much easier because it's new. It´s designed for specific applications including all the hardware that is necessary." In a nut shell, when you buy new, not only do you know what you are getting, you determine what you are installing.

Investing in new rack will almost certainly be a better choice than used. Used rack's major selling points have long been affordability and delivery speed. Many new rack manufacturers have established these claims as being true to the casual observer, but much less true to the bottom lines of warehouse owners.

New rack offers the overwhelming advantage of knowing what you are getting.

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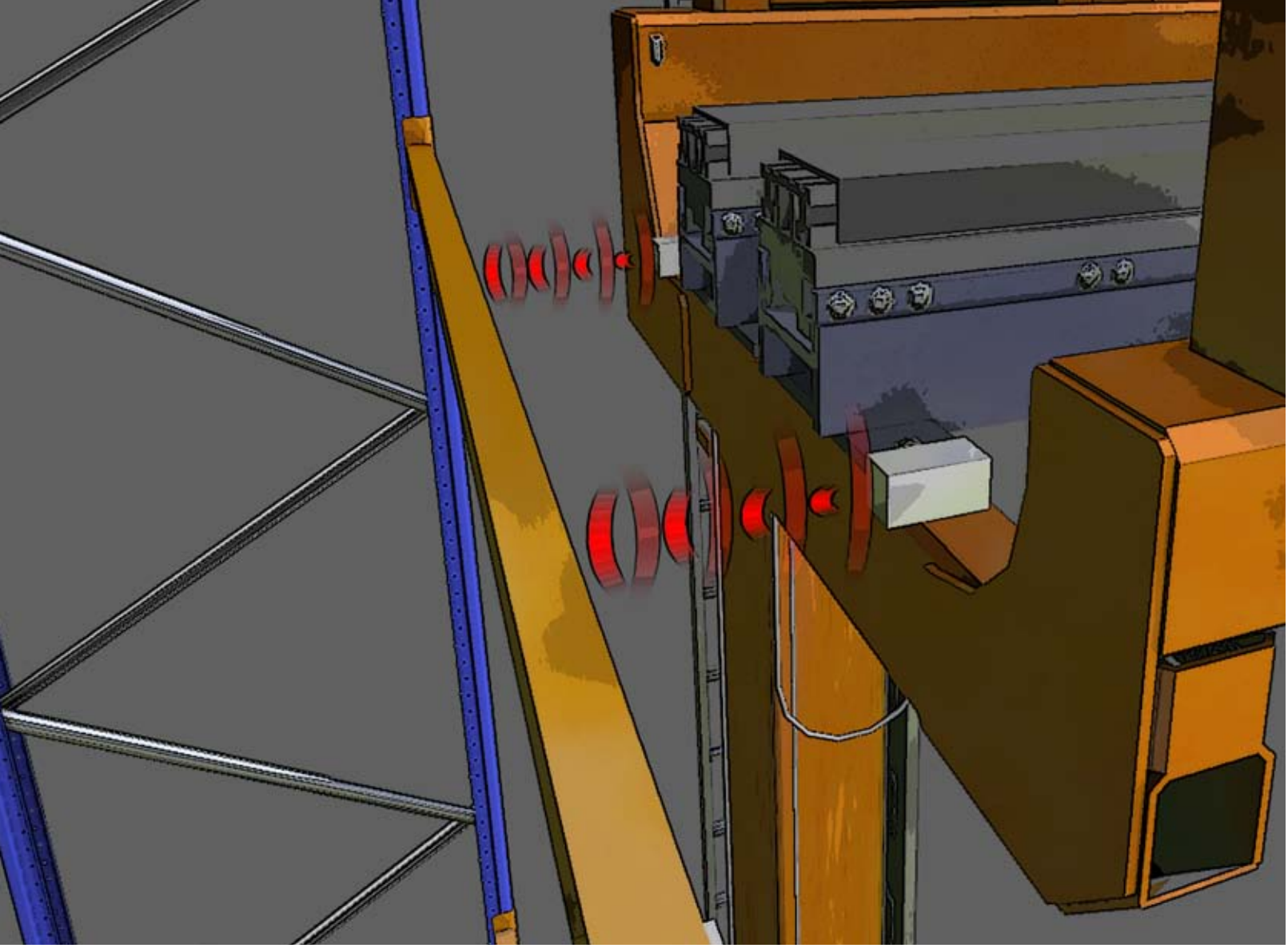
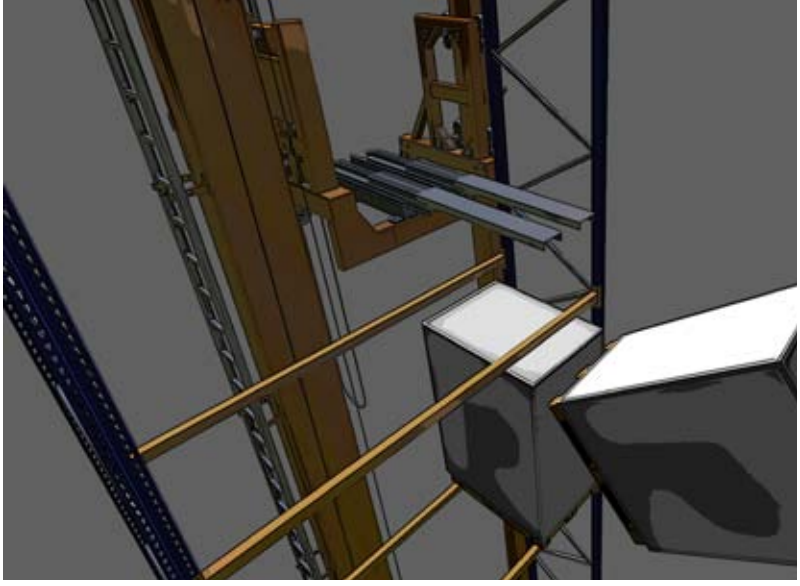


