The Founding Father - František Zykan
The Age of Aluminum
School Through Play Works
The Biggest Macabre Stage Ever
Bamboozled by Bamboo
Robot and Dollar
Fire Busters

Velvet Backstage

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Text by Pavel Vondráček • Photo by Jakub Frey

The Founding Father of True Constructivism

Through obstacles to the stars – this is the life story of František Zykan, founder of Area4Industries. In the past, he started making stages in a barn on the outskirts of a small Czech town; in the present, the biggest stars of world show business perform on his structures, and in this interview he hints at the future of the industry.

How would you react to the arrival of an extraterrestrial civilization?

I would sell them a stage to show us some real space fun.

When did you come up with the idea to make concert stages?

At the beginning of the nineties, right after military service, which was mandatory in the then Czechoslovakia. I was working as a disc jockey with a friend and I was reading a book about the Gold Rush in Alaska. There was interesting information in it that those who sold equipment to the prospectors were even more successful than the gold diggers. So we tried to do business with concert equipment. It was a fermenting time. In the euphoria of the nineties everything went easier, there was less bureaucracy. And so, while having fun, we started to innovate our sector.

Have you used your experience from rural discos in the manufacture of stage structures?

No, because we didn't have any. There was nothing like it here in Central Europe, it was a time of wood, literally. The DJ stages – these were two wooden pub tables, a shiny canvas thrown over them, an orange flashler from a garbage truck, and a blue one from a police car, a transparent garden hose into which we put Christmas tree lights and, of course, a disco ball. We made it ourselves. We glued shards of broken mirrors to a ball of polystyrene. And they were so heavy there was often a problem actually hanging them. All the other equipment could be laid on the floor or or put on the table, but the ball had to be hung from a structure. And if you didn't have any and you couldn't buy it anywhere, you had to make it. And so it all began.

And so you got the idea to start importing structures...

No, we didn't import the structures, we started producing them right away. Of course, we knew desperately little about it at the time, but it seemed so simple to us... When you're young, you don't have inhibitions and you think you just have to get started and it will go by itself.

Where did you get your inspiration?

We knew everything only from pictures. Physically, at that time, just after the fall of communism, these things could only be seen in circuses, because they were traveling all over Europe and inspired each other. So I went to circuses and observed their equipment. Not only the construction, but I saw for the first time the so-called rotators, lights rotating in all directions, or cyclops, which had only one light bulb in the middle surrounded by mirrors, which tilted to the rhythm of the music. Even today, people may rightly think that the equipment for discos is a bit of circus fun.

Did you ever think that in thirty years you would be managing a company that operates in forty countries around the world and supplies constructions for concerts of world-famous bands?

I never dreamed of anything like that. After all, I have constantly read about the approach that you make a clear business plan for 15 years ahead and go by it... A lot of people talk about it, but I haven't experienced it working in practice. It is definitely necessary to go forward, by taking gradual steps.

Those were what?

Not far from my hometown, Roudnice nad Labem, I rented a part of former farm premises and started looking for metal shelves that seemed to me to be ideal for assembling stage sets for DJs. I hired employees (two of the first four still work in the company today), bought welding machines and saws, and that's how it all started.

Was it a success, did DJs buy it?

It was a blind shot. I was producing, but I didn't have a secure outlet. I had a full barn of structures that no one was buying because no one knew about them. But we in the Czech Republic have a saying: "Don't do anything that doesn't work in America." So I remembered Henry Ford and his line "if I had the last five dollars, I'd put three in advertising," and so I did, and the business got going. The first significant commission was a stage in the Lucerna Music Bar in the center of Prague. Then I immediately went to Germany, where I got a few more orders. It was 1993 and I celebrated my first success with a chef salad at McDonald's.

Was it still the Iron Age?

No, aluminum! From the very beginning, we concentrated on aluminum products. They are lightweight, which is an advantage both in production and handling – you simply bring the individual parts of the structure to the place, assemble them, disassemble them, then transport them elsewhere, reassemble them again, and so on. We didn't add products made of iron, i.e. high-strength steel, until later, when we were getting orders for the biggest shows. There, the stages have 50 meters – these are already such large spans and large load capacities that aluminum is not strong enough. One of our first such events was a Metallica concert in Germany.

Your garage business has grown. Today it would be called a successful startup. But in addition to the fitters, you also had to have people with extensive know-how...

I was lucky to have my first employee, who I met in a curious way. In the beginning, when I was looking for shelves, a guy from a company that made the shelves came to me in my rented workshop in a former farmhouse. We agreed that he would contact me in 14 days. And he didn't show up. So I called the company myself, but they told me that he no longer worked for them. But Roudnice is a small town, so it didn't take me too long to find out where the person lived. I went to see him at his home to ask him if he would like to work for me. He gave himself two days to think about it and then we both shook hands. I didn't have any workers at the time, but there were already two production managers in the company. We worked together for the next fifteen years, and I had never known a more comprehensive person. He was almost thirty years older and, of course, more experienced, he taught me a lot. In addition to technical things, he invented a working and remuneration system for workers who manually make a thousand different types of products so that it would be understandable to them. This is one of the most important things that a company must solve in the first place.

Is there anything new in such a conservative field as the production of structures for the entertainment industry?

Of course, that's why we have several development centers. They are in the Czech Republic, Holland, Italy, and the USA. The structures consist of hundreds of products: They are not only supporting elements, but it is possible to develop better systems for attaching canopies, hanging lights, increasing the size of stages and with it the spans of structures... Today, customers simply want to get a Lego-like kit from which they build what they need. But they often need some special parts that we have to quickly invent, test, and deliver. Two months is already a borderline for them. But we can always do it.

At the very base: you have a load of a given weight and a stage of a given size where you want to place the equipment, and all this together needs to be solved to make it stable and safe. But it is also conservative from another point of view: structures are goods that are rented. The customer who builds the podium has precisely specified requirements and an inventory of the structure and logically does not want to have different suppliers, but only one. At first glance, it may seem that when the structure is still unassembled on the ground, parts from different manufacturers look practically the same. But when they stand up, it can be seen from afar that the "spokes" (this is what connects the main tubes) are different. And no one wants that, from a purely esthetic point of view. But neither from a technical point of view – even different manufacturers can have almost identical trusses, but with a different load capacity. So you're going to have two identical-looking structures, one of which can carry 200, but the other only 100 kilos, and there's a risk that someone will get it wrong during construction. Therefore, customers are traditionally conservative and have great loyalty to one proven supplier. Unlike, for example, suppliers of lighting technology, which is basically a fashion commodity with a short lifespan of about five years.

What is the service life of the structure?

There is actually no "expiration time" for them, so they can be used over and over again, as elements from Lego – after all, it is actually also a kit. However, there is a manual according to which all parts are checked after their use and the unsatisfactory ones are discarded from circulation – if they are chipped and there is a risk of thinning of the wall, or battered or damaged after someone has crashed into them with a lift truck. But that's about all.

If structures have an almost unlimited service life, why are new ones produced all the time? Is it because there are more and more festivals, or is the wear rate of parts so high?

Both. Until the beginning of the covid pandemic, the number of festivals and other events was growing. However, it is not only that the parts do not suit technically, but much more often do not suit esthetically. Aluminum is a soft material and has no durable finish, so you only use one structure two or three times and it looks like you have been using it intensively for five years. It's scratched, dirty, just plain ugly, and big promoters hosting prestigious exhibitions or events for companies just want to have shiny new stuff, so the old ones are sold as "second hand".

Why don't you make colorful parts? Maybe orange, blue...?

The point is that the structure should be as invisible as possible, because it is just a supporting thing for hanging lights, attaching a sail, or an LED screen. But we do not only produce structural parts with a natural silvery surface, half of the production program is with a surface finish in matte black.

Stages are built by riggers. Is it possible to translate this word into other languages, such as your native Czech?

Montér (fitter) sounds weird, the same goes for lešenář (scaffolder) or, like in a circus, tenťák (tent builder). Rigger is simply rigger even in Czech. They build structures at car shows, concerts, theaters, expos... It is a specific group that has its own special name, originally derived from the sailors who controlled the sails on ships. Today, there are an estimated ten thousand of them around the world. Although now, after two years of Covid, when many events were canceled, many of them have left for other fields, where they like fixed working hours and the fact that they do not have to constantly travel from place to place. We have information from customers that it is very difficult to find new employees. But it is a similar problem in the production itself – there are no people for manual positions, not only in our country but also in America, the Netherlands, or Italy.

So will robots come into the company?

They have already arrived. There are simply not enough welders, and without them, production could no longer continue.

What about 3D printers, which are so much talked about today as the future of industrial production?

I'm skeptical about that. Although today mechanical parts are printed for cars, they are still made of plastic or some kind of composite. But there is nothing that has the mechanical properties of aluminum or steel. We're testing many new things, but we haven't yet come across a technology that is usable in practice. Welded metal parts are still the best solution. Moreover, plastic ages much faster than metal.

Can you imagine what concerts will look like in 50 years?

Our designer Ivan Dlabač has a virtual reality headset that you put on and can examine a product from every conceivable angle. As an educational or design technology, it's perfect. And you can do a lot of other things with the VR, even watch concerts. But don't we go to the concerts not only to see a favorite band live but also because we want to experience the atmosphere, to be among other people? The question is whether this desire will not disappear after we start escaping from physical to virtual reality.

When you travel the world, do you suffer from professional deformation? Do you look for stages? And can you tell which is 'yours' even from afar?

This cannot be avoided. Yes, I look around and recognize ours immediately. They're simply the best, it's a pleasure looking at them.

There is actually no "expiration time" for the structures, so they can be used over and over again, as elements from Lego – after all, it is actually also a kit.

30 Rockefeller Plaza

The skyscraper that forms a central part of the Rockefeller Center complex in New York City. The construction of the 70-story skyscraper, originally called the RCA Building (1933-88), then the GE Building (until 2015) and now the Comcast Building, widely known as "30 Rock" (hence the name of the popular comedy NBC sitcom that is based here) was completed 85 years ago. With nearly 259 meters, it is the 10th tallest building in NYC and the 34th tallest in the U.S. The iconic photo is the view on the top floor observation deck. It was built by the Irish Glynn brothers, several Swedes and Mohawk Indians, who were known for their fearlessness about heights. In reality, they were just afraid to admit to their wives that they were as afraid of heights as the next man.

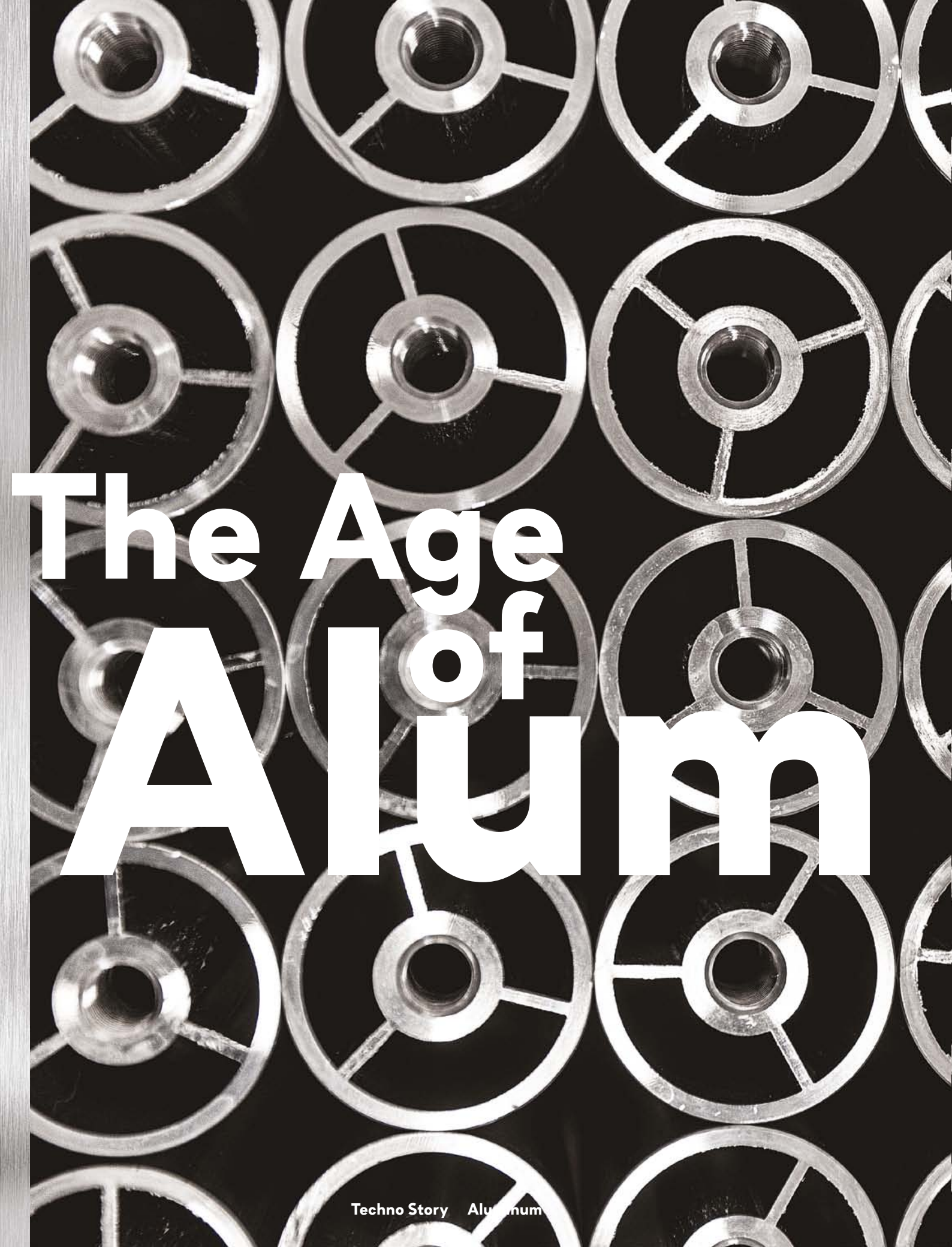
Lunch on Top of a Skyscraper

One of the most famous riggers photographs not only of the 1930s but perhaps of the entire 20th century. The first sight of it makes one dizzy, even if it is only a skillful composition. What is far more interesting, however, is the search for its story. Who photographed it and who was actually depicted in it? And above all – who was the gentleman on the far right?

Text by Radek Kovanda

The photo was taken on September 20, 1932, on the 69th floor of the just-completed RCA Building in Manhattan, New York. Eleven workers are lounging on a 260-meter-high traverse and appear to be completely at ease. They well should, since they are actually sitting above the 68th floor, which has already been built, and there are only about three meters of depth below them. The picture was published by the New York Herald Tribune with this caption, "While thousands of New Yorkers crowd into restaurants and diners, these sky-high workers on a 70-story skyscraper in Rockefeller Center have all the space and fresh air they could wish for at lunch. As to office space capacity, the RCA Building is the largest in the world." Why that last sentence? Well, promotion and publicity were already in full swing then. Skyscrapers were sprouting up everywhere, but because of the recession, it was not easy to find uses for them — hence the phrase to attract wealthy tenants. And since this was not a report but marketing, neither the names of the workers concerned nor the author of the photo were mentioned. The photographer has only recently been traced, although not with 100% certainty, as there were several photographers at the location at the time. The image has such a powerful charisma that people started hanging copies of it on their walls at home or in bars, and it was also sold as postcards and posters. And one of them was seen after the fall of the Iron Curtain by the Slovak artist and director Ivan Popovič. He knew the image from his parents' photo album. When he took the photo out, he found that on the reverse side of the photo was a text from his grandfather to his grandmother: "Don't you worry, my dear Mariska, look, I'm still with the bottle. Your Gusti." Gusti, full name Gustav Popovič, was a carpenter who, like many others, went to America to work. He returned home before the start of World War II, the end of which also marked his end: he was killed by a grenade in his home village of Vyšný Slavkov. He is buried in a common grave with the addressee of the postcard, his wife, in the local cemetery. This crucial discovery identifying the first person in the iconic photo 'rewrote' its history and was for many years featured in official promotional materials. No one found one detail apparent from the date of death on the grave strange: that Maria died in 1930, but the "Lunch atop a Skyscraper" did not take place until two years later. Could it be that Gusti did not learn of his wife's death?

The Irish filmmaker Seán Ó Cualáin later made a similar identification discovery as Ivan Popovič. Five years ago, when he happened to go to a pub in the village of Shanaglish, he saw this photo with a written note: "That's my dad on the far right, my uncle on the far left." Shortly afterwards, he met its author, old Mr. Glynn, and made a documentary in which he reveals the identity of the other workers (see YouTube: "Men At Lunch"). Finally, there's another weird thing: how come the worker has a bottle of alcohol in his hand? In the 1930s, there were yet no strict safety regulations in the US, but there still was strict prohibition and alcohol consumption was a crime.



The Age of Alum

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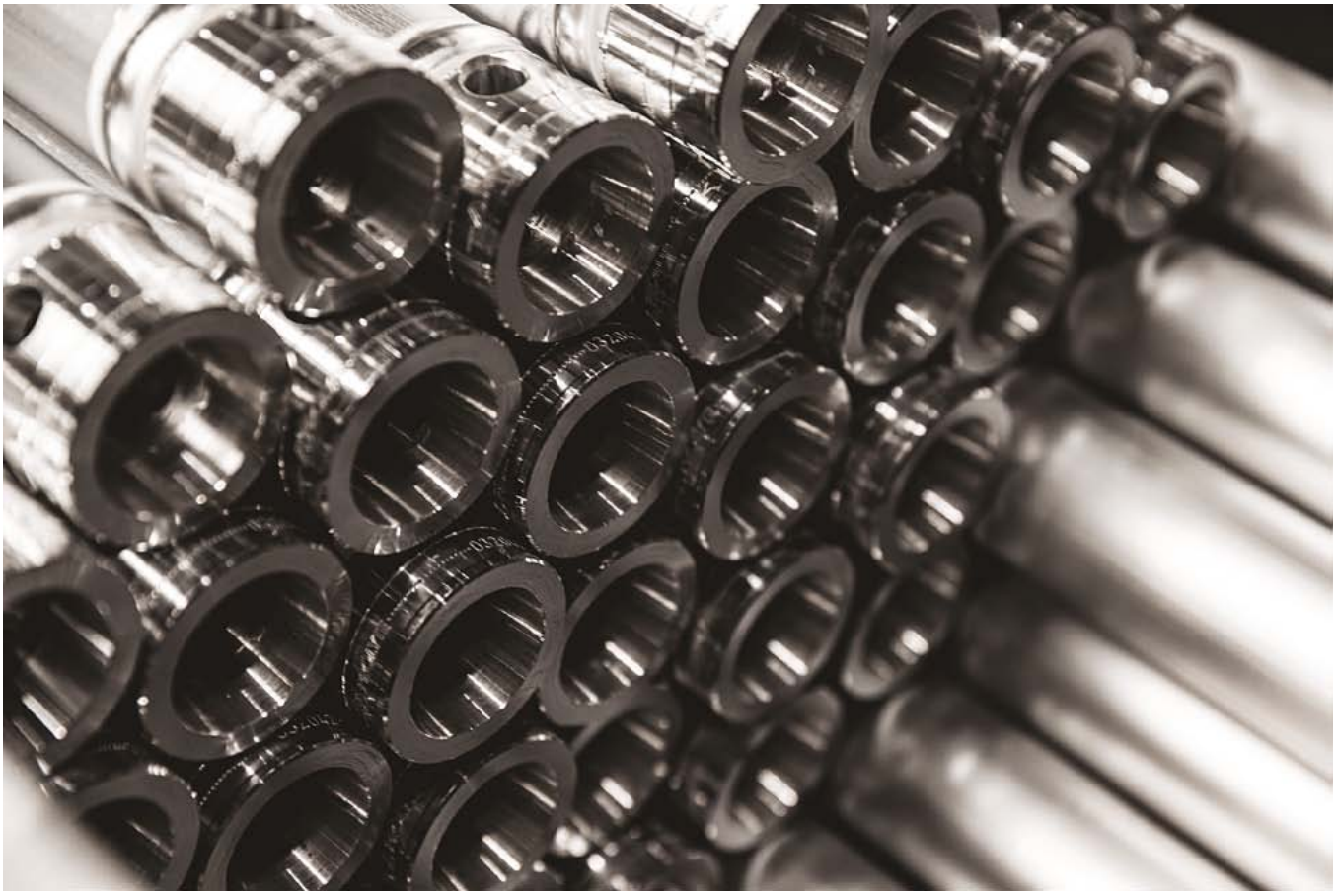
Text by Petr Bílek
Photo by Jakub Frey



Upper photo:
On the surface, all objects made of aluminum seem to have this color. As pure aluminum quickly reacts with oxygen, a very thin oxide layer is formed instantaneously, giving the surface a bright look. Only when cut, drilled, milled, ground, or polished, does the real face of aluminum unveil – shiny dark silver.

Lower photo:
There are several methods for welding aluminum parts, like e.g. TIG (Tungsten Inert Gas) and MIG (Metal Inert Gas), both of which are used at the MILOS factory. Which method is better? Neither one! Both produce strong, high-quality welds.

Aluminium is the young man among metals. Although it is, after oxygen and silicon, the third most abundant element in the Earth's crust (and the twelfth most abundant element in the entire universe), we had no idea aluminium existed until recently. Until 1807, to be precise, when English chemist Humphrey Davy discovered it. He assumed that the ore "alum" (and we now know that it is potassium aluminium sulphate) contained the metallic element. And this element, according to Humphrey, was to be called "aluminum". Scientists later changed the name to the more sonorous and linguistically more classy "aluminium", but in North America, it is still called "aluminum".

The fate of humans, unlike other species, was fundamentally determined by how they were able to understand physical processes and materials and use them for their purposes. We are, to some extent, also what fire, electricity and, among materials, especially metals, have made us: we can aptly distinguish between the Bronze Age and the Iron Age, and in more recent history, we can speak of the Steel Age. The last 150 years or so can be called the aluminum age — after metal with unique properties: aluminum is strong, light, malleable, conductive, durable, and recyclable.

The aluminum compound, aluminum ore, which was initially the easiest for people to get hold of, was already known in ancient times. Five thousand years B. C. in Mesopotamia, alum was used to make pottery. The Egyptians and Babylonians used aluminum compounds in medicine. Alum was used, for example, to tan leather or as an additive to coat metals and glass. In the first century BC, the Roman military physician Dioscorides recommended alum to stop bleeding. We still use this recommendation today: when we cut ourselves shaving, we apply an alum stick, a clay compound, to the spot.

