STEELCASE
LEAN PRODUCTION AND INDUSTRY 4.0:
MAKE YOURSELF COMFORTABLE

VANSTAR
MORE AUTOMATION TO OBTAIN
QUALITY AND FLEXIBILITY

STRUCTURAL STEEL
STEEL BUILDING WITH LASER
One of the Internet’s most popular viral videos showed a one-year-old child attempting to browse a glossy magazine as if it were an iPad. The youngster was very disappointed to see that the magazine “didn’t work”, as it failed to react to her attempts to swipe or pinch the pages. This image is symbolic of the changes we are experiencing, changes which concern society in general and the manufacturing world in particular. It all pivots around humans who expect sophisticated tools to provide the information they want in the manner they expect. Tools must adapt to humans, not the other way around.

The fourth industrial revolution that we are experiencing is not driven by the discovery of amazing new technologies. Instead, the change concerns what machines are required to do. Their nature and function remain very much the same: it is the way they operate and interact with the outside world that is new. In the BLM GROUP world, bending, laser cutting and end-forming systems communicate with one another, simulate production processes to simplify the operator’s tasks and autonomously solve the issues they detect themselves whenever possible.

There are many examples of this. All-In-One applications are a practical example of the integration concept between production systems. BLMelements software packages, such as Protube for instance, implement the communication concept between the company’s Factory Information system and machine tools during production batch creation and during accounting and controlling. VGP3D, with remote simulation function for realistic part feasibility analysis, means production activities can be monitored from the office. Active Speed controls laser processing quality by automatically varying the working parameters according to predefined algorithms.

Just like the child thought it was normal for a picture to disappear when she tapped on the edge of the magazine, manufacturing system users expect their machines to include sophisticated tools with the same type of straightforward functionality. For this reason, BLM GROUP is already in the industry of tomorrow.
STEELCASE, with more than 15,000 employees and production sites in various parts of the world is renowned in the interior furnishing market where its over 100-year experience is respected. In its plant in Wisches, France, not far from Strasbourg in the heart of Europe, STEELCASE produces many models of office chairs and armchairs in a production site with long history and an ambitious modernization project.

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STEELCASE

The Wisches plant was started by a company that produced tables and closets with the French brand name of STAFFORD. In 1974, to become established in the chair market, Stafford entered into a joint venture with the renowned STEELCASE that later acquired the whole company in 2011. Today, 350 people work in the 30,000 sqm of the plant to produce 600,000 chairs/year. Four different chair models and 6 armchair models, for office use, correspond in total to more than 40 different frame versions. All are high end products.

Flexibility and quality are the keywords that characterize the production process. “We need an efficient and flexible process able to produce large volumes but also able to change from one production line to another”, explains Pascal Jaeger, production manager. He continues: “We work on two shifts according to the principles of lean production. Our production is all Just In Time, the order arrives three weeks before delivery and we never produce for stock. Our lead time is currently 12 hours and every 4 hours we produce all our seat models.” It is understood how process flexibility is a need more than a desire. “Work is organized on lines dedicated to a specific product range. Orders arrive three weeks before production and this is the time that we must manufacture the product. We also have high flexibility of operators, for example we can produce 8,000 chairs one week and two weeks later we can produce 15,000 chairs.

We are in a transition phase toward a more modern technological process that started with the purchase of the tube bending machine E-TURN from BLM GROUP. We had to replace our machines that had been working on two shifts for 20 years, and upgrade to a different technology that would include automation.” The production process of an important manufacturing site cannot just be changed for the technical interest of an engineer enthusiastic of new technologies. “It would be necessary to demonstrate to management that each investment is cost-effective”, confirms Pascal Jaeger. Pascal Jaeger, and his colleague Pascal Dastillung who is responsible for metal processing, had to demonstrate this aspect.

These benefits made the decision to move forward with the equipment investment straightforward. Safety at STEELCASE comes before quality. It is evident looking at the production department: clean and tidy with special attention to safety and quality of working environment. With E-TURN, the high
productivity combines with a constant high safety factor. It is no longer necessary for an operator to stay at the machine. This becomes a considerable saving in our overall operational & production expenses.

The E-TURN was quickly installed and integrated into the production cycle of the plant, producing 140,000 parts from the start of the year. “This has been very positive and has made a fundamental contribution to the decision to continue with the investment.” Jaeger explains and continues: "Now we need two new electric tube bending machines with automated feed and an unload robot. The objective is a fully-automated line which also includes laser systems. The robots will pick up the parts, move them directly to welding, and then onto painting.

INDUSTRY 4.0

The final objective is to have fully robotized lines. We are talking about Industry 4.0 and Jaeger and Dastillung have defined the scope and objectives of the project. "I wish I could see machine data on my smartphone: I know that it is already possible today, but it is necessary for the future. Our relationship with BLM has worked. We already had BLM machines in the past and today we purchased the E-TURN from BLM."