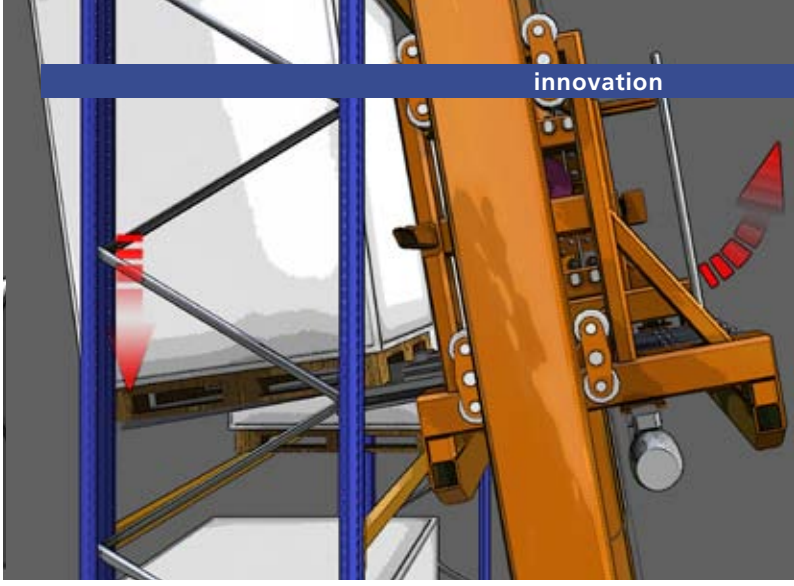
A Better View

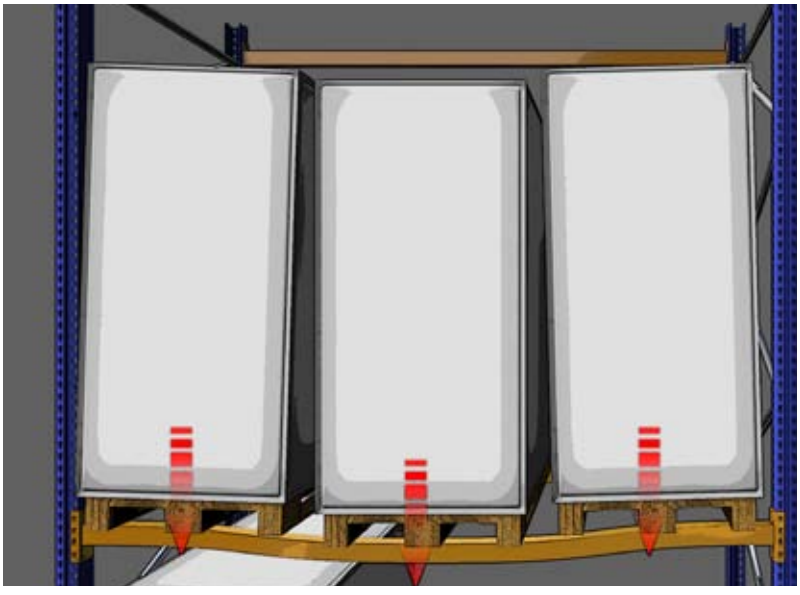
Mecalux is developing an advanced vision technology solution to the problem of deflecting pallet rack

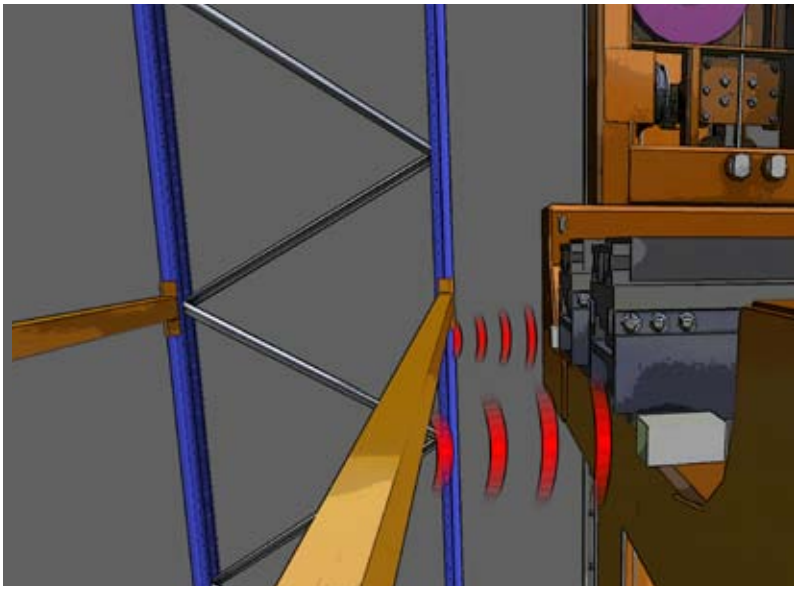
by Edesio Sanchez-Gomez

The material handling world has come to terms with one certainty: in time, all pallet rack deflects. The many years of loading and unloading pallets will slowly but surely dent and bow the rack structure, affecting picking and storage operations. In an automated warehouse setting, an AS/RS unit would inevitably encounter a hindrance of this kind. The telescopic forks located in the crane's lift cradle would have difficulty picking or storing a load without seriously damaging rack beams or the load itself. To ensure precise pallet movement operations, stacker cranes are fitted with proximity sensors to detect the distance between the cradle and the rack beam. However, after years of successful use, the slowly deflected rack could hinder the sensors' ability to precisely determine the depth a fork must extend. As the AS/RS unit moves toward the pallet position, a deflected beam would render the pallet as "missing" (as a sensitive unit would be unable to "find" the product). In light of these deflections, Mecalux is engineering a solution by completely revamping its current proximity measurement system.