The discovery of aluminum raised a problem that proved quite a conundrum: how to extract aluminum from compounds and ores? Because of this problem, aluminum became a precious metal, more expensive than gold. Yet of all the metals on the planet, aluminum is the most abundant. So how do we get it?

The difficulty is that aluminum as an element readily bonds with other elements. Therefore, unlike gold, for example, it is nowhere to be found in its pure form. Sir Davy himself tried to obtain aluminum by electrolysis of molten alumina and potash. He succeeded theoretically, not practically. Raw aluminum was first prepared by the Danish physicist Hans Christian Ørsted by reducing aluminum chloride with potassium amalgam. The German chemist Friedrich Wöhler produced powdered aluminum again by reduction with potassium. Later he was able to prepare larger lumps of aluminum from which he determined some of its properties.

The French Emperor Napoleon III (1808-1873) was a great supporter of the beautiful new metal. He hoped that the lightweight metal could be used to make weapons and armor, giving the French army an advantage on the battlefield. The emperor paid a chemist named Henri Sainte-Clair Devill. Devill was commissioned to find out how to prepare pure aluminum. And he did it: by reducing molten aluminum chloride with sodium. The trouble was that the aluminum prepared by this method was scarce and very expensive. There was no military use in sight. Out of frustration, Napoleon III had large quantities of French aluminum stocks melted down to make cutlery. At banquets, the emperor and his distinguished guests dined with aluminum forks, knives, and spoons, while the emperor's less important table guests had to make do with silver or gilded cutlery.

The new metal was introduced to the public in 1855 at the Paris Exhibition. At that time, it could be prepared in small quantities and at great expense by reducing molten aluminum chloride with sodium by Devill's process.

A tremendous symbolic tribute and welcome of aluminum into the world of metals was the completion of the George Washington Memorial on December 6, 1884. The finished monument was complemented that day by placing a large aluminum casting on top of it. The proper completion of the structure was reported on the front page of the contemporary press, and much attention was given to the aluminum top. "Hundreds of thousands, perhaps millions, of people who had never heard of aluminum before suddenly knew what aluminum was," wrote the Society for

Left page:
Welding line inside the production hall: everything is running like clockwork.

To the inexperienced eye, every weld looks the same, but professional welders can unmistakably identify their work according to minute details known only to them.

This page:
Aluminum welding wires.

Helmet and gloves – indispensable accessories for any welder.

The Czech Republic has one of the highest rates of dog ownership in the world, so it's no wonder some occasionally accompany their "masters" while they're documenting the hustle and bustle in the production hall.

Minerals, Metals and Materials' trade journal. The first-ever statue cast in aluminum is the famous winged man on the bronze fountain in London's Piccadilly Circus. The statue is commonly referred to as the Greek god of love, Eros, but it represents his brother, Anteroth. The latter, unlike his sibling, is the god of selfless and mature love.

And two years later (in 1886), a revolution finally occurred: a way was found to extract aluminum from ore in an economically viable way. The year 1886 was a watershed year for aluminum. Two young men of twenty-two, one in Ohio, the USA, and the other in north-western France, figured out how to produce aluminum from ore in a cheap way and on a large scale. The American, Charles Marin Hall, was greatly inspired by the lectures of his chemistry professor at Oberlin College. The professor said, "Whoever figures out how to make aluminum practically and cheaply will become a blessing to mankind and will become rich." Meanwhile, in France, Paul Héroult was independently solving the same problem. And almost simultaneously, both men found the same answer. And that was electricity; huge volumes of electricity passing through the molten ore and depositing pure aluminum at the bottom of the vessel. But more on that later.

The two discoverers had a dispute over who was first. Héroult filed a patent application six weeks before Hall, but the American proved (probably thanks to the notes of his sister Julie Brainerd Hall) that he had made the discovery a few weeks before Héroult. Eventually, the young men settled their dispute and became friends.

In 1888 Hall founded the Pittsburgh Reduction Co., an aluminum plant that later became part of the giant Alcoa. A year later, Héroult industrialised the method in France. Both men died in 1914 at the age of 51.

At the time of the Washington Monument's construction, 1884, a kilogram of aluminum cost $35, the same as the then prevailing

Right page:
Not even a weightlifting champion would be able to carry this truss with such ease if made of steel, but with aluminum, anyone can be a weightlifting champion, like here John Marek working at the Roudnice plant.

Below:
The otherwise hidden inner beauty of metal profiles is revealed in crosscuts, resembling artistic ornaments.

Even hi-tech production cannot do without good old tools like hammer and clamp.

Jaromír Hála from the Roundice plant is finishing the very last step of the production process before shipping.

market price of silver, which was considered a precious metal. Within a decade of discovering commercial production, the price dropped to just $1 per kilogram. The world had a precious metal that was about to become something relatively cheap and common. But price often does not reflect value. It is much like the air — it is free, but its value is essential. Indeed, suddenly common and cheap aluminum has started down the road to a future that is heading higher and higher even today.

Even the public was enthusiastic about aluminum. In his novel From the Earth to the Moon (1865), Jules Verne mentions that the spacecraft for the flight to the moon is built of aluminum, which is light and robust enough for this purpose. About fifteen years later, J. W. Richards wrote in his work "Aluminium": "It has been rightly said that if the problem of flying through the air is to be solved, aluminium will be the prime factor in the solution."

The French-American invention is still used in aluminum production today. The whole process starts with the extraction of aluminum ore and bauxite, usually mined at the surface. Bauxite is named after the picturesque village of Les Baux in Provence, France, where it was discovered in 1821 by geologist Pierre Berthier. The largest deposits of bauxite are found in Australia, China, Guinea, Brazil, Indonesia, and Jamaica.

The first step is the conversion of bauxite by the Bayer process into alumina. Then comes the Hall-Héroult method: alumina is dissolved in molten cryolite (a fluorine-containing aluminum compound) and calcium fluoride at 950 to 980 °C. A strong electric current is passed through this mixture. The pure aluminum produced by the electrolysis is deposited at the bottom of the vessel and is usually later cast into ingots for further processing. Recycling is an important part of aluminum production as it saves energy consumption significantly.

Electricity costs account for up to 40 % of the cost of aluminum production. For example, in the United States, up to 5 % of all electricity produced is used to make aluminum. Aluminum smelters are therefore usually built close to power stations. The largest aluminum production plants are located in China, India, Russia, Canada, and the United Arab Emirates. The majority of aluminum comes from China, around 55 %.

Thanks to the availability of aluminum, humans took to the skies in the early 20th century and then further into space. In 1903, brothers Wilbur and Orville Wright worked on the first heavier-than-air aircraft to make history. They needed a material that was both strong and light enough to achieve an excellent lift-to-weight ratio. Charles Taylor, the Wright brothers' mechanic, suggested using an alloy of aluminum and copper for the block of a four-cylinder petrol engine. Every gram counted. The roughly ninety-pound engine, 10 kg lighter than originally designed thanks to aluminum, did its job: it flew successfully. This first-ever lighter-than-air flying machine and subsequent aircraft after it were made of wood and textiles, but for speeds of over 250 km/h, more robust material was also needed to construct the entire fuselage. By the late 1920s, aluminum was the obvious choice and became the most widely used metal in aviation. And for spacecraft, such as the American Apollo project, designers again turned to aluminum alloys. Jules Verne's vision became a reality. Where would aerospace be without aluminum alloys?

Aluminum has excellent properties: it is strong, light, conductive, corrosion-resistant, non-toxic, and does not break. In addition to aerospace, it has a wide range of "down-to-earth" uses and has become a sought-after material in engineering and technology in general: aluminum and its alloys are used to make cars, bicycles, building elements such as windows doors, electrical components and, for example, concert stages. But also crockery and cutlery.

However, it also found uses in the smallest things: aluminum was used to make dishes or packaging for chewing gum or chocolate. The first aluminum beverage can appeared in 1959 and was used to hold Coors beer. Until then, beverage containers were mainly glass or steel. However, the problem with steel for beer was that the material left an undesirable aftertaste. That's where aluminum came in. The response from customers was initially less than enthusiastic. However, by the mid-1960s, aluminum beer cans had caught on and are still popular today. And they can also be popular with environmentally-minded customers: the American company Novelis, the largest producer of aluminum sheets for beverage packaging, uses 60 % recycled aluminum. It is probably the most recyclable and environmentally friendly packaging material. And when you drink a can of beer and turn it in for recycling, the material can end up not only in new cans but also in the cases of electronic devices like the MacBook Air or Summit Lite watch.

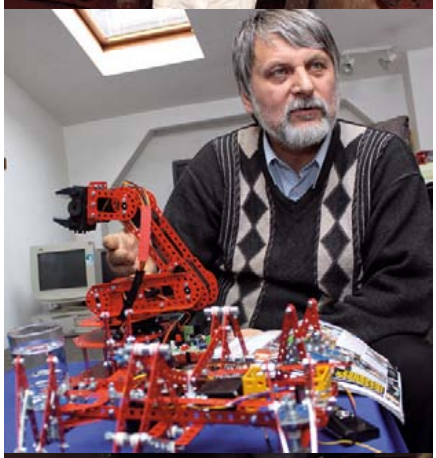
School Through Play Works

Mechanical metal kits have been with us for more than a century. Kids can easily learn the basics of rigging on them and their creations can literally grow with them. The popularity of kits from Mecanno or Merkur has not changed over the decades. Their charm is timeless.

Text by Pavel Němec, Václav Rybář
Photos by David Háva, Radek Kovanda, manufacturers' archives

Left: The "life-size" mechanical excavator is a masterpiece of the Czech Merkur kit. It is on display at the Technical Museum in Prague.

Right: Our trip to the Czech Merkur factory brought back childhood memories. Mechanical kits were an opportunity to "make" otherwise unavailable toys. The fact that they taught us important habits didn't dawn on us until much later.



When you say "a construction toy kit" almost everybody nowadays thinks of the popular LEGO. For many children, plastic pieces are the gateway to the world of construction and demolition. Yet the Danish bestseller did not take off until after WWII and was preceded by a series of cardboard and wooden building sets from the second half of the 19th century, followed by metal sets, led by the Lilienthal brothers' set, which, introduced in 1888, allowed simple structures to be built from cardboard and perforated wooden strips. Unfortunately, it did not take off, nor did the Brückenbaukasten metal kit, with which you could build bridge structures in 1892. Here was already the germ of table rigging, but we had to wait until 1901 when Frank Hornby of Liverpool patented the Meccano under the slogan "Mechanics made easy and fast". The product was a huge hit and, thanks to the standard spacing of the punched parts and screws, it allowed for the easy purchase and assembly of parts. This resulted in constructions that the author of the original concept had never dreamed of. Meccano was quickly followed by regional variations — some authorised, others not. Among the most famous is undoubtedly the Czech Merkur from the mid-1920s.

Pieces of painted sheet metal, pre-drilled holes, screws, nuts, drives, gears. And then it's up to you whether you build a giant excavator, a contact lens machine or a guillotine for soldiers. Merkur was a chance for many children behind the Iron Curtain to build their own toys or rather complex machines. The turbulent history of the nationalised company, whose founder became a lathe worker literally overnight when he had to not only hand over the company to the communist regime but also pay off debts for previously purchased materials through his own labour, fortunately, has a happy ending. Merkur is not a relic of the past, but a living phenomenon. Ing. Jaromír Kříž, who saved the kit company from extinction after the Velvet Revolution and who runs the company with his sons, shows us several prototypes during our welcome tour. For example, a robotic arm, which has six degrees of movement and is equipped with a ServoAnim control module, into which you can easily program the desired sequence of movements on your PC. Then there is a six-legged 'spider' controlled by radio or a robot called Alpha that can follow a line drawn on a surface: up to eight sensors can be attached to its microprocessor, such as a colour recognition sensor or a temperature sensor. Depending on how you program the 'car', it can then search for objects of a given colour (which could be useful for finding discarded socks) or avoid candles. Are they even... toys anymore? "Well, it's both a toy and a learning tool," explains Ing. Kříž. "If children are to develop manual dexterity, gain a relationship with technology and understand the laws of physics, they need something tangible. When it is taught only in theory, the forgetting curve is terribly steep." Merkur has long been trying to take hold in primary and secondary schools, and Jaromír Kříž has already had discussions with the Ministry of Industry and the president of the Chamber of Commerce. "Companies face an acute lack of technically qualified staff. There is no one to replace the retiring generation — our society is educating everybody but technicians," says Mr. Kříž. We head out to the plant, which is divided into several buildings. In the one just outside the town, mainly small-lot sheet metal parts are punched, laser-cut and bent in bending presses (non-standard parts are also required by the aforementioned robotic arm). Two floors up, the kits are assembled. Finished parts pass on a conveyor belt, from where the workers stack them into boxes, which can number five hundred a day, or even 'just' twenty in the case of large kits. Most of the work, however, takes place in Police nad Metují, a small Czech town a few steps from the Merkur Museum. Here we watch the drilling, threading or milling of teeth into metal wheels. Into this mixes the rhythmic beats of the presses, under which the 'classic' pieces are created. The charm of Merkur is also that its parts are extremely well thought out — so that the minimum number of their types can be used to build the maximum number of shapes.

It took a lot of effort to get all this going. Mr. Kříž tells how difficult it was to buy a company that was (as the first in the Czech Republic) declared bankrupt. Or how many years ago he ordered an expensive die-cutting machine, was promised a loan agreement by the bank on Monday, but on Friday the bank went bankrupt – "I was done," he says. It is good that today the machines are rumbling again in Police. Not only because Merkur is beautiful. It is also because the future graduates of humanities will not build new stages for Metallica. Merkur, Meccano or Erector have huge competition today in the form of "sexy" LEGO Technic or Creator sets, but they also have the advantage of being the most evocative of real structures in their basic mechanical form. If we bring children to them at the right age, we lay the foundations on which we can build.

The high precision of Merkur production is fascinating, as are the giant creations that fans of these kits are able to invent and assemble. Unlike LEGO plastic cubes, you see every joint and the whole structure in its physical beauty. An invaluable tool in the age of virtual reality and immaterial digital models.

"It's both a toy and a learning tool. If children are to develop manual dexterity, gain a relationship with technology and understand the laws of physics, they need something tangible. When it is taught only in theory, the forgetting curve is terribly steep."

Atlas of Mechanical Construction Kits

Inspiration for small and more grown-up riggers

Merkur
Established 1920, Czechoslovakia

Jaroslav Vancl founded the company Inventor in Police nad Metují and started the production of mechanical kits. At first, the joints were secured with hooks, later with screws and the kit was renamed Merkur. During WW2, the production stopped due to the lack of non-ferrous metals, then came the nationalization and Vancl became a mere employee. With privatization after 1989, the revival of Merkur was only possible thanks to Mr. Jaromír Kříž.

LEGO Technic
Established 1977, Denmark

Over time, LEGO had to respond to the long-lasting popularity of mechanical construction kits. In order to offer fun for a more mature audience, the company began producing so-called Technical Sets in 1977, later renamed LEGO Technic. These contain more complex moving parts (wheels, pulleys, axles, pins, beams) and often also electric motors or pneumatic sets. Since 2000, they are even more similar to Meccano or Merkur.

Meccano
Established 1901, Great Britain

The oldest, most famous and most successful mechanical kit still in production today. Frank Hornby, originally a clerk by profession, capitalized on his toy-making skills when he patented a kit called Mechanics Made Easy. The name said it all and his "mechanics by play" became incredibly popular and virtually all the other kits on this site are its successors. You can find it in toy stores all over the world.

Erector
Established 1913, USA

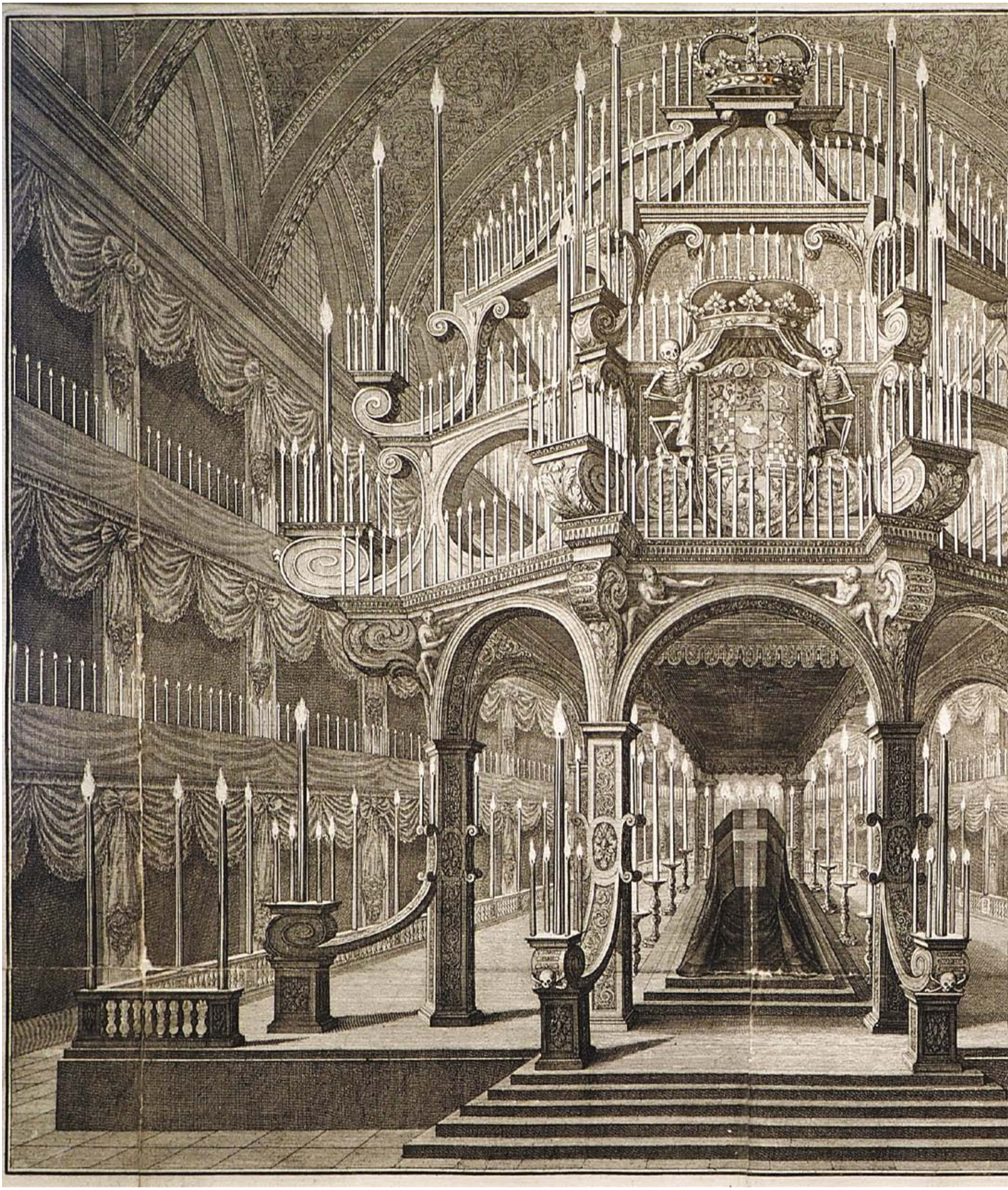
The American kit is the invention of parlor magician A. C. Gilbert. When traveling by train from New Haven, Connecticut, to New York in 1913, he watched a symphony of railway switches. Originally he produced just a magician's kit but then decided to start a company called Erector and market an electromechanical kit that would satisfy more than just train enthusiasts. Erector was an immediate success and has educated many generations of American engineers.

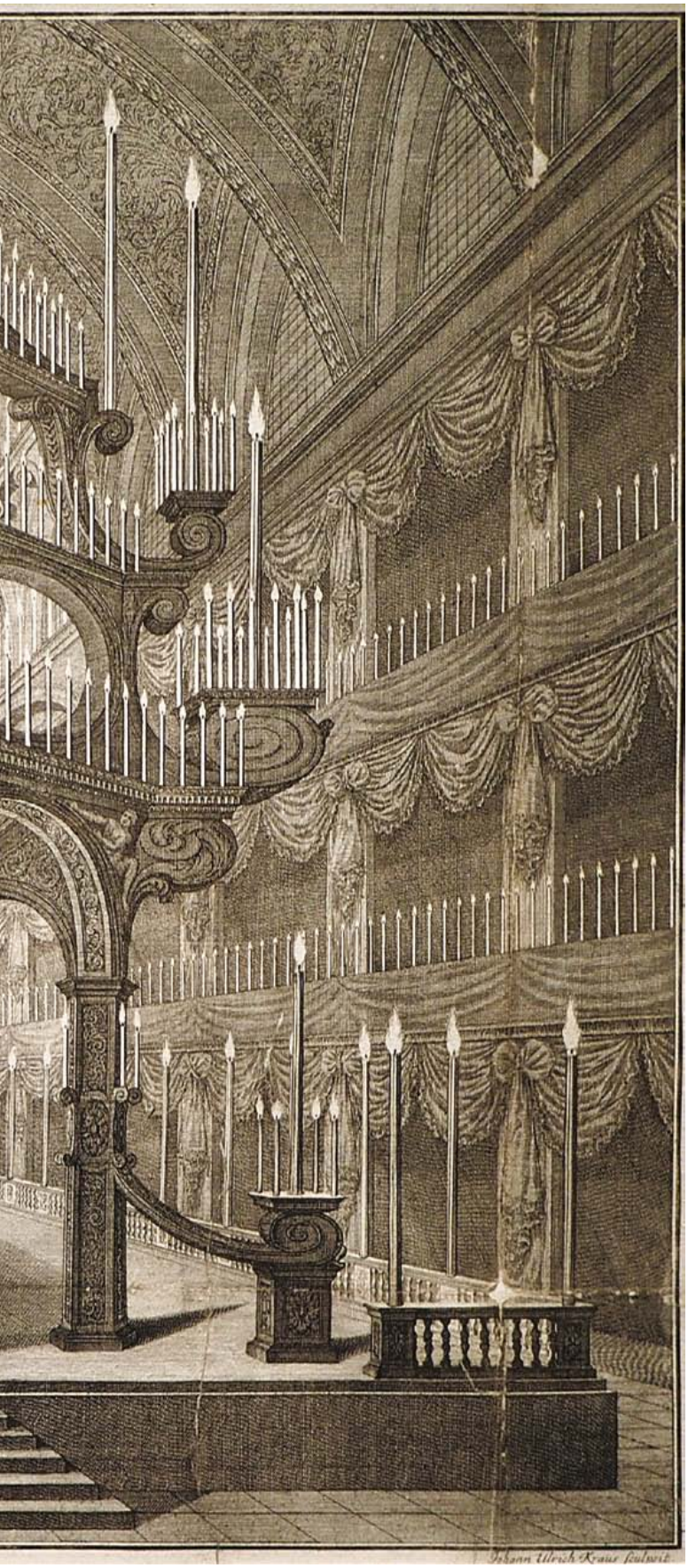
Construx
Established 1983, USA

A plastic kit for small constructors from the American company Fisher-Price was created in the 1980s. Instead of screws, it used connectors, thanks to which you could build really big constructions. Don't be fooled by the cheerful colors (the version for little ones, Basic Construx, was even more cheerful), this is not mechanical Minecraft, but a complex system with cogs, pulleys, belts and electric motors. It is a shame that the kits are no longer in production.

