

Columbia

FEED DRAWER

Columbia Machine's Informational Publication

2020

MANSFIELD BRICK

Raising the Bar in Plant Performance

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COLUMBIA
ADVANCED AUTOMATION



**EVERYTHING
WE DO
ALWAYS
FROM THE EYES
OF OUR
CUSTOMERS**

Columbia

ENGINEERED SOLUTIONS // WWW.COLMAC.COM

VISION

We will be the preferred supplier of engineered product solutions in the targeted markets we serve. We will provide exceptional customer value through strategic marketing, innovative product development and unparalleled customer service.

MISSION

We are committed to recognized leadership in serving targeted segments of the Concrete Products, Material Handling and Manufacturing Services Industries.

We will “always” see our business through “the eyes of our customers,” and provide them with superior solutions through innovation, quality, reliability and continuous improvement.

We will leverage the expertise, product knowledge and technology of our business units to better serve our current and future customers.

Our core competencies will be Marketing, Product Development, Manufacturing Technology and Customer Service.

We value safety, integrity, trust, fairness, professionalism and teamwork in relationships with our customers, employees, business partners, suppliers and shareholders.

We respect our legacy and reputation within our communities and global markets.

We strongly encourage personal growth and the involvement of all employees in achieving Company goals.

We will secure our future through strategic investments and profitable growth.



Columbia

FEED DRAWER

Published by

Columbia Machine, Inc.
107 Grand Blvd.
Vancouver, WA USA 98661

Telephone: (360) 694-1501

Fax: (360) 695-7517

www.colmac.com

Some of the equipment pictured in this publication may have guarding removed for demonstration purposes.

Columbia Machine, Inc. recommends that equipment never be operated without all guarding in place and in good working order.

ON THE COVER:

Robotic Solutions
Advance Concrete
Production

Let's Talk

A MESSAGE FROM THE PRESIDENT

As a leading global supplier of equipment in the concrete industry, Columbia Machine's success continues because of our value-driven vision. Our strategic investments around the world position us to provide localized manufacturing and service support in our markets.

Columbia has adopted a lean-based methodology, Operational Excellence (OpEx), to drive our continuous improvement efforts by creating a physical, visual FLOW through the value stream. By connecting every manufacturing process from beginning to end, the flow of material and information will prevent items from being overlooked or moved in the downstream processes. It creates a customer delivery system with the shortest and most predictable lead-time, while increasing the values of safety, quality, delivery and cost that are sought by our customers. All of our operation improvements cascade from this objective.

The safety of our employees and customers is our top priority. From our internal processes, best practices, and designs, we strive to improve safety continuously. Three years ago, we introduced the CPM+. This machine has the safest and fastest fully automatic mold change in the industry. With this HMI (Human Machine Interface) improvement, mold changes and adjustments no longer require employees to be on the machine physically as the control system is now outside of the guards.

Columbia has five locations around the world that can manufacture and service molds for all equipment manufacturers' machine types. Through process improvements and combining technology with our family of companies, we have increased our production capabilities while reducing lead-times. Our goal is to be the world's leading supplier of molds, and we are well on our way.

Diversification is a key component to growing our market share. With manufacturing in four continents and our diverse product lines, we can provide any level of automation for any size production machine from small semi-automatic to fully automated large pallet machines. Columbia is a total solution provider for robotic palletizing, automatic bag placers, pallet handling systems, mixing & batching, molds and everything in between.

With our CRM and ERP systems, business intelligence shapes how we see the market and allows us to make adjustments that keep us ahead of industry needs. This data is shared within our network and helps us optimize product development, product line integration, and new markets ventures.

Columbia is committed to employee development and attracting top talent. We make strategic hires that support our vision of product and market development. As our team continues to evolve, we will continue advancing our products and technology while growing our global footprint.



Kevin Brown
President, Concrete Products Division

FEED DRAWER

Volume 63 Issue 1

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GET CONNECTED

WITH

Columbia[®]

WHERE WE ARE

CHECK OUT OUR ONLINE PARTS ORDERING!

Our system provides access to a fully customized parts ordering experience. Your personalized store will offer a quick and intuitive way to order the parts you need to keep your plant up and running.

SHOP.COLMAC.COM



OUR BLOGS

Concrete Products
columbiamachine.com/blog

Palletizing
palletizing.com/blog

Columbia/Okura
columbiaokura.com/blog



INSTAGRAM

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Concrete Products
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Be sure to keep an eye on all of our social media outlets for regular updates on company culture, division specific articles and other news.

COLUMBIA MACHINE, INC. ANNOUNCES EXECUTIVE RETIREMENT AND NEW DIVISION PRESIDENT



Rick Goode, CEO of Columbia Machine, Inc., announced that after 18 years with Columbia Machine, Richard Armstrong would retire as Concrete Products Division President. Richard agreed to stay on part-time as the Director of Business Development supporting Columbia's new manufacturing operation, Columbia do Brasil.

Columbia is pleased to announce that Kevin Brown as the new President of Concrete Products. Kevin has been with Columbia for 30 years, serving in numerous leadership positions. He brings extensive product line, application, customer service, and market development experience to his new role. "I am excited to take on this expanded role with our Concrete Products Division," Brown remarked. "These are exciting times for our Division. Under Richard's leadership, we have invested heavily in product and market development. We have seen the resulting growth over the last two years and see good potential for the future."

"While it is always challenging making a leadership change during times of growth and expansion, we are fortunate to have someone as experienced as Kevin Brown ready for the challenge. I have worked with Kevin for over 20 years and am thrilled to have him on our Executive Team," said Goode. "I have enjoyed working with Richard Armstrong, as he has led two of our Business Units in the last 15 years. Since he announced his desire to retire almost a year ago, we have been working on the transition plan. I am very appreciative that Richard has agreed to stay on part-time to support our transition and to help us with several business development projects that we are currently integrating. We hope to keep Richard challenged enough to convince him to stay on and postpone full retirement for the foreseeable future."

COLUMBIA MACHINE DO BRASIL



For over 40 years Columbia Machine has been active in Brazil with a substantial number of machines installed throughout the country. Brazil's restrictive conditions for importing machines, molds, and parts made serving customers difficult for Columbia. The incorporation of Columbia Machine do Brasil (CMB) and the acquisition of Vibramolde, a leading Brazilian mold supplier, gave the company the base to support customers locally. In June of 2019, Columbia and CMB completed the acquisition of Vibramolde.

Fabio de Andrade, the previous owner of Vibramolde, became the president of CMB. He brought over his key engineers and Production Team. CMB's Sales Team includes professionals who have worked with Columbia for years.

Columbia opened the new CMB manufacturing space and headquarters in Campinas, Brazil with a grand opening ceremony held in August of 2019. Campinas is located outside São Paulo and central to the majority of Columbia's customers. CMB expects to begin manufacturing machinery in 2021, prioritizing mold and parts production for regional customers. The production space includes 6,000 sq. ft. of space with 700 sq. ft. for office space with room to grow. Additionally, the new facility contains three CNC milling machines, a CNC burner, and brake and welding stations arranged for efficient mold and part production. In December of 2019 two more CNC mills were added to the line.

Columbia Machine and CMB share technology, engineering, and manufacturing processes to improve mold quality and manufacturing efficiencies. The CMB organization now has links into Columbia Machine's extensive database of customer information and decades of parts and mold designs. Since June, Fabio has concentrated on optimizing manufacturing to match production capability with increasing customer demand. Fabio is also changing the designs of molds to improve quality and extend their lifespan, thanks to the new processes and engineering available from Columbia Machine.

With mold production capped on a single shift, CMB will be moving to a second shift to meet growing demand. This second shift will give CMB added capacity to begin producing machine parts for Columbia's substantial machine base in Brazil.

CMB is not only the growing manufacturing hub for Columbia Machine in Brazil, but it is also the sales office for Columbia's extensive offering of machine solutions. Its sales force represents the small board machines from CME in India, the medium board machine solutions from Columbia in Vancouver, and the large board machine solutions from the Techmatik subsidiary in Poland. Each of these solutions has a place in the Brazilian concrete products industry.

Columbia is very excited to welcome CMB into its family. Founder Fred Neth's vision for Columbia Machine was for it to become a worldwide supplier of concrete products solutions. With operations in four states, seven countries, and four continents, Columbia is fulfilling that goal.



COLUMBIA MACHINE, INC. INCREASES NORTH AMERICAN MARKET PRESENCE

WITH ACQUISITION OF BIKLE MANUFACTURING AND INVESTMENT IN NORTHEAST MOLD REPAIR AND PARTS FACILITY

On May 9, 2019, Rick Goode, CEO of Columbia Machine Inc., announced Columbia's acquisition of the assets of Bikle Manufacturing, Inc. Located in Smithsburg, MD, Bikle Manufacturing is a recognized leader in big board mold repair and manufacturing services provider to many customers in the Northeast. Bikle's employees were hired by Columbia Machine, allowing the business to carry on without missing a day of operation or a customer commitment. Columbia Machine intends to grow its business as a regional support center for mold repair, manufacturing services, and as a parts depot for Columbia customers in the region.