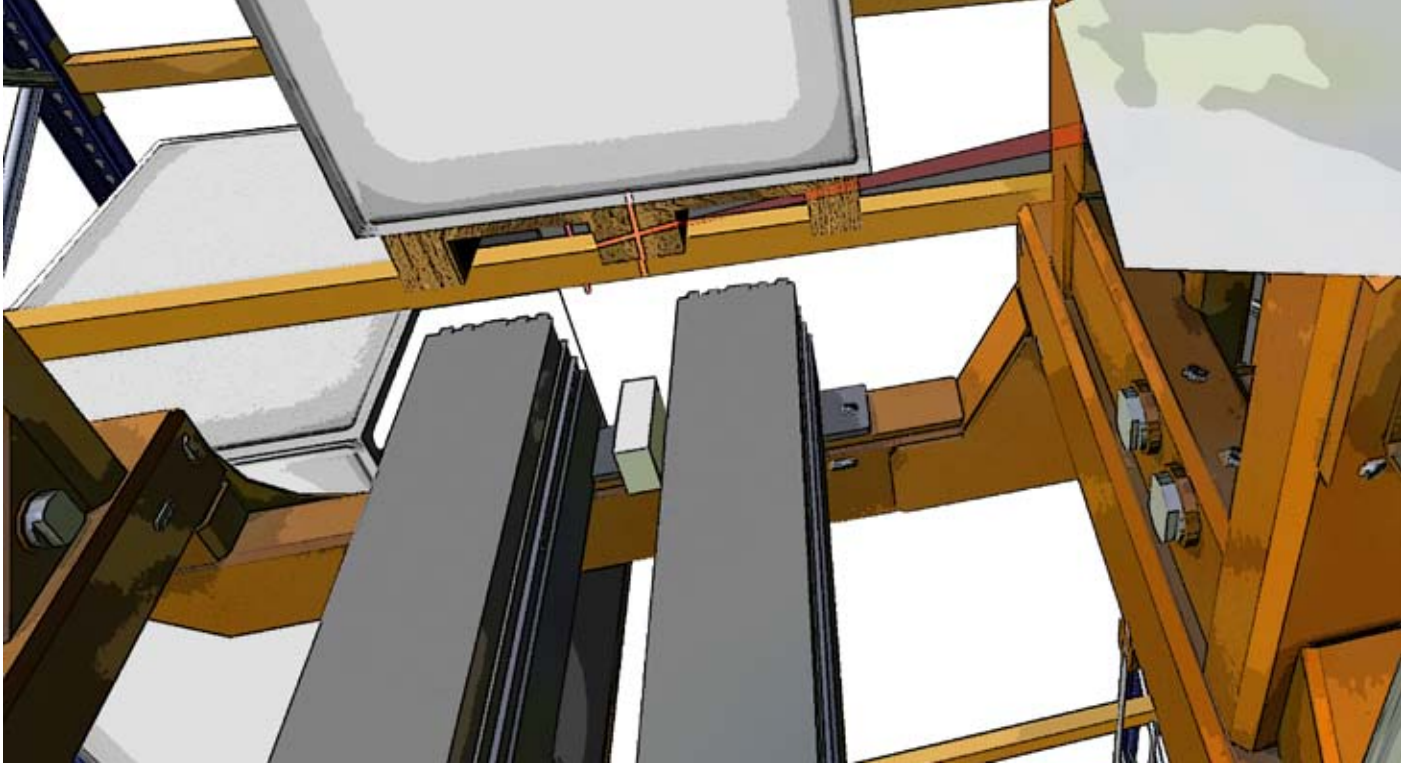




ABOVE: Regardless of the type of deflection present, the Mecalux artificial vision system can precislely detect any deflection and correctly position pallets on rack beams.

Current Mecalux stacker cranes use a system that mounts diffused proximity photoelectric sensors (photocells) onto the telescopic forks of the cranes. The sensors transmit a laser beam toward a remote target — in this case, the rack beam — and then the beam is reflected back to a photoelectric receiver. The system calculates the distance between the cradle and the beam according to the time-of-flight principle: the time delay between laser beam transmission and reception is measured and provides the distance in between. Based on the proximity to the rack beams, the telescopic forks will extend a specific distance from the crane's cradle and load or unload a pallet onto the rack. However, the disadvantage of photocell sensors is the lift cradle requires a large amount of sensors (a cradle can have up to 18 photocell sensors on it) to ensure the most precise position. Since the photocells function when the laser beam

Mecalux continuously improves AS/RS responsiveness to rack deflection and remains dedicated to assuring tolerance between the machine and rack. The most current prototype diagnostics the company has developed are expected to yield results by the end of the year.



ABOVE: Employing a combination of laser optics and cameras, a stacker crane adjusts its operations to make up for any type of deformation.

Mecalux Envisions an Innovative Future

The Mecalux 5 showroom in Barcelona displays a multitude of groundbreaking solutions that will be available to the material handling industry in the coming years. Although this space showcases projects and prototypes that will see the light in the next five years, many of them are becoming a reality right now. The artificial vision system being developed by Mecalux is not merely a part of this glimpse into the future of warehouse solutions, but a present day innovation that is endowing warehouses with a longstanding existence.

transmission is received, it computes the presence of a remote target, not its position. Therefore, the sensors are unable to take into account any degree of deflection in a beam.

Another disadvantage is the limited range of the laser beam transmission, since after a certain distance away from the remote target, the laser beam light particles begin to disperse, causing the beam to lose its intensity and provide imprecise information of an approaching target. This in turn also affects time responsiveness, so a stacker crane may have a delayed response to an approaching beam and prevent the stacker crane from colliding against it.

Mecalux set out to find a solution that made the same system more effective in the face of deflection. The solution is the development of an artificial vision system that employs laser optics and cameras to function as rangefinders. As the crane carries out its loading tasks, the cameras take up to 50 photogrammetric images that a computer then uses to calculate a more precise position and distance between the rack beams and the lift cradle. In the case of a rack deflection being present, the camera can take a real image of the beam position and calculate the load and unloading movements, the stacker crane — using the Galileo control software — can then adjust its movements to compensate for any form of deformation. This is especially useful for warehouses

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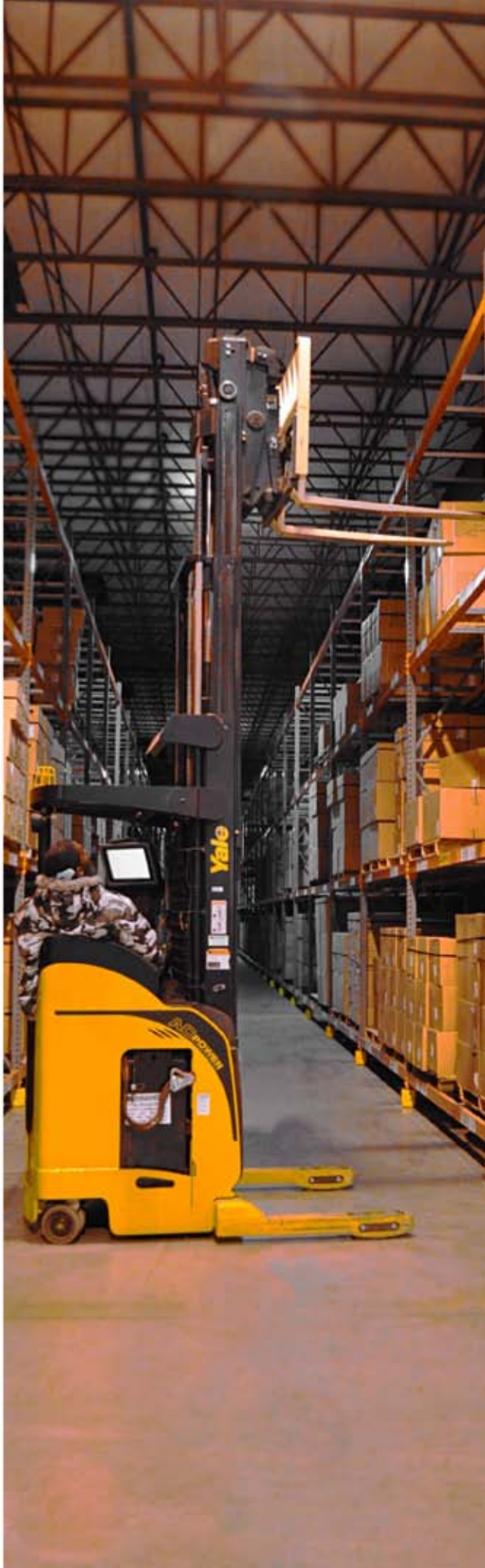