BILOfix
Established 1959, Denmark

The wooden kit with plastic screws, which bears a striking resemblance to Meccano, is an offshoot of LEGO. Or rather it was because it couldn't compete with its established metal competitors. BILOfix was founded by the two sons of the original inventor of LEGO, Karl Georg and Gerhardt Christiansen, in response to LEGO ceasing to make wooden toys in 1960. They didn't want to give up the wood, and at the same time decided to offer something a little different.





Castle of Pain

A story of the biggest macabre stage ever.

Text by Anna Vondráčková

Throughout the ages, the art of building stages was meant primarily to provide entertainment for the masses, both artistic and (spi)ritual. With one distinctive exception – the so-called Castrum Doloris meaning Castle of Pain, designed not for the enjoyment of happy moments, but of the sad ones. Interestingly, these mourning stages used to be at the time a lot more elaborate and impressive than those built to entertain.

Imagine a huge bunch of carpenters, joiners, riggers, painters, carvers, sculptors, decorators, and other craftsmen working both in harmony and haste for many days or even weeks to build a perfect stage – not outdoor with plenty of space, but indoor, in a confined room of a church or a cathedral. That's exactly what the construction of Castrum Doloris was all about. These temporary stages, looking like eternal structures, with impressive dimensions and decorations, often resembling complicated spires combined with triumphal arches and making an impression of castles or chateaus, used to be built on the occasion of the ultimate solo performance given by a significant personality – his last, loud and sumptuous farewell to the world. The supporting skeleton was made of wooden beams, poles, and planks, the surface finish was created using varnish, paper, cardboard, flowy fabric, and stiffened canvas.

The very first historically documented Castrum Doloris was the one in El Escorial in Spain, made for the burial ceremony of the Holy Roman Emperor Charles V in the year 1558. It probably was not really the first one of its kind, there surely must have been earlier predecessors, but unknown today as they had not been documented either in paintings or books like the later creations. What historians know for sure is that since the late Renaissance, Castrum Doloris became a popular phenomenon not only among kings, but also among members of the aristocracy, clergy, and military. During the "hype", prominent architects of the time were engaged to create these funeral stages, and famous painters captured the splendor of the short-lived constructions before the mourning ceremonies that would last weeks or even months, finally ended. And they often tried to surpass the other creators with their designs in a sense of dimensions, beauty, and complexity. However, nothing lasts forever – the golden times of the Castra Doloris only lasted through the 17th and 18th centuries, gradually fading out the century later with fewer and fewer funeral stages being built, more and more without the previous emphatic architectural touch and splendor – the last ones were made in 1881 for Tsar Alexander II, in 1888 for Emperor Wilhelm I, and in 1894 for the French president Sadi Carnot.

FIRE BUSTERS

As you walk through the MILOS productions halls, you can see veils of fiery sparks and behind them men welding aluminum structures. We asked them to take off their dark-glass helmets for a moment and show their faces. Every part that is shipped out into the world has a sticker on it with information and also the name of the welder. Now they're not just anonymous names, but behind them are the stories of decent but humble guys who love their work, their city, and their lives.

Text by Pavel Vondráček
Photo by Jakub Frey

Luboš Zdražil

Lubos, how long have you been a welder?
This is my eighth year with the company and I've been a welder for three years.

You come from Roudnice nad Labem?
No, I'm from a town nearby, Mělník. I commute the farthest from the company, 25 km.

Mělník is the center of the wine region. So what do you like? Beer, wine, or spirits?
I drink sparkling water. But if I have may choose, it's wine, specifically a semi-sweet chardonnay from Mělník.

Your work is very technical. Do you do tech after work?
No, I enjoy gardens. I help many of my friends design and maintain them. It's a nice counter-point to my work.

Is there anything special about your garden?
Yes, I designed it to be ornamental with minimal maintenance. Work is for work, home is for relaxation.

Where do you go on holiday?
I travel abroad a lot, to Croatia, Greece, Italy.

Would you like to live there?
No, I like it in Czechia. I wouldn't change. When I think about it, I find that Czechia is actually an ideal place to live in. We are an extremely safe country, very peaceful, quite rich, very tolerant, the landscape is varied, we are in the middle of Europe, nothing is far away. I can't think of a single reason why I should leave.

What is the level of your education?
I'm a graduate of a construction technical school.

Was it difficult to train as a welder?
When you want it, it is a piece of cake.

Nguyen Pham Van (L) and Nguyen Manh Uoc (R)

Where are you from?
North Vietnam.

How long have you been in Czechia?
Ten years.

What was more difficult to learn - to weld or to speak Czech?
Czech is much more demanding!

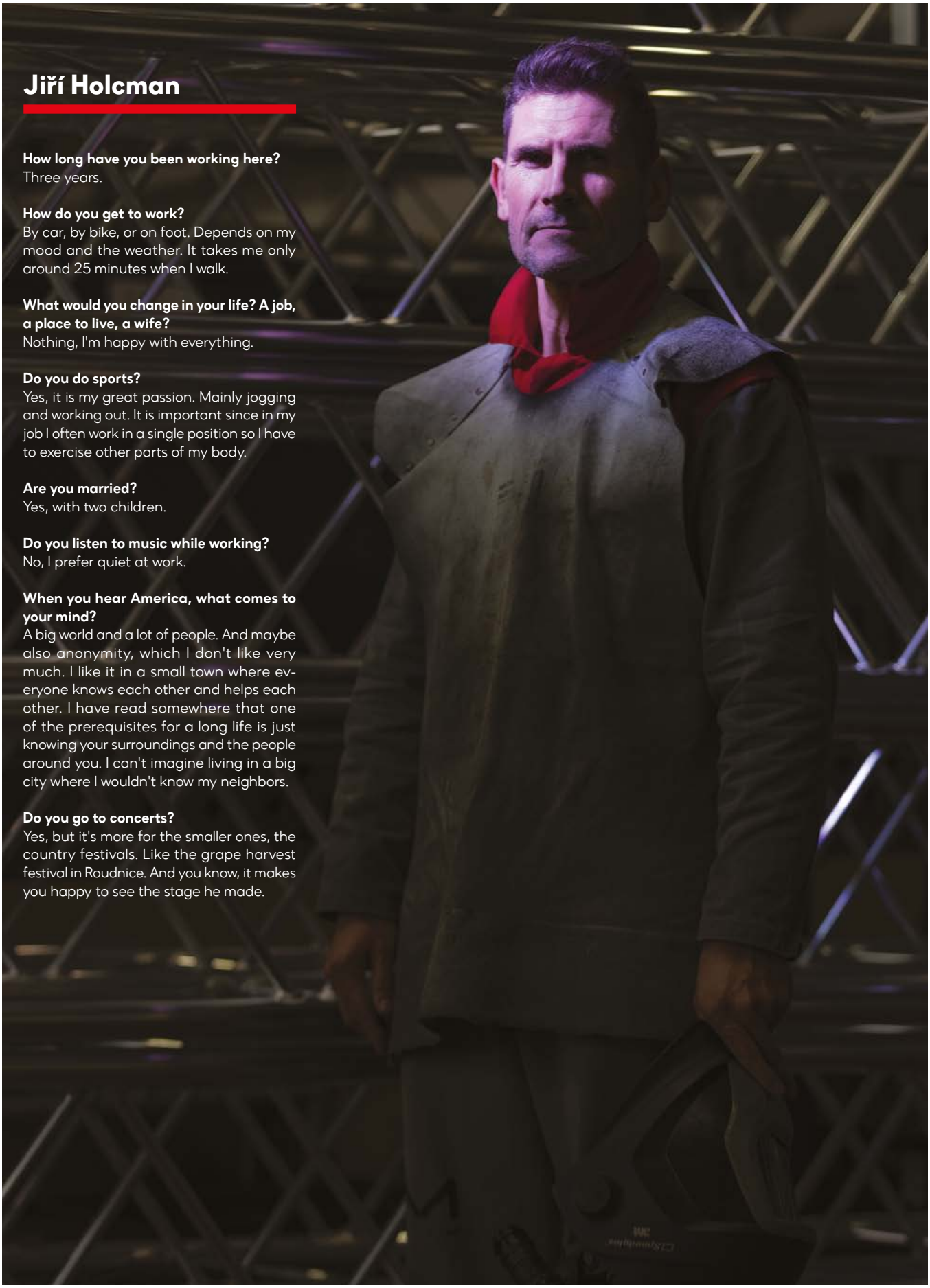
Do you plan to stay in the Czech Republic or do you plan to return?
We want to stay here. The Czech Republic is a comfortable country to live in. And we already have wives and children here.

What do you like the most?
Football.

American or European?
Naturally European. It has dynamics, and speed, there are twists and turns, and something happens from the beginning to the end. We saw American football a couple of times and it was really boring.

Do you seem to be in a hurry?
Yes, we are. We have a lot of work to do. In Vietnam they say, work first, fun later.


NYMWAG
NYMWAG
NYMWAG



Jiří Holcman

How long have you been working here?
Three years.

How do you get to work?
By car, by bike, or on foot. Depends on my mood and the weather. It takes me only around 25 minutes when I walk.

What would you change in your life? A job, a place to live, a wife?
Nothing, I'm happy with everything.

Do you do sports?
Yes, it is my great passion. Mainly jogging and working out. It is important since in my job I often work in a single position so I have to exercise other parts of my body.

Are you married?
Yes, with two children.

Do you listen to music while working?
No, I prefer quiet at work.

When you hear America, what comes to your mind?
A big world and a lot of people. And maybe also anonymity, which I don't like very much. I like it in a small town where everyone knows each other and helps each other. I have read somewhere that one of the prerequisites for a long life is just knowing your surroundings and the people around you. I can't imagine living in a big city where I wouldn't know my neighbors.

Do you go to concerts?
Yes, but it's more for the smaller ones, the country festivals. Like the grape harvest festival in Roudnice. And you know, it makes you happy to see the stage he made.

Ladislav Čermák

Do you have a nickname?
I have. Everybody here calls me Strix, they say I look like an owl.

How long have you worked at Milos?
Seven years already.

Are you from Roudnice nad Labem?
No, I'm from afar! I commute almost 6 km by car!

Have you trained as a welder?
Sure.

Is your work monotonous?
Quite so, but I don't mind it, it's actually a way of concentration, like Buddhism.

Do you assemble the structure yourself?
I do. I prepare it, assemble and weld it.

What is the difference between you and a welding robot?
A robot is not responsible for its work by its name.

And what is the advantage of a robot?
A robot doesn't talk back, doesn't smoke, doesn't want a vacation.

Do you think robots will ever completely replace human labor?
Certainly not.

Can you identify your specific piece of work?
Well, sometimes I do. Every welder has his own signature. I was in Prague a few years ago at the For Fishing fair. A lot of companies had booths built from our designs. So I look at the welds and I say to myself, this must be my job. And it was, I found this nameplate with the name Cermak on it. So I patted the structure and said, "Good job, welder."

What kind of fish do you catch?
I'm focused on carp. A seemingly boring fish, in foreign countries they call it water pig, but appearances are deceiving! The carp is an extraordinary fighter, it doesn't tire easily, it's like some sea fish.

Angling is a drain on money and time. You don't have a problem at home?
It's an expensive hobby but I can make money to spend on it. Plus I'm a free, single man.

Where do you go on holiday?
Where can a Czech angler go? To the south of Bohemia, of course, where there are hundreds of ponds. There is a carp paradise!

What springs to your mind when you hear America?
New York.

And Italy?
Rome.

The Netherlands?
Cheese and tulips.

Did you know that the head of the company František Zykan was a DJ in his youth? Did you ever go to your boss's disco?
No, when he was a DJ, I wasn't born yet.


ESAB

Petr Šimo

How long have you worked as a welder?
Nine years.

And would you change jobs?
No. I live nearby and am happy here.

Is it hard work?
I wouldn't enjoy a light office job. I need a man's job! And when you learn it and you're good at it, it's cool.

Do you know that your name is known all over the world?
Oh, I know that! It's on every piece of construction I weld. And I wonder if the riggers notice the name when they build the podiums?

Do you do sports?
I like watching football, especially the Czech league. But I only play foot tennis actively. This purely Czech sport is not well known to foreigners. It's a cross between tennis and football. And the Czechs are the best in the world at it, maybe because it's hardly played anywhere else.

You stand around all day welding. What do you do to keep yourself in great physical shape?
Well, I weld, assemble and carry parts, my job is a real workout. I like to go to the sauna in the evening.

You're wearing headphones. To cancel out noise?
No! I listen to music, mostly electrohouse. That's what goes best with welding.

Milos company operates in shifts. Which is your favorite?
I do both afternoon and morning shifts. I've been here since 4:30 this morning, so I got up at 3:30. But then I'm off most of the afternoon.

What does a welder actually see when he wears a dark glass mask?
He sees everything, the weld and its surroundings. This is where humans have a huge advantage over robots. He has to have it programmed to the millimeter and if there's a mistake, it can't fix it, unlike me. That's why I don't think robots will ever completely take our jobs.

What are your hobbies?
I'm at work most of the time and after work, I'm with my nine-year-old daughter. There will be plenty of time for hobbies in retirement.

Petr Kekule

How long have you worked in the company?
I have worked for twenty years here.

What is the name of your position?
I'm the warehouse manager. But I've been through manufacturing, so I know the company like the back of my hand.

When you read the addresses of clients, don't you feel like traveling to some of the destinations?
We ship all over the world, from Israel to Ukraine to the USA. But I'm not a big traveler myself. We Czechs say that there is no place like home. Why explore the world when I have it all around me. It's enough for me to stay in my garden and look carefully around, and then I will know the world perhaps even more deeply and also cheaply.

What music do you listen to?
Mostly Czech bands. I think that if Americans ever heard Kabat and had a Czech beer with it, they would be just as excited as if they go to a Bruce Springsteen concert. The music is different, but the stage and the construction are the same, it's our job.

Do you walk or drive to work?
Here we are not in America, here we are in Central Europe, everything is close. So I walk to work. I live almost around the corner.

The Czechs rank first in the world in beer consumption per capita. But in the vicinity of Roudnice nad Labem, wine is grown. What do you prefer?
Beer!

Is your salary good?
I've heard that in some countries it is rude to disclose your salary. That's not the case here, we're not jealous. And I'm definitely not complaining about my salary!

When you watch concert footage on TV, do you also watch it from a professional perspective?
Sure I do. And I could tell you our designs right away. Even my seven-year-old son can recognize them. He yells, "Daddy, look, it's made by you."

Operation Deep Freeze

You surely know Cat Lift Trucks as indispensable, reliable, and popular helpers for moving and lifting heavy loads when building the stages. What you might not know is this brand's machinery and equipment are also helping us conquer and settle permanently on the sixth continent, the extremely desolate, cold, and icy Antarctica.

Text by Adam Maršál
Photo by Zeppelin CZ


XD

The reason for launching Operation Deep Freeze was the International Geophysical Year running from July 1, 1957 to December 31, 1958, focusing on the exploration of the atmosphere, outer space, and the earth's interior.

It's the coldest and driest place on Earth. The ice sheet is several kilometers thick. You're only about 3,000 meters above sea level, but the low pressure and dry polar air make it feel like you're at 4,000. Summer temperatures may go twenty degrees Celsius below zero. In winter, they go down to minus seventy. The freezing air burns like fire on any exposed part of your skin.

It's not advisable to laugh or even open your mouth at all, or your teeth and gums would immediately start hurting and there is a risk of instant frostbite. But despite all of this, some people are living here permanently, even through the Arctic winter periods when it's freezing cold and pitch dark 24 hours a day. They can only survive thanks to polar stations, in large part built with the help of Caterpillar machines in the past 60 years. Like one specific piece of machinery stumbled upon by a construction equipment fan and a machinist by profession John Kearns from California.

John has seen a lot in his life. He sells used construction equipment at Iron Planet and has had hundreds of them pass through his hands, but this one was different. He knew only two things about it: it once served in Antarctica and now it was destined for the scrap heap.

Kearns had been a machinist for ten years, and at first thought he had gotten his hands on a Caterpillar 14-A, but web research didn't confirm this assumption. It was only after deeper investigations across the machining community that he discovered the mysterious tractor was one of twenty-one rare Cat SD8-LGP machines built in the 1950s for deployment in extremely cold conditions.

The three letters in the SD8-LGP designation stand for Low Ground Pressure and mean that the machine is equipped with wide tracks to distribute the weight as much as possible. This technology is used when working on unstable surfaces such as wetlands, swamps, or snow. The machine was acquired by the US Army for the so-called Operation Deep Freeze, a series of mixed military and scientific missions in Antarctica. Back then, if you needed a machine able to handle masses of heavy snow and ice, you could not find a better helper.

Operation Deep Freeze I begins

The start of this operation was motivated by the International Geophysical Year, which ran from 1957 to 1958. It was a major international event, involving experts from dozens of countries. Its main objective was international cooperation in research on the atmosphere, outer space, and the earth's layers. During the Geophysical Year, both the USA and the USSR launched their first research satellites.

This event was preceded by an extensive survey of the whole of Antarctica. For eighteen months, 70 agencies from all over the world, including Czechoslovakia, took part in the project. In 1956, the Halley Research Station, named after the British astronomer Edmund Halley, was established here. Around the same time, the Amundsen-Scott Polar Station was built at the South Pole and the Russian Vostok Research Station was completed in East Antarctica near the South Pole, becoming the most isolated research station on the continent. At the same time, the world's southernmost Berkner Island was discovered.

In addition to the USA and the USSR, also New Zealand, Great Britain, France, Japan, Norway, Chile, and Argentina joined Antarctic exploration to broaden knowledge of hydrography, weather, glacier movement, and underwater life. The US scientists were supported in their efforts by the US Navy. To accomplish these tasks, Task Force 43 was created in 1955.

Into action with the Walt Disney logo

The first task was to establish a permanent research station to provide a beachhead for further exploration of the continent. The expedition, conducted in late 1955 and early 1956, was filmed by a crew from Walt Disney Studios alongside the U.S. Navy. Disney, who created the logo for the unit, was named an honorary member. Seven U.S. Navy ships were involved in the operation, including three icebreakers, three freighters, and one tanker.

On the last day of October 1956, Admiral George J. Dufek successfully landed at the South Pole in an R4D Skytrain. It was the first-ever landing at the pole and he became the first American to ever set foot here. The plane was named "Que Sera, Sera" after the title song from Alfred Hitchcock's movie The Man Who Knew Too Much, which dominated the charts at the time. The plane is now on display at the Florida Air Museum. The day of the landing is considered the beginning of the construction of the permanent station at the South Pole, which is now named the Amundsen-Scott South Pole Station.

Caterpillar tractors were used to build and later supply the scientific stations in

The logistics of Operation Deep Freeze were provided by the U.S. Air Force. Caterpillar machines built runways for cargo aircraft and maintained them in service even in severe snowstorms.

The work of the mechanics was exhausting and dependent on the supply of spare parts from afar, but the Cat machinery helped them out thanks to its durability and reliability even in the harsh Arctic conditions.


XD
9130

Besides the construction of permanent bases, Caterpillar machinery was used for building the roads and airfields, transporting supplies, plowing, and hauling snow to drinking water units. Without it, polar stations would not be able to survive in the long run.

Antarctica. Not taking into account the motorized sledge of Robert Falcon Scott, who had died during the "battle for the South Pole" with Norwegian Roald Amundsen, the Caterpillar machines were the first crawler tractors used in Antarctica.

Before the establishment of a permanent airfield, they were transported to place by ships or dropped from aircraft. "Over the South Pole and Marie Byrd Land Station, we airlifted and dropped everything from kitchen sinks and light bulbs to seven-ton Caterpillar D-2 tractors using Douglas C-124 Globemaster transport planes," recalls Col. William G. Forwood, a 63 Squadron pilot who frequently took off from bases in New Zealand. Aircrews tried various unloading methods, including successfully dropping twelve tons of heavy timbers without parachutes in low flight at 14 meters above the ground. The greatest loss happened in October 1957 when the main parachute failed with one of the Caterpillar D-2 tractors. The machine crashed after free fall and most of the parts were buried several meters deep under the snow crust. Witnesses allegedly experienced a minor "snowquake", and one man was injured when a flying fragment broke his tooth. The second drop was successful and the tractor was collected only 15 minutes after it had landed.

With the growing number of deliveries, new tracked machines flocked into the sixth continent. In addition to the construction of polar stations, they were used for building roads and airfields, hauling supplies, plowing, and transporting snow to drinking water units. In 1958, they helped the U.S. Navy establish the continent's first permanent airfield.

From building the airports to unloading

After the tractors prepared the landing areas for larger aircraft, the heavier Cat SD8-LGP dozers were brought in. The supplying process became easier, but pilots complained about difficulties with distinguishing the solid ice and the surrounding soft snow from height. Getting stuck could be disastrous on landing. Following the experience of the United States Navy Air Force, the area was demarcated with colored barrels, but in the end, the best solution turned out to be live trees, which the pilots transported from New Zealand. Branches moving in the wind were said to be more distinct than the barrels. It is not known, however, how long were they able to withstand the polar freezing temperatures. Caterpillars were also useful for handling aircraft on the tarmac, salvaging, or unloading bulky shipments, such as unassembled sections of Sikorski H-34 helicopters.

"It was terribly important they be working reliably at all times because the lives of the station crew literally depended on them. But they never failed us," recalls Glen Sankey, who worked there as a serviceman in the late 1950s. The polar explorers had so much respect for them they were giving them names like Pam, Colleen, or Big John and considered them fully-fledged members of the team. They even celebrated their birthdays on the day of their delivery to the base. Apparently, this could be said only of a few machines.