"Our customers have been asking us to provide mold repair capabilities and regional parts support on the East Coast. We have been searching for the ideal location, capabilities, and people to bring this to fruition for a couple of years," said Goode. "Moving into the Bikle facility, acquiring the assets and hiring the employees ensures our ability to meet customer demand quickly and efficiently."

"Our markets require us to be diverse, efficient, and available," said Kevin Gilchrist, Corporate Account Manager. "Bikle's location, mold repair expertise, and nearly fifty years of manufacturing experience give us an optimum position in supporting our East Coast customers and expanding our North American coverage."

"This is a great opportunity for the Bikle family," said Joanie Gerber, Director of Public Relations. "Our business was established in 1971 by my grandfather to be a quality supplier of equipment and manufacturing services. My grandmother and I are very happy to see the business carry on under Columbia. We all see the growth potential, and it allows us to continue to grow our skilled workforce and capabilities."

The acquisition of Bikle Manufacturing continues Columbia's strategic vision to grow the business and better support customers regionally. Smithsburg has several sizeable, horizontal boring mills, both manual and CNC, as well as a CNC vertical mill and lathes. The 25,000 square foot facility has room for manufacturing and repair operations with storage space for the replacement parts inventory needed to support regional customers. At the Maryland location Columbia has full-service mold and parts capabilities.

With mold repair capabilities in Vancouver, WA and now Smithsburg, MD, Columbia will be able to stock standard molds, carry out mold repairs and be a regional hub to offer new molds with its state-of-the-art manufacturing facilities around the world. This new Northeast facility complements Columbia's other North America service centers in Vancouver, WA, Ontario, CA, Orlando, FL, and Mississauga, Canada.

CUSTOMER PROFILE

Columbia
MACHINE ENGINEERING (I) PVT. LTD.



Metco Blocks Mfg. Co.
Concrete Solution, Wonder Construction



Metco Blocks Mfg. Co. is a highly renowned and respected name among the top producers of quality concrete blocks. The founder, Imtiaz Patel, looked at multiple options when he planned to set up his first production facility in the outskirts of Mumbai. Familiar with the construction business, Patel was well aware of the big players in the market and the highs and lows of the industry. His persistence, hard-work, and capability resulted in Metco becoming a prominent name in the block masonry field.

While planning his operation, Patel visited many concrete block plants across India, met numerous people, gained valuable insight, and scanned all the options available in the market, the pros and cons, before stepping into this venture. Patel conducted multiple meetings with Columbia, which convinced him to proceed with a Columbia plant in 2011. The equipment's robustness surpassed local and Chinese machines, and its world-class technology and the quality and breadth of products it could produce sold Patel on his decision.

Working with Columbia, Patel designed his plant to be efficient and clean and made sure replacing or upgrading equipment to keep up with the latest technology would be simple. The storage of raw material, curing of finished products, and proximity of the plant to good quality raw material sources resulted in a highly efficient plant with high manufacturing output. As the business grew, Patel upgraded his plant with automatic batching of cement and aggregates. He also installed a boiler to accelerate the curing process. These changes helped him to secure numerous orders from elite builders as well as prestigious projects with Hiranandani, Lodha, Apollo Hospital, and Reliance. Currently, he is focusing on supplying to the new phase of the Mumbai Metro.

Starting out was not easy for Patel. When he began production, AAC blocks were gaining popularity in Mumbai and the suburbs. However, he was able to



recapture the lost market by producing quality blocks. His team is motivated and high-energy, and he attributes his success to the high-quality people working for the company along with the high-quality products produced by the equipment. With their backing, Metco was able to undertake a significant number of projects, satisfying the needs of its clients.

"COLUMBIA'S NAME IS ENOUGH TO GET REPEAT ORDERS. THIS IS THE KIND OF PRODUCT QUALITY AND PUBLIC IMAGE THE BRAND HAS BUILT."

Mr. Patel has only praise for Columbia's service, molds, and parts. He always recommends Columbia to prospective buyers when they visit his plant. Patel remarks, "I have grown exponentially because of Columbia's SPM20 machine. I only make concrete blocks, but I don't need to chase sales. Columbia's name is enough to get repeat orders. This is the kind of product quality and public image the brand has built. I urge people to look at the long-term benefits. I would have failed in this business if I'd purchased any other concrete block machine just for the savings and would have quit this business long ago. The enthusiasm I started with still exists. Columbia has made me happy and content."

CUSTOMER PROFILE



Omkar Infracon Pvt. Ltd., one of the biggest manufacturers and suppliers of concrete pavers and blocks, has capitalized the East India market in a big way. Starting with a single fly ash plant and a team of fifteen, owner Sandeep Khandelia has grown his business and now operates four concrete block plants, employing over 200 people. His turnover has increased significantly, and there isn't a product type that Omkar hasn't produced. From fly ash bricks to hollow and solid blocks to standard pavers, kerbstones, and retaining wall blocks, Khandelia's company has manufactured it all.

In 2011, Omkar Infracon entered the market when the state government introduced a ban on red brick production in West Bengal. Khandelia did extensive market research, visiting plants of varying sizes and meeting with existing Columbia customers across India. Noting the potential for profitable fly ash brick production in his area, Khandelia saw an opening for his company. With other manufacturers outputting five to ten thousand bricks per day, he set his sights on exceeding 50,000 per day.

Before long, Khandelia zeroed in on Columbia's SPM20 concrete block machine. In the winter of 2011, he installed his first plant in Durgapur, West Bengal, and validated his predictions: Omkar Infracon's products did well in the market. Shortly after, Khandelia purchased three more Columbia machines that he installed at new locations.

As Omkar Infracon grew, it expanded its product base, offering more than fly ash bricks. Defying convention, Khandelia produced high-quality products on a small pallet machine, reaching some of the highest efficiency levels ever seen. His formula for success was simple: Purchase a new mold from Columbia and start making a wide variety of products that were new to his market using the SPM20. His single-mold investment made significant waves. Omkar Infracon achieved resounding success using the Columbia Model SPM20 plants, making the company a market influencer and helping to build infrastructure in Bengal and surrounding areas.

Khandelia modestly attributes his success to Columbia Machine and shares his success story with other prospective buyers, recommending Columbia equipment. He explains, "Columbia machines are reliable,

"COLUMBIA MACHINES ARE RELIABLE, CAPABLE OF PRODUCING A WIDE VARIETY OF HIGH-QUALITY PRODUCTS ON A SINGLE MACHINE."



capable of producing a wide variety of high-quality products on a single machine. We knew the machines were a serious investment, but we also knew that they would stand the test of time."

From a turnover of 10 crores to now nearing 30 crores INR, Khandelia has created a niche in the market. His clientele includes big names like Shapoorji Pallonji, Kolkata Port Trust, Mani Group, TCS, L&T, and Ahluwalia. He is active in several prestigious associations and organizations and continuously imparts his knowledge and expertise to those around him.

Khandelia imparts, "Our Prime Minister has envisioned five trillion for this economy, and this is not possible without considerable growth in infrastructure projects, which will stimulate huge demand in the precast and paver industry. Customers are getting more and more time bound. They need to complete a project within a stipulated time, meaning precast will come into the picture in a major way. The sky is the limit."

REPEATEDLY RAISING THE BAR FOR PRODUCT QUALITY
& PLANT PERFORMANCE IN THE MIDLANDS, THE
HEART OF THE UNITED KINGDOM



Mr. Dominic Delich, a native New Zealander who doesn't believe in standing still, is the Director and General Manager of the Mansfield Sand Company Brick Division. With his dedicated management staff, Dominic leads his skilled and motivated team of employees to exceed annual production targets repeatedly.

Privately owned by David Abraham and family, the modern-day Mansfield Sand Company Ltd, which has been trading since the middle of the 19th century, is comprised of two operating divisions based in Mansfield, North Nottinghamshire, United Kingdom. Its production sites at Two Oaks Quarry and Crown Farm Brick Works operate under the ISO 9001 Quality System, from quarrying through to washing, grading, blending, and high-volume concrete product production.

The Mansfield Sand Division has been operating for more than 170 years. Recently, it moved to a new quarry development at Two Oaks, which gives it renewed life. Mansfield Sand is incredibly well known for its wide range of free-draining, silica sand products used in sporting arenas, such as football pitches, golf courses, and equestrian surfaces. It also produces one of the best asphalt sands in the midlands.

Mansfield's Brick Division was formed in 1926 to produce calcium silicate bricks for the general building industry, adding a wide range of concrete products to their product line after considerable expansion in the early 1980s. The firm currently supplies many of the major builders' merchants, buying groups, and independent suppliers, along with producing bespoke products to meet the needs of the industry.

Mansfield Brick, a producer of high-quality concrete brick products, has been in operation for over 90 years and excelled at producing products on its older press machines and with autoclave curing. When company growth required expanded facilities, Mansfield set its sights on having a top-notch operation with model efficiency, energy savings, and quality.