BLM has become a partner and key contributor to the success of the next phase in the project. The Lasertube and the robots will further increase process quality level. “It took us five years to make the decision to invest in new machines, but meanwhile we continued to work on processes to improve efficiencies. If you want to utilize technologically advanced machines at maximum capability, you must change the process too. In the past, the central part of production was the operator, there was one for each machine; now the technicians and the engineers send information to the machine necessary to carry out production and process return data. This also meant investing further in our employees by training on the new processes.”

Software is playing a key role in this process. The possibility to work outside the machine with VGP3D from a PC in the office is an advantage. Simulation and the possibility to load 3D models are operations that can be conveniently carried out in the office and are in line with the current change of philosophy in personnel. Everything is managed from the office and this is really a great advantage.

With the E-TURN, quality has vastly improved due to the all-electric operation and the usage of new tools, safety is higher because there is no need for an operator to be constantly present to run the machine, and productivity has radically improved. Previously we had an operator in front of every machine, whereas now we have an automatic feed system.

The objective is to be always more efficient in terms of safety, quality, service, costs, lead time and efficiency.

Repeatability, no operator present at machine, reliability, cycle time... In other words, the BLM system has exceeded the expectations of Jaeger and Dastillung.

When the parts were ready for the welding operation, we realized that all parts were produced identically. This machine has allowed us to increase our internal and external quality level. Previously, the operator that found a faulty part had to rework it to meet specification.

This is no longer necessary, as production process is inherently reliable and repetitive with the E-TURN.
Among Eastern European countries, Poland is probably the one having a greater development as it shows an entrepreneurial dynamism that has generated a continuous growth even during downturn periods. And thinking about a driving force in this evolution process, the automotive sector is an excellent example. In recent years, many major car manufacturers have opened production sites in Poland, boosting the growth of expansion opportunities among local suppliers.

One of these local realities is VANSTAR P.W., a company established in 1993 by Leszek Szostak to produce load systems for STAR trucks and then little by little the market extended to other manufacturers of buses and special equipment for ports and airports. Today the company employs 150 people working in a plant of 3,500 sqm. Paweł Szostak, name partner together with his father, founder of the company, recalls the early times: “At the beginning, we built a tube bending machine with a mandrel ourselves to be able to work and we went on for eight years with that machine. After completing my studies, I joined the company and with my father we bought the first industrial machine tool.”

VANSTAR lived thru the entire evolution of tube processing for the automotive industry in Poland. Paweł explains: “Initially, the market accepted machining imperfections, with some folds on the bending area and clamping tool marks. Today, the automotive world has changed and problems such as avoiding tube distortion are taken into account. This increases the necessity to use automatic production systems able to ensure accuracy, reliability and repeatability.”

VANSTAR has been dedicated to aftermarket production for a long time. Today the company is changing direction and about 30% of its production is dedicated to OEM components. Paweł explains: “The after-sales market in Poland is very difficult today as competition has soared. Many small businesses with simple machines produce components at very low prices. That is why VANSTAR has recently turned to OEM components. Many automotive manufacturers have come to Poland and this is a golden opportunity.” Characteristics of this market are however different and clear in the thoughts of Paweł, who lists them in order: “Very low price, very high quality and commitment to delivery times.” A company must be able to adapt in order to keep up with market changes. In 2011, the implementation of a quality system certified by ISO 9001 and ISO 14001 and recent investments combine with the objective to enter the market of first installations.

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Production is divided among truck parts and special equipment parts, such as vehicles to unload cargo vessels in ports, and VANSTAR can manufacture the finished product, ready for installation. Currently their main customer is Cargotec, a major manufacturer of vehicles to load and unload containers. Vanstar manufactures the unloading system and though it relates to the automotive sector, numbers are not the same as for cars. Paweł explains with another example: “We have a customer producing 2,000 buses/year. Production volume is established, 2,000 units in a year is not a large quantity, but the complexity and quality required is very demanding.”

In order to meet the high standards, it was essential for Vanstar to invest in machines capable of performance requirements. Low volumes imply frequent production changes and machines able to change production efficiently and this is the reason why, after some unsatisfactory experiences, they chose BLM GROUP. “We knew the person who proposed the products of the Group in Poland and we were pleased to have a Polish contact: this gave us confidence”, Paweł explains. In 2010, they acquired the first tube bending machine, a DYNAM8 then in 2016, a change in direction: an end-forming system AST80, an ELECT-M, an ELECT-L and an ELECT-XL, all fully electrical systems to ensure a real qualitative leap.

With the ELECT systems, they have been able to make quality components, free of imperfections on bends: something that was not possible before with the hydraulic machines. Torque control on clamps ensures a correct gripping force leaving no warping on tube.

Now with all the machines they’ve bought, the market has expanded. In addition to the tube bending machines, they have a LT-FREE 5-axis laser system in their equipment portfolio. The LT-FREE augments our existing laser cutting capabilities. The market commands complex components, just in time delivery and therefore more flexibility.