Besides the tracked machines, the Polar explorers used Cat electric generators to provide electricity for heating and lighting, communications systems, kitchens, radar and approach equipment for landing, and drinking water units. The engines were designed to run flawlessly 24 hours a day, even in persistent extreme temperatures around minus 60 °C. Around 1960, nearly 150 Caterpillar engines and generators had been working in Antarctica, and many of these have only recently been taken out of service after nearly 60 years of operation. Today, US polar stations are still equipped with Caterpillar machinery.

Long forgotten machine with a story

Many of those special machines built between 1953 and 1959 have been lost. Some have been swallowed up by the ocean, others are buried in glacial crevasses, and a few have been moved to work in Greenland or the Netherlands. Five pieces were donated to the SeaBees Museum in Port Hueneme, California. This consignment also included a machine nicknamed Rebecca, which went to a public auction. "I heard that Rebecca had been taken out of service and ended up in a scrapyard where she had lain for years under a permanent snow layer," says John Kearns of Iron Planet, who was instrumental in her rescue.

Some of the machines were transported to New Zealand in the late 1970s, where they were "kept alive" using off-brand spare parts. In 1979, the Camp McMurdo station was taken over by the National Science Foundation, whose staff freed Rebecca from the snow and revived her. Thanks to her long-time hideaway under snow and ice, Rebecca avoided being moved to New Zealand and is now the most original Caterpillar machine with the designation SD8-LGP.

However, she had not been serviceable until the early 1990s. At that time, John Kearns teamed up with Iron Planet mechanic Noah Pestak, who carried out a complete refurbishment. So today, Rebecca, with all her incredible story, is ready to get back to work.

Until the temporary airfields were built, all supplies were transported by sea. Tractors for pulling sledges on the snow were equipped with wide tracks to spread the weight of the machines over a larger area.

Anyone who has ever put snow chains on tires in freezing weather can imagine how difficult it must have been to replace tracks in Antarctica.

For loading and unloading the aircraft, small Cat D-2 tracked machine models were used, dropped in the place on parachutes before the airfields were started to be built.


American view


European view


Asian view

Roudnice is the Navel of the World

In the heart of Europe is a small industrial country, the Czech Republic. In its center, not far from the capital Prague, lies the small town of Roudnice nad Labem. Among the grown trees, on its outskirts is the Area Four Industries' headquarters. Looking at a map, Roudnice is in the world's middle, its navel. Is it? Well, it depends on where you look at the navel of the world from.

Text by Pavel Vondráček

Take a look at these three maps. They all show planet Earth. At first glance, they are similar, yet they differ in fundamental ways. And because Area Four Industries is a global company, it is not simply possible to present just a single map. There's strength in unity, but diversity is always strength. Area Four Industries may be the mother of the design family, based in Roudnice nad Labem, but its members are scattered worldwide and have as much independence as possible, living their own lives.

The planet is a sphere, but its maps are flat. That's why Greenland, for example, looks much bigger than Australia when in fact, Australia is three and a half times bigger than Greenland. This "misrepresentation" is best recognized by looking at a conventional globe or google.earth.com. However, since our school days, we have had images of the world in our heads, mainly inherited from geography textbooks and world atlases. Rarely do we realize that their appearance is the result of historical development. In Europe, the 'center of the world' is Europe, more precisely the Eurasian continent, and the two 'Americas' are shown on the left of the map. Because in 1884, by agreement of the great powers of the time, it was decided that the so-called 'zero meridian', which unified the calculation of time and longitude, would pass through the observatory in Greenwich, England. The US delegates agreed to this, but later the Americans "centred" their world map to move to the middle of it. Just as the Incas once saw it, who named their capital "Cuzco", the Quechua word for "navel of the world". And it is much the same with China, whose name means "Empire of the Center". But although the depictions in school map books vary from region to region, the world is still the same, and the best way to see it is to explore it yourself.

Ideally, go to Roudnice nad Labem, a small Czech town of twelve thousand inhabitants, the home of Area Four Industries and the place of Milos production facilities. A prominent mountain is not far from the city, its shape resembling a woman's breast. It is Říp, a legendary mountain of Czech and European history. This region is the actual geographic center of Europe. If you are looking for a place in Europe that is a veritable crucible in which different kinds of thoughts and ideas have been mixed for centuries, go up to the top of Mount Říp and look around. Not far from here, in the north of Bohemia, Ferdinand Porsche, the founder of the famous car brand, was born; to the west, in a valley of the Ore Mountains, the forerunner of the American dollar was minted; down by the Elbe River, the composer Ludwig van Beethoven once said that he knew no landscape more beautiful... wherever you look from the top of the mountain, you will find a glorious cultural tradition, a European industrial heritage, but also a rich and dynamic present. Area Four Industries is not an isolated company, but it has its finger on the pulse of the times. It builds on history, mastering the past and preparing for the future.

These pucks with the logo of Czech carmaker Škoda, the major sponsor of international ice hockey, are intended for promotional purposes only. How can you tell them from the real ones used in hockey-games? Any printing on offical game pucks must not exceed 4.5 cm (1 ¾") in diameter or 35 % of the surface area.

A Czech Black Masterpiece

Ice hockey puck seems to be a simple and trivial thing. Until the moment you try to make it. Or rather bake it.

Text by Václav Rybář • Photo by skoda-storyboard.com

Nestled between the Hostýnské Hills in the Moravian Wallachia region of the Czech Republic, the small village of Kateřinice is home to the world-renowned maker of small round pieces of black rubber. The ice hockey pucks (a. k. a. the "biscuits") made by the local family firm Gufex are now indispensable participants of the Winters Olympics and the World Championships. Gufex was established just after the Velvet Revolution in 1989. Its owner, Karel Mráček, first produced rubber paddings and similar products. However, after the ice hockey club from the nearby town of Vsetín had been promoted to the Extraleague, the country's top ice hockey competition, in 1994, Gufex's range of products changed radically, with ice hockey pucks becoming the core product. This was the first breakpoint

The black gold

Gufex has rapidly achieved top-quality standards. And 1998 marked the second major milestone: all matches in the legendary Tournament of the Century at Nagano Olympics, where the Czech team won gold medals, were played with Gufex pucks. Why? Sponsors who place advertisements on the boards do not like seeing their logos smeared from the puck during the game. In tests, Gufex pucks left the boards 90 percent cleaner than competing products. And that was the decisive factor.

While all pucks may look the same, they may (and do) differ in quality. To achieve the top quality, the crucial criteria are the know-how, the exact formula of the mixture and the human skills. The composition of Czech pucks from Gufex is a top secret known only to five people, including the founder's stepdaughter Kateřina Zubíčková, who is now the managing director of the company with only about 10 full-time employees. While about 1.5 million of pucks is manufactured at Gufex annually, Mr. Zubíčková says it is still a handicraft, because each piece passes through the hands of many people during the final quality control.

Hockey pucks are nowadays made only in six countries in the world (Czech Republic, Slovakia, Canada, the United States, China and Russia). The success of the Gufex pucks at the Olympics and World Championships has opened door for this small company to clubs and competitions all over the world. Along with supplying the Czech ice-hockey leagues, Gufex exports its pucks to over 60 countries, including South Africa, Dubai and Mexico.

The way of the puck

Has it ever occurred to you why pucks are so beautifully black? It is because of soot, or carbon black, a material consisting of more than 95 % carbon. The base material is, of course, the rubber, but there is about a dozen of other ingredients. The mixture is kneaded like dough, of which small loaves are made. These are baked in a mould at 170 °C for the rubber to vulcanize and attain necessary qualities. In a similar way to baking muffins, the mixture crowns over the rim, therefore each puck is manually cleaned with a trimmer machine to remove excess rubber. The moulding process adds a diamond cross-hatch texture around the edge for more friction between the stick and puck for better control and puck handling.

On ice in 60 countries

Gufex pucks for world championships or the Olympic games must meet the strictest criteria. They leave only minimum marks on the boards and must not break the protective glass or helmet visors. With a diameter of 76.2 mm (3") and height of 25.4 mm (1"), a puck weighs 156–170 grams (5.5–6.0 ounces) and can travel at speeds up to 160 km/h during a hockey game, with the current record being 183 km/h.

While the rubber disc is highly resilient and practically indestructible under normal use, its surface is subject to wear and tear. According to the rules of the International Ice Hockey Association, the print on the puck must survive at least one period.

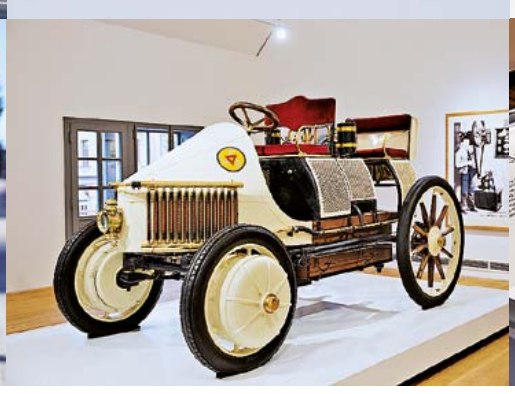
Pucks are always frozen before the start of the game to prevent them from bouncing too much on the ice. A frozen puck glides better on the ice as the friction is reduced between the solid rubber and the ice. Freezing the puck also solidifies it against impact so that it doesn't slow down to absorb shock when impacting the boards.

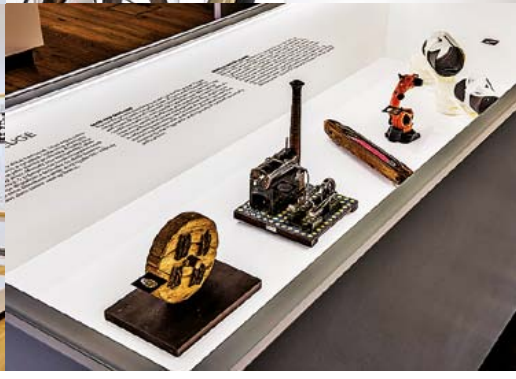
A puck for everyone

However, Gufex pucks are not just for professionals and even not just for those who actually play ice hockey. About 10 full-time employees also manufacture collectible pucks with various printing, and you can even order your own personalized pucks.

Back in the history of ice hockey, the first matches were played with pieces of wood, stones, and reportedly even with frozen horse excrements. Now every kid playing ice hockey on a frozen lake can enjoy the game with the very same pucks as the world's top-class professionals, since an official Gufex puck can be purchased for less than 2 U.S. dollars. What a great fun-to-money ratio!


FERDINAND
PORSCHE





The Czech roots of a motor legend

Ferdinand Porsche was a brilliant inventor and the moving spirit behind several fundamental milestones in automotive history. Porsche is one of the most desired motor brands in history. The fans can admire them in the spectacular Porsche Museum in Stuttgart, Germany. However, the deepest roots of Porsche are in Vratislavice nad Nisou, Czech Republic.

Text by Václav Rybář • Photo by Petr Homolka

Above:

A replica of the famous Porsche-Lohner car with a hybrid drive. The original has been taken away by the owners in 2013 when Vratislavice distanced from Ferdinand Porsche.

In the middle, from left:

The original Porsche's family house had to be pulled down due to poor foundations, but the newly built one is a true replica.

The 2013 petition against Porsche hasn't been forgotten, but the sign and commemorial plaques are back.

The exposition shows a number of photographs and sketches from Porsche's youth.

Below, from left:

The commemorative plaque on the corner of the Tanvaldská street, where the Porsche's family house is located.

A true replica of the Semper Vivus ("Always Alive") vehicle with wheel-hub motors, which fascinated the visitors of the Paris World Exhibition in 1900. Porsche himself drove another prototype from Vienna to Vratislavice to introduce his spouse Aloisie to his parents.

The Porsche's family house is full of various inventions and gadgets from the times of Ferdinand's childhood and youth.

FUTURE IN THE NAME OF VOLTS

Ferdinand Porsche was born into a German-speaking family in Vratislavice nad Nisou, Bohemia, in 1875. His father Anton Porsche ran a successful mechanical workshop. Ferdinand showed a great aptitude for technology, and was especially intrigued by electricity from a young age. He was already attending classes at the Imperial Polytechnical College in Reichenberg (now Liberec), some 5 km from his home at night, while still helping his father in his mechanical shop by day. However, the father did not support Ferdinand's electric dreams. The reason? Anton first-born son died in an accident, and so Ferdinand was supposed to take over the family business. The fact that young Ferdinand once attached small electric bulbs to his skates and became a star among kids on the frozen river of Nisa did not change the father's determination. Neither did the electrification of their house as the first in the town, replacing the twinkling light of kerosene lamps. His father was adamant that Ferdinand started training in metalworking which he successfully completed.

Finally, at the age of 18, he fled to Vienna. There he started from scratch: working at the United Electrical Company Béla Egger, later Brown Boveri, now ABB, attending lectures at the Vienna University of Technology after work… and meeting his lifelong love, Aloisia Johanna Kaes from the village of Pořejov near the Czech town Tachov, who he married in 1903. A year later, their daughter Louise and in 1909 their son Ferry were born. Both children would also go down to automotive history.

Over four years at Béla Egger company, Porsche worked his way up from a mechanic to the manager of the testing department. In this period, he designed a wheel-hub motor. Another turning point in Ferdinand's career was an order by the Lohner company, a manufacturer of coaches for monarchs, for an electric motor for a new carriage-like car. Porsche collaborated with Lohner so closely that he was soon offered a job.

At Lohner, Porsche developed his unique 4-wheel drive with electric motors in the wheels. The car was displayed at the Paris World Exhibition under the name Toujours-Contente ("Always Satisfied"). In 1901, Porsche introduced the "Lohner-Porsche Mixte Hybrid": instead of a massive battery-pack, an internal combustion engine built by the German firm Daimler drove a generator which in turn drove the electric wheel hub motors. As a backup a small battery pack was fitted. It was the first gasoline-electric hybrid vehicle in history.

Three decades later, after a series of grand victories as well as blind alleys, he set up his own company, "concisely" named *Dr. Ing. h.c. F. Porsche Gesellschaft mit beschränkter Haftung, Konstruktionen und Beratungen für Motoren und Fahrzeugbau*.

WELL, FINALLY AT HOME AGAIN

You will definitely be familiar with the ensuing chapters of Porsche's story, including the famous Volkswagen (initially Volks Wagen) and the infamous collaboration with the Nazi regime. On the eve of World War II, Volkswagen was manufactured in a military version known as Kübelwagen. Only after 1945 the iconic Volkswagen Beetle was born.

Ferdinand Porsche's reception in his birthplace in Bohemia has been riddled with controversy. In 2013, the citizens of Vratislavice renounced Porsche due to his wartime engagement, removing all his commemorative plaques and signs. Fortunately, the abandoned Porsche's family house had been bought by the Czech carmaker Škoda, a member of the Volkswagen Group, carrying out a reconstruction according to original plans from 1875 and setting up an enthralling exhibition, which clearly shows that dreams of stunning cars have been conceived in Bohemia. And Porsche is just a fraction of the Czech automotive and engineering heritage…

In the beginning was the Word

Robot and Dollar

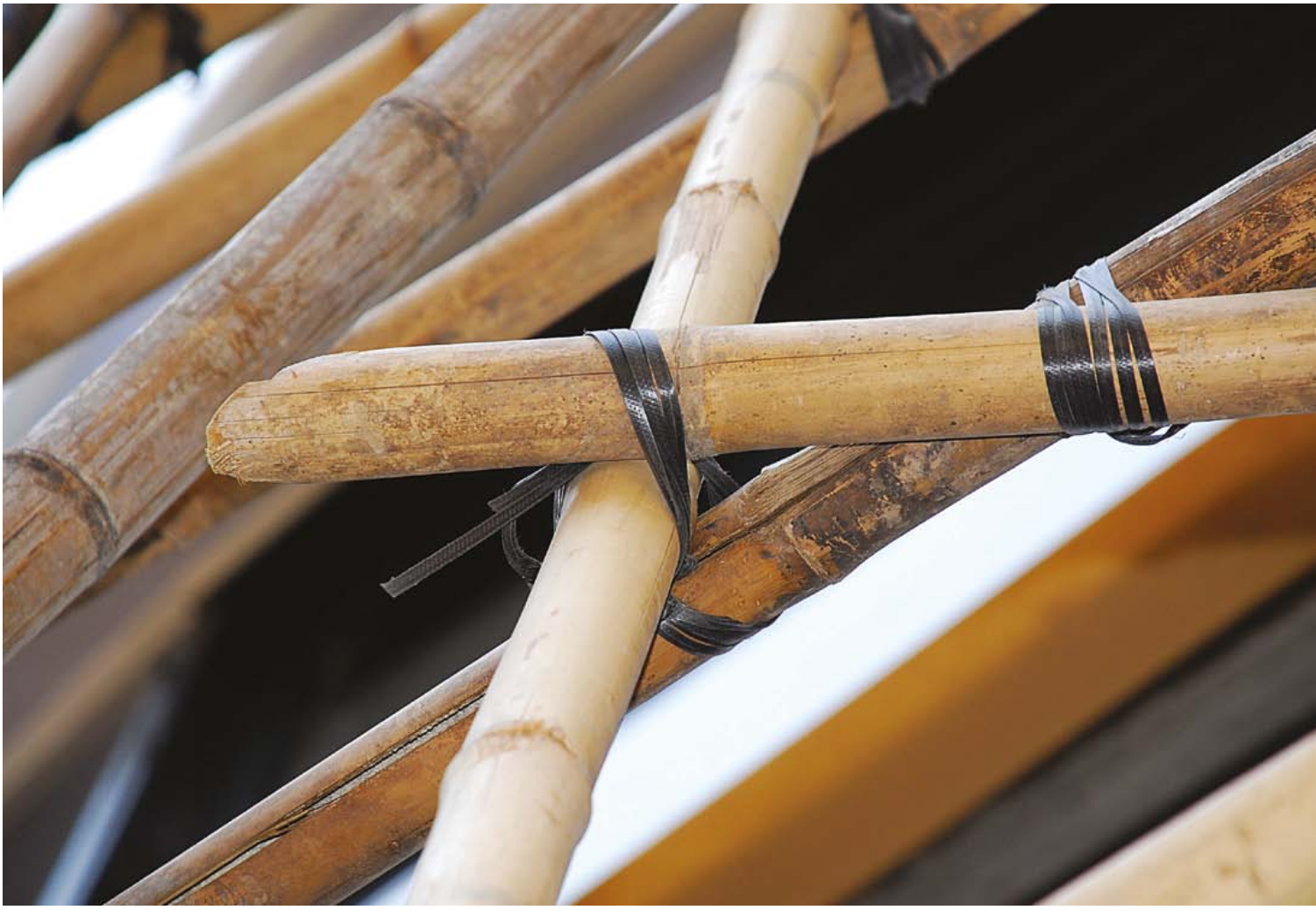
Two words you use every day that you may think are originally from English and first appeared in America. But they aren't and they didn't. The former is from German, the latter has a Slavic linguistic basis, and both originated in the lands now called the Czech Republic.

ROBOT

This word celebrated its 100th anniversary only two years ago. It was born one day in 1920 when Czech writer Karel Čapek was sitting at his desk over the first draft of a science-fiction play that later became known as R.U.R. (Rosum's Universal Robots), and was later translated into more than thirty languages. In it, shortly after the end of the first world (and the first "mechanized") war, the author wanted to depict the impending negative effects of technology on humanity, in the form of an army of "artificial workers" who had relieved people of the burden of hard work, but then unexpectedly revolted. Near his desk stood a painting easel and Josef Čapek, Karel's older brother. "I really don't know," sighed Karel at one moment. "What should I call my artificial workers? I would like to call them "laboři" – laborers, but it sounds to me fake and unnatural..." A short, murmured reply came from the mouth holding the paintbrush: "Why don't you call them "roboty" – robots." And that's what really happened – this spontaneously uttered remark became a globally used word that, even many decades after its inception, defines the era of today's modern technology. Of course, it didn't just come out of thin air – Čapek's brain (sub)consciously derived it from the Czech word "robota", which far down in history, in times of serfdom, used to mean "forced labor" and later became synonymous with any kind of backbreaking work for little, if any, money. In various forms, this word is present in most Slavic languages today, for example the Russian "rabota" means "work". Incidentally, Karel Čapek later went even further in his visions of the potential negative impacts of technology on humanity, prophesying that one day not only would every person have a robot to serve them, but that, vice versa, every robot would have its own human slave. He was perhaps not far from the truth, just look around at all the people "chained" incessantly to their cell phones.

DOLLAR

When gold for coinage began to run out in Europe in the late 15th century, it was gradually being replaced by silver. The first silver coins, still under the traditional name guldiner (gold coin), were minted in Tyrol, but soon afterward in 1519, the first mint in the northwest of Bohemia in the Erzgebirge (Krušné hory = the Ore Mountains) followed the new trend. The silver coin was named Joachimsthaler after the town near the silver mines of Joachimsthal (Joachim's Valley). However, this official name was impractically long, so it was immediately shortened to "thaler" in common speech. The coin was minted here for only 10 years, but its name was then adopted by other countries throughout Europe. Over the centuries, the name changed slightly in different languages, just to fit properly into the mouths of their speakers – originally German "thaler" thus became "tolar" in the Czech lands, "tallero" in Italian, "daler" in Dutch, and "dólar" in Spanish. And it was exactly this one that along with its name became the basis of the first independent currency of the USA, and not only of this country – more than twenty states around the world have their dollars today, including Australia, Barbados, Fiji, Guyana, Jamaica, Liberia, and Singapore.



BAMBOOZLED BY BAMBOO

How bright and promising is really the future of this sustainable material of the past?

Text by Radek Kovanda

On the left page:

As bolted joints are only possible for large bamboo stems, the method most widely used for joining involves conventional binding.

This page, upper row:

Scaffolding rigger working on skyscraper construction in Hong Kong.

Observation tower in Hemer, Germany, uses bamboo and timber as the main visual elements of the outer shell.

Lower row:

Impressive scaffolding at a high-rise building in Hong Kong, made in a traditional way using bamboo poles as structural elements.

Bamboo Pavilion Designed by ZUO STUDIO Expresses the Natural Beauty of Taiwan in the Industrial City of Taichung.

Bamboo is a fast-growing grass whose hollow, thickened stems, up to several centimeters wide and several meters long, have comparable and, allegedly, even better mechanical properties than modern construction materials. Nowadays, with environmental impacts becoming more and more important than the cost of production, bamboo is increasingly thought of as a 'good old' natural material that in the future may, or even should, replace concrete, steel, or aluminum. But, you probably wouldn't want to have to build an entirely bamboo-based stage even with the best technology available today. Why?