As part of this goal, Mansfield Brick paid close attention to space and workflow requirements throughout the operation. Lorry traffic flows smoothly from supplying raw materials to loading cubes of finished products. There is plenty of yard storage, allowing for safe and efficient lift truck flow. Inside the facility, a large elevated control center allows operators a clear view of the entire operation. In all, its employee facilities are second-to-none, using the latest technological equipment.

At the heart of the plant is a Columbia CPM60 concrete products machine, utilizing steel pallets (pallet size 700 X 1400 mm) and Columbia's renowned vibration system to produce high-quality brick products. Housed in a generously sized acoustic sound room, operators can switch molds and products rapidly to optimize productivity. "Columbia has an excellent reputation in the UK for the equipment reliability, longevity, and their on-going support," says Dominic, "We are completely satisfied with Columbia as a highly responsive, first-rate partner."

The Brick Division prides itself on the quality of its products, innovative development, competitive pricing, and first-class service & technical support from its central base. During single shift operation, Mansfield's Columbia CPM60 concrete product machine produces more than three million units a month, including standard products, coursing bricks, closure blocks, and infill slips for the beam and blocks flooring market. In short, Mansfield Brick is in a unique position to satisfy the requirements of the demanding United Kingdom building industry.

Using Columbia equipment, implemented in 2010, Mansfield Brick has been an industry leader for almost ten years with its state-of-the-art facilities and impressive production.

The Mansfield Brick team is focused on raising the bar on operational efficiency, with a specific production capacity target of 30 million or more bricks a year in single-shift operation. Its dedicated team of maintenance engineers reviews the plant and equipment, making plans to meet the ambitious target accordingly.

“

WE RUN GENUINE COLUMBIA MOLDS ON SOME OF OUR HIGH VOLUME PRODUCTS AND HAVE ACHIEVED EXCELLENT RESULTS.”

Varying moisture levels in raw materials were affecting the company's ability to consistently achieve the optimal mix design, resulting in the delivery of wet batches of concrete into the plant. To address this, Conspare refurbished Mansfield's planetary mixer by implementing new wear parts, restoring the vent filter to control dust on the mixer platform, and installing Matrox chute liners and two belt scrapers. Conspare serviced the existing mixer washout system to keep its pan clean, and Mansfield commissioned a Hydronix HydroControl automatic moisture control system to control the mixer sensor. Overall, the services provided by Conspare hugely improved Mansfield's operation. Hydronix HydroControl's latest winning selection immediately provided consistent quality concrete to the operation.

Mansfield visitors are always impressed by its heavy-duty Columbia PTS system, which feeds the sturdy curing chamber. Dominic notes, "Our CDS Envirocure system controls humidity and temperature precisely with efficient airflow, eliminating condensation and color variation. Energy efficiency is very important to us in the plant. We utilize high-efficiency electric systems and value the energy-efficient, single atmosphere curing system."

When cubing finished products, Mansfield uses Columbia robotics. Stephen Wilson, Columbia Machine's UK-based sales representative, explains, "The vacuum end effector provides ultimate cubing flexibility. A simple, dedicated vacuum head is used for each product. We select a product recipe stored in our CommandView system, and product change could not be easier. Only the robotic cuber can provide this level of flexibility." Similarly, Mansfield uses Columbia robots for pallet buffering and storage, which allows for optimized wet and dry side productivity.

The CommandView supervisory system allows the plant operator to quickly see how a plant is operating, troubleshoot, and correct any line stoppages. With remote access from Columbia Vancouver or its service team in the UK, Mansfield receives 24/7 supported coverage.

DOMINIC DELICH

*DIRECTOR AND GENERAL
MANAGER AT MANSFIELD BRICK*



CUSTOMER PROFILE



South Carolina based Longleaf Packaging, LLC is a dry mix packaging company that specializes in bagged materials, including a wide variety of mortar mixes, grouts, concrete mix, sands, cement, and other blended goods. Their 20,000 square-foot plant sits on 36 acres and houses an industry-leading, automated bagging facility, producing various weight valve bags as well as multiple sizes of bulk bags. This facility is capable of producing up to 30 tons of finished bagged goods an hour.

Working together, Longleaf Packaging and Columbia Machine, Inc. designed and constructed a new bagging facility to serve local contractors and the surrounding market. This plant showcases a material handling system with future expansion capabilities to store and manage wet sand and aggregate before drying. A 30-ton per hour rotatory dryer system runs the raw materials. Multiple dry storage holding silos house the dried product.

Columbia's Batchmatic G2 batching controls handle all batching and mixing requirements for the plant. These controls store hundreds of programmed recipes for multiple product types, and its easy-to-use operator interface makes optimization of batching output and cycle times easy to monitor and adjust.

At the center of the blending plant is a 2250L counter-current, planetary mixer with dry-mix specific mixer features. Finished mixed materials are handled at the bulk bag filling station or by Columbia's dual spout, model 201 PS Air Packer Station. Additionally, Columbia's 401 Impeller Packer bags powders and cement.

Columbia/Okura LLC installed a robotic palletizing system to transfer and stack finished products efficiently. This system conditions and palletizes bags at rates of up to 28 bags per minute. The reduced footprint, low maintenance, and high uptime made the robot an obvious choice to bookend the bagging line.

Columbia offers complete bag line solutions, from raw materials to finished products, and as exemplified by Longleaf Packaging's new facility, Columbia is an expert in bagging systems.



ROBOTIC SOLUTIONS ADVANCE CONCRETE PRODUCTION

By Stacy Gildersleeve, PE, Chief Engineer



Clamp end effectors that use pneumatic cylinders or electric actuators may be required when product heights get above 100mm/4", if products are too porous to achieve proper suction, or if not enough horizontal concrete area is available to lift the load. In either case, robotic cubing adds the versatility producers require, reducing sliding actions as well as face and vertical wall scraping while handling products gently.

In 1998, Columbia Machine ventured into robotic applications for the concrete products industry with an installation at Oberfield's Inc. in Columbus, Ohio. Oberfield's system uses a vacuum type end effector and handles its vast array of standard products. The robots receive yearly maintenance and continue to perform well, even with the implementation of additional capabilities that serve to address product mix changes throughout the years.

Pallet buffering, where empty production pallets are pulled out of the production loop temporarily, is frequently used in production facilities. This type of system allows the cubing and dry product lines to operate nearly independent of the concrete forming machine. By supplying a steady flow of pallets to the concrete forming machine, regulated cycle rates enable variation in cubing and product making cycle rates, preventing plant downtime when issues arise.

Columbia systems remove a pallet and place it in one of six stationary stacks (600-900 pallets total) and, if desired, can turn the pallet over in the process. This system uses compressed air powered vacuum generators mounted to suction cups operated using compressed air. Integrated conveyance systems allow for the storage of substantial quantities of pallets, increasing pallet buffering potential. With these systems, adding and removing pallets can be automated. Since 2008, a Columbia customer in the UK has been operating a 600 pallet system that runs 1400mm x 700mm pallets for close to a decade.

Robots shine when it comes to value-added processing, increasing growing plants' capabilities significantly. De-cubing, processing, and re-cubing products that go through value-added processes allow better attention to quality and inspection, moves operators away from dust, noise, and moving equipment, and with fewer exposed moving parts can increase the time between scheduled maintenances.

Columbia Machine, Inc. has a long history of creating advanced products that provide exceptional value in concrete product production. Its journey into robotics started with a joint venture in robotic palletizing with Okura Yusoki Co., Ltd. in 1996. Strong technical history from Okura and palletizing expertise from Columbia Machine are the foundation of Columbia/Okura LLC, allowing it to fulfill application requirements of unique problems across multiple industries. Its robotic palletizers, capable of supporting niches requirements, compliment Columbia Machine's already successful lines of conventional palletizers.

In concrete production facilities, robots operate in harsh environments. They contend with heavy loads, versatile handling requirements, a wide range of operator experience, low maintenance expectations, highly robust design expectations, and rigorous production schedules. Applications that benefit from robotics solutions are Cubing (clamp and vacuum), pallet buffering, offline value-added processing, and product handling. Similarly, robots can handle heavy loads, repetitive motions, and unique space constraints.

Robots can handle products individually, in rows, and full layers, as well as manage tier courses and product arranging. They can be integrated into an existing system or stand alone as a wholly robotic or hybrid cubing system with a slide deck that aids in arranging and cubing products.

When cubing concrete products, robotic vacuum and clamp-type end effectors are well-suited to simple and complex layer patterns. For example, pavers, slabs, and other products of lower height or solid faces commonly use vacuum end effectors. Generally, the vacuum is a dedicated high-flow system located near the robot.



Quality assurance improves when de-cubing, processing, and re-cubing products that go through value-added processes that move operators away from dust, noise, and moving equipment. Additionally, these systems have less exposed parts, increasing the time between scheduled maintenance and streamlining production.