The LT-FREE system allows for trimming and cutting of bent tubes, formed sheet metals and other types of 3D components with extreme accuracy and repeatability. “With the LT-FREE we are making parts that previously were not feasible with traditional processes”, explains Paweł, while he shows us a detail of a tube bent and cut very close to the bend by means of laser cutting. “Previously we tried to carry out that machining with a lathe, but the cut near the bend was not as it should have been.” The part is for a very important customer, Solaris, a bus manufacturer. This part is to be used on an innovative bus prototype, with hydrogen engine. “LT-FREE, with its 5-axis head, allows us to cut the tube as required, very close to the bend and we managed to solve the problem and get exactly what was requested.”

With the new machinery, Vanstar can work with its customers to efficiently process prototypes, small batch or large production with a commitment to quality and delivery. He shows us a bent and cut part.

Before having the LT-FREE system, many steps were required to produce a part: a first passage under the press and then other manual machining to drill the holes. Five days were necessary to produce 200 parts: now, with LT-FREE, the same number of parts are produced in a work shift with higher precision, reliability and time predictability. This is the necessary leap to enter the OEM market.

Paweł is already thinking about future expansions to his manufacturing capabilities and, at the end of the interview, he points out the Lasertube systems that he has seen at ADIGE and the machine could be the ideal solution for other processing needs.
TOOL-DESIGNER

THE BENDING TOOLS MODELS AVAILABLE TO YOU

Program your part in VGP3D.

Check all the required bending tools.

Download the construction models of your needed tools.
EXPERIENCE

MarkSTAHL, a German company based in Jahndorf established at the end of 2010 by Roland Markert, is unmatched in the tube global market. In 2016, this innovative company built an industrial plant able to produce all the different phases of tube and sheet metal processing. The strong points are two Lasertube systems, LT5 and LT8.10, and a tube bender E-TURN52, integrated in a synchronized production line that represents the concept of All-In-One. Mr. Markert is in contact with selected agencies from around the world to find materials that can satisfy his customers’ requests at best. The cooperation between MarkSTAHL and the steel plants brought new types of metal to realization, not yet present on the market. The pieces produced by MarkSTAHL are sold to customers globally and often are used for the production of innovative applications.

Toward the future of tube machining processes with All-In-One

MARKSTAHL

TUBE PROCESSING KNOW-HOW AT GLOBAL LEVEL

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“Tubes belong to their own world. That has always been fascinating to me for its aspects, peculiarities and possibilities” states Roland, without hiding his enthusiasm. His in-depth knowledge of tube processing was gained from working in the tube department of a firm processing special steel bars. This experience led him to establish his own business producing tubular products for the global industry. The appeal for specialty materials rose immediately so that he could acquire regular customers.

Markert shows us a construction, the purpose of which is not clear at first sight. “This is a drilling head that pumps fluids from many thousand meters deep”, explains Markert, and we understand that, with his 20 employees, he manages a company that meets the most specific needs of his customers.

The company supplies to many different facets of businesses all over the world ranging from furniture to production of vehicles, naval, healthcare, aerospace or mining industry: markSTAHL is therefore a versatile company able to meet the most diverse needs.

“Our strong point is that we know how to identify the specific needs and from there to plan every step: from purchase of the right materials, to part production, including all process steps”, affirms Markert, to underline the difference between his company and competitors.

The focus of the company is the quality of the material used: as a matter of fact, the company often discusses with customers the possibility to create new materials depending on the specific needs. It’s not uncommon for many years to pass from project conception to its final realization.

**SERVICE SUPPLIERS FOR SPECIAL CASES**

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**ALL-IN-ONE: MACHINE INTEGRATION**

Thanks to the integration of the three machines with All-In-One technology, production of reject parts has considerably decreased when machining of parts with holes. Therefore, machine operators laser cut parts with the LT8.10 or with the LT5. Parts obtained are then positioned on a loader and machined by the tube bending machine that recognizes position of holes on tube and transfers the information to B_Tools.

At this point, the software adapts the bending program depending on cuts previously performed, also considering the elastic return factor and stretching that tube may undergo during bending. “When processing parts that are not too complex, i.e. most part of our production, holes are already in the right position, without the need of any program correction”, explains Markert.

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“The E-TURN52, is used for bending parts with an external diameter from 6 to 52 mm. The possibility to perform right-hand/left-hand bending in process gives markSTAHL the freedom to bend and offers huge machining flexibility. With the tube loader for oval, round and square tubes up to 6 m long, the machine produces large series even without the operator being present, but ensuring perfect radii, both fixed and variable.”

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“With the LT8.10 we process above all profiles and tubes of great thickness - but not only” affirms Markert smiling while he shows us the machine. Once we reached the LaserTube he asks the operator to show us a part just obtained from the production process in progress. We were surprised to see that the part dimensions were only 3x4 cm. 3D section can be observed on the oblique angle of the produced part. Markert affirms: “This part is used as stop for a piece of furniture adjustable in height. This is what I mean when I say that the machine is flexible.” The machine is therefore able to produce very small parts and to process tubes with large diameters.

For high volume production, operators position tubes and profiles up to 8 m long on loaders. In small batch production, we use a step loader. In automatic mode, we can load parts of 6.5 m with 240 kg weight. The machine has three load stations that automatically divide the finished parts.