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Seismic Changes

Global seismic events are rocking the material handling industry, necessitating the enforcement of stricter construction regulations. As the seismic map grows to encompass more areas prone to high-intensity seismic activities, warehouses are now faced with the task of reinforcing their structures to withstand a significant seismic occurrence. Mecalux is aware that although it may not have any control over natural phenomena, it provides the means to ensure that warehouses all over the world remain safe and operational on shaky ground.

located in areas of high seismic activity, where pallet racks may buckle gradually under the combined strain of loaded pallets and beam deflection. Although the result of an artificial vision system would ultimately be the same as proximity sensor, it would simplify the number of sensors, decreasing from 18 photocells to a single laser projector and camera.

Mecalux continuously improves AS/RS responsiveness to rack deflection and remains dedicated to assuring tolerance between the machine and rack. The most current prototype diagnostics the company has developed are expected to yield results by the end of the year.

The disadvantage of photocell sensors is that the lift cradle requires a large amount of them to ensure the most precise position.

Mecalux is developing an innovative solution to counter deflection issues that could critically affect operations in an automated warehouse.

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In the News

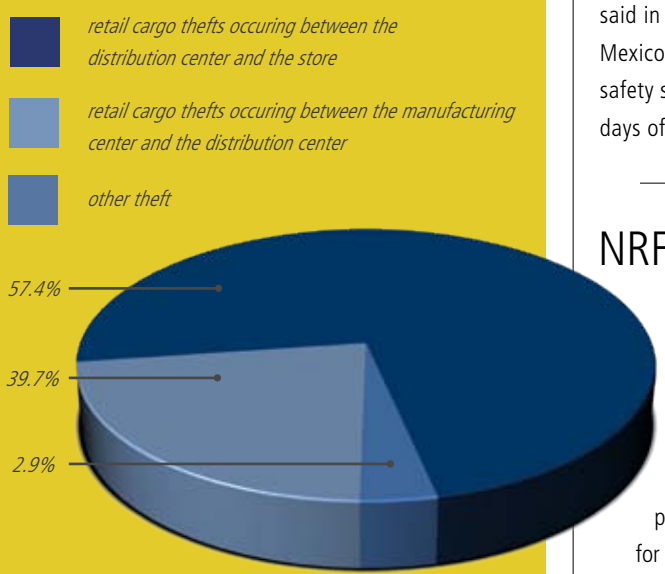
U.S.-Mexico Border Officially Opened for Long-Hauling

Three months after the United States and Mexico announced their agreement to re-open the border for long-hauling trucking companies after a 17-year moratorium, the initiative is now official.

As recently reported in this publication (Vol.1, No.3), NAFTA granted Mexico access to U.S. highways with minimum restrictions. The U.S. quickly determined that Mexican fleets were unsafe and restricted the drivers' access to within 25 miles of the border. Eventually, Mexico retaliated by charging the U.S. taxes on anything they brought over the border. That era is over. Mexican truckers are once again transporting their goods deep into el Norte, while the U.S. is no longer forced to pay the pricey tariffs to its third-largest trading partner.

Mexican truckers are once again transporting their goods deep into el Norte, while the U.S. is no longer forced to pay the pricey tariffs to its third-largest trading partner.

"The agreement is a win for roadway safety and a win for trade," U.S. Department of Transportation (DOT) Secretary Ray LaHood said in a statement. To appease both sides, trucks coming up from Mexico will be required to comply with U.S. federal motor vehicle safety standards, while the transport tariffs were suspended within days of the first truck's certification.



NRF's Cargo Theft Study

Half of all retailers report that they have fallen victim to cargo theft, according to the 2011 National Retail Federation (NRF) Organized Crime survey. "Cargo theft is a rewarding, profitable enterprise, and criminals are increasingly finding ways to infiltrate the supply chain," said Joe LaRocca, NRF senior asset protection advisor. In-store theft has always stood as a problem for retailers, but increasingly, merchandise is being filched before it even hits shelves.

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Of the retailers who admitted to having faced cargo theft, 57.4 percent say that the theft occurs between the distribution center and the store, while another 39.7 percent note the problem lying between the manufacturer and the distribution center.

FreightWatch International, an Austin-based cargo security firm, collected reports of $425 million in stolen cargo in the U.S. last year. The company, along with the FBI, estimates that thefts range between $10 billion and $30 billion a year. They also note though that it is hard to estimate an exact value. FreightWatch indicates that cargo freight theft has risen 30 percent since 2007.

The company also reports that nearly half of all cargo threats are committed by organized specialists, with the FBI citing many of them based out of south Florida, coming up from Cuba. The average boosted truck load is $417,000, with pharmaceuticals being the most coveted. In March of 2010, the highest-value cargo theft in history happened at a warehouse in Enfield, Conn. with thieves taking $76 million in antidepressants.

Manufacturing Sector Slips in Second Quarter

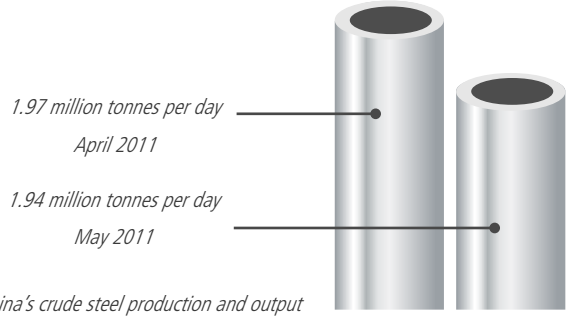
Quarterly growth in manufacturing sector shows signs of diminishing when compared with first quarter expectations according to the Beige book, the Federal Reserve survey which continually tracks regional economic activity. However, the survey also showed growth in manufacturing activity through the end of May in 10 of 12 Federal Reserve Bank districts.