In proper arrangements with adequate space, one robot can handle both the de-cubing and re-cubing operations. One value-added system in the Czech Republic, installed in 2008, is an excellent example of this. Operated by one person, its system can manage offline splitting operation, is capable of taking cubes loaded into the system, splitting products in two directions, and reassembling the cube. It integrates with horizontal and vertical strapping, split debris management, vacuum debris management, wood pallet recycling, and only requires perimeter guarding.

Columbia has developed technologies specific to handling concrete products that maximize uptime with robotic applications. Its crash detection end-effector mounts allow for damage-free product pick and place while maintaining a rigid system during the move between pick and place, reducing the potential for damage or manual errors. Columbia's vacuum brake valves to prevent high vacuum levels from damaging equipment while its custom vacuum valves allowing for fast response, high flow, and minimal vacuum loss during operation. Additionally, Columbia has universal and dedicated vacuum end effectors with multiple chambers and quick changeover, as well as clamping arms and surfaces to ensure a secure grip with product size and texture differences over a wide range of clamping sizes.



Columbia continues to investigate and develop new technologies, products, and programming to enhance and improve the operator experience and increase equipment reliability and performance handling for concrete products of all shapes and sizes. Continued investment into the robotic applications for the concrete products industry means long-term advancements in technologies and equipment that will support customers' requirements to deliver on-time, exceed expectations and maintain competitive prices.

LATIN AMERICA



COLOMBIANA DEL CONCRETO

LOCATION: Colombia

EQUIPMENT: Model 16, manual offbearer

Colombiana del Concreto is one of Columbia's newest customers in Colombia, located in Valledupar, a rich farming and cattle region.

Its major crushing operation, the parent of its new block and paver company, expanded recently to serve economically vital areas. In late 2019, the new company installed a Columbia Model 16 production machine with a manual offbearer to oversee market demand in these regions. Market conditions are bright, and the company expects to replace its manual offbearer with an automated loader-unloader Model 26 soon.

Columbia's follow up before and after plant start-up for Colombiana del Concreto was crucial to its success, allowing the company to reach desired production levels in the shortest possible time.



PROCRETO

LOCATION: Guatemala

EQUIPMENT: Model 1600 Plant

Guatemala has one of the largest per cápita block and paver demands for a country. With its new Columbia 1600 plant, Procreto is now a major player in its market. The new equipment is capable of making face mix pavers, which allow for a new level of quality and cost savings for customers.

In addition to face mix, block production with heavy and lightweight aggregates will allow Procreto to reach new markets in towns and cities around Guatemala's capital. All Columbia molds provide competitive advantages and guarantee machine performance.

Columbia is proud to call Procreto a customer.

CUSTOMER FEATURES



DISTRIBUIDORA NORTE PACASMAYO. DINO

LOCATION: Peru

EQUIPMENT: Model 1600, UL-37, PSC 200 Cuber

Long-time Columbia customer DINO has a new 1600 Columbia plant that has replaced its 1997 Model 22 machines. Located in the northern city of Piura, Peru, the new operation started production in the first quarter of 2019. The plant will continue to increase market share in blocks and pavers based on DINO's trademark top quality and quick delivery.

DINO's new Columbia 1600 plant mix and batch system uses aggregate weight to match procedures and control required reports. In all, the plant consists of a Columbia 1600 production machine, Model 37 loader-unloader, and Model 200 cuber, featuring all-new Compactlogix PLC controls as well as a state-of-the-art fortress-key door access system for increased plant safety.

From day one, Columbia has provided training to DINO's staff while supporting its new start-up plant. Both companies have high expectations for the operation's future, and Columbia remains invested in maintaining the plant's equipment integrity through any growing pains.



PREFABRICADOS SANTA JUSTA

LOCATION: Mexico

EQUIPMENT: Model 1600, UL-37, Cuber

Prefabricados Santa Justa has ten years of construction market experience and a strong knowledge of quality standards and market requirements.

In 2012, it started up operation with a used plant, a Columbia Model 16HF with UL-26 and Cuber, to provide blocks to the growing construction industry in Culiacan, Sinaloa.

Commitment to customers and the market allowed it to grow into an established and recognized company, leading to its second Columbia plant purchase. In 2018, Prefabricados Santa Justa implemented the second plant, a Columbia Model 1600 with UL-37 and Cuber.

In December of 2018, the new operation started up, and Prefabricados Santa Justa now has more production capacity and can offer a wider variety of products, successfully fulfilling the expectations of its customers in the construction market.

TECHMATIK IMPLEMENTS THE QRM METHOD



Based in Radom, Techmatik is one of the largest employers in the region, with over 350 employees, and successively implements an innovative quick response manufacturing (QRM) production management method.

Currently, Techmatik is also one of the largest manufacturers and suppliers of molds for paving stones and precast concrete products (number 3 in the world). It is a leading company in Central and Eastern Europe, offering paving stone production process lines. An ever-increasing number of orders, growing production, and the pursuit of the industry-leading position have forced the company to shorten production time while maintaining the same product quality level.

Recently, Techmatik was offered help by 4results, who, having analyzed the production condition of the company, has been implementing the QRM method since September.



THE QRM METHOD

As the analysis of production in most enterprises shows, companies put excessive emphasis on production cost reduction. Often, this attitude can do more harm than good to a company. Righting work organization on all the production levels is the best way to boost a company's profits. Proper work organization means reducing order fulfillment time, which provides higher productivity. In turn, this leads to a higher gain with a more significant number of orders.

Enterprises that have deployed the QRM method in their structures have recorded a significant reduction in operating costs as well as increased sales. This work organization method can determine a production company's success on the market.



WHY IMPLEMENT THE QRM METHOD AT TECHMATIK?

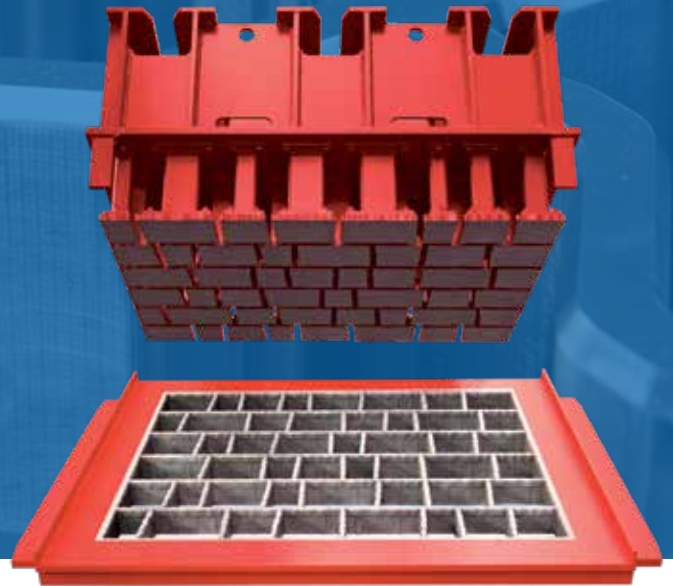
"We want to be #1 in the world, i.e., Techmatik is aiming to become the largest manufacturer of molds for paving stones and precast concrete products. Increased production, from 1500 molds now to over 5000 in 2024, necessitates implementing the QRM method. We believe that if we employ this solution, we will achieve our targets."

– Mariusz Gil, President of Techmatik S.A.



Columbia[®]

**EFFECTIVE JANUARY 1ST, 2020,
ALL MANUFACTURED MOLDS
AND MOLD PARTS WILL BE
PAINTED MOLD RED ACROSS
ALL OF COLUMBIA MACHINE'S
GLOBAL OPERATIONS.**



Effective January 1st, 2020, all manufactured molds and mold parts will be painted Mold Red across all of Columbia Machine's global operations.

Columbia Machine, Inc. continues to invest heavily in the advancement of its mold designs and manufacturing capabilities. Through strategic asset and company acquisitions, Columbia is driven to maintaining its position as the world's leading concrete mold supplier. In order to better leverage our technologies and offer top quality molds worldwide, take advantage of our continued efforts to improve and increase operational efficiency, Columbia has made the decision to adopt a standardized paint color across all of its global mold operations. This change allows us to combine our products into a worldwide brand to ensure competitive pricing and faster delivery to our customers from any of our manufacturing locations.

Starting on January 1st, 2020, all manufactured molds and mold parts from all of Columbia's facilities will be painted Mold Red. Legacy paint colors (such as grey and green colorways) will continue to be supported when specified during the ordering process. All mold repairs will be painted black, unless otherwise specified by the customer. With over 1,000 team members, five manufacturing facilities on four continents and nine service centers around the world, we are dedicated to improving the products and services we provide our customers. Columbia is excited about these changes and the advancements in our mold services as we work to become your preferred full-cycle mold partner. If you have any questions or concerns about the noted changes, please contact your local Columbia representative.

Contact us today to learn more

+1 360 694 1501

www.columbiemachine.com/molds

Columbia Machine, Inc.