Flexibility of materials: steel, stainless steel, brass or copper, the laser cuts any material rapidly and always ensures the highest quality.

“We will continue producing cuts in 2D for our customers” affirms Markert. In this case the LTS is the ideal machine thanks to its high reliability. Parts up to 3.5 m long can be loaded on this machine and it is able to ensure high productivity also on batches consisting of more than 30,000 parts.

Integration of the three-dimensional Artube CAD/CAM software of the LaserTube and the VGP-SID of the tube bending machine E-TURN52, offers to markSTAHL all processing possibilities for tubes and profiles necessary to the company.

When production is very broad, as is our case, it is necessary to develop a chain production process that links every process, from part design to its production, until it is unloaded in the specific carriages. We will have to face this and other challenges in future.”

WIDE RANGE

states Markert, hinting at the topic ‘Industry 4.0’. “We have already obtained great results thanks to the integration of the LaserTube and the tube bending machine.” It is then obvious that these new technologies, as All-In-One, can only surprise us with their development potential. For this reason, BLM GROUP is the right partner for markSTAHL, the same applies for EHP.

TUBE MARKET GROWTH

Tube market is continuously growing, and this is a great advantage for markSTAHL. “Our customers are currently replacing tubes to solid material in processing. For example, it is not that long ago that it became possible to produce tubes with a tensile strength of 1,400 N/mm², according to standards required. These are the sectors where, together with carpentry, we intend to develop new production system and use new technologies.” It is difficult to imagine how expensive the development of new ideas will be and in how many fields tubes can be used.

With its machines, markSTAHL is gradually conquering more and more customers. For example, recently the company has been involved in the production of tubes for the nuclear industry.
China is changing its image and production philosophy. Through a scheduled path, China wants to evolve from low cost production to a country of quality production. This process involves all sectors and many companies are facing the question of how to implement efficient organization and automation like the majority of the advanced industrial world is doing.

ZHEJIANG CFMOTO POWER

AUTOMATION LANDS IN CHINA

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ZHEJIANG CFMOTO POWER CO. LTD. was established in 1989. Today it is one of the major road bike manufacturers and the major Chinese manufacturer of quad-bikes, or more precisely ATV (All-Terrain Vehicles): 4-wheel motorbikes suitable for all terrains and produced for recreational or sport purposes.

Production plants, extending over about 120,000 sqm, are in Hangzhou, in the Zhenjiang region, not far from Shanghai. The company employs approximately 1,300 people who design, develop and produce engines and boats in addition to motorcycles and ATVs.

Mr. Liu Jianlin is the Process Technology Manager of CFMOTO: “We are a private company with nearly 30-years’ experience in bike manufacturing. Three core principles lead our business: harmony, honesty and innovation.” We consider the last one undoubtedly the key factor in the development of this important industrial reality. Over 200 people working in the R&D department and ownership of 110 patents support this commitment. Mr. Jianlin continues, “20% of production is intended for the domestic market, with 400 authorized distributors, whereas 80% is intended for the foreign market.” The distribution network of CFMOTO is present in 78 countries including the USA, Canada and Europe.

Overall production volumes are high, but the single production batches are limited and change rapidly, as Mr. Jianlin explains, “We have 98 different models of vehicles and 51 different models of engines, therefore it is necessary to produce several hundreds of various parts for each component. Quality must be guaranteed but all of the production changes do not make this an easy task.”

The biggest problems that production has to face, concern mainly accuracy of produced parts. An important renovation of production process efficiency is currently underway, and the improvement is focused on automation.

“When we buy machines, the crucial aspect is the level of automation. This aspect ensures accuracy of machining operations and process repeatability. In practice a Higher quality. This is the main objective, even more important than production increase, which is still a key objective.”

These needs lead CFMOTO to buy tube machining systems from BLM GROUP and the goals have been met: “The decision to buy a tube bending machine ELECT40 and a Lasertube LT5 system was taken with the aim to improve process quality and productvity.”

ELECT40 is a multi-radius all-electric bending system. “With the ELECT40 productivity is three times higher than before and machining operations are performed with higher precision and repeatability, exactly as we needed”, Liu explains. Previously, processing used hydraulic machines and accuracy and repeatability could not be duplicated. Torque control on vice closing, as result of the all-electric operation, also provides higher speed in the tooling calibration phase at passage from one machining process to the other.

“Quality of bends obtained has greatly improved. Before it was adopted, about 10-15% of the production was rejected and now that percentage is reduced nearly to zero” Mr. Liu explains enthusiastically.

The Lasertube LT5 system for cutting of tubes with a diameter up to 120 mm was included in the production process of CFMOTO and offers new development opportunities. “LT5 is something totally new in our production process and has had a very strong impact right from the start”, Mr. Liu explains: “Now we can make parts that we could not before. Projects which were once impossible due to manufacturing constraints are now feasible!”

Since 2014 CFMOTO has been an official supplier of the President of the People’s Republic of China, defined as a company that is expanding through the automation of the production process.