Bamboo has always been used as a building material in its native habitats of Asia, the Pacific, and Central and South America. The world's oldest bamboo structure is said to be the Qian-Xian Bridge from the third century BC in China – only it's not like the pyramids that were built once and then have stood firm and solid for millennia; instead, its structural components must be replaced regularly or the suspended structure would collapse. The age-old practice of bamboo scaffolding also originated in China – although the current building regulations only allow its use on buildings up to six stories high, you can still come across bamboo scaffoldings in Hong Kong used in the construction of much taller skyscrapers.

Other typical bamboo architecture includes the Philippines' traditional 'nipa hut' dwellings, with walls and roofs made of split bamboo and supporting elements of whole bamboo stalks, or Central American houses and barns built in the 'bahareque' style, where the walls are made of bamboo stems covered with clay or cement plaster – in both cases, these structures are believed to withstand middle-scale earthquakes. In Japanese architecture, bamboo has traditionally played a large role in the construction of fences, gates, and paneling or decorative elements of buildings; in India, on the other hand, it is used as a purely utilitarian material, most often as indoor clothes hangers/dryers, as ladders, and as stretchers for the sick or the dead, but most often you will see bamboo as tall flagpoles with saffron-colored Hindu flags.

In the 21st century, with the growing emphasis on ecological sustainability, bamboo has also become popular among architects, who foretell a bright future for this all-natural material. And they claim they are prepared to work out solutions to numerous problems relating to bamboo applications in modern structures with high demands. The principal one to be dealt with stems from the irregular shape and the different thickness and length of individual bamboo stalks. They do not fit together perfectly, which poses a problem, for example, when building insulated wall assemblies, essential anywhere outside tropical climates. Also, note how many more bamboo poles are required for any scaffolding-type structure compared to iron or aluminum poles.

Very challenging is also the joining of bamboo poles in a secure and reliable way. The traditional method of using ropes made of palm or other leaf fibers has its strength and durability limits, and bolted joints are quite tricky to be made – the internal structure of long, longitudinal fibers in bamboo stems makes drilling very difficult, as the stem tends to crack and split. One of the solutions may still be the conventional lashing knot, using ropes made of artificial polymers and synthetic adhesives to both strengthen and seal the joint. Another one involves conventional bolted joints, with metal clamps along the stem to prevent it from cracking and splitting.

Moreover, there has already been invented a number of advanced technologies and processes, which involve scanning individual stems, cutting them to desired lengths, and fitting the ends with 3d printed fasteners and joints, while CAD-type software uses the scanning data to calculate mechanical properties and precise positions of individual structural elements in the building project. The results are certainly unique and impressive, as






well as stable and secure, but they are also – compared to conventional structures – more expensive, take longer time to complete and, most importantly, they are certainly not as carbon neutral as claimed.

However, carbon neutrality is the main reason why architects are nowadays turning their attention to bamboo. It grows fast and "just by itself" – and not only sucking up carbon dioxide from the atmosphere in the process but also providing us with a structural material with admirable mechanical characteristics comparable to steel or aluminum. While there is surely no doubt about the first claim concerning CO2, there are many about the latter one. In terms of strength-to-weight ratio and tensile strength, bamboo is said to have the same properties as lightweight steel (namely + 250 N/mm2), but as laboratory tests show, this is only true for the strongest parts of the stem, and only for some bamboo species. In fact, only 5 to 10% of bamboo poles comply with the strength criteria required for comparable metal products.

Also, bamboo's durability and resistance to weathering are claimed to be the same as in metals, but is it really so? It, unfortunately, isn't. Firstly, bamboo is prone to changes in ambient humidity, may easily dry out, and shrink significantly; and secondly, without impermeable surface treatment, it is susceptible to insect, mold, and fungal infestation, resulting in rapid and irreversible degradation. Moreover, any potential plans regarding its cultivation for construction purposes should bear in mind that bamboo is an invasive plant – in the tropics, its natural habitats, bamboo is kept at bay by competing species, in the mountains by a lack of available soil and nutrients; but everywhere else it quickly and easily invades and destroys the surrounding ecosystems unless strict control measures are continuously maintained.

Please don't get this wrong, bamboo is certainly not to be condemned entirely. As a truly natural, thus ecological structural material, it certainly makes sense to use this material as much as possible, or rather practicable and feasible – mainly as a structural, filling, or decorative supplement, just like it has been so far throughout history. But it is quite impossible for bamboo to completely replace metals in the construction of buildings, bridges, towers... or even concert stages in the future, despite a growing number of claims stating "bamboo stage rigging is the way of tomorrow" – like at the end of last year when the British band Coldplay announced that they would play on an all-bamboo stage during their "eco" tour this year. In reality, most of the supporting and anchoring elements will have to be made of steel and aluminum, just covered from sight with bamboo.

Upper row:

Freshly cut bamboo stems called "culms", thick and colorful. They need to be dried out with care as they tend to lose water fast...

... and shrink considerably in volume, thus becoming fragile and tending to snap.

Bamboo has to be properly impregnated, and firmly anchored in a metal or concrete base plate when used as a supporting element.

Lower row:

In order to enhance stability, bamboo culms are often intertwined in helix-like structures.

Green School in SibangKaja, Bali, with a floor area of 2,740 sqm, and a build time of exactly one year (May 2008 – May 2009).

Flower Sea Bamboo Pavilion in the campus park of South China University of Technology in Guangzhou.

The origins of rigging – and bungee-jumping, too.

Although this tower may appear to you as a creation made of bamboo, this appearance is deceptive. The structure is made of another "good old natural" material, increasingly used in modern ecological architecture today, only in different forms and shapes – yes, it is wood, in its simplest form of thin trunks and thick boughs of young trees that are both strong and flexible. This true mastership of neolithic rigging can today be seen only once a year at Pentecost Island, one of numerous in the Vanuatu archipelago in the vast Southern Pacific. Since so long ago that no one remembers, older men of the local tribe build these intricate towers for their youngsters, who have to climb up to the very top and then jump down, secured only with vines tied around their ankles, the length of which is just a bit shorter than the tower's height. Participants have to tilt their chin to the chest to prevent a potentially lethal bump to their heads and get away with just a painful brush of their shoulders against the ground. Pain endurance is just one part of this transition ritual, the other being the courage to climb up and jump down in the first place.

A4

Magazine Issue 2022

New Products

People in Area Four Industries

Exciting Projects

Manuals and their Importance

Structural Reports

Technical Corner

Robotization

Modernization

Brought to you by Area Four Industries

PROLYFT

LIFT IN BLACK

NERO

The new Nero hoists are redesigned with a unique black chain for the complete range, keeping the same look and feel and camouflaging with the stage.

Equiped with a unique outside limit switch on both LV and DC, it becomes easy to set limits on the rig positions.

Its faced bracket allows the chainbag to move position related to use motor-up or motor down configuration.

Connected to the fully new online database for a unique service program and a live time warranty the new Nero won't let you down.

Prolyft is a Prolyte product | PROLYTE Feel. Fantastic.

Content:

New Products

MILOS 4
LITEC 6
PROLYTE 8
EXE TECHNOLOGY 10
FLEXA 14
TOMCAT 16
XSTAGE 17

Fresh

New positions 18
A4l.tv & Rigging Commandos 20
Siobhan Colleen 21

Brand Highlights

MILOS 22
LITEC & EXE TECHNOLOGY 26
FLEXA 30
PROLYTE 32
TOMCAT 34
XSTAGE 34

Technical Corner

Manuals 36
Structural Reports 38
Anodizing vs. Powder Coating 39
Integrated Systems for vertical keder systems 40
Certifications 41

Area Four Industries

Robotization 42
Vertical stocks 43

Milos. Works better.

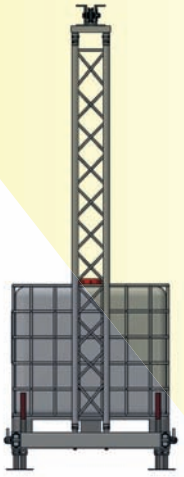
Milos. Works better.

Icon Base

- PA Tower, Tower for LED Wall or Basement for stages
- Optional outriggers for increasing the footprint, height adjustment by spindles
- Attachment points for wire ropes
- Matched with trucking size
- For M290, M390 and M520
- Exact dimensions for an IBC tank

Gravity Bar

This idea is based on the design and functionality of a Delta Plate. The disadvantage of the Delta Plate is that it is unlikely to achieve a 100% load distribution of 50 to 50. Thanks to this design you will have always a perfectly balanced weight distribution. If one chain hoist will move slower, the distribution will still be 50 to 50. By rotating the bracket you will have a fixed "attachment point" which works as a Delta Plate. Two products in one.



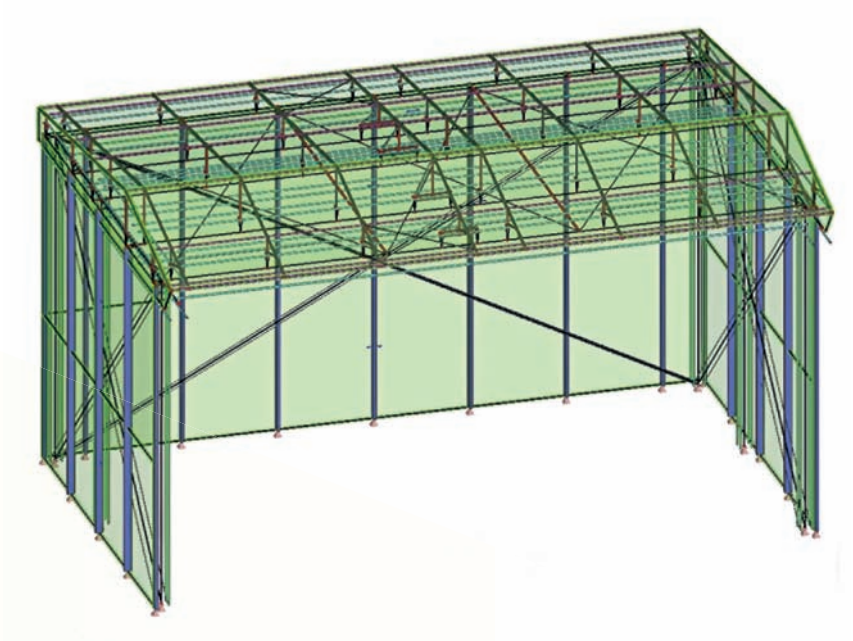
Delta Plate

- Aligning a line array / PA
- Distributing the load
- Disassembling a chain hoist / switches from one attachment point to the other
- Distance of holes: 240, 340, 470mm
- Dynamic factor of 1.2
- Structural report according DGUV 17 with double safety factor

RTR Truss

A new construction designed to meet the requirements of even the largest aluminium roof.

- New connection type - R
- Matched with trucking size
- Holes at end frame allows mounting roof support, wind braces, or life line systems
- Internal support for inserting a smaller truss for storing and transport
- Axis dimension 1118x720
- Main tube 60x8, Braces 50x4

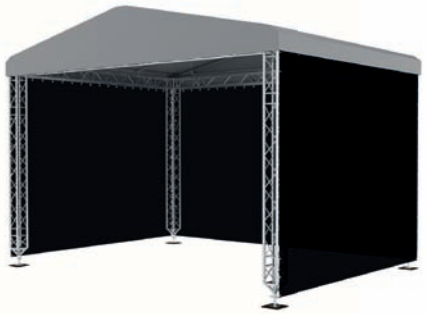


New 26x15 roof

Thanks to the existence of new RTR designs, we can now "Go Large."

- **Side canopies possible**
- **5 main spans of 26 m made from RTR truss (between the Sleeve Blocks)**
- **6 towers, QTPT, clearance height 14,0m**
- **Load capacity 30 tons (UDL) and 3 tons for PA per front cantilever**

No Guy Wire Roofs



The MILOS MR0 NGW 6x5m aluminium roof incorporates our HD Multi-Cube, eliminating the need for any wires or corner braces for this set-up. Using HD Multicube in the construction of this roof allows loading capacity of up to 30 kg /m plus 200kg for the PA. Great size, simple set-up, no hassle.

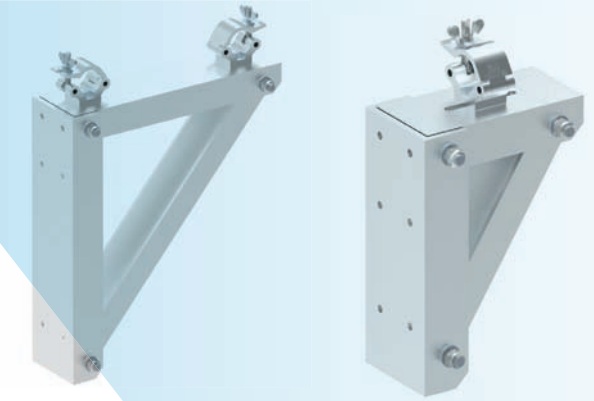
The MILOS MR0 NGW 8x6m aluminium roof requires NO internal wind bracing wires within its construction due to the use of the innovative Corner Brace HD. The special diagonal brace creates a rigid and stable construction. The adjustable spindle base provides a wide range of adjustment for uneven surfaces. The innovative Corner Brace HD, enables a respectable loading capacity for small / medium size events (front and back truss 30kg/m, side truss 25kg/m, ridge 10kg/m plus 200kg for the PA). Using our Milos M290 QTVU in this roof allows loading capacity up to 60kg/m plus 300kg per PA).

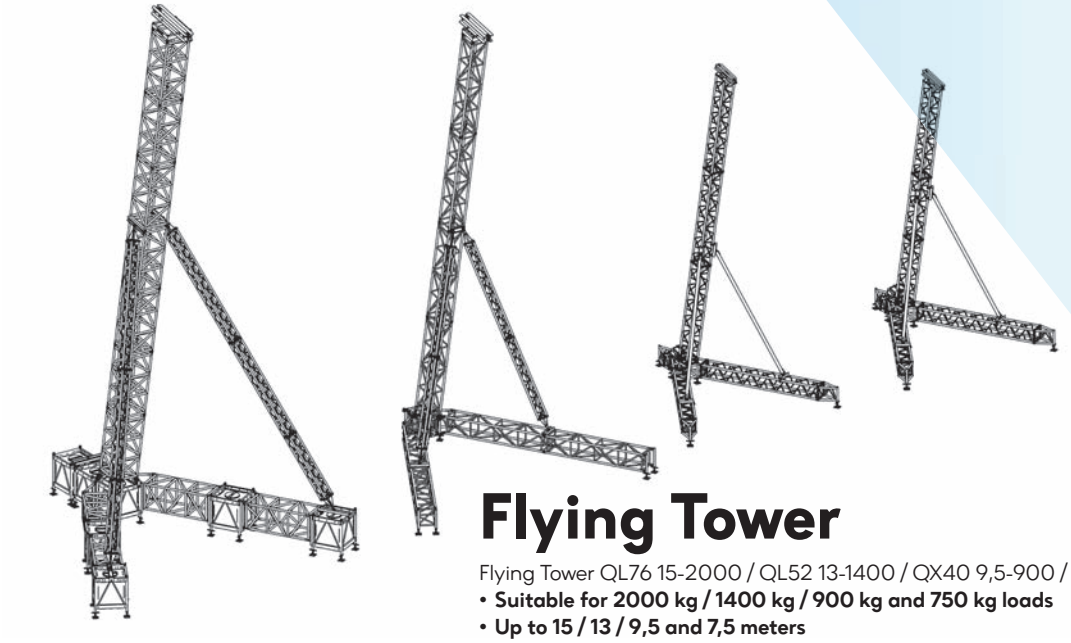
Barrier HD 120-90 Basic Corner

- **Inside and outside corner with the same piece**
- **Single hinged corner, wide range of angles between 90° to 270°**
- **Possibility to be bolted to all of Litec's Crowd Barrier models**
- **No need for floorplate (If requested, there is the possibility to create a custom floorplate)**
- **The strong extruded hinge guarantees the same strength of standard models**
- **Easy to fold, storable in the standard dollies**
- **Outer dimensions compatible with the standard models**

Wall Brackets

More and more often, we receive requests for integrating light aluminum trusses in permanent or semi-permanent installations. An example could be the installation of pipe racks in petrochemical, chemical and power plants in industrial sites. In order to provide a reliable, professional and modular solution, Litec developed this new line of wall brackets.

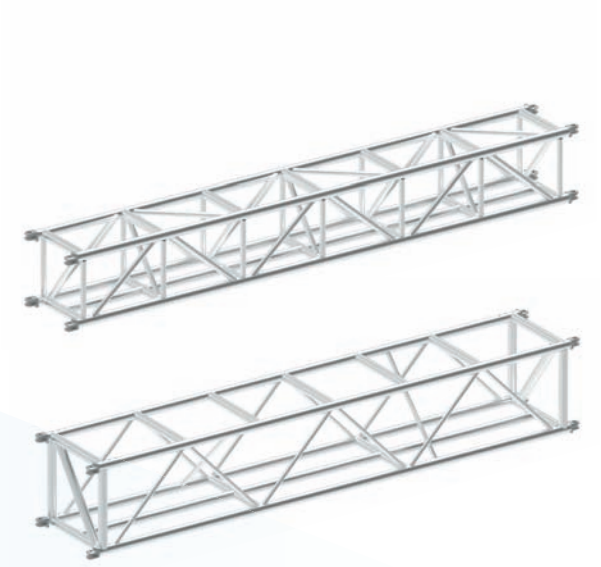




Flying Tower

Flying Tower QL76 15-2000 / QL52 13-1400 / QX40 9,5-900 / QX40 7,5-750

- **Suitable for 2000 kg / 1400 kg / 900 kg and 750 kg loads**
- **Up to 15 / 13 / 9,5 and 7,5 meters**
- **Water ballasts integrated in the system, guy ropes are not needed**

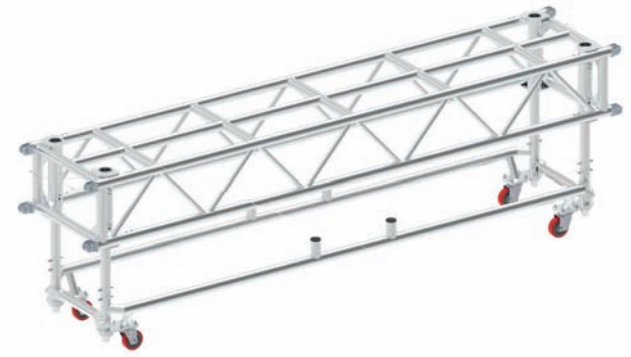


Pre-rig Classic Evo

The main difference in comparison with standard Pre-Rigs is the possibility to change the fitting orientation (vertical to horizontal or vice versa) by just flipping the spigoted forked connections. This permits the use of the two different accessories (ADJ Vertical Hinge and ADJ Horizontal Hinge) with the same truss, without needing any further accessories.
Like previous models, LITEC's Pre-Rig Classic Evo "Pre-Rig Truss," and its dedicated line of accessories, allows for the permanent attachment, storage, and transportation of a wide range of lighting equipment. Each Pre-Rig "dolly" comes with removable legs and caster frames for easy transport and manoeuvrability during load in/out operations. The bracing pattern, located on the upper side of the truss, provides multiple fixing positions for many types of lighting fixtures directly to the truss or via a dedicated lighting drop bar.

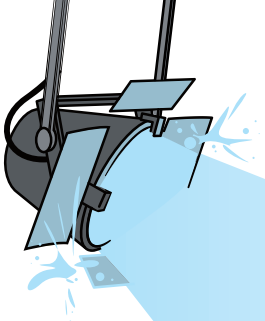
QL40 + QL52 with lower chord

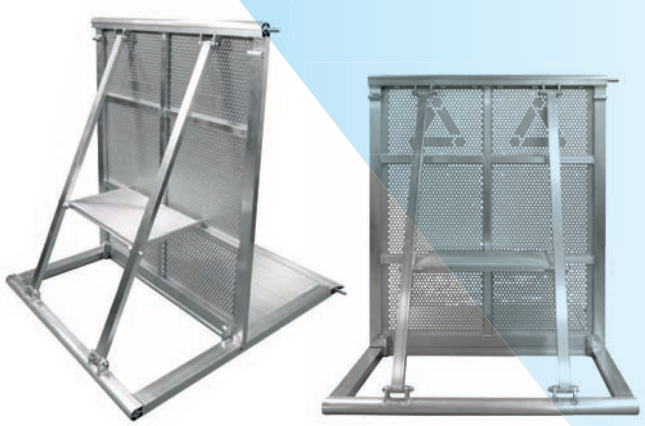
The Litec quad truss QL40 and QL52 with an additional lower chord, allows the easy installation of different models of LED wall. The QL40 and QL52 truss size guarantees the possibility to build a very stiff beam, avoiding deflection. The static characteristic of these two model are compatible with the standard QL40 and QL52 models.



MyT Folding Aluminium Dolly

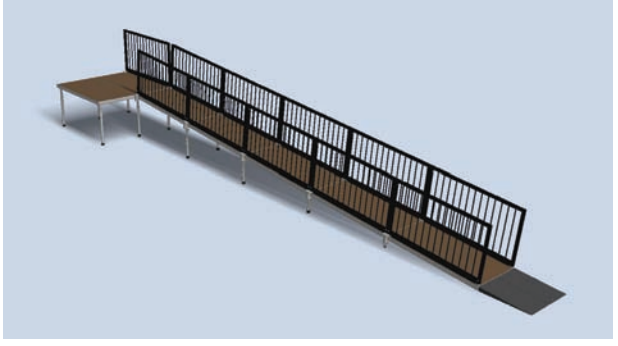
These dollies can fit up to n°3 MyT Folding Trusses. They can be moved both with a transpallet or a forklift. They can be stacked up to 3 times in order to maximize the storage height.
MyT Folding Aluminium Dollies can be opened on both sides and have inner wood bumpers to preserve the MyT Truss and fixed points for ratchet straps. Every Dolly is provided with red spacers to keep the right distance between the trusses in order to avoid damage during transportation. There is a specific storage position for these spacers in the dollies to avoid risk when the truss is outside the dollies. The dollies are bolted and can be folded to save space in the store.





Barriers

The Barrier has a self-weight of only 35 kg per 1m section. The smooth round top bar and the bottom bar incorporates a stainless steel 15 mm slot pin that provides easy connection points for the Barriers. The bottom side can be secured using a hexagon socket head screw (M 12 x 180 mm). All profiles have soft, rounded edges for maximum comfort. The maximum allowable load on the horizontqal top chord is 3kN/M1. The barrier folds flat after use and can be stacked in dollies for easy transportation and storage. Apart from the standard 1 m sections, the Barrier can be delivered with different accessories, SnakeGates, and others.