107 Grand Blvd.

Vancouver, WA 98661

MOLD ON THE MOVE

NEWS FROM THE COLUMBIA MOLD DEPARTMENT

MOLD TRAINING CLASS ORLANDO



Recently, Columbia set aside space at its new parts depot in Orlando, Florida, to hold a pilot mold assembly class. The class went well, so moving forward, Columbia will host two mold classes per year in this new space. Special thanks to A-1 Block and Tremron for sending hard-working participants, and to Kevin Gilchrist and Tom Bailey for hosting the class.

Back Row: Kevin Gilchrist, Mark Jones, Mike Booth
Front Row: Walt Tullis, Chris Simmons, Tom Bailey

MOLD MAINTENANCE TIP

Be mindful of mounting bracket height. If you need to check and verify your mold, your mold should be set to the same height as your mounting brackets. On molds that have an adjustable mounting bracket (10C through 1600, including model 50 and 60), the die support must be set to within ± 0.005 " in height. If your mold is out of balance on the die supports in your block machine, it could do great harm to the vibration system and cause premature wear on the mold and mounting brackets.





IN-PLANT MOLD TRAINING

Are you having?

- Product quality issues
- Trouble getting the mold to line up in the machine
- Premature wear of your mold in certain areas
- Breakage of mold or machine parts during operation

These could all be signs of an improperly built or aligned mold. You may have new employees or simply want more life out of your molds. Give us a call, and we can schedule an on-site training session for you and your crew. Standard service rates apply. The time and money you will save from improved efficiency will more than pay for this one or two day visit by our skilled mold assembly technician.

THE NEW HL4200

NEW HIGH LEVEL PALLETIZER DELIVERS COMPACT FOOTPRINT AND HIGH PERFORMANCE

This year, Columbia Machine's Palletizer Division launched the HL4200 high level palletizer. Over the past few years, the division has worked tirelessly toward completing this design project and has succeeded in putting all Columbia High Level Infeed Palletizers on a standard frame with a common, modular hoist design. Columbia's top priorities are safety, flexibility and performance, and the HL4200 high level palletizer meets this standard while ensuring maximum daily production to meet user needs.

In addition to its compact footprint and high-performance capabilities, the HL4200 high level palletizer's standard features include a VFD-controlled pacer meter belt, bi-parting apron and Columbia's state-of-the-art Product Manager controls package. These features, combined with the ability to form "layer gaps" side-to-side and front-to-back, make the HL4200 extremely flexible. Ideal for both retrofit and new applications, the HL4200 can handle a wide variety of package types, including cases, display packs, totes, trays, bundles, shrink film, crates, small cases and more.

The former machine in the HL4200's speed range was the SP4000, Columbia's best-selling palletizer model over the last several years. Its compact footprint and relatively high output made it a natural choice for multiple line systems. Now, the high level machine product line is a complete family that uses standard components and can handle applications from 20 to 150 cases per minute.

At Pack Expo Las Vegas 2019, Columbia successfully debuted the HL4200 as the latest addition to its growing product line. The machine ran flawlessly for the entirety of the show and drew strong interest, marking the product launch a success.

With the broadest and most current product line available, Columbia remains the leader in palletizing solutions in North America. Palletizer Division Sales Director Ted Yeigh shared, "This is by far the best and most complete product line in our industry."



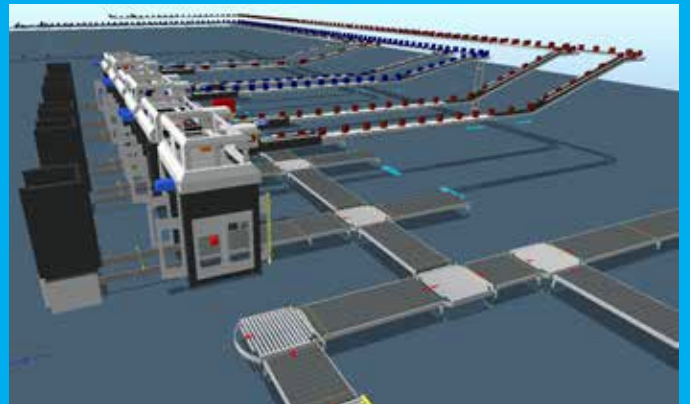
PALLETIZER DIVISION UPDATE



Columbia Machine's Palletizer Division (PD) continuously works to develop and produce innovative factory automation solutions. In addition to the launch of the new HL4200 high level palletizer, Columbia has expanded its integrated systems capabilities by establishing a PD Application Engineering department in St. Louis. Braxton Ubben, the Applications Engineering Supervisor, is joined by Project Engineers Brian Trigg and Brett Groene. Mark MacDonald, the Applications Engineering Manager, supports the team out of Vancouver, Washington.

The St. Louis team handles quoting and estimating for customers that desire an expanded package or full load handling system in addition to their palletizer. Additionally, the Midwest is home to a large variety of companies in the packaging and material handling industry, making the St. Louis office a convenient location for regional trips to meet with vendors and customers. Working with vendors who provide case conveyor, pallet conveyor, stretch wrappers, vertical lifts, spirals and contractors for mechanical and electrical installation allows the PD team to develop customized, turnkey solutions that best fits Columbia customers' needs.

With PD's expanded capabilities, the Engineering Team has been able to design 3D models of Customers' systems using Demo3D. These models allow system simulations to display real case rates across the conveyor system along with palletizer production. With this technology update, customers can better view the entire automation solution they are purchasing.



CELEBRATING RETIREMENT

FRED NETH JR.

Fred Neth, Jr., Columbia Machine, Inc.'s former Chairman of the Board, had a long and successful career at Columbia. For over 65 years, he was a colleague, leader, mentor, and friend to many. Columbia will not forget his accomplishments.

In February of 1941, Fred Neth Jr. was born to Fred Sr. and Alice Neth. Early on, he developed a love of the outdoors and mechanics, passions that would later become crucial assets to his career. Through the years, Fred's involvement in Columbia grew. After school and on weekends, he would spend time at the small but growing plant, helping with odd jobs and cleaning.

One of Fred's earliest memories of Columbia is his time spent collecting old lumber from around town with his cousin, Will Neth, and their grandfather, Ludwig Sr. Neth. They used the repurposed wood to build additional buildings at the main plant as well as to crate new equipment and machine part orders. When asked, Fred recollected, "We pulled nails for hours and hours, and days and days. Our damn hands were so sore we could barely hold a hammer." He went on to explain that they also used the lumber to expand the plant once it was moved to its present location on Grand Blvd. in Vancouver, Washington. Fred noted, "It was tough times. We all did whatever we could to make the company grow."

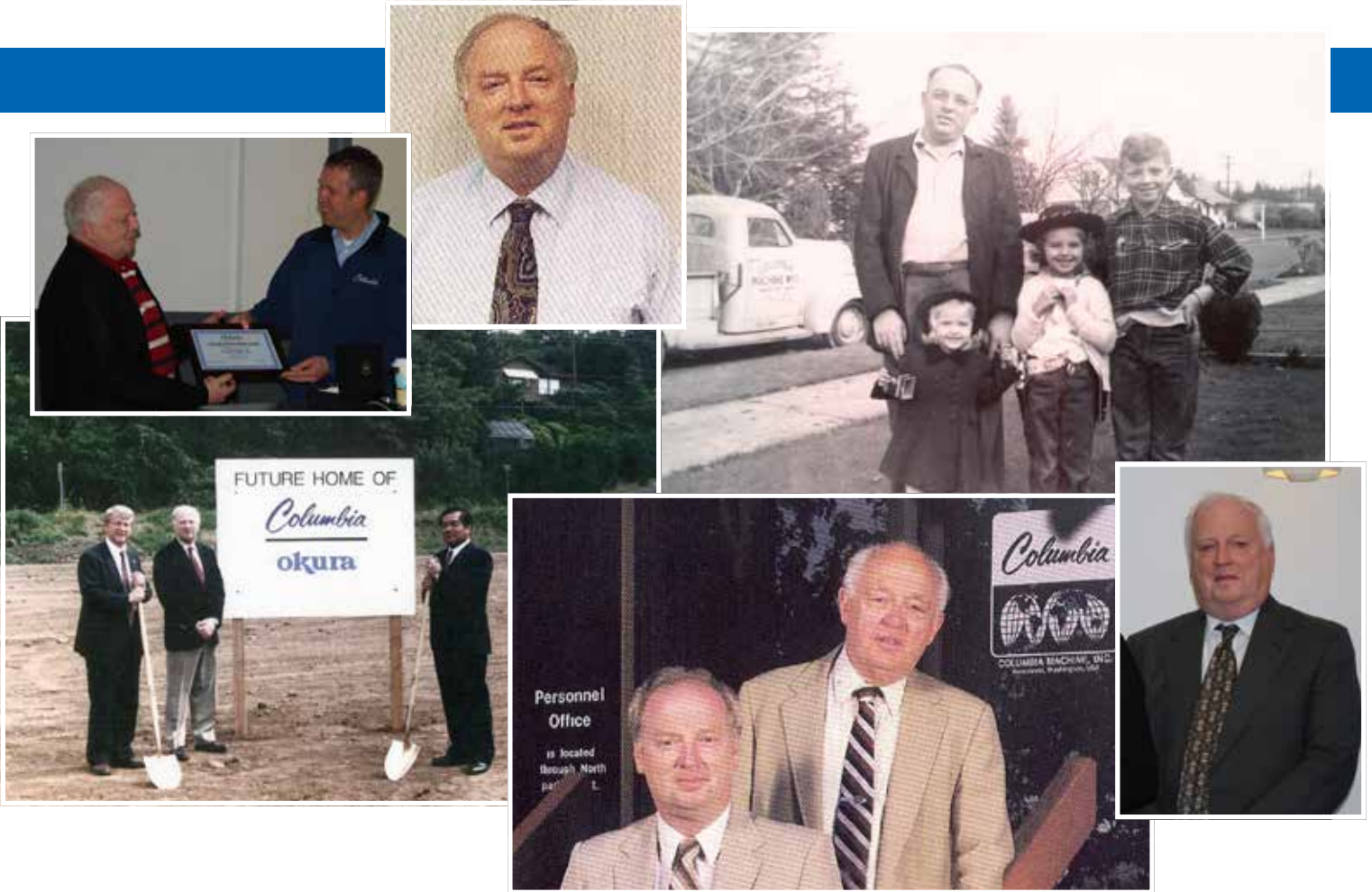
In the late 1950s, Columbia's growth began to take off, and Fred decided to part ways to attend college at Washington State University. After a year away, Fred realized that his true passion lay in working at Columbia. He returned to start his machinist apprenticeship, and enrolled at the local college, attending classes by day and working swing shifts in the machine shop. Over