Increase in productivity Compared to the previous process
The use of laser technology allows higher architectural freedom and efficiency, both at a structural and productive level. For a long time, BLM GROUP has been involved in the study and implementation of ad hoc solutions for this sector.

A SUCCESS STORY

STEEL BUILDING WITH LASER

Our Italian tradition shows solid buildings, made of stone and bricks that have survived over time, some even for millennia. In the last century, we have mainly built using reinforced concrete, believing in its “eternity”, even though our recent history has shown a very different reality of damaged, deteriorated, collapsed buildings requiring repair after 20-30 years.

At the beginning of the third millennium, it is evident that this kind of development is no longer practical and that we need new building standards: reduce land consumption, restore and salvage buildings, use recyclable materials and products, repurpose buildings at the end of their service life with attention to social and environmental costs. Steel is the most important material of this constructive philosophy, which
interprets the most recent synthesis between engineering and architecture and creates construction that results in favorable investments over time.

Steel is an effective solution: seismic, flexible, traceable, high performing and cost-effective. It has a high architectural and expressive value and reliable construction timing. Use of steel saves energy, allows thermal and acoustic efficiency and it is 100% recyclable which supports a circular economy. It is also ideal for requalifying existing building assets.

To quantify these countless advantages, a qualitative and quantitative investigation was carried out (analysis by the Foundation for Steel Promotion with the collaboration of the manufacturer Stahlbau Pichler, March 2017) which, during this first step, focused mainly on bearing structures, the state of art of pros and cons of the most common constructive systems.

The analysis involves a case study of different types of buildings with different structural solutions: the first made of concrete and the other made of steel. The steel solution is remarkably more advantageous in means of timesaving and construction time (without considering direct costs). The estimate of direct costs shows that there are no big differences between the two types. When considering all other costs, such as foundations, security, on-site qualified personnel and public land occupation, the steel solutions provide interesting savings. Steel constructions are seismically safe due to their lightness and ductility that can scatter more energy than other structural materials.

Construction technology has a significant impact on the time spent building a multi-story structure. With a dry steel stratified construction system, the processes are very industrialized; the load-bearing structures are entirely pre-assembled by the manufacturer as mechanical elements. Construction on site is much faster than the solutions that
involve concrete pouring. Lifting and unloading tools are generally much lighter and allow operating in problematic urban areas with the presence of existing infrastructures.

The Lasertube cutting technology contributes to the production of steel structures. It is a very useful tool for creating innovative, light, precise, pre-assembled structures that can be interconnected with each other quickly without the costs and delays of adaptations often required on site. The freedom to find new joints between structural elements offers designers new scenarios that contribute to further enhancing the benefits of steel construction. Lasertube technology not only replaces the more traditional building methods, it also creates added value because it allows to conveniently achieve what previously only the great and expensive Starchitect could afford to.

Lasertube technology automatically allows for design and production of parts including various operations previously performed on different machines such as: sawing, drilling, trimming, grinding, etc. Its precision allows for the design of joints and junctions that were previously unfeasible. The result is remarkably more precise than the tolerances of the raw material. Various processes, such as measuring cycles, compensation of the deformations of the tube or profile allow the machining to comply with the tolerances of the whole structure. The remarkable reduction of welding equipment contributes to time and cost savings. This can be done with a just-in-time approach that, in addition to avoiding some process steps, eliminates the intermediate storage of unfinished parts. Another advantage is the possibility of cutting both orthogonal and tilted respect to the metal surface, thus creating chamfers that simplify following welding operations.

The potential of this technology is huge. It is now time to take advantage of it!
FREA & FREA S.r.l. is a typical family-run company, established in 1978 from the initiative of the current owner, Giovanni Frea, in the beautiful setting of Roero’s hills. “This is a farming area, my grandfather grew strawberries and my father started building equipment for farming”, explains Mauro Frea, Giovanni’s son, who after his degree in engineering joined the family business by assisting the founder in managing activities. From structures for farming to light carpentry of aluminum doors and windows it is a short road, but it meant a crucial change. Volumes have increased and we passed from doors and windows to coverings and continuous facades and today FREA & FREA is known as specialist of this sector of the building world.

**IF THE JOB IS A BUILDING FACADE...**
**...WE KNOW HOW TO DO IT!**

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Laser in the construction industry is still at the beginning. “Major customers usually start from an architectural detailed study already prepared and we are able to engineer it, optimize machining and reduce costs. Laser enables special machining operations that make it possible to create joints between the different elements and therefore simplify installation reducing times and errors,”

ONE SUPPLIER, FROM DESIGN TO INSTALLATION

and found out that nobody has the technological level of BLM GROUP for the tube. The LT COMBO system was the solution to our needs for sheet metal and gave us the opportunity to get to know the world of laser cutting of tube.”

The choice turned out to be correct and the opportunities offered by the combined system have exceeded their expectations: “We recognized that with LT COMBO, it was enough to have imagination and the machine would offer significant advantages. For a long time, we processed the sheet metal at night and the tube during the day and over these six years, tube sections have never been the same. If we look at the volume of machined material, we’ve probably machined far more tube than sheet metal.”