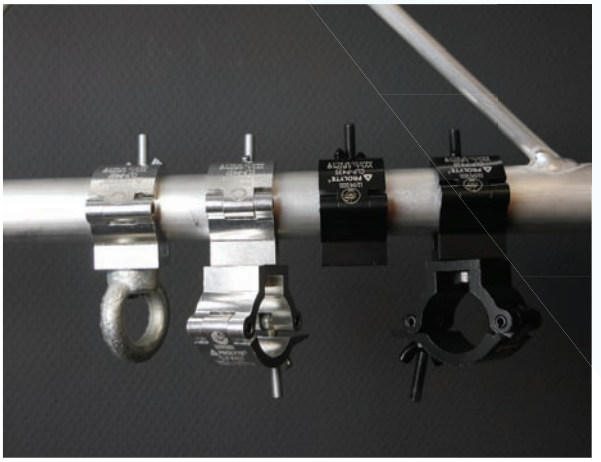


New Ramp Solution

The new ramp solution gives the possibility to create easy access to your stage. With the flexible leg solution it is easy to create a ramp for loading and unloading to your stage or to give disabled people easy access. To fulfil these needs, Prolyte has designed a solution which gives you the possibility to adjust the angle of your ramp.
In combination with the topline stagedex series it is even possible to mount a 100kg railing to both sides of the ramp. Landing platforms can also be integrated, so the possibilities in ramp shapes, length, and width are huge.

Cell Clamps

From 30 mm to 60 mm diameter tube, our own branded clamps comply with safety regulations and are TÜV approved. They are rated with a safety factor 8:1 (kg) DGUV17/BGV C1 and polished surface with laser markings. Available in both aluminum or black coated finish.



LSU Raised

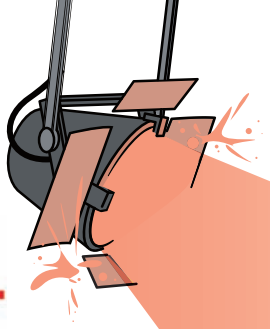
Building your LED screen from ground level is now easy. Whatever your type of screen, Prolyte offers a universal solution - the LED Stack system. This combination of a base-unit, connection bar, and ladder truss, creates a very stable system to support you LED screens in various configurations and offers flexibility in height as well as width.
In addition to the existing program we have added an in-height adjustable support. This gives you the opportunity to install the bottom of the screen at a higher level. With this support you can install the screen at a height between 90cm and 130cm.
To complete the series we have added accessories which enable you to create curved screens. With connection bars in different lengths and degrees available you will be able to create curved led walls between the 2.5 and 10 degree angles. It can also be used in combination with an extendable support.

Circular Roof

The latest addition to the Prolyte Roof systems is the CMP-Roof. This is a circular shaped roof system based on the multi-purpose truss series. Its typical shape gives a new dimension to your event. The structure is fully designed from the H40V (square 40cm) truss series. All the lengths are standard available truss modules, and the Heavy duty box corners (BOX-40V-HD-0) optimize the strength of the roof top.
The special 8+2 way corner gives you the opportunity to go with 8 truss spans from the centre of the roof to the outer ring, which gives you a lot of suspension possibilities. It also gives the roof a fantastic aesthetic look.

Verto

The Verto truss is a different revolutionary system, making truss connection fast, silent, and safe. The Verto truss brings a totally new perspective to truss assembly and is described as a game changer in our industry.
The Verto truss is based on a different principle of truss connection, where the sections are joined by a rotating coupler system. This system has great advantages over existing systems. The name Verto is derived from Latin, meaning to turn or to turn around and that is exactly how this coupler works. A simple flick of your wrist will connect the truss sections. The Verto truss is designed as an additional system for those situations where its specific characteristics come into play, such as a silent connection and reduced assembly time. Its structure resembles that of the standard H30V truss.



EXE RISE

EXE Rise Chain Hoist D8+ 250kg

The new EXE Rise D8+ 250kg compact medium frame chain hoist is made from durable but extremely light precision die cast aluminum.
Its low profile frame makes it ideal for squeezing into small spaces and achieving the greatest possible headroom in low-ceiling venues.
This lightweight, compact hoist is ideal for corporate event venues, and for simple rigs in educational, religious, or theatrical settings.

EXE SENSE

EXE Sense Touch Controller

8 channels

Precision at your fingertips. Control EXE Rise hoists through the digital touchscreen of the EXE Sense, the latest linkable hoist controller by EXE Technology.

Command up to 64 hoists individually or in groupings. Use the touchscreen to either manually move hoists into position or input the exact elevation. Alternatively, control hoists with the multi-channel touchscreen remote.

This international, one-for-all solution is available for either 208 or 400-volt power, depending on which configuration you require for saving events in your country. The system reliably communicates with any fixed speed hoists over distances up to 100 meters through Cat5e cable.

EXE TECHNOLOGY

EXE Technology

EXE Technology unveils the latest range of **ALL IN ONE** solutions, and open source **ONE FOR ALL** solutions. Customers have a wide range of choices on the approach to choose to suit their specific technical requirements.

ALL IN ONE SOLUTIONS ONE FOR ALL

ALL IN ONE is designed as a fully integrated system including 'smart' hoists and intellient controllers, offering plug and play devices. It is the integration between equipment designed to operate as a "single" stage machine.

Managing increasingly complex events, led us to imagine a world where our most advanced series and third-party products interacts with each other.

It's a unique and ambitious project, that we called **ONE FOR ALL:** it's the open source system capable of interacting with third-party producers. A decisive step forward for the interaction of various technologies within the same event.

The EXE Technology electric chain hoists have been developed as part of the **OPEN UP** platform, which is based on the scalability of each hoist. The OPEN UP platform is a world of options capable of expanding the scope of the standard range.

Each EXE Sense / B / D / S series controller has its own wired touch screen remote control

EXE B Chain Hoist
- D8+ 500kg dual speed (2 or 8)m/min

EXE D Chain Hoist
- D8+ 500kg
- D8+ 1000kg
- D8+ 2000kg

EXE S Chain Hoist
- D8+ 500kg (variable speed)
- D8+ 1000kg (variable speed)
- D8+ 2000kg (variable speed)

EXE B

Dual speed for fast & precision control

EXE B 8 Channel Controller
- 8 channels
- Linkable to 64 channels (max 8 controllers)
- 8x 16A CEE-F 4pin (hoist) 2x XLR10 (link) 8x IMLE 4 pin M (speed control)
- 400VAC 32A 3PH+N+E 50Hz

EXE D

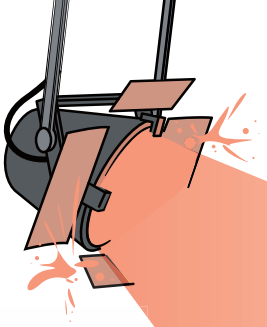
Load Monitoring / Protection & Position Control System

EXE D Controller
- 8 channels
- Linkable to 64 channels (max 8 controllers)
- 8x 16A CEE-F 4pin (hoist) 2x EtherCon (link) 8x XLR6 F (encoder) 1x XLR5 F (load cells) 1x EtherCon
- 400VAC 32A 3PH+N+E 50Hz

EXE S

Variable Speed Smart System with Load Monitoring / Protection and Positional Control

EXE S Controller
- 4 channels
- Linkable to 32 channels (max 8 controllers)
- 16A CEE-F 5pin (hoist) 2x EtherCon (link) 4x XLR7 F (control)
- 1x EtherCon (remote)
- 400VAC 32A 3PH+N+E 50Hz



EXE ACE

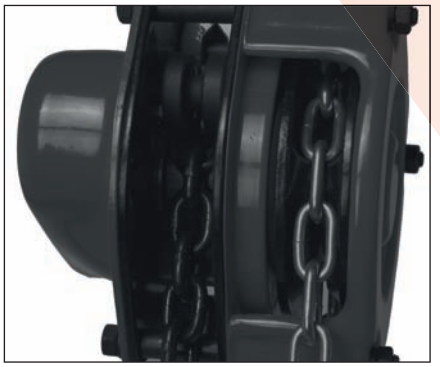
EXE Ace Chain Hoist

D8 500kg – 1000kg – 2000kg

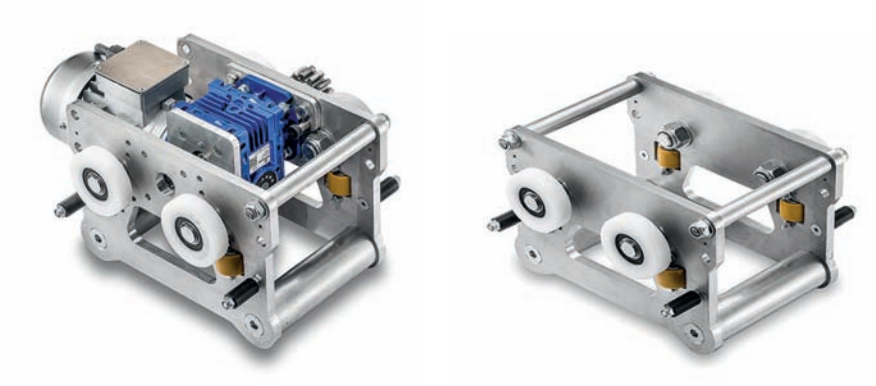
The EXE Ace collection is the most cost effective solution for one-off events or for installations that last weeks or months at a time. Since these types of events don't require constant starts and stops day after day from the hoist, the EXE Ace collection has been designed with a lower duty cycle and are all compliant with D8 requirements, we have been able to make them more lightweight by designing them to a standard 5:1 safety factor with a single brake unit, though a secondary brake is available.
Available hoist capacities include the D8 ½ ton compact medium frame, 1 ton medium frame, or the 2 ton compact XL frame. These hoists pair seemlessly with the EXE Drive 4 or 8 channel Basic Controllers.

EXE HCB

The EXE HCB Hand Chain Block is the new family of products, designed to lift loads where it is not possible to use electric chain hoists.
Available with 1000kg capacity and with 18 meters of chain.



EXE
DST



DST52
Motorised Trolley

The DST52 Motorised Trolley Weight	25,7 kg	25,7 kg	25,7 kg	25,7 kg
Max. payload	1000 kg (*) (**) (***)	1000 kg (*) (**) (***)	1000 kg (*) (**) (***)	1000 kg (*) (**) (***)
Max. speed	10,56 m/min @ 50Hz	21,19 m/min @ 50Hz	28,25 m/min @ 50Hz	42,37 m/min @ 50Hz
Power	0,37kW 4 poles	0,75kW 4 poles	0,75kW 4 poles	0,75kW 4 poles
Voltage	400 V	400 V	400 V	400 V
Rated current	1,1 A	2 A	2 A	2 A
Gearbox	CM040 i=20	CM040 i=10	CM040 i=7,5	CM040 i=5

Slave Trolley

Weight	10,7 kg
Max. payload	1000 kg (*) (**) (***)

(*) Ramps of acceleration and deceleration, depends on weight of the load applied and length of the stroke of the trolley; they must be defined case by case. (**) The only horizontal forces considered are in the direction of the motion. (***) The trolley can be used only on a horizontal DST track.

Motorised Rotation 360°

Weight	55 kg
Max. payload	1500 kg (*) (**) (***)
Max. speed	3,82 rpm @ 50Hz
Power	0,75kW 2 poles
Voltage	400 V
Rated currentwwwww	1,72 A
Gearbox	CMPU i=369
Max. torque on slewing ring during utilization	500÷800 Nm (adjustable with clutch)

(*) The payload refers to a still rotation module with no translational acceleration, no translational speed and no lifting movement. (**) Value of payload refers to a balance load; unbalance load is not allowed. (***) Ramps of acceleration and deceleration of rotating movements depend on the weight and length of the load applied and must be defined case by case.

Local control - Real time line

The Real-time Line provides continuous information every second.
When setting up a stage it is vital to monitor the loads in real time. The Real-time Line provides continuous information every second.
The cells transmit wirelessly every second to their Gateway. The Gateway is connected via cable to a local PC to ensure a stable connection with very low delay.
Cells data are updated every second and displayed on the PC screen.

General features

- Possibility to create multiple events in the same interface
- Event layout formed by sectors and zones
- Flexible number of cells per zone
- Instantaneous update of load information
- Possibility to define overload and underload alarms

DynaCell 0,5

- 500kg
- ENAW-2024 T351 Aluminium
- Fully tool free
- Smooth design

DynaCell 5,0

- 5,0t
- Stainless Steel
- Fully tool free
- Smooth design

Smart Pin

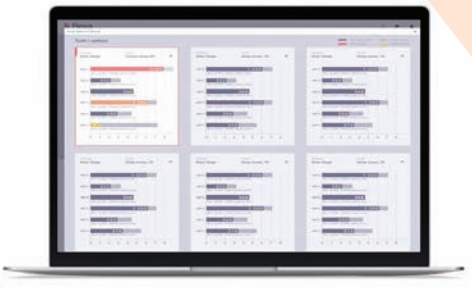
- To measure dynamics of loads at critical points at the base of the towers and in the middle of truss spans
- For engineering purposes

Shackle Load Cell

- 4,7t
- Zincked Steel
- Fully tool free
- Van Beest Shackle

EXE Wireless Load Module

- (Add-on to standard EXE Hoist)
- Anti-tamper Antenna
- Battery operated



Graphic User Interface

- Free download
- Simulation area for self-learning
- Windows 10

Cloud operating – IoT Line

Cloud operating – IoT Line to monitor thousands of points over large areas every 3 minutes
IoT solutions are well established in many areas of our life. The Flexa IoT Line has been designed to collect large amounts of data over large areas. We are now ready with the load cells, but more sensors will be available in the future.

General features

- **Breakout Design - Compact Size - Long Battery Life - Strong Brand Recognition**
- **Long Range : ~500m (with our Load Cells), up to a few kilometers with other sensors**
- **Based on 868MHz (EMEA) or 915MHz (USA, Canada, South America) frequencies**
- **User-friendly, no configuration required (simple drag and drop)**

USB-A Gateway

- **Range covered ~500m**
- **Multiple powering options**
- **RGB LEDs for status info**

DynaCell 0.5

- **500kg**
- **ENAW-2024 T351 aluminium**
- **Fully tool free**
- **Smooth design**

DynaCell 5.0

- **5,0t**
- **Stainless Steel**
- **Fully tool free**
- **Smooth design**

Fully Wireless Repeater

- **Range extension ~600m**
- **Multiple powering options**
- **RGB LEDs for status info**
- **Twin antennas**
- **Free standing or clampable**

LoRaWAN compliance

- **Range covered >1000m**
- **220V AC supply**
- **RGB LEDs for status info**
- **SIM slot and LAN socket**
- **Indoor & Outdoor versions**

Graphic User Interface

- **Free download**
- **Simulation area for self-learning**
- **Windows 10**

Flying LED Wall

LED Wall solutions allow users to quickly and easily transistion the same LED wall from being used as a vertical wall to a horizontal ceiling using the same components. The wall is assembled on a wheeled cart that is able to be moved. Integrated rigging points in the framing system allow the wall to be lifted off the carts and used as a flying system.

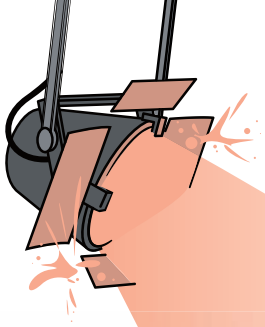
- **Users can assemble an LED wall that can be used in a vertical or horizontal application.**
- **Rolling Cart allows users to place the LED wall as needed.**
- **Quick connections to go from vertical to horizontal use.**
- **Rigging Points included to fly the wall.**

TOMCAT Ultimate Hinge, angles in creative lighting

Our new, Light Duty 12 x 12 Ultimate Hinge provides interesting angles for creative lighting setups on your lower capacity support structures. Its hybrid design of aluminum and steel components provides a low self-weight compared to existing load bearing hinges that are often constructed completely from steel

Compact Strength in a new duty category -Middle!

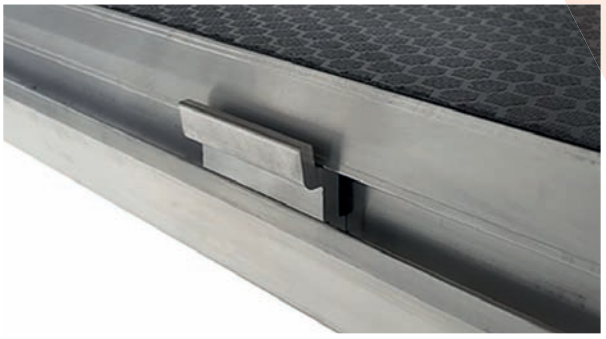
Discover the strength of our 16 x 16 Middle Duty truss, which is a new truck-pack-friendly truss size that delivers over a 50% increase in load capacity compared to our existing Light Duty 12 x 12 spigoted truss, but in a considerably smaller form factor than our Medium Duty 20.5 x 20.5 truss. In fact, you can fit over twice as many Middle Duty truss sections in the same truck space compared to our 20.5 x 20.5 truss.



Xstage S10

Xstage S10= 33 kg + 750kg/m²

Xstage S10 stage decks add up to a great choice with their newly designed, lightweight extruded aluminium profile that helps reduce the overall weight of the deck to only 33kg, while maintaining a high loading capacity of 750kg/m²! The S10 also features a universal leg securing system that accepts a wide range of round and square legs. It also fully complies with DIN 15921.



LEG Saver

Using the new Xstage Leg Saver saves you both time and money when constructing the Xstage S10 stage...
As the name suggests, the Leg Saver gives you the opportunity to reduce the number of legs used in the construction of the stage. Despite the reduction in the number of legs, the deck is still capable of supporting a more than respectable load of 350kg/m2 at a stage height of up to 1m.

The main advantages of the Leg Saver are as follows:
- **Reduction in the number of legs**
- **Speeds up the installation and disassembly of the stage**
- **Lower transport and storage costs**

Textile Lath

Use the Xstage Textile lath profile to neatly attach any fabric to the Xstage S10 podium. It also works superbly with your advertising banners and infills.
The Xstage Textile lath is available in a length of 970mm. The package also includes Velcro for a neat and tidy finish. (fabric not included with profile)

New positions

Pieter Van De Velde

Area Four Industries
Sales Team Leader

What was your first working experience?
My first steps in the business of entertainment was in 2001 when I started work as a sales guy for a DJ/PA & theatre store. Here I first came in contact with the aluminium structures called Trusses.

What is your current position?
In Area Four Industries I have taken on the role of Sales Team Leader, due to my many years in the business and knowledge of positions starting at the very bottom. I know very well what each job requires, what good and bad habits are, and how we can grow in a secure way.

Has the company culture changed since you started?
Because this is an international company this group doesn't have one culture, but multiple. As everybody has a personality, so does every country have his/her way to look upon production and sales. They all have their own wishes and desires and a priority list of them. So, it's not to change cultures but to align them.

When was your first contact with Area Four Industries ?
My very first contact with this company, was when my previous employer had bought the sound and light department of the company I was working for at that time. The first conversation was not regarding truss or stages, but of lifts. Even then it took almost 5 years before the connection with Area Four Industries became more solid.

Where do you see the biggest advantage of Area Four Industries?
Area Four Industries is an amazing group of people and knowledge. The largest part where I see the overall strength in is the all-for-one approach. The one guy on the top, who build this group from scratch, has enormous respect from every employee. The sober and hard-working mentality keeps it all in balance.

What do you like the most working for Area Four Industries?
The part that I like the most aren't the products, although I know that they are amazing and from a very high quality. The international environment is what makes me feel at home. I like very much to work with a lot of different cultures and languages. I'm very happy to be able to combine my product, sales, and marketing knowledge in this worldwide group.

Where do you think the company will be in five years?
Area Four Industries is a company with a very steady base and it is growing every year in an organic way. We are already the biggest manufacturer of trusses in the world and by strengthening these ties we can fortify our position. Keeping our position as world leader in our industry is a very heavy task with a huge responsibility.

Eddie Slotboom

Area Four Industries
Product Strategist

First Eddie, what is your current position in the company?
My current position is Product Strategist in the Area Four Industries.

Can you tell us little about yourself?
I joined Prolyte after 20+ years at Stageco. In Stageco I was Managing Director of the Dutch division for 13 years. With the takeover of Prolyte by Area Four Industries I was very pleasantly surprised by the open and constructive conversation I had with Frantisek and Fabio. Down to earth mentality and focusing simply on moving forward.

Can you tell us briefly about your responsibilities?
In this role I manage the Product Managers of each brand, follow the flow of the developments, and help the Product Managers to get it done. Also, to keep an eye on a realistic outcome. Beside this, I also keep an eye on internal Area Four Industries competition focusing mainly on related iconic brand products. In the end, we are all part of Area Four Industries, but with all our brands having their own strategy, market, and product portfolio.

I am also responsible in Prolyte for the projects. This means non-standard larger scale projects and bigger roof systems. This is a very nice combination which fits to the role which I have in Area Four Industries.

What do you like the most working under Area Four Industries?
What I really like about Area Four Industries, and which is a direct advantage, is the multi-cultural surroundings. It is not only on a company level with your colleagues all over the world, but also the client base which is very diverse. In my role the advantage is to keep the brand identity but also take the group values and strengths in consideration.

What can we look forward to from Area Four Industries in the future?
I see the future of Area Four Industries as being very positive. The brands in Area Four Industries are all very strong brands with a very loyal customer base and a great team of colleagues. My goal is to have a realistic flow of new products entering the different brands and having challenging projects with the different teams, and ending up with happy customers who keep on smiling.

Will Todd

CEO Area Four Industries America + TOMCAT/JTE

How long have you been working at TOMCAT?
I started in May of 2000. So nearly 22 years now.

What kind of jobs have you worked on at TOMCAT?
I began in Sales covering the central region of the US, then moved to Project Manager, followed by Product Support Supervisor, then Design Manager, then COO and now President/CEO.

What do you like best about TOMCAT?
The best part about TOMCAT is the relationships we forge in the industry and within our own building. We strive to create relationships that are more than partnerships with our customers. If our customers are successful, then we are in turn. Within our building, we all work together towards our goals.

Where do you see the biggest advantage of Area Four Industries America?
The wide variety of products under the Area Four umbrella really puts Area Four in a great position to give customers the most options when it comes to covering their needs.

As the new CEO of TOMCAT and Area Four Industries America, what are your main goals?
Continued growth of the brands is the main goal. Maintaining TOMCAT's position as the 'go-to' for both standard products and custom produced products as we continue to innovate based on our customer's needs. For Area Four Industries America, we are going to focus the year on making sure our customers know the wide range of products that are offered here in the USA. Between TOMCAT and Area Four Industries America, we really can cover a wide range of our customer's needs.