the following two years, Fred learned to operate and work nearly every piece of equipment in the shop.

After completing his apprenticeship in 1963, Fred moved to the day shift. He spent the next five years learning the inner workings of each of Columbia's current manufacturing departments: Fabrication, Shipping, Parts Purchasing, and Assembly. Fred shares, "I got the opportunity to work with and learn from some of the very best of the best in those early days." He goes on to say, "Miles Davis and Carl Sunderland really taught me a lot. I was so lucky and fortunate to have the opportunity to work and learn from those guys. There were so many people back in the early days that made a real impression on me."

Ten years later, Columbia had grown domestically and gone international. As the company grew, Fred's role within developed too. In 1970, Fred became the day shift Machine Shop Supervisor, putting his understanding of how the company operated to good use. Between the 1970s and 1980s, his responsibilities continued to grow, and he quickly became the Manufacturing Manager,



responsible for nearly a third of the company. He oversaw the Machine Shop, Mold Machine Shop, Fabrication Shop, all Assembly areas, Shipping, Plant Maintenance, and the yard.

Fred's role within Columbia was much more than just managing the manufacturing side of operations. From big to small, he oversaw a vast number of responsibilities that made Columbia what it is today. In addition to his primary roles, he helped cultivate customer relationships, engaged actively in company events, and even helped with trade shows. He was always involved in Columbia's bigger picture.

In 1988, Fred became the Vice President of Manufacturing, and he was elected to the Chairman of the Board for Columbia in 1993. For several years, Fred filled these two roles, continuing to develop Columbia's manufacturing capabilities. Eventually, he retired from Vice President of Manufacturing but remained as the Chairman of the Board.

Although no longer involved with day-to-day operations, Fred continued to work on expanding Columbia's growth and capabilities. After his retirement from the Vice President's position, he became heavily involved in the retiree picnics and was the driving force to keeping them going.

On December 31, 2019, Fred, Neth, Jr. retired from his position as Chairman of the Board for Columbia Machine, Inc. From the beginning, Fred enjoyed working at Columbia, and the company would not be the same without his contributions. Fred has always felt that being able to work at his father's company was a great honor, and he is proud to call Columbia's customers and employees family.

CUSTOMER PROFILE



WE BELIEVE IN THE TRANSFORMATIVE POWER OF AUTOMATION

ROBOTS ENABLE VALUE-ADDED PACKAGING AT MICHIGAN SUGAR COMPANY

There's no question that as retail channels have expanded, packagers have had to adapt their operations in order to produce different package styles and configurations to suit individual customer needs. Michigan Sugar Company is no exception. The Bay City, MI-headquartered cooperative, which is made up of nearly 900 grower-owners that harvest up to 160,000 acres of sugar beets each year, sells its sugar to industrial, commercial, and retail customers under the Pioneer and Big Chief brands. At its Sebewaing, MI, plant, requests from its customers for specific package formats and pallet patterns led to the installation of two robotic palletizers—one in 2010 and one in 2018.

The Sebewaing facility is one of four operated by Michigan Sugar. Approximately 925,000 tons of sugar beets are processed annually at this location, with an average daily slice of about 5,400 tons. Each year, the factory produces about 260 million pounds of sugar, along with 12,000 tons of dried beet pulp, 130,000 tons of pressed pulp, and 36,000 tons of molasses. To package its sugar, the plant operates three bagging lines that together produce 150 bags/min.

In 2010, a request from fast-food giant McDonald's for 4-lb bags of sugar packed in overwrapped trays led the company to replace a mechanical palletizer with a robotic system from Columbia/Okura. Having already installed a robotic palletizer from the equipment supplier at its Bay City, MI location, Michigan Sugar was confident Columbia/Okura could meet its palletizing needs in Sebewaing as well.

Until last year, the output from all three bagging lines was palletized by the single robotic system. In 2018, Michigan Sugar installed a second system in response to a demand for retail display pallets, where individual, unbundled bags of sugar are placed on pallets in a range of patterns, according to customer requirements. "For the display pallet experience, you need the total flexibility of a robot," says Michigan Sugar Director of Engineering Jim Martin. "You can't do it with a mechanical system—at least not in our facility. So that's what drove us to our second robot."

While flexibility was a major consideration in the selection of the machinery and supplier for this application, Martin unabashedly admits that price was the main factor. "Of course, Columbia had the advantage, since we had experience with them, and they performed very well for us in the past. So there was no question mark with them as far as knowing what we'd get for the money," he says.



What they got was an Ai1800 high-speed robotic palletizer that can accommodate bags from any one of the three lines, if need be. Although generally, as Contracted Project Engineer Robert Hite explains, it handles bags originating from two of the lines, while the legacy robot palletizes bags from the third. The new robotic palletizing system can stack whole and half pallets at speeds to 10 pallets/hr—"which is not lightning fast, but it's reliable, and it just keeps on working," Martin says.

Michigan Sugar is using the Ai1800 to palletize four-pound bags of sugar in pallet patterns determined by the customer. Bags exit the bagging machine in an upright position, after which they are knocked down and conveyed through a metal detector. Next, they are transported by conveyor into the robot cell, where they are divided up into two lanes into the specified number of bags needed for a pick. For example, two lanes of five bags each. The robot then picks the two lanes of bags and places them on the pallet. Each layer of the pallet is formed in the opposite direction, creating an interlocking stack.

To hold the bags securely during picking and placing, the robot is fitted with an end-of-arm tool comprising of two paddles that measure approximately 48 in. long and 8 in. high. One of the paddles is stationary, while the other moves to squeeze the two side-by-side rows of bags together.

As Martin explains, one of the improvements Columbia/Okura made on the design of the robot is that the original EOAT used three paddles, with the third positioned in the middle of the two rows. Removing the third paddle provided two benefits, he says: "First, when you get rid of that intermediate paddle, when it comes time to lift the robot away from the pallet, you don't get any rub against the bags that would cause them to tweak. Second, it allows you to pack the bags side-by-side, very close together, which is very important when you're creating interlocking rows. You get a much tighter pallet."

However, palletizing individual bags of sugar is like creating "a stack of marbles," says Martin. Interlocking rows help, but the other tool Michigan Sugar uses is coating the bags with a tacky, anti-skid coating that causes them to stick together on the pallet, rather than slip off.

Another improvement to the robot made by Columbia/Okura is its ability to create half pallets as if they are whole ones. "When you are doing a whole pallet, you can pick 10 bags at a time, but on a half pallet, when you are going in the cross direction, because you want those interlocking layers, you can only pick two or three bags at a time," explains Martin. "So that involves a whole bunch of picks to go and marshal these products."

"That's one of the big things that Columbia did for us—they found a way to do the cross picks across two pallets as if they are a whole one, and then split them apart. We didn't think that was possible, but they showed us how to do that."

Confirms Rob Clark, Director of Communications and Community Relations for Michigan Sugar, "It saves an incredible amount of pick time when building the pallets."



As for programming the new robot, one of the things Michigan Sugar learned from its experience with the first robot is that it's very easy, with a touchscreen interface offering user-pattern programming and easy operation. Says Martin, "You just have to tell it what your end product will be, and the robot figures it all out from there. It's super simple to learn."

Adds Hite, "The robot allows us to tweak and adjust the running conditions as we change the product and the bags we get from our suppliers."