Frea explains and concludes: “The customer often proposes an architectural solution, but we knew how to realize it.”

The ability to face the problem in all its aspects is an essential asset. “When we face a new job, we are able to provide the full package from design to installation. This is particularly appreciated by customers who love to deal with a single supplier”, Mauro explains.

How could we at BLM GROUP disagree as we propose the same philosophy in the tube processing machines!
Since the purchase of the LT COMBO, the sheet metal volumes and the requests on tube have continually grown. “With a need to increase production capability, combined with the incentives offered through the National Plan Industry 4.0, we decided to invest in dedicated systems, one for sheet metal and one for tube”, explains Mauro Frea. Furthermore, in structural metal carpentry, dimensions, thickness and weight of tube are increasing and what we used yesterday is no longer sufficient.

“With the skill and support of ADIGE-SYS, we were confident in our decision to buy additional systems. Therefore, we purchased a LT14 Lasertube, dedicated to machining tubes up to 355 mm diameter and 100 kg/m weight. It’s true that 80% of tube is up to 150 mm, but the machine is however able to process it.”

The LT14, equipped with a 3D cutting head, can machine open sections too. “This allows us to make another important step and expand our thinking on how to design everyday carpentry. We used to make templates on paper, to wrap them on the tube, mark them with chalk and then cut with plasma by hand. Work has always been carried out this way. The problem is that if today the laser stops, our employees do not know even where to begin to perform the work manually.”

The LT14, with its 16 m of load at entry and 12 m of unload at exit, allows you to load bars, obtain finished parts and do anything in between. “Machining of network trusses made of round tubes is carried out in automatic and times are non-comparable at all. Thus shortly, all cutting and drilling operations on I-beams will move to LT14.”

WEIGHTS AND DIMENSIONS OF CONSTRUCTIONS ARE GROWING
According to Mauro Frea "Industry 4.0" is not only an occasion for financial incentives: "It is the goal we are expanding on." Today’s production system is already automated and controlled directly from the office. "Before everything was based on the expertise of the personnel in the workshop. Now the expertise lies in the office and all the machines work autonomously. The machines in the workshop receive the programs and are managed from the office. Everything is drawn in CAD 3D and programs are sent directly to the machine.

We have a management system that tracks job orders, communicates with automatic magazines and sends out orders of materials that are not available to the suppliers. It creates magazine requests, orders sent to suppliers for what is missing and accordingly prepares carriages with materials to be assembled. Laser machines integrate well into this process; they enable us to have the control of production and to know the status of the job orders in the workshop. The great advantage is that a single person has the control of the entire situation. When I ask something the operator knows how to answer, without the risk of getting contradictory answers from multiple employees." With the laser system, the person in charge of managing production can tell me all that is going on, from job orders to consumption, to what is necessary to complete the process. At production, we feel quite aligned to the state of the art in terms of automation and integrated factory. The LT34 is another step in this direction.
The first laser tube cutting system in Iceland is an LC5 combination system, installed at a dynamic job shop working mainly for the naval sector and the food industry. Processing of stainless steel, great operating capacity and the will to be different: this is MICRO RYDFRI SMIDI EHF in Garðabær, at the outskirts of Reykjavík.

FISHING IN THE NORTHERN SEAS... WITH A LASERTUBE?

MICRO RYDFRI SMIDI EHF

EXPERIENCE

Iceland - the origin of the name defines the snow and ice that cover this island for the majority of the year, but on a sunny day in August, the view extends over unlimited stretch of volcanic rocks and a cobalt color sea that leaves you bewitched. It is a natural paradise and you need to be focused in order to speak about the industrial realities that operate in this region. The Island is inhabited by 320,000 people in all, one of the less populated areas in Europe.

Fishing is one of the main economic resources and many Important industries, especially in the food sector, were born around it. This is the environment where MICRO was born and has grown, as Steinrn Arni Asgeirsson tells us and who, together with Sveinn Sigurrsson, was the founder of the company of which he is currently the owner.

“We started our business in 1996; a workshop of 80 sqm only, repairing fishing boats. We worked mainly for Marel, a large industrial food processing company, and built accessories and equipment, until we evolved to on-board systems for fish processing.” Today, in a hangar of 1,000 sqm, MICRO EHF is able to design and fabricate complete products ranging from boat and motorboat accessories, to kart frames, assembly and welding included.

In few years, the company moved from a manual and artisan production to automatic systems. Some CNC machines, a cutter and a lathe, started the modernization process that reached its pinnacle with the purchase of the laser system in early 2017.

The addition of a laser system could be considered a logical and natural step for a metal job shop that outsourced most of its laser cut parts. “Iceland has a limited population and the market is not very wide, but the food industry is raising food equipment standards, which increases the need for laser processing”, explains Asgeirsson and continues, “There are already many companies here in Iceland that perform sheet metal laser processing and we realized that we had to distinguish ourselves. That is why we made the decision from the beginning to buy a laser system to process tubes.”