Several steel producers throughout the nation noted that customers were resisting any price increase despite the climbing price of commodities. Manufactures are trying to balance this dilemma through price hikes or fuel surcharges.

A turnaround is predicted for the third quarter. Participants surveyed in Minneapolis noted increased activity of their energy and mining sectors and their iron ore mining was operating at full capacity. Drilling activity in Dallas and San Francisco was also reported as strong and with foreseeable growth in the future. Work has been re-permitted in the Gulf of Mexico. The large surge of drilling is directly linked to an overseas surge for oil and natural gas.

However, the report indicated that no district saw a positive push in housing prices, and residential building continued to remain rather stagnant. Though, non-residential construction had an uptick in Boston, Chicago, Dallas and Minneapolis, as well as high-end commercial development.

Energy Needs Hurt Steel Production



China's crude steel production and output

Fully recovered from the power shortages in March and still facing a weak market, China's crude steel production and output dropped from a record-high average of 1.97 million tonnes per day in April to 1.94 million tonnes per day in May, according to figures released in June from the China's National Bureau of Statistics. With the energy problem being most predominant in southern China, mills have been forced to curb their production. There is no sign of production picking up in the mills with the Bureau noting an expected drop in June.

Population and Mother Nature are two of the grievous opponents of the country's energy crisis; 20 percent of China's energy comes from hydroelectric power supplied through three gorge dams. But its recent drought has played havoc with the energy production and reserves. The Yangtze River, as reported by the Chinese government, is at a historic low, and water levels surrounding the city of Wuhan have fallen so dramatically, ocean-going vessels have been forced to circumvent the area.

Mecalux donates rack to the University of Illinois racing team

The Engineering Students at the University of Illinois' Projects Lab are fabricating cutting-edge prototype vehicles on par with any of the big auto makers. Competing their roadsters in events and races throughout the United States, the university's team – Orange Thunder – recently took eighth place at an event with their eco car, which gets an intimidating 894 mpg (380 lpk) and weighs roughly 97lbs (44kg). Their hybrid racing team also received high praise from General Motors for the battery design in its formula hybrid race car.

The students receive a portion of the items used for builds through donations and fundraise for the rest, making their inventory precious to them. Interlake Mecalux stepped in and helped further these young engineer's efforts with a donation of widespan shelving installed into the storage space the team kept all their tools and parts.

"Five years of a mess has built up in our shop and needs to be straightened out," said student lab supervisor Pete Hetman. "I'm really glad Mecalux was willing to help."

Porcelanosa update

The new Venis installation, part of the Porcelanosa group, a 35,000 square foot addition to the original Porcelanosa warehouse constructed by Mecalux in 2003, is on its way to being completed, which will make it one of the largest automated warehouses in the world.

At the time of publication, the installation of the ground slabs and the closing of the warehouse building were being finalized. The ground slabs were planned and mapped, with each of the new developments coordinated relative to their distance from one another.

The new Venis installation will connect to the Porcelanosa warehouse by way of a 2,625-foot-long underground tunnel. Conveyors within the tunnel, that will move the 3,500 lbs pallets from the addition to the main warehouse, are receiving finishing touches. Two stacker cranes were erected in late August.

The final reception of material and pre-construction phase is on its way and will culminate with the raising of the racking structures by September 1.

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Nearshoring Trends Slow Offshoring

In order to improve logistics and manufacturing, many global companies are bringing it all back home

by David Batka

With the economy still treading to stay afloat, supply chain executives in a recent survey expect nearshoring to increase over the next two years. WT100 and the University of Tennessee's recent survey of global supply chain trends shows that 52 percent of industry leaders anticipate production of U.S. goods to relocate closer to the States.

Nearshoring, the act of maintaining production or IT in a country in close proximity to your own, minimizes some of the logistics and problems associated with offshoring. While American offshoring to countries with inexpensive land and labor forces like China and Japan is enticing to many businesses, product quality may diminish because of the distance and the enhanced risk of miscommunication. Japan's earthquake earlier this year disrupted much of the global supply chain and jolted executives into considering offshoring and outsourcing to be less than lucrative than it has been in the last decade.

Turnaround time for new production implementation lengthens when a company isn't based in the States and has production half-way around the world. Communication isn't as fluid, as noted by the survey's 28 percent of executives citing poor product quality. A company overseas may subcontract out production of a product, thus when businesses in the States need immediate changes to a product, multiple lines of communication need to be

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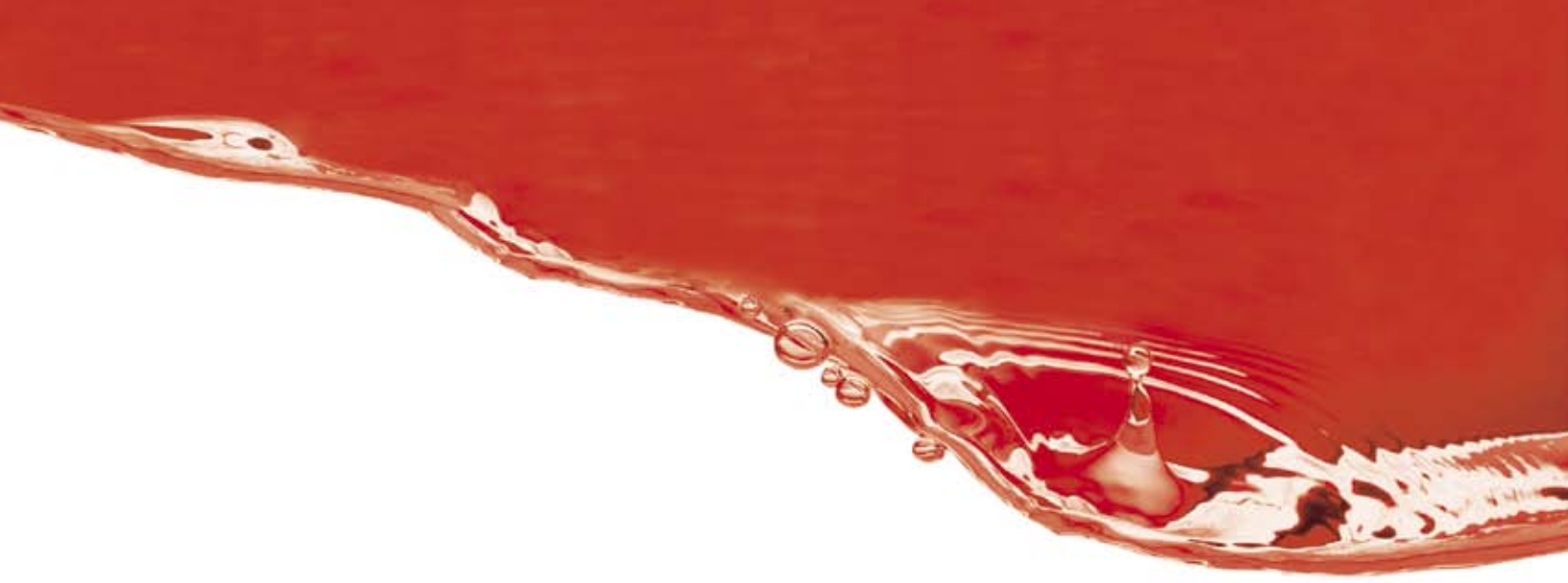