Though the robot is "super simple," with each of its two new robotic palletizing systems at the Sebewaing plant, Michigan Sugar sent a team of people from its plant, including mechanics and electricians, to participate in the Factory Acceptance Tests at Columbia/Okura's facility. "I think that was a key thing that gave those guys ownership of the systems. When they got back, they were the experts, and they made sure the systems worked," says Martin. "Columbia/Okura took the extra time to talk each person through what they were looking at. We really appreciated that."

And, having ownership of palletizers has proven a positive experience for the plant overall. Says Michigan Sugar Executive Vice President Jim Ruhlman, "At Michigan Sugar Company, we like to say our sugar is 'Packed with Pride,' and the morale boost of creating a state-of-the-art pallet is huge out in Sebewaing. There is an inherent benefit for the workforce when you have high-quality equipment putting out a high-quality product."

MANUFACTURING SERVICES DIVISION UPDATE

Columbia Manufacturing Services Division (CMSD) is in its twelfth year, continuing to succeed in its quest to be the supplier of choice for local and regional OEMs seeking additional manufacturing capabilities and capacity. Over the years, the division has developed strong partnerships with key accounts that provide high volumes of repetitive parts orders. Columbia's Vendor Managed Inventory (VMI) program manages these orders, allowing for production flexibility and excellent customer support.

In 2019, CMSD made great strides in developing additional opportunities within its existing customer partnerships. As a result, the division saw its most substantial sales volume yet, largely thanks to significant contributions to factory optimization.

Through contract manufacturing relationships, CMSD manufactured tubular frames used in the automation and tooling industry, parts and components for customers in the metalworking industry, and components for wood processing equipment. CMSD also manufactured a variety of tanks and components for one of the world's leading water-jet manufacturers.

Columbia has enjoyed CMSD's additional business diversification and plans to continue leveraging its manufacturing assets and competencies to benefit customers. Chris Wright, General Manager of Columbia Manufacturing Services, shares, "We value all of our customers and appreciate your consideration of Columbia Machine as a solution provider, and as your partner in manufacturing excellence."



Model 28 Automatic Block Machine

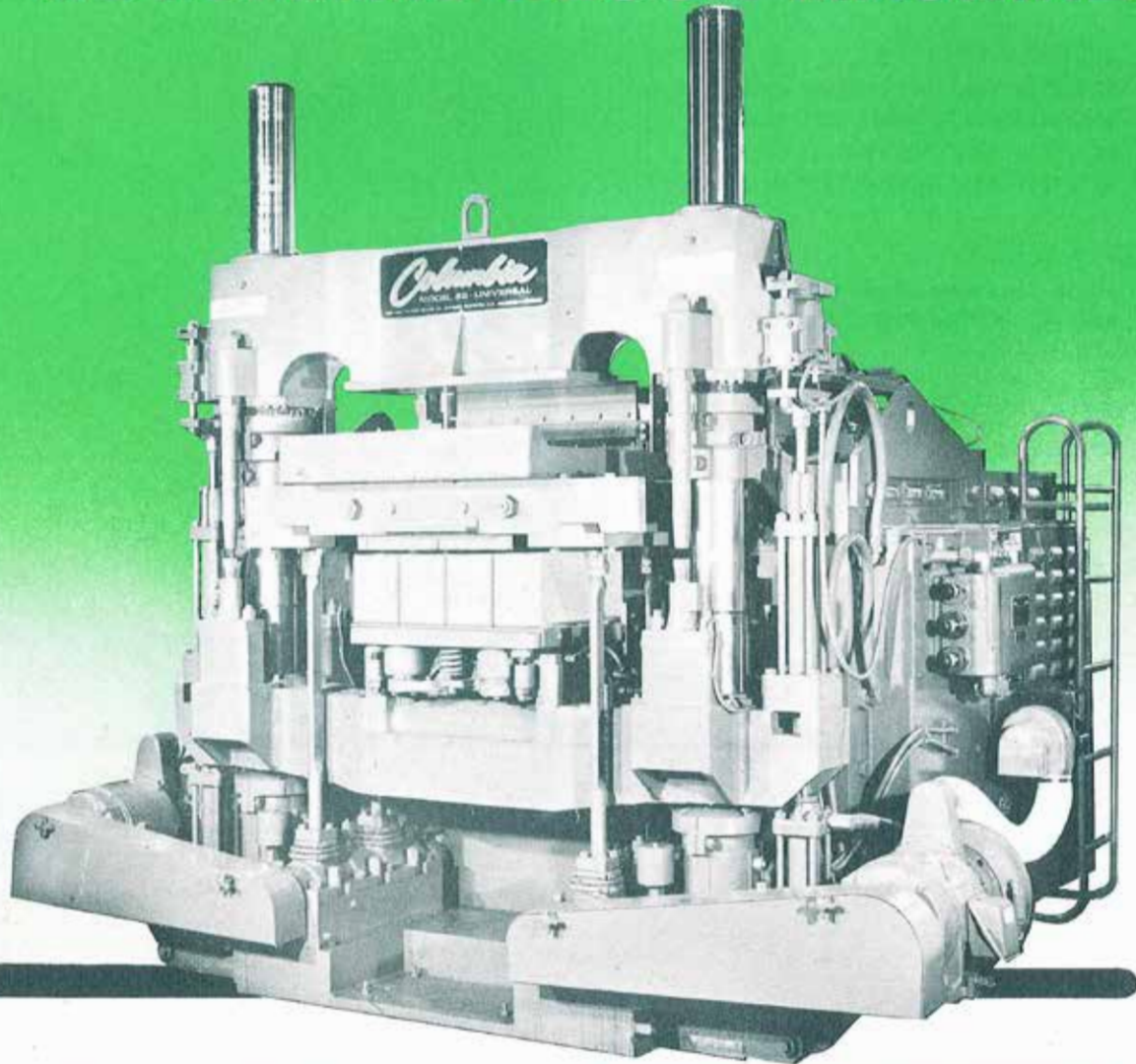
Columbia Machine brochure, printed in the 1970's.

"Hydraulic Power... Electronic Controls"

**COLUMBIA
ARCHIVES**

**BULLETIN
28-73**

Columbia
**MODEL 28
AUTOMATIC BLOCK MACHINE**



*Hydraulic Power...
...Electronic Controls*



Manufacturers and world-wide distributors of a complete line of plant equipment for producing concrete products.

FORTRESS MAINTENANCE – WD40

How to Mechanically test, inspect and service the Fortress Door Interlock mechanism.



WARNING: Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous. Avoid personal injury or death by following manufacturer, local, and OSHA safety procedures. Contact Columbia Machine for safety decals, guards, horns, and beacons.

MECHANICAL FUNCTION TEST



ASSUMING STANDARD SEQUENCING:

1. Start with the primary key inserted and the door closed and locked.
2. Remove the first secondary key (If DM2/DMS2 or more).
3. Check that the primary key is trapped in position and the door remains locked.
4. Remove the remaining secondary key(s) (If DM3/DMS3 or more).
5. Check that the primary key is trapped in position and the door remains locked, upon removal of each secondary key.
6. Insert and turn all of the secondary key(s).
7. Check that the primary key can only be removed when all the secondary key(s) are inserted.
8. Check that the door can be opened.
9. Ensure that when the actuator is removed from the head, the primary key cannot be fully turned 120 degrees.

INSPECTION AND SERVICE

Regular weekly inspection of the following is necessary to ensure trouble-free, lasting operation:

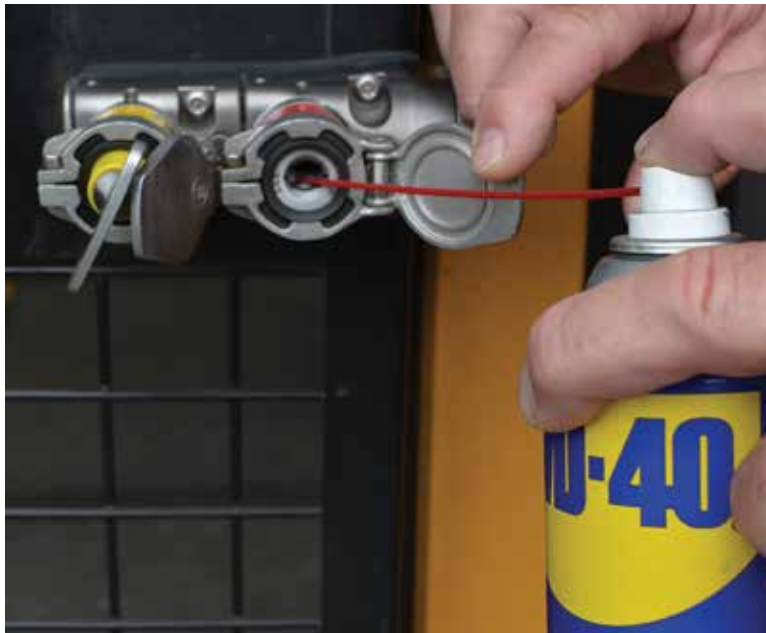
1. SECURE MOUNTING OF COMPONENTS.