MICRO uses a lot stainless steel and aluminum tubes to create frames and support structures for its products. They immediately realized the significant advantage that could be obtained from laser cutting and began looking for a product suitable to their needs.

“We had been told that ADIGE was the best for tube cutting and many times at exhibitions, we would watch the Lasertube in action and every time we told ourselves that we absolutely had to buy it.”

When they visited BLM GROUP in Levico Terme with the intent to buy the system, there was an unexpected development, as Asgeirsson explains:

“By this time we’d seen many Lasertube systems in operation, and almost by chance, BLM proposed the LCS ‘combination’ system. At first we didn’t know what they were talking about, but when we saw it we immediately knew it was the right machine for us.”

LC5 is a system, unique in its kind, for tube and sheet metal laser cutting. It combines two automatic systems in one compact solution and offers the maximum level of flexibility.

“We made our decision in an instant, guided by instinct. We thought more about the future than about present. The world is moving in that direction and we decided to follow it.” Asgeirsson explains and continues: “We thought that tube processing would have let us acquire new customers and
the sheet metal cutting was considered an added bonus that would have given us the opportunity to process work that we were outsourcing."

A few months after installation, the LCS is processing tube 40% of the time. Expectations are confirmed. Asgeirsson shows us some production parts; a filtering system for the biochemical industry consisting of a drilled panel with an aluminum tubular frame. "It was a product that we made before having the LCS system, using outsourced processes, now we are completely autonomous", explains Asgeirsson.

Another example is the tubular frame for a rescue motorboat prototype with a new type of keel to ensure greater stability in rough seas.

"With traditional methods we needed almost a day to cut these parts, and now it is done in few seconds. If we consider the entire assembly and welding process, savings in terms of time and cost are even greater", concludes Asgeirsson.

Certainly, tube processing has its peculiarities compared to sheet metal processing: material to be machined is constantly moving and you must gain experience.

Asgeirsson, smiling, explains how he gained experience, "I remember the first time we put a 10x15 profile on the machine. We were below the system operation limit and the tube was too flexible... I don't want to say what happened, but I can confirm I've learned a lot from that experience."

"But it will still take some time to raise awareness of the possibilities and benefits offered by tube laser processing. It is a new machine here in Iceland and engineers still have to get to know it", concludes Asgeirsson. As a matter of fact, MICRO has invited the engineers of its customer to see the new system in order to understand the opportunities of laser cutting.

Production management is controlled from the office where projects and production orders are generated. 3D CAD models can be easily imported into Artube, the CAD/CAM software from ADIGE. The models are converted to native files, where you are essentially ready for production. "Often customers send their request on a hand drawn piece of paper or even by telephone and we must draw it from scratch, but major customers send projects of complex structures with parts already bent and"

Artube is an important advantage as it can import these structures and calculate the development of curved tubes and realize the correct work program. Furthermore, it enables us to also add specific parts as joints to industrialize the project and save on assembly time." The advantages in using the laser on tube processing are not limited to time saving during cutting or in the automation of the cutting process, but also and above all in the subsequent phases.

The main competitive advantage MICRO EHF has, is the quality of the service it can offer. We pride ourselves on meeting commitments made to the customer, by supplying the desired product before the deadline and always answering every question. "We enjoy challenges and complex projects that we can find and propose a solution to the customer, even when the request seems impossible. We like to define ourselves as a customer driven company" a subject with which we at BLM GROUP agree without any exceptions.
“We were at our wits end as far as service and support,” concurs Doug Wichman, Manufacturing Engineer for AAON. “That’s the main initial reason we contacted BLM GROUP.”
“Our consulting proved fruitful and resulted in the delivery of one of our ELECT80 bending machines in August of 2014,” notes Dave Cotton, regional sales manager at BLM GROUP USA. The ELECT family of All-Electric, multi-stack, CNC tube benders covers a range of tube diameters from 40 mm (1.5”) to 150 mm (6.0”). AAON chose the 80 mm diameter model, hence ELECT80. ELECT machines have multiple tool stack capability and can produce both fixed and variable radius bends. A maximum of up to eight tool sets can be mounted simultaneously within the stack height, and automatic loading is available.

ELECT machines are equipped with a CNC control optimized for tube bending. This is particularly important given the fact that tubing, as a raw material, often comes with a host of imperfections (dimensional tolerances, chemical composition, etc.) that cause it to react inconsistently when bending. This often results in creating bends that are out of tolerance, repeatability or quality specification. The ELECT has been engineered with the functionality to manage these variables as well as the variations that characterize different market sectors.

“BLM GROUP support and service completely lived up to our high expectations,” says Wichman. “If we have a problem all we have to do is pick up the phone and they respond immediately.” But as important as this support has been, the technology has proven to be equally vital. AAON was seeking to expand its role in the small commercial HVAC market, largely in terms of units from one-half up to three tons. To serve this market more efficiently they wanted to move to single piece flow manufacturing.