Where would you like to see TOMCAT in 5 years?
In 5 years, TOMCAT will continue to be the market leader for the North American market. We will have re-established our presence in Central and South America and grown our product portfolio to maintain our position as the market leader.

And what are the main goals for Area Four Industries for upcoming years?
For Area Four Industries we will focus on brand recognition so our customers know what is available through Area Four Industries. There is so much poor quality imported product being sold in the market that customers are buying - and they may not know there are better options out there.

A4I.tv & Rigging Commandos

Area Four Industries has created The Rigging Commandos, a rigging & trussing team with a mission to "elevate event engineering & safety practices in the entertainment industry through continuous education programmes".

Made up of seven experienced team members, the Rigging Commandos are using their knowledge and practical experience in a series of rigging & trussing videos, which are produced continuously and released on Area Four's video channel A4i.tv.

Members of the Rigging Commandos team were chosen not only for their knowledge and experience in entertainment production, but also for their ability to communicate directly with riggers and technicians, says the company. Thanks to the Rigging Commandos and the A4I.tv, the first dedicated internet television station, Area Four Industries is consolidating its position as a world leader in event engineered support structures and building a large community of professional riggers from around the world. At the same time it fulfils one of its key pillars, namely the continuing education of people working in this field.

Siobhan Colleen

When did you think you were going to be a rigger?
There's always so much bustle at the ground level of an arena, that I simply never realized that actual people walk those beams dozens of feet above the cold concrete floor. One fateful day, after a year of stagehand work, I noticed those ropes dropping and pulling motor chains. That was the moment I thought, "Wow, that looks scary. I want to walk up there one day." I was a freshman at CSUF at the time.

What do you enjoy most about it?
Our entire industry is amazing. What I love most is the ability to live through once-in-a-lifetime experiences that give me a fulfilling sense of adventure. Like, I got to work at an active volcano for a live broadcast! No matter what team or project I'm on, bringing events and entertainment to life is thrilling!
You've been involved in rigger safety for a long time. What does your job entail?
To one extent, I am responsible for the physical safety of myself and others. Riggers need to wear protective equipment, use fall protection properly, understand the proper use and limitations of rigging gear, be able to conduct rescue operations, and recognize when they need to take breaks to eliminate the risk of overexertion. Safety isn't just physical. Safety is psychological. My job, no matter where I am, is to provide that psychologically safe environment by defusing tense situations, encouraging a positive safety culture, and educating myself on how to recognize abuse, sexual assault/harassment, toxic behavior, and more.

Do women have it harder in the rigger world?
Women are capable. Rigging itself is not more difficult for women. When things get too heavy, guess what? We use mechanical advantage. In other words, we rig! Now let's play a game. Imagine someone getting emotional at work. Was it a woman? Imagine a powerful leader. Was it a man?
Implicit gender bias affects everyone and it is a major contributor to the barriers that women face when trying to enter a male-populated industry. Harmful stereotypes affect children as young as 5 and are continually reinforced through childhood and well into adulthood. That's one reason why not as many girls join skilled trades like entertainment rigging. And if when asked to think of a strong rigger to fill a call you first think of a buff guy, then that makes it difficult for women in rigging to receive the recognition, opportunity, and promotion they deserve.

How did you get involved with Area Four Industries?
Storytime. I strongly value education. Education saves lives. One day while up rigging, my team kept receiving baskets tied to the wrong shackle. Not only does that slow us down, but it creates a hazard because now there are more pieces of loose hardware that we have to handle (not the case if you get to work with cool baskets that use self-locking hooks). After load-in I made a 90-second video teaching the Pin-Rope-Steel-Shackle method of tying to a rock'n'roll basket. Fabio Prada (Area Four's sales and marketing director) saw the video on LinkedIn and the rest is HERstory.

You're launching a new line of EXE Technology chain hoists and controllers. What are you most excited about?
Integration. Integration is my new favorite word. The One-For-All product line of hoists and controllers is designed to integrate within existing rigging systems. That coupled with their robustness makes them versatile and cost-effective. I also have to extend my love to the EXE Data Logger (formerly the EXE Technology Black Box). As someone who is very excited to study computer science, I see massive potential for analyzing hoist lifespan and making data-driven improvements to products and operations processes with that device. The future of the EXE Technology brand is exciting. What you see today is merely the tip of the iceberg.

Milos. Works better.

Inspecting a Connecting Weld

In order to guarantee the very highest quality of MILOS welded products, we take the greatest care to test our products to optimize safe usage.
Metallographic inspection is a very commonly used to complement mechanical property tests in the verification of welded joints. According to the magnification used, metallographic tests are divided into macroscopic and microscopic tests. The tests can be carried out by acid etching, and are used in the detection of the macroscopic or microscopic characteristics of the weld joint.
Macroscopic inspection is carried out by a visual inspection with the naked eye, or with the assistance of a small optical magnification. The inspection is carried out on a test sample taken transversely on the weld line (cross section), which includes the welded metal, the heat-affected zone (HAZ), and the base material.
In the welded joints, macroscopic control offers the basic quality check of the weld. After polishing and etching, the surface of the sample allows an assessment of the quality of the joint (presence of defects), the shape of the weld, the method of laying the weld layers, the connection of individual weld beads, the dilution of the weld metal with the base, and finally the shape and extent of the heat-affected zone.

Milos. Works better.

Powder Coating Adhesion Grid Test

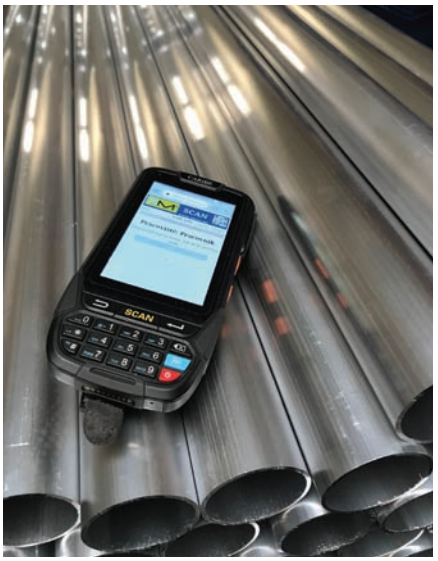
At MILOS we pay particular attention to checking all painted structures thoroughly before sending them to the client.
Firstly, we always use the highest quality and most adhesive paint. Secondly, MILOS subjects every manufactured piece we produce to the so-called **Grid Adhesion Test**.
Fundamentally, the essence of the test is to engrave six horizontal and vertical cuts through the colour to the base material. The spacing of each individual cut is precisely controlled by the thickness of the coating (up to a maximum of 100 µm) and the specific material used.
Through these cuts a special film is then glued. How well the paint adheres to the surface will obviously determine whether any structure will be sent to the customer.
If the paint peels or shows any sign of damage after testing, then MILOS guarantees that the structure will never be sent to any client.

Quality Management of Metallurgical Material Supplies

QR code scanning is another safeguard in guaranteeing the high quality of MILOS structures, and provides a comprehensive visual account of the metallurgical materials supplied by our reputable suppliers. The use of QR code scanning technology enables a quick overview and response to possible defects, as well as the prevention of any re-currence of any such defects.
The metallurgical material for the production of MILOS structures undergoes a detailed inspection relating to possible defects. Every worker in the relevant workplace is knowledgeable in the methodology of assessing quality. The data collection process is carried out by fully trained specialists. The check has several phases:
After unpacking the materials, a careful visual inspection is performed. If any defects are found, the designated specialist begins the process of recording all necessary formalities:

- **Vendor**
- **Material type**
- **Defect detected /description of the defect**
- **Packaging/delivery**

This recording is done by scanning the QR code that is assigned to each supplier, the type of material used, and the defects. Another step implemented is photo documentation of the defect and the identification of the manufacturer in real time. By scanning, the data is immediately transferred to our database with which the quality and purchasing management subsequently works and systematically evaluates.
The whole MM supply quality management process is one of the first parts of the MM supply control chain, and we are implementing it to ensure transparency and efficiency in unifying the quality view shared between MILOS and its suppliers.



Milos. Works better.

Steel welding

MILOS uses ultra-high-strength steel (UHSS) for the production of selected MILOS steel products.
Due to its high strength and toughness, UHSS is widely used in the automotive, mining, crane, and other highly specialized industries. The continuing development of UHSS makes it possible to design lighter and stronger structures for the most demanding conditions. The preparation process for the actual welding is very important for high-quality and accurate welding. It goes without saying that the steel must be properly cleaned before the actual welding takes place. Additionally, the whole surface of the product needs to be treated so that the protective layer meets the strictest criteria for the life of the surface treatment.
Ambient temperature and surface treatment thus play an essential role in the welding process. The thickness of the welded material has an enormous impact on the welding itself. Thicker materials require multi-layer welding, which guarantees a solid connection of the welded components. Our highly qualified and skilled welders, who have successfully completed the full range of training necessary to produce work of such precision and expertise, weld MILOS steel structures using the MIG/MAG method. Thanks to our emplaced processes, production, and control mechanisms, we offer high-quality MILOS steel structures that meet the strictest criteria demanded by the current market trends and industry standards.

Milos. Works better.

Marek Žubor

Milos Brand Manager

Marek briefly gives us some insight about himself, then moves on to reveal the true power of steel. We also discuss the needs of giant events.

Marek, firstly tell us how long have you worked at MILOS?
I have been happily working for MILOS since summer 2004

Why did you choose to work at MILOS?
After mandatory military service, I first applied for the position of designer at Milos, but it was occupied already, so I found a job in another engineering company and after a year I was invited by Frantisek Zykan to join the company because of the expansion of the team. I did not hesitate, Working in the company related to entertainment industry with amassive growth potential attracted me.

Can you tell us about any development with MILOS over this time?
I am really glad you asked. We managed to finish another important project involving steel towers. For some time we were making improvements and developments on the production of the next type of steel towers. For example the steel tower S-MT-P is constructed with special, ultra-high-strength steel, which is the same as our steel truss range. That provides massive loading capacity of up to 30,000kg and reaches amazing heights of up to 20 metres. This makes it a good choice for massive size events where aluminium isn't enough.

Can you tell us about the needs of larger events?
The worldwide market for events is becoming larger every year as artists depend again more on the income via concerts - not to mention electronic dance music as a real upcoming force in live events. This market requires higher loads as well as taller structures.
Through the use of very special steel alloys, MILOS has developed steel truss and towers. These steel trusses are able to handle an average of 2,5x more load at just double the weight compared to aluminium system with the same dimensions and under the same deflection. We are producing these steel truss elements under TUV monitoring and according to EN 1090-2 exe3.

How do customers see the steel based products?
The steel truss line from MILOS is appreciated and valued by both customers and industry professionals alike. In fact, MILOS is the only truss manufacturer in the world that has ultra- high-strength steel truss line as part of its standard offering. With the introduction of the steel truss line from MILOS, the most demanding events in live entertainment have met their match.

What are the plans for MILOS in 2022?
We'll continue developing and, of course, delivering high quality products to our many customers around the world. It seems that the world is getting back to its old ways and the entertainment business with it.

Special use of Litec QX-30 trusses: an aerial platform towards the audience

Litec Truss & EXE Technology

A combination of skills and experience

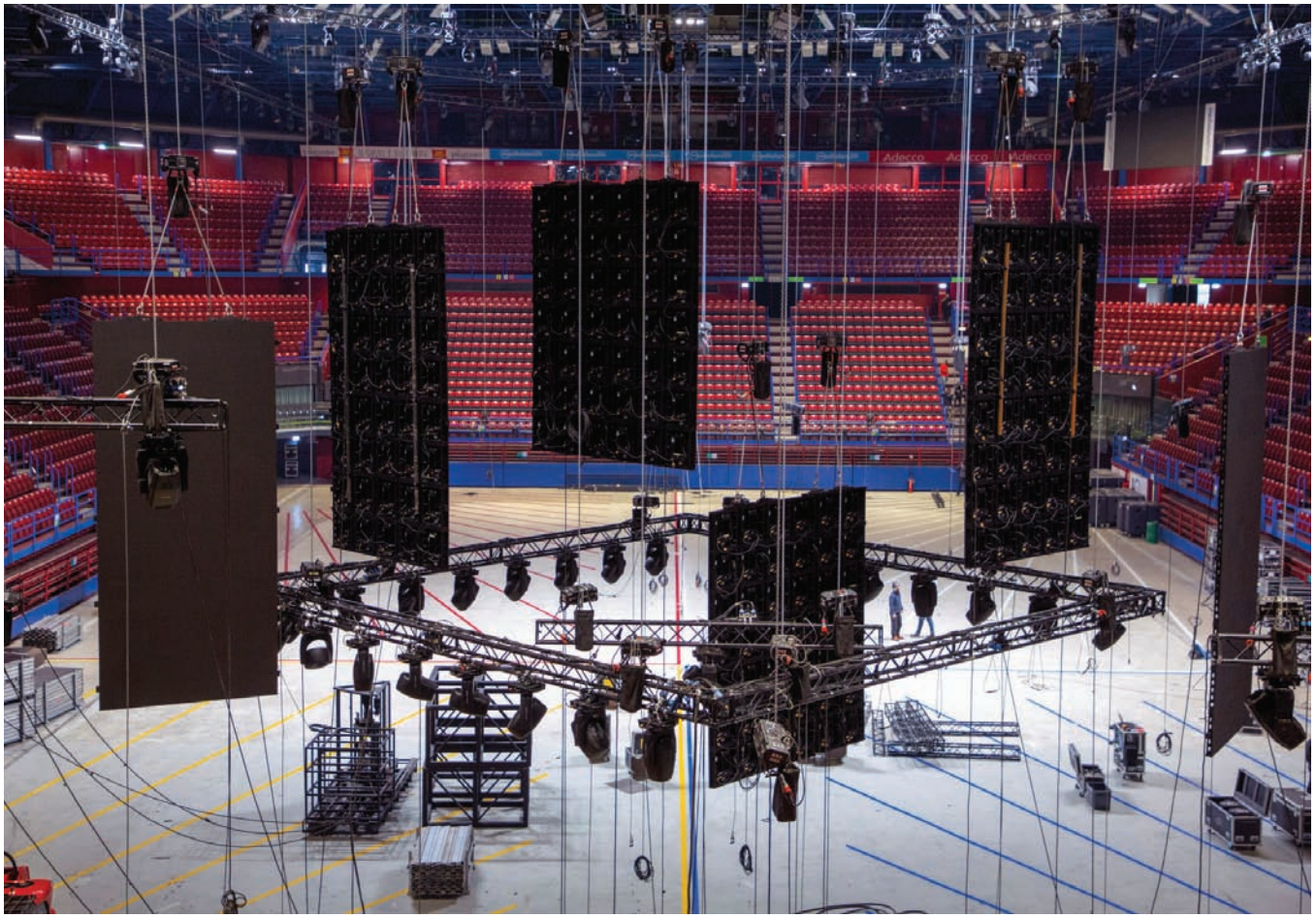
The **X-Factor Italia** edition finally took place last December 2021. The fifteenth edition ended with the grand finale aired on Sky Italia, live from the Mediolanum Forum in Milan. An exciting final, having been the first with the arena full after two years with a greatly reduced capacity due to the restrictions for Covid-19.
„We built a castle in three days: an operation that is not so common, in Italy and in the world". This is how Ivan Pierri, DOP and light designer of the show, summarizes the work done at the Mediolanum Forum.
A large television studio created by the specialists of **AMG Show Evolution**, divided into teams, who lived in the building 24 hours a day, working with perseverance and professionalism on one of the most successful television talent shows in Italy.
AMG is a full-service company that has been operating for years in the world of cinema, TV, concerts, and events in general. It is one of the leading companies in this industry and now boasts over 50 years of activity in Italy. AMG is use to work with planners and designers and collaborates from the very beginning in the drafting of the technological needs of the events. In addition to the supply of structures and the hoist system, AMG also supplies other technologies related to the show: Lighting,

Audio, Video, Camera with Light & Grip and Generator Sets.
For the structural set-up of this edition of this Top-Show, the following were used:
More than 800 meters of Litec **QX30 trusses** in various sizes and 190 **Hoist EXE Rise of 250**, **500** and **1000kg**. All hoists powered by EXE Drive DL 8 and DL 16 controllers. To complete, a series of pendant pushbutton with various channels.
Litec QX-30 trusses were used for ceiling beams, for stage sets and for an elevated stage area towards the audience. The Litec QX-30 truss is the most popular product in Italy and has long been a very familiar among users, riggers and rental companies.
A4l Italia has been collaborating with AMG Show Evolution for years both for the supply of standard products and for creating solutions on request that, more and more often, the world of events is asking for.

View of the first set-up floor level

The Final Set-up

The show. X-Factor Italia, Dec. 2021



EXE Rise and Litec truss, the lifting of the centre ceiling.

Carlo Ughelini

Litec Product strategist

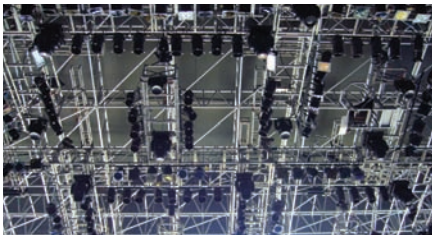
First Carlo, can you tell us briefly when did you start working for LITEC?
The first time I starded working with Litec was in 2009.
During my studies I started working like a stage hands during concerts and festivals. I always loved live music and helping building stages for concerts was the perfect compromise to combine my passion and a part time work.
I was fascinated from the Entertainment Industries and I wanted to see what happens before the "back stage"!
During this period, I started knowing some trusses' brands, one of this was Litec. I investigated about this brand searching for it in internet. After my bachelor's degree in mechanical engineering I sent the request to do a training period in the R&D office in Litec. Litec gave me this opportunity and so started the story…

Can you tell us about your experience in the entertainment industry?
After this training period in Litec I continued studying for the master's degree in mechanical engineering. In the meanwhile, I worked in different sectors of the Italian Entertainment Business as designer for structures and machines in the professional entertainment business.

What is a typical day for you? What issues are you normaly dealing during day as Product strategist?
Hopefully there is no a standard day at work. I like to see new things and try to solve new challenges every day.
Usually in the R&D office we try to balance the normal day to day business -i.e. quotations and configurations with standard material-, with the development of some special requests for custom projects.
From the custom projects or from the strangest requests we take the inspiration to develop new ideas and new products.

Can you tell us which product do you consider the most interesting?
After two year of pandemic is very difficult to understand what the market demand will be in the next months. There are still too many uncertainties. We are receiving all kind of requests: from small structures for private events to big structures for concerts with 50000 people of audience.
The only certainty is we are ready for every kind of solution the customers require!

What are your plans fot LITEC this this year?
In our new product portfolio we have a lot of very good ideas. In particular we are improving the already existing range of products in order to provide to the professional users the newer and the best performing products in accordance with the new regulations.



Gianluca Ferrari

EXE TECHNOLOGY

You are the Automation Manager for EXE Technology. Can you tell us a little about the brand for people who may not be familiar with it?
EXE Technology is a brand created by LITEC. The impetus for creating this brand came when the entertainment industry expressed a need for high quality load handling products. We currently offer a wide range of fixed and variable speed electric chain hoists, controller, and wired and wireless load cells. We also have a special DST (Dynamic Stack Tracks) System that allows for the horizontal movement of loads for achieving more creative scenic effects.

Movement of LED walls is currently a popular trend in our industry. Are you seeing a growing demand in this direction?
We have surely witnessed an exponential growth in LED tiles. They've become cheaper and smaller, but with more resolution than we could ever imagine. This brought a wider use of LED screens in the entertainment industry, and we've done our part in supporting this revolution. We developed the DST System, and made it possible for everyone to have a motorized, controllable, precise and heavy load bearing platform to move their LED walls. Opening an LED wall, splitting it into separate spinning panels, and moving it around with precision is now a piece of cake!

What has been the biggest challenge for EXE Technology in the past year?
Buyers in our market are interested in the design, functionality, safety and reliability of products, but they are also sentimental about products they've chosen in the past and like to keep the same brand in their stock. Building up recognition of our brand has been a long road, but when given the chance, we have proven that our products offer an excellent range of solutions. I'd say overcoming this challenge has been our biggest reward. The high quality and impressive performance of our products have successfully convinced many of our competitors' customers to come over to EXE.

Some EXE Technology products need automation to function properly. Which one do you use?
From the start, we have collaborated with Kinesys to automate our entire range of variable speed chain hoists and DST System. We have also collaborated with other system integrators around the world to make their project come true. As a manufacturer, we always strive to help our customers find the best solution. If they have a preferred automation system, or already own one, we work together and we find a way to fullfill the customer's needs.

What customer service do you offer, along with the products themselves?
We have a technical office that assists our customers in bringing their ideas to life, from the project stage to training, and day-to-day assistance. We do our best to find the proper solution for their next project, and are always there to help after the purchase should any problem arise.

How does the future look for EXE Technology products? What plans do EXE have for the near future?
Our foucs is to offer products which are safe and easy to use, updated with the current safety standard and ready to answer the market needs. We are now working on a revised range of motor and controller to be the swiss-tool every technician can rely on. More info on the upcoming expos!

FLEXA

The load on the cloud

Flexa Sensors has completed the development and testing phase of its load cell IoT line.

This line was born mainly to manage large quantities of sensors distributed in relatively large areas. Sensors are „nodes" that read and transmit the parameters of a device. The first series of „nodes" developed by Flexa are the load cells, but other types of sensors will join in the future to parameterize other values: air quality, acoustic pressure, crowd flow management, people counters and many others.
Here we are talking about an installation made by Fair Engineering to monitor some stand's structures in a fair event in Verona (Italy).
Fair engineering is an engineering company specializing in consulting and technical design in the exhibition and entertainment industry. This company focuses on the use of innovative technologies for the development of projects with important Italian fairs. Consequently, it is natural for A4I Italia to have Fair Engineering as a reference for the distribution of the Flexa Sensors IoT line in Italy.

Why are load cells needed at the fair and why do we use an Internet of Things platform?

Hanging large structures from trade fair ceilings has been an established trend for many years. Almost all exhibition centres set load limitations for each individual ceiling hanging point. It is clear that if there is no load sensor, no one is able to define exactly how much weight is attached to each single point. Wireless load cells are the simplest and most precise answer to this need.
In an exhibition hall there can therefore be many "nodes" that read the applied load. They can be hundreds, even thousands. And they must be read by several devices, even at the same time. Only robust and well-proven transmission networks can perform this task. The Flexa IoT series is based on the **LoRaWAN** platform, a worldwide connectivity solution. LoRaWAN uses Sub-1GHz frequencies (868MHz for Europe). From the very beginning, Flexa's choice was to use frequencies other than those used for Wi-Fi and Bluetooth which, notoriously, are very clogged during events.
Fair Engineering monitored 6 stands located in 2 halls, distributing 95 cells connected to 2 gateways with SIM card for full autonomy in data management. The Gateways are also equipped with a LAN connection if the exhibition centre makes its local area network available.
The connection between the cells and the Gateways takes place automatically.
The operation diagram is as shown here.