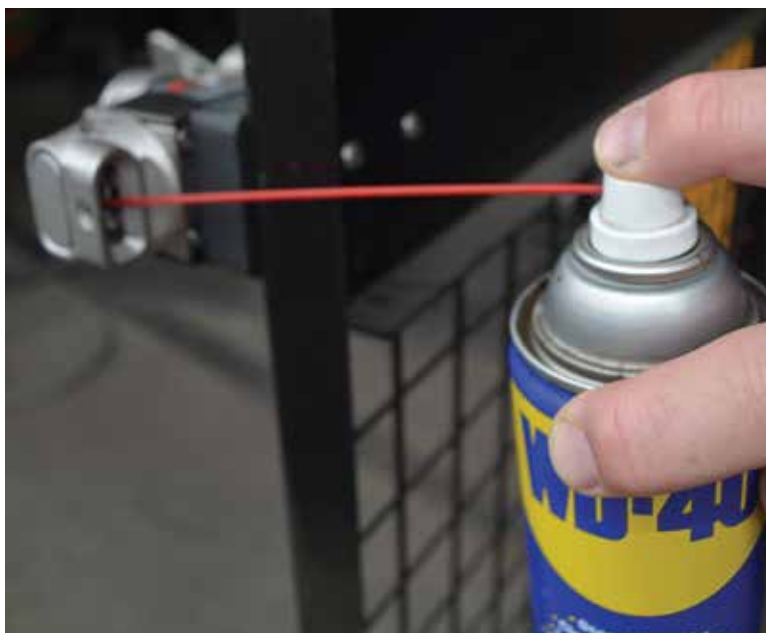
2. INSPECT FOR DEBRIS AND WEAR.



3. LUBRICATION. IF LUBRICATION/CLEANING IS REQUIRED USE WD40. **DO NOT USE DRY LUBRICANT.** THE FREQUENCY OF LUBRICATION/CLEANING WILL DEPEND ON THE ENVIRONMENT. LUBRICATE / CLEAN AT LEAST ONCE A WEEK WHEN USED IN THE CONCRETE INDUSTRY.



4. THERE ARE NO USER SERVICEABLE PARTS IN A DM/DMS MODULE. IF DAMAGE OR WEAR IS FOUND, THE WHOLE MODULE MUST BE REPLACED.



bauma

Make sure to check out our library of 360° virtual plant tours on columbiemachine.com or by visiting our YouTube channel

BAUMA 2019 RECAP



In April, Columbia Machine, Inc. exhibited at the BAUMA trade fair in Munich, Germany. Bauma is the world's largest construction equipment and building-material machinery trade show with 3,700 exhibitors and 620,000 visitors from over 200 countries.

This year, Columbia Machine exhibited alongside Techmatik to display our entire line of production capabilities. The booth showcased the brand new Techmatik SHP 6000 Pro C machine, five production molds, and an interactive display that allowed booth visitors to take 360-degree virtual tours of small, medium, and large pallet production facilities. Columbia's booth and promotional messaging were well received, and the trade fair gave the company and its visitors an excellent opportunity to plan for our future success together.

Columbia would like to thank all of its employees who were involved in the planning, support, and presentation of another successful Bauma. Special thanks go to the customers and visitors who stopped by the booth to see Columbia's latest innovations. We are excited about the future and we look forward to showcasing our solutions again at Bauma in 2022.

Columbia received the honor of host the ICPI & NCMA Pre-Bauma Tour, allowing us to showcase our technology on a broader scale. We're incredibly appreciative of Mansfield Brick's willingness to open its doors and sharing their impressive operations.

TRADE SHOW RECAP



ICON XCHANGE
ORLANDO, FL



THE PRECAST SHOW
LOUISVILLE, KY



UK CONCRETE SHOW
BIRMINGHAM, UK



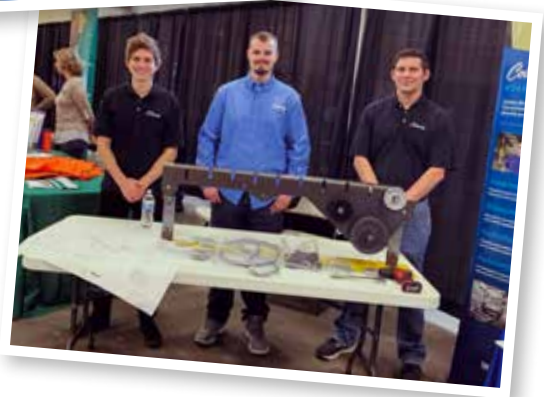
WORLD OF CONCRETE
LAS VEGAS, NV

COMPANY EVENTS



PHYSICS THROUGH ENGINEERING CONTEST

YES 2019



MANUFACTURING DAY



Columbia[®]

IN-HOUSE TECHNICAL TRAINING

Classroom Education // Troubleshooting // In-Depth Instruction // Industry Expertise // Maintenance

Visit our headquarters,
meet our staff,
see our operations.



2020

Classes Offered



Basic Electrical

Basic Electrical Class: During the four (4) day course, the first two day hands-on course will help you understand electrical symbols, read electrical schematics, be able to use a test meter properly, quickly recognize areas at fault, and help you reduce your down time. The next two day course covers I/O components, input, output, analog, remote I/O, and flex I/O modules.

Basic Mechanical

Basic Mechanical 22/16/1600 Class: This five (5) day course covers instruction on safety, general hydraulics, pneumatics, and preventative maintenance. Students will get training on making machine adjustments, hydraulic and pneumatic settings, and more. This one week class is a must for all machine operators, plant maintenance personnel, and plant production managers.

Columbia Machine, Inc.

We manufacture machines for every aspect of concrete products production. Ruggedly built, precisely engineered, adaptable to any environment, our machines work as hard as you do to create valuable, profit-driven products year after year. It's how we've set the standard for over 80 years.

Contact

Columbia Machine, Inc.
107 Grand Blvd.
Vancouver, WA 98661
+1 360 694 1501

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www.columbiamachine.com

REGISTER NOW FOR 2020 CLASSES

Basic Electrical - \$995

Basic Mechanical - \$995

January 28-31
October 6-9

February 3-7
October 12-16

TO REGISTER, SEND COMPLETED FORM

By Mail Columbia Machine, Inc.
P.O. Box 8950
Vancouver, WA 98668-8950 Attn: Jon Kraft

By Fax +1 360 906 5728 Attn: Jon Kraft

By Email jonkra@colmac.com

*General Registration Information

Airline tickets should specify Portland International Airport (PDX) as your destination. Airfare, hotel, and transportation (between the airport and hotel) is at the registrants expense and is not included in the class cost. The hotel will provide a shuttle service between the hotel and the classes at Columbia Machine headquarters each day. Shuttle departs at 7:45am from the hotel lobby each morning of the scheduled class. Friday's class let's out around noon so return flights should be scheduled after 3:00pm.

*Hotel Accomodations Contact Information

Homewood Suites by Hilton
701 SE Columbia Shores Blvd.
Vancouver, WA 98661
Phone: (360) 750-1100
Fax: (360) 750-4899

.....▶ Airfare, hotel, and transportation (between the airport and hotel) is at the registrants expense and is not included in the class cost. ◀.....

Dept 407-6940

Applicant Information

Name: _____ Job Title: _____ Jacket Size: _____

Address: _____

City: _____ State/Province: _____ Postal Code: _____ Country: _____

Telephone: _____ Fax: _____

Email Address: _____

Company Information

Company Name: _____

Contact Name: _____

Address: _____

City: _____ State/Province: _____ Postal Code: _____ Country: _____

Telephone: _____ Fax: _____

Company Email Address: _____

Payment Information

Method of Payment	Check	Visa	Mastercard	Discover
Company Name: _____		Contact Name: _____		
Card Number: _____		Expiration Date: _____		
Name on Card: _____		Signature: _____		

General Information

Terms, Cancellations, Deadlines, Travel Plans:

Method of Payment

Registration deadline is 30 days before first day of class. Any class may be cancelled if student enrollment is below minimum of six (6) students. If class is cancelled, a notification will be sent three (3) weeks prior to class start along with a full refund. If you must cancel, please contact CP Service at (360) 694-1501, a refund will only be issued through the Thursday prior to the beginning of the class. All cancellations will be subject to a \$100 administrative fee. It is advised to not purchase a non-refundable or non-transferable ticket, as classes may be cancelled or rescheduled. Columbia Machine is not responsible for any airfare charges incurred as a result of a class cancellation.



See us at trade shows in 2020

WORLD OF CONCRETE

Las Vegas, NV | 4 - 7 February, 2020

ICON XCHANGE

Salt Lake City, UT | 20 - 22 February, 2020

CONEXPO-CON/AGG

Las Vegas, NV | 10 - 14 March, 2020

UK CONCRETE SHOW

Birmingham, UK | 25 - 26 March, 2020

CONCRETE SHOW SOUTH AMERICA

São Paulo, Brazil | 11 - 13 August, 2020

Columbia[®]

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107 Grand Blvd.

Vancouver, WA 98668-8950

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