Essentially, this means being able to produce efficiently in lots as small as one. This enables them to economically meet the diverse needs of this market, which frequently entails some degree of customization, and do it at a speed which couldn’t have been achieved in the past.

In the fourth quarter of 2016, AAON took an important step toward meeting this goal with the introduction of a new Water-Source Heat Pump and the purchase of their first BLM GROUP 4-RUNNER. The AAON Water-Source Heat Pump is a technologically advanced unit that employs a state-of-the-art automated sheet metal production system. Induction brazing on all copper connections enables this highly automated production line to electronically heat joints rather than using torch welding. This produces a higher quality, low leakage refrigerant circuit. The new AAON Water-Source Heat Pump is offered in two configurations, horizontal and vertical, and multiple efficiency levels to meet a wide array of application requirements.

“BLM has been terrific in this respect,” says Wichman. “We’ve been able to integrate the BLM software seamlessly with our existing computer system, which is essential for the sort of flexible, responsive production we depend on.”

As close as the BLM-AAON collaboration has been to this point, it promises to be even more extensive in the future. This is illustrated by the fact that AAON now has four 4-RUNNERs with, as Wichman says, “a fifth 4-RUNNER to be delivered in a month - with another seven to come in the future.”

The software boasts several features, including 3D simulation, collision avoidance, the ability to import part geometry from CAD programs to rapidly create a part program, and the ability to determine part feasibility and generate accurate cycle times. The first thing Doug Wichman mentions, though, is its ability to seamlessly integrate with the central software.
EXPERIENCE

Accrete has seen all the intermediate steps between the business of trading the tubes at the beginning to the present activity of supplying finished sub-assemblies to the automotive sector. Now as part of their drive to modernization, they have selected BLM GROUP as their partner for tube processing technology by purchasing the BC80 machine to manufacture metallic bushes.

IS THE “GIANT” REALLY WAKING UP?

Accrete Electromech rose on the ladder of success by staying true to their motto, “Customer First” and have made it their principle of conducting business. “Initially we were selling only tubes, then our Customers started asking us to supply cut-to-length pieces and then other processing on these pieces. This was the reason we added cutting, machines, power presses and welding capabilities in our factory. Now we carry out seam welding, spot welding, TIG and MIG welding and other processes to supply finished assemblies that also have appropriate surface treatment. This is how we converted ourselves from a simple tube trader to a well-equipped company supplying ready to mount sub-assemblies for two and four wheeler suspensions,” explains Abhishek.

The different processes like cutting, machining, stamping, bending, fabrication etc. are carried out in different units. “We continued to grow and now we supply to almost all major suspension manufacturers in India: such as Gabriel, Endurance Technologies, Magneti Marelli, ZF and Cosmo Magna. We take pride in being Tier 2 supplier to OEMs like Volkswagen, Hyundai, Honda, Tata motors, GM, Mahindra, Bajaj Auto, Hero MotoCorp says Abhishek. These Automotive OEMs have strict quality requirements regarding the precision and surface finish of tubular components and the same needs to be delivered by Accrete. Abhishek continues, “It is very difficult to maintain the required quality levels with such a high volume when you are working with different processes, different machines and different operators. An operator error or a worn-out/ damaged tool can cause heavy rejections. This was the reason why we chose the BC80 to manufacture metal bushes starting from full length tubes in an automatic, single point process.” The BC80 can produce up to 2,200 bushes per hour in an automatic process that covers all of the steps like cutting, chamfering and on-line length measurement.

For Accrete, this is the first machine from BLM GROUP and in fact it is the first BC80 in India. “Our mission statement is, to supply products and services with best quality by using modern technology. Therefore, when we are considering a new machine or process, we focus on quality. Of course, the cost is also an important factor in decision making process, but we do not just consider the initial investment, but we also calculate the global costs savings resulting from process automation and lean logistics,” states Abhishek. “When my uncle visited the factory in Levice to see the machine for the first time; he was quickly convinced that BC80 was the right machine for us when he saw the company, the manufacturing process, number of different machines being manufactured and overall level of technology.”

Looking back at the first few months of the operation, Abhishek says “we had some learning obstacles to overcome with the machine, but we always received excellent support from BLM GROUP’s after sales service. Now that we are over the learning curve, we are ready to take on new challenges. On another positive note, we were recently awarded an export order which we probably would not have received without having the BC80 in our factory. We hope to get more orders such as this because it helps us to improve our internal processes and opens new opportunities.

We are also optimistic that the new GST tax reforms in India and the “Make in India” program launched by the Indian government will stimulate the growth of our business.”

With BC80, we have been able to improve productivity and precision and at the same time save on manpower, lead time and space. Now BC80 carries out the work which was previously done using 6-7 different machines in different steps.

For example, we used to produce 400 pieces of a given component in 12 hours using our traditional process; now with BC80 we manufacture those 400 pieces in one hour with guaranteed precision. I was not able to imagine this kind of speed and productivity,” admits Abhishek.

ACCRIE ELECTROMECH

IS THE “GIANT” REALLY WAKING UP?

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