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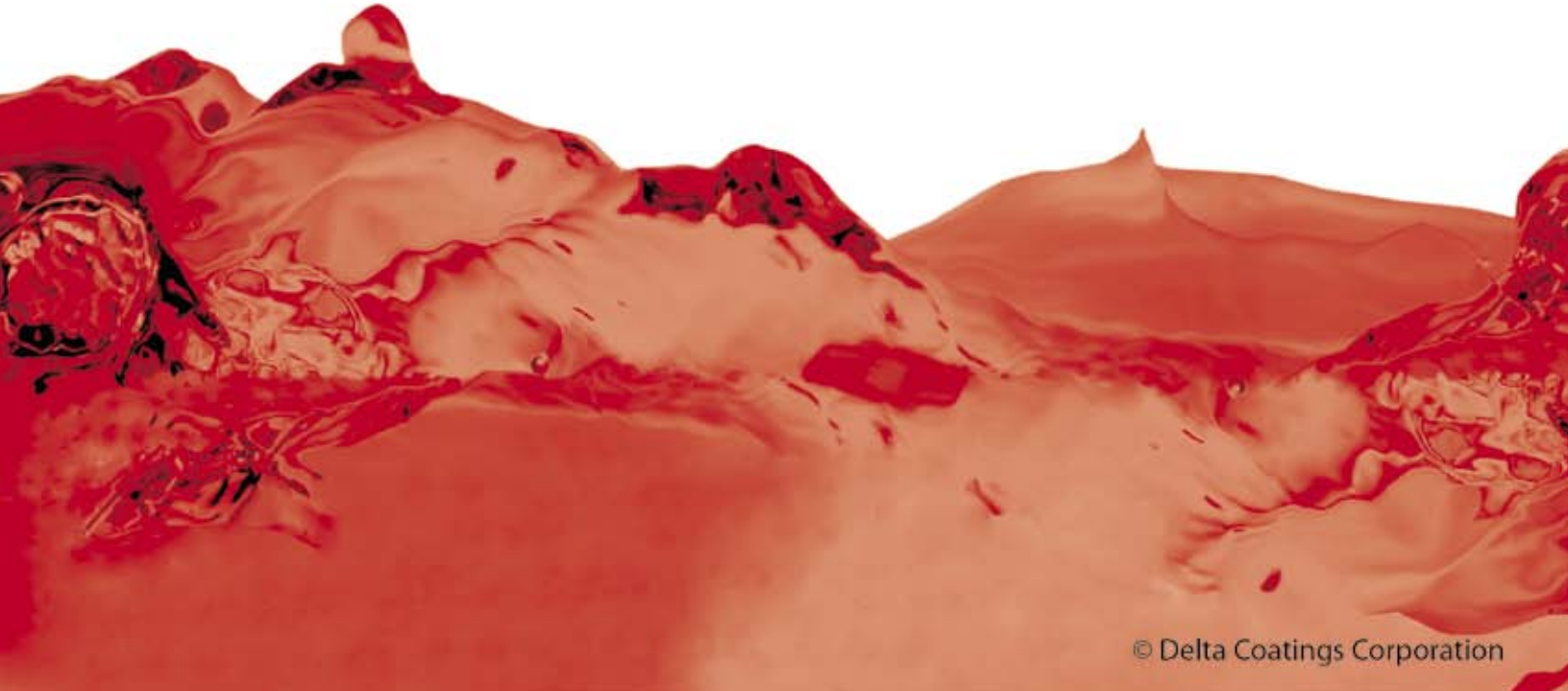

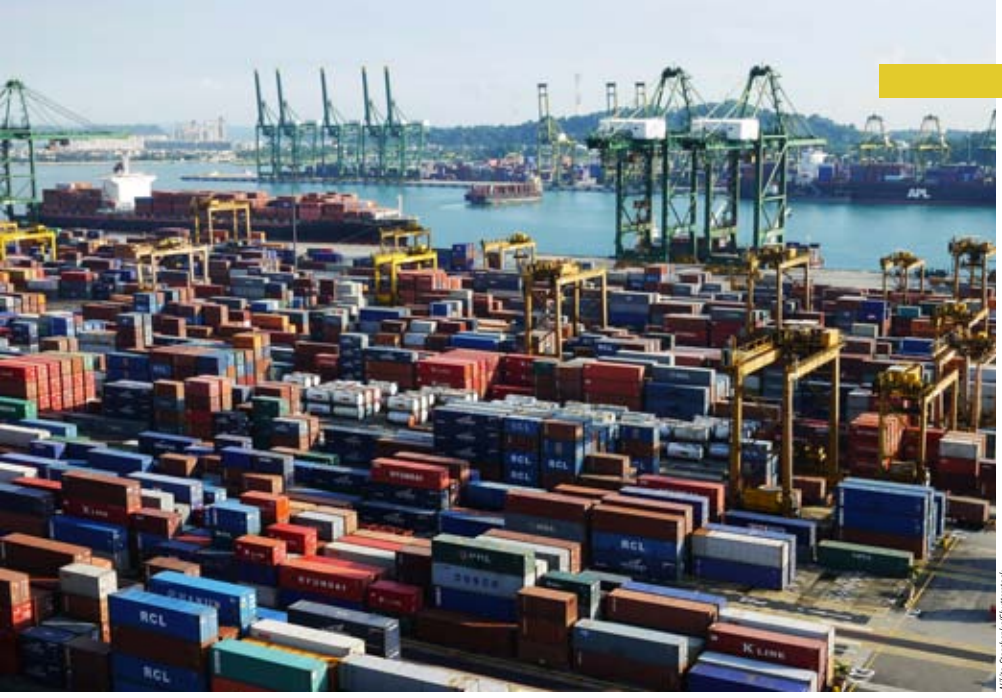

Nikita Starchenko/Shutterstock

opened first. This relay can easily become delayed and misunderstood, resulting in a subpar outcome. This can be seen with the drastic drop in outsourcing and offshoring through U.S. technology companies, with 35 percent outsourcing services or manufacturing – a drastic change from the 62 percent in 2009, according to a study by BDO USA, LLP, a leading accounting and consulting organization.