Each cell transmits its data to the nearest gateway which sends it directly to the cloud via the Internet. Those who have the credentials to log into the Flexa portal can access the information defined by their log-in status. The portal can be reached from a browser or from an app, for mobile devices. The portal allows different levels of permissions. For example, the installer can check his own

works even if they are located in different cities at the same time. The exhibition centre can see all the stands in its halls. The stand supplier, if authorized, can monitor his own stand data.
For each cell the user sets the over-load and under-load limits. The portal allows you to manually position the cells on a PDF map of a pavilion for a quick identification of any critical points. Each cell that exceeds the load limits is immediately reported within the portal or via email, if required. For each cell, various parameters are reported, including the battery level. Each cell has a unique serial code and the data of the entire life of the cell are stored in the portal and can be recalled for analysis and statistical graphs.
The battery charge is estimated at 7000 hours of operation, about 300 continuous days.
The data is refreshed approximately every 3 minutes. The solution with IoT cells is the most suitable for load management in a trade fair. Transmitting data more frequently would become unmanageable in the case of hundreds of active cells.
Flexa sensors has two lines of wireless load cells. In addition to the IoT, we have the Real-time line, designed for use on stages and Ground Supports where a transmission every second is required.

Giuliano Luvisotto

Gulliano, can you please tell us more about your connection with Flexa Sensors?
The intuition behind Flexa Sensors came from my long-standing goal of adding value to the rigging world. The Flexa Sensors project started 4 years ago and it is the product of hard work and a team effort that extends to our partners developing advanced technologies with us.
The current goals are to refine the existing product line and at the same time develop new devices.

How did Flexa and EXE actually come together?
EXE Technology and Flexa Sensors are different products, which in some cases integrate and in others follow their own development and market paths. Some integrated solutions are already available, such as the Flexa wireless module embedded in some EXE hoists and the wired Dynacell load cell which is exclusively available under the EXE brand and fully compatible with the EXE CELL LC-NLP and LC-PRO lines.

Can you please shortly explain us, how flexa works?
We currently offer two wireless solutions and a wired solution integrated in the EXE ecosystem.
Our wireless portfolio includes two product lines addressing two different needs: the **"Real Time"** line, to continuously control static and dynamic loads, and the **"IoT** (Internet of Things)" line, to monitor large-scale load cell systems over the Cloud.
The "Real Time" line is designed for the rigging world. It allows users to visualize load information for each cell every second on a PC. Each cell is wirelessly connected to a Gateway, which is in turn connected to the PC via cable. The radio coverage between cells and Gateway extends to 500 meters under ideal conditions. The system has also been tested in real events, showing that all practical needs are covered and that the range is more than sufficient even in presence of obstacles.
The "Real Time" line is developed on a proprietary platform and uses the 868MHz / 915MHz frequencies, without any risk of interference with Wi-Fi or Bluetooth networks operating at 2.4GHz.
The "IoT" line was mainly designed to handle many hanging points in exhibition halls. It allows to simultaneously monitor thousands of cells via multiple gateways installed inside or outside the halls. The update frequency of load data is 3 minutes on average. Each cell communicates with the nearest gateway that forwards the data to the Cloud. Data, statistics and alarms can be accessed by any device with an Internet connection.
The "IoT" line is based on the LoRaWAN platform, an increasingly popular international standard for low-power wide-area wireless networks. Also in this case, the transmission frequencies of 868MHz / 915MHz prevent any interference with the multiple Wi-Fi networks typically found in exhibition centers.

What plans Flexa has for the future?
We need to make a disclaimer: our companies core business includes trusses, hoists and controllers . In all these fields safety has the highest priority, in accordance with both our ethical responsibility and government regulations. EXE Technology hoists and their control systems already include advanced safety systems, both mechanical and electronic.
Flexa Sensors will be consistent with this vision as it expands its load cell line and starts exploring other areas in which different kind of sensors can be deployed. Applications like environmental monitoring, weather monitoring, crowd management and many others will provide ever more data to installers and producers of events.
The continuous technological evolution of sensors and communication networks will support us in this mission.

PROLYTE

Actavo Roof

After a long period of uncertainty in the world, especially within the event industry, the Space roof delivery finally took place.
Actavo has been an active user of Prolyte products for a very long time. In addition to various trusses and a large stock of barriers, Actavo has had a Prolyte Tunnel roof for a long time already.
Now with the latest investment in the Space roof, Actavo is able to set the next steps in the upcoming events, festivals and shows in Ireland.
The Space roof delivered to Actavo consists of four C52T towers with a coverage area of 26 x 16m and a clearance of 10m. By making optimal use of the aluminum keder profiles, a tech area of 4,14m deep has been created over the full width and depth, both backstage and sidestage. The roof is modular and can be built in several sizes, and with the investment made at this moment, possible further expansion of the roof was also taken into consideration.
The Space roof gives designers and riggers unprecedented possibilities, with an option to make a rigging point on every square meter. In addition, the roof structure with the Space frames lends itself to walk in, which makes working in this roof safe and easy.
The loading capacity is a massive 17 tonnes distributed in the roof and another 4 tonnes for the load of the PA.
Although the training and first build would usually take place on a location from either the customer or at the Prolyte premises, the Space roof was delivered immediately for a first event. The training, given by professional Prolyte trainers, was also a physical load-in for the roof. The first user, the Belsonic festival in Belfast, had made the site available a week earlier so that the Actavo team could be properly trained.
With the Space roof, Actavo is ready for the future!
„We are very happy and satisfied that we were able to make such a great product in still such insecure times. With this roof, Actvao is ready for the future and we are there to support them!"- Eddie Slotboom

PROLYFT

Prolyft is the hoist range which completes the portfolio of Prolyte. Prolyte is the first truss supplier with its own hoist brand. The hoist development is a continuous process. The Prolyft hoist is a reliable and robust hoist. It is fully utilised in Prolyte roof systems, rigging towers and multiple other in- and outdoor solutions. Prolyft is loved by many riggers because of its simplicity and user friendliness. With the unique and fully upgraded database, where all hoists are registered, the yearly certification and

maintenance is easy recordable. From the outside, the same look and feel remained. The technical components in the hoist evolved with the latest available techniques and the general requirements as described in the EN17206 standard.

Unique features:
The Prolyft hoist stands out with its black chain, iconic characteristics, and trusted look and feel. Standard on the low voltage and the direct control is the unique outside limit switch which makes it very easy to set limits on their rig positions. The TAG, which is on the hoist, is the link to the unique and completely upgraded Prolyft database where the complete log of the hoist is saved. When certifying the hoist on a yearly basis, we guarantee a lifetime warrantee. Our unique worldwide network of Service Points makes yearly certifying locally available, quick and easy.

William Voskuil

Sales Director EMEA and LATAM

How long have you been at Prolyte?
I have been working for Prolyte for almost 15 years now, since 2007. I Started in the Sales Department when the warehouse & production was still located in the Netherlands.

After a few years I found the challenge in becoming Brand Manager for the StageDex brand. Extending the product range, giving trainings for our customers worldwide, I have enjoyed this position for 2 years.
In 2012 I had the opportunity to return to the „commercial" side of the company, heading the Sales Department. Until today, this is what I enjoy most.
One of the greatest assets of Prolyte is the team and the network. To be able to be part of this makes me proud, and with the new setup of Prolyte, as part of A4I, we will get customer satisfaction back to where it belongs - at the top of the entertainment industry!

How do you look back at the last two years?
Well, it has been a turbulent time with a lot of challenges. We have made a lot of progress in the right setup within A4I and we have great and supportive colleagues. The result is a great and growing team. I am proud looking back at where we come from and where we are today. I feel confident we are nearing a better time where we can all celebrate what we love most - supplying great solutions to our wonderful entertainment industry.

What are Prolyte's current plans?
Our main focus is continuing to support our existing network and the expansion of our network. All the factories are in full speed, and are doing an amazing job in this difficult and challenging period. Our own team here in the Netherlands has been extended over the last months, and we are at a level that we feel comfortable in providing the optimum support, while maintaining a lean philosophy.

What do you think makes Prolyte unique?
Over the last 30 years, one of our unique strengths is our network. By working together, we have always managed to serve our users in the best possible way. Our view on safety, education and service-oriented market approach are key strengths we are proud off!

What is one of the most rewarding moments you had with Prolyte?
I have been working for Prolyte for 15 years now. It's hard to mention only one rewarding moment. If you ask me to pick my most rewarding moments, it is seeing our partners. At shows, at our yearly partner days, locally on a visit. It is something, we have all seen over the last two (COVID) years, and which cannot be taken for granted. But these moments are the most rewarding. It is where professional friendships and loyalty take shape, where foundations and partnerships are forged.

For our new customers, what advice can you give them?
Do good research. We all know price plays a part in the buying decision. However, we also see that local availability, local support, support from the manufacturer, engineering, and a service orientated approach plays a big part in the growth for companies.

TOMCAT

TOMCAT now able to aid customers with their inventory management

Over in Knoxville, TN, and Thousand Oaks, CA, the introduction of bar code scanners has helped immensely with our efficiency. Products are scanned every step of the way, from our welding bays, through to product being loaded onto a truck for shipping to our customers. This new process allows easy traceability of all products, eliminates errors, and allows our production and sales team to quickly check on an order status. An added benefit to this new process is that TOMCAT can now offer the ability to add customers own inventory control ID's to products prior to shipment from our factory. Thanks to TOMCAT's new system, customers own identifiers can be cross referenced against our own serial numbers in the online portal, helping many of our larger customers with their inventory management, before product has even left our facility. In the past customers have had to ship to a centralized facility for the allocation of ID numbers etc., this new process has allowed customers to skip that step, and we are now shipping directly to individual venues and local warehouses.

Adrian Forbes-Black

Vice President of Sales and Marketing

You are responsible for the sales and marketing activities for two big American brands - TOMCAT and JTE. Can you tell us how these brands coexist peacefully on the market?
Well both brands are highly established in the U.S. with JTE first having a presence in the American market as far back as 1982 and TOMCAT started operations in the US in 1987. Therefore, as you can imagine, the customer base and product portfolios are very well developed with both brands having literally hundreds of thousands of sections of truss in operation throughout the U.S. However, from my point of view the good news is that the two customer bases were somewhat diversified, and the majority of their most popular products were different, which has made it easier to ensure that we can maintain their core DNA alongside each other without causing confusion. If a customer calls us and specifically asks us for a JTE or a TOMCAT product, for whatever reason, then obviously we can quote them for what they ask for, alternatively if they give us a brief then we will choose the right product from either of the brands that best suits their requirements and application. Our sales team is not split between TOMCAT or JTE, so again the salesperson will choose whatever is right for the customer, not necessarily for them.

What's new in the US event and entertainment market? Are there any trends you can tell us about?
Obviously 2021 and 2020 were "anomaly" years however prior to that 2019 was a big year for us on custom projects. The custom work can often be quite cyclic and for some reason a number of very large projects all happened at relatively the same time that year. That was great for business but it sure made it fun for our production team, juggling two or three pretty complex builds pretty much all year long on and off! In 2019 we also launched a number of new standard products including a new size of truss, our 16" x 16" Middle Duty, and the reaction was extremely positive with some pretty massive orders having been shipped since. For 2022 we expect another big year for our custom fabrication business as all the projects that were paused during COVID come back to life. We also have a full slate of new products that we developed during the pandemic that we hope to officially launch during the next twelve months or so.

TOMCAT and JTE opened their offices on the west coast of the United States, just outside Los Angeles. They are now located on both the east and west coast. How is this working out?
I'm physically based out of the California location, so I'm probably a little biased, however I think that if you asked anyone in the organization, they would recognize the additional benefits that the new facility has brought to the table. Prior to COVID between both the Knoxville and Los Angeles locations we literally had thousands of sections of standard truss in stock and although the recent massive increase in product demand has reduce that stock considerably, we are currently working as fast as we can to get those levels back in stock at both locations. As we know time is money so if we can reduce shipping times to get that truss into the customer's hands then it gives us a competitive advantage. We can now get truss to just about any major city in the United States within two days without using an expedited freight service and this fact has been embraced by our customers and is manifesting itself in increased sales to both new and existing folks.

Education is a key element for Area Four Industries. How is that reflected by TOMCAT and JTE in the United States?
In early 2019 we were really excited to hold our first TOMCAT U customer training event at the new Californian office. That office has a dedicated training room, allowing us to teach over forty people at a time in a purpose-built facility. This first event was a complete sell out and as the pandemic hopefully comes to an end we now intend to offer regular training events again on relevant subjects, such as truss inspection, for both brands, using this massive resource. We work in a potentially very dangerous industry, so education in order to improve safety is a very important focus for us now and looking forward into the future. Assuming that the health situation allows then we expect to hold TOMCAT U in early 2023 in California once again.

Xstage

Lukas Tuzar

Brand manager, Xstage

Within this brief interview with Lukas he tells us little about his responsibilities as Xstage manager

From the start, tell us how long have you worked at Milos?
I have been working at Milos since 2018

Can you tell us little about your responsibilities?
As a Brand Manager for Xstage i am responsible for all activities related to the Xstage brand and their products. This mainly includes the introduction of new products on the market, product promotion, customer service, and many other activities that are related.
In addition, what is very important is to gather and analyze customers feedback for assisting in the continuous development and improvement of our product line so we keep up with current trends.

Have you realized any interesting project in the past year?
As we all know, pandemic has made the situation quite challenging and difficult, so instead of dedicated projects, our customers required basic products for their stocks, in order to be ready once Covid restrictions would be cancelled. Thats why we started to focus more on production, innovation and improving our capacity. The modernization of the product line was also present.

What modernization have you made?
Precisely, we improved our handling process during assembly by new vacuum manipulator. Our workers are much quicker and it is less physically demanding.

You've worked at Xstage for some time. Do you see the customer needs changing as time goes on, or do these needs remain the same?
There are some changes. Customers expect much faster picking options and are more prone to product delivery time and still need to keep the goods on hand. That's why we innovate to improve our warehouse and capacities. Of course, the requirements for special and non-traditional projects is slightly increasing as the world gets back to its old ways.

What can we look forward to from Xstage in the future?
Product offerings are complete at this moment so we are focusing more on improving our current existing products based on feedback from our customers. Finally we add accessories like leg savers, textile lathes, etc.

Technical Corner

Manuals
Norbert Tripp

Technical Director of Area Four Industries

How does a good product differ from any other? The short answer is primarily quality, therefore guaranteeing a high standard of safety. But for Area Four Industries, the concept of quality does not stop with the production of a flawless product, but also refers to high-quality technical documentation. We spoke with Dipl.Ing, Norbert Tripp, Technical Director of Area Four Industries, about the revision of technical manuals within the Area Four Industries Group.

Norbert, what was the reasoning behind revising the existing manuals?
There were a number of different reasons. High-level customer support is an important part of our activities. Therefore, it became obvious that this should be reflected in all the documentation related to our products. The old manuals, which were created many years ago, were no longer up-to-date and were certainly not as professional as we would have liked. We also decided to standardize the manuals across all of our brands to enable the quick and easy creation of new manuals in the future. Finally, we also wanted to stand out from our competitors. In my opinion, a high-quality technical manual is a sure sign of a high-quality product.

And what were the steps involved in creating these manuals?
In order to meet the high expectations we had set ourselves for the manuals, we cooperated with a Finnish company that specializes in creating user manuals and other technical documentation. Since then, we have had a team of 8-9 people working on the project across all brands. It has proved a very large-scale project. We have invested several hundred working hours to realize our vision.
We began with the user manuals of a truss belonging to one specific brand and used this as a template for the other brands. The resulting document, the first part of which deals with concerns related to trusses of all types, runs to 36 pages. This includes, for example, an explanatory list of technical terms, as well as instructions for the safe use of trusses including slinging methods. It also includes instructions for maintenance and definitions of the discard criteria.
In addition to these documents on the basic requirements of all trusses, further manuals have been developed which refer individually to the different truss types. Therefore we differ into the general truss manual part 1 and the individual manuals called part 2.

It sounds like a lot of hard work. What challenges did it pose?
Oh, there were several challenges. At first, we had to find a suitable linguistic style to convey information in a factually correct and clear way. To quote just one example: In order to describe the careful use of trusses, an older manual says: "Treat it like a lady." It is obvious that this description leaves a lot of room for interpretation!
In addition, there were many interesting internal discussions. One of these concerned creating uniform parameters to define the discard criteria of trusses for all brands that should be practical and not overly restrictive. One can perhaps imagine the different considerations arising from the sheer diversity of the products, the situation regarding local markets, and user behaviour. Ultimately, however, we have defined the discard criteria in a way that we think will meet everybody's needs.

So far, we have spoken only about trusses. But the product range includes much more. What about the rest?
Of course, there is a lot more. We started with the Truss Manuals as it is the most basic product. Then we shifted our attention to smaller products consisting of several components such as a lifting bracket or the Ultimate Hinge. Then we moved on to stage platforms. But it became really complex when a manual of large structures such as a complete roof structure was created.

It sounds as if manuals for the entire range has now been prepared?
Unfortunately, not. We are still a long way from reaching completion. We have now finalized the manuals for different individual product types and brands, and these can be used as blueprints for other manuals. But we are still far from having the full product range documented, and even less so for all the brands. There is a lot to do in the future. However, our customers can look forward to a constantly expanding library of high-quality manuals that for us are a hallmark of high-quality products.

PROLYTE
Feel. Fantastic.

Structural report

Eric Laanstra

Which question is asked most on a weekly base?
One of the most asked questions is when and why a structural report is needed, because Prolyte has loading tables available. Can loading tables be used for calculation for 2D or 3D truss structures.

What is actually a structural report?
Well in short, Structural calculation is carried out to prove if a truss or truss structure is stable and has sufficient load bearing capacity. All Prolyte truss series are proven by individual structural calculation resulting in the loading tables of single span trusses (truss span with supports at both ends) with the maximum allowable loading and the design internal forces of the truss and its components.
The structural calculation of a structure gives the user information about the maximum allowable loading a structure can handle in different load cases, ballast values which needs to applied (where applicable), calculations in depth. It's the outcome for a safe use of your equipment which prevents overload and dangerous situations.

When can I not use the loading tables anymore?
As soon as it comes to multiple-span trusses or truss structures the published loading tables are no longer applicable, they just can be used as an indication when following our rules of thumb for the assessment of a safe setup. The design internal forces of the used truss type will be needed by a structural engineer or an adequately qualified person to perform a structural calculation. Structural calculation must always follow all applicable standards defining structural design and material specifications.

Is Prolyte over-engineered?
It has to be emphasized that structural calculation will always consider the worst-case situations with the maximum expectable actions on the structure.
Especially for outdoor structures where not only the static or dynamic loads are applied, but weather conditions are of influence on truss structures like wind, rain, etc. Truss structures also needs to be protected against uplift, sliding and falling over by adding ballast. Ballast values must be high enough to withstand the maximum allowable windspeed on a structure. For an engineer it doesn't count when somebody states: "But we never have wind here". This information is also available in the structural calculation when it comes to structures placed outdoor.
In situations where trusses or truss structures are obviously loaded with a small fracture of the possible loading and truss structures are apparently stable against collapse, sufficiently experienced and qualified persons might also be competent to judge if the situation is safe enough.
Anyhow, we see unsafe truss setups day by day all around the world. That's why we, as Prolyte, recommends to have an individual structural calculation in advance for every truss setup.
Know what you are doing!

Anodizing vs Powder coating

The finishes on aluminium products come in four categories – natural, painted, anodised and powder coated. Today we're going to talk about two of these finishes that are the least understood – anodised and powder coated. Both of these finishes are extremely high quality and will serve you well for many years to come, but each one is special in its own way.

Anodising

Let's start with anodising. This is a very unique finish, as it's an electrochemical process that converts the aluminium surface into an anodic oxide finish that is attractive, durable and corrosion-resistant. Aluminium is an ideal candidate for anodising, but other metals that are nonferrous, such as magnesium and titanium, can also be anodised. It is normally carried out on smaller aluminium products, which are tossed around and see a lot of abuse.

The process starts by dipping the aluminium component into an acid electrolyte bath and applying an electric current to the liquid through the use of a cathode. This causes oxygen ions within the aluminium to be released, which then combine with the aluminium atoms on the surface of the component to create the anodic oxide finish. This process gives the metal surface a porous structure, which can then be colored with dyes and sealed afterwards.

Since this process is carried out in an acid bath, larger products in the product range are normally not available with this finish. Products with welds that are not completely sealed are also not good candidates, as the liquid can drip from the weld holes and ruin the finish.

An advantage of the anodised finish is that it is not applied on the surface of the metal. Instead, it is integrated with the aluminium substrate, which means it does not peel or chip like paint.

In summary, you can say that anodising is a turbocharged process of oxidation, which occurs naturally with aluminium over time.

Powder Coating

Powder coating is a very popular finish and is offered on all sizes of aluminium products. As the name suggests, it is a completely dry paint that does not contain any solvents. As the powder coating does not contain any liquid, thicker coats of paint can be applied compared to conventional liquid coatings without running or sagging of the paint, and powder coatings can be applied horizontally or vertically without noticing any difference in appearance.

The powder coating process is fairly straightforward. The first step is to externally apply the powder to metal with an electrostatic paint gun, which gives the powder a positive charge. The positive charge allows the paint to attach firmly to the metal's surface. The product is then moved to an infrared oven, where it is heated up so the powder melts into a uniform film. This is followed by a cooling process, which hardens the paint. The result is a tough and durable powder coat finish that resists scratches, chipping and peeling.

It's interesting to note that the powder coating process is environmentally friendly, as it has none, or very few, volatile compounds and produces a very limited amount of hazardous waste. In addition, any overspray during the coating process is captured and can be reused.

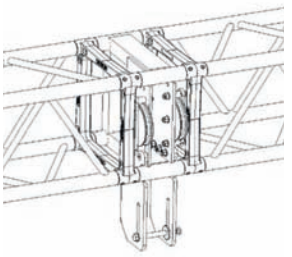
Now you're up to speed on both finishes and hopefully have a better idea of what you're receiving when given the choice of these finish options on future product purchases.