> Japan's earthquake earlier this year disrupted much of the global supply chain and jolted executives into considering offshoring and outsourcing to be less than lucrative than it has been in the last decade.

Labor overseas is also not as cheap as it once was. According to the U.S Bureau of Labor, China's hourly compensation in the manufacturing industry more than doubled between 2002 and 2008, rising from $0.57 to $1.37. While this is still far under the U.S. manufacturing wage rate, rising fuel and transportation costs have decreased much of the profit once gained through the global supply chain. Crude oil prices are a contributing factor towards a push for nearshoring, with crude oil prices reaching a 30-month high at $114 per barrel in May. Of the executives surveyed, 61 percent cited the spike in shipping costs to be the key reason of the perceived future utilization of nearshoring. Likewise, increased shipping costs and late product deliveries are a source of ill sentiment toward global supply chains.

Surprisingly, of those surveyed, 48 percent said that they do not analyze risk while making their outsourcing decisions. Those who do, safeguard themselves mostly by doing business with an established provider and implementing a second domestic source that can be quickly implemented if necessary. In a 2010 survey, conducted by Grant Thorton, a consulting firm, of those surveyed, 44 percent felt that they had received no benefit going overseas.

The survey highlights supply chain executives seeing continued growth in outsourcing from the U.S. to China, India, and Latin America (excluding Mexico). However, American nearshoring in Mexico is logistically smart for some businesses, since it's an easily accessible border country, and its transportation infrastructure has improved. Additionally, the cost of Mexican labor is much cheaper than compared to that of the U.S. "[T]he country has a lot of appeal right now because of its proximity to North American demand and the continuing need of many companies to improve their working-capital positions," Chas Spence, a director in the Latin American Manufacturing Practice at Alix Partners, explained. "That appeal could grow if fuel prices continue to rise globally." For other Latin American companies, English proficiency still needs to be overcome.

PACKEX 2011: Under the Great White Toronto Lights

With the trade show season winding down, Interlake Mecalux packs up and heads north to PACKEX

by David Batka

In June, Interlake Mecalux attended PACKEX, Canada's premiere showcase of packaging, logistics and material handling solutions. The event, organized by PAC, the Packing Association of Canada, helped bring prominent names in the material handling industry together.

The expo helped highlight Canada's entrance into the manufacturing and shipping arena. Started in 1951, PACKEX is the country's premiere business acceleration event. This year saw the country's first large-scale premiere event with co-located exhibits, showcasing automation technology, design and manufacturing, process technology and green manufacturing. Despite Canada's small reputation in the manufacturing center, Industry Canada, the governmental department responsible for developing economic initiatives to fuel growth, has cited the presence of over 56,000 manufacturing plants, employing more than 1.7 million people with a combined revenue climbing over $600 billion annually and investing over $300 billion on materials and supplies. By comparison, the U.S. employs roughly 11 million people in its manufacturing sector.

Attendees discuss the benefits of EasyWMS.

The 20,000 square foot venue was the ideal place for Interlake Mecalux to introduce EasyWMS to the Canadian market. While a majority of the country's warehouses are on a smaller scale, EasyWMS is still ideal for their needs. Companies ranging from breweries to produce suppliers took note of Interlake Mecalux's unique software, enticed by the possible increase of their warehouse proficiency. PACKEX participants embraced EasyWMS because it offers multiple levels of functionality, allowing the software to adapt to the specific needs of a warehouse and the complexity of its automation. This feature allows for the software to work well with business growth and new processes.

Lynette Pettrone, Interlake Mecalux events coordinator, was pleased with the company's showing at the expo. "PACKEX was a great show for us in terms of branding," she said. "With the new Toronto sales office providing additional support to our distributor partners, there is a clear opportunity for us to grow and expand throughout Canada."

For Interlake Mecalux, PACKEX was a success, having built new prospect relationships while widening the geographical scope for which the company is creating new warehousing solutions.

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Upcoming Events

EasyWMS Webinars offer a 30-minute online preview of EasyWMS software. Customers are given the opportunity to see the software and ask questions.

Pick Module Seminars are two-day, in-depth training sessions on pick module design, benefits and applications.

Product Schools provide our distributors in-depth, real-life application training for our complete product offering. Training sessions are taught by our sales and engineering teams with presentations from Engineering, Customer Service and Marketing. Distributors have the opportunity to see and feel our products, ask questions and receive sales tools.

Partnership Courses are seminars or classes developed and hosted by organizations endorsed or supported by the Mecalux Group.

Traveling Showcases provide localized training for distributors who may not have the opportunity to attend our Product School. Scheduled for multiple segments over one full day, these education sessions provide detailed training similar to the Product Schools with bonus training on a specific product line or application.

Product Schools, Seminars and Webinars

September 20, EasyWMS Webinar

October 4, EasyWMS Webinar

October 13, Traveling Showcase
Atlanta, Georgia

October 25-26, Pick Module Seminar
Naperville, Illinois

Tradeshows

EPSam. Buenos Aires, Argentina. September 8-11
Initiated through the Municipality of General San Martin and the Economic Chamber Sanmartinense in order to promote the economic activity of small businesses, EPSam will showcase products and services from local SMEs. The 600 industry, trade and services participants will exhibit within the Park Yrigoyen and Exhibition Centre Migueletes in order to develop their business and optimize all the opportunities for productive sectors.

MidPack. Chicago, IL, USA. September 20-22
Find new equipment technology and materials at lower costs, reduce waste and increase efficiencies. The latest in: bags, containers, contract services, custom automation, equipment machinery and machinery components, materials, packages, package design and printing, robotics, supplies and software will be on display. Visit Interlake Mecalux in booth #1622 for a variety of warehouse solutions.

Alimentek. Buenos Aires, Argentina. September 20-23
More than 400 packaging professionals in the fields of materials, machinery, raw materials, computer services, design and new technologies will visit Alimentek to present their packaging systems innovations to nearly 42,000 industry professionals. Alimentek 2011 will have an influx of international visitors from Bolivia, Brazil, Colombia, Chile, Ecuador, Spain, USA, Italy, Mexico, Paraguay, Peru, Uruguay, Andorra, Austria, Belgium, Canada, Costa Rica, Guatemala, Holland, Honduras, Latvia, Panama and Puerto Rico.

Europack-Euromanut. Lyon, France. November 15-17
Solutions to packaging, packaging machinery, handling and storage problems will be on full display during the Europack-Euromanut exhibition. The exhibit is largely designed for engineering and purchasing managers seeking new suppliers, or hoping to receive solutions to their short-term projects. Visit Mecalux in Hall #9, Stand #D6.

Idtrack. Barcelona, Spain. November 17 2011
For the second year, Mecalux will present its flagship EasyWMS software to the 500 professionals attending the Congress Idtrack Technology Identification and Traceability in November. In addition to presenting at the Softrack seminar, the company will participate in Food Logistrack to exemplify the software's tremendous capabilities through case study evidence.

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Product Spotlight: Selective Pallet Racking

The Mecalux Group's most popular rack exemplifies how minor features provide huge advantages

by David Batka

Selective pallet racking is ideal for any warehouse, offering direct access to each pallet, simple stock management and adaptation to any product volume, weight or size. The racking is designed and built to last; shelving units purchased today will still be in use decades from now. With the products visibly exposed on the racking, picking efficiency is increased, since only a single pallet sits on a shelf.

Welded

- Powder coated in Vista Green for durability
- 1" fillet welds at all connections
- Horizontal and diagonal trusts penetrate columns
- Less staging area required for construction
- Ideal for seismic installations

Bolted

- Coated with Mecalux blue through cataphoresis
- Utilizes Grade 5 bolts with serrated washers
- Footplates bolt to teardrop-punched frame columns
- Shipped assembled for quick setup
- Repairs and reconfigurations are easily made

Interlake Mecalux's upright racking sets itself apart from its competitors through the unique design of the rack, contributing to its over-all function. The rack's column uprights or struts are shaped like none other on the market. Interlake Mecalux's U77 model offers seven bends, while models U80, U82, U101 and U122 offer nine bends for additional strength. The majority of competitor uprights only have the industry standard four bends.

The foundation of Interlake Mecalux's upright selective racking starts figuratively and literally at its endplates.

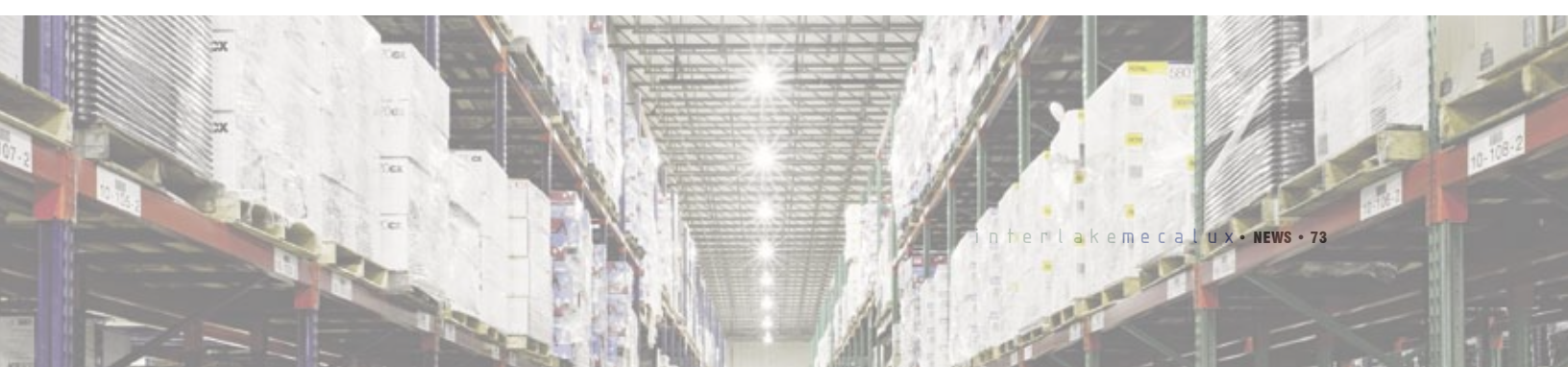
Interlake Mecalux's technical support engineer Greg Hajdus explained the advantage of the extra bends, "Strength and stability of the rack are increased with having more bends in an upright's column, leading to a higher storage capacity. Regardless, if two upright columns are the same gauge, the one with more bends will create a stronger backbone for the entire rack."

Interlake Mecalux's painting process is also unique to its selective shelving. Welded frame units come in a Vista Green powder coat finish, though custom hues are available. Powder coating the racking is beneficial because an even, durable coat covers the rack and inconsequential amounts of VOCs are released into the atmosphere. Bolted selective pallet rack units are painted in the well-known Mecalux Blue, using a paint process called cataphoresis, which is derived from electro-chemical processes.

The Mecalux Group's bolted selective pallet rack remains the gold standard of industrial strength rack and the ideal for any application where selective racking is to be utilized. It's far more cost-effective to ship a bolted rather than a welded product. Also, repairing bolted is easier and quicker than welded. Even in the improbable instance of a bolted rack's nut and washer come off the bolt, the unit will still hold because the bolt is in place. If a weld breaks or was created improperly, the entire structure of the rack is compromised.

The foundation of Interlake Mecalux's upright selective racking starts figuratively and literally at its endplates. The beam-to-upright connection, garnered through the piston automatic locking system remains its most unique feature. The locking system draws together under loads, creating the industry's most secure connection, while also maximizing total capacity. The locking system engages immediately once a beam is seated within the slot of the upright but also allows for easy release if adjustments need to be made. The piston locking system is also damage and tamper proof, preventing disengagement during use.

Interlake Mecalux is the leader of bolted selective shelving, constructing its products with Grade 5 bolts coupled with serrated locking nuts for a reliable and secure connection. "Selective pallet racks meet the capacity that consumers need and rival that of competitors," stated Interlake Mecalux Sales Representative Michelle Rankins, "We stamp our products because people try to copy us. Consumers want the original."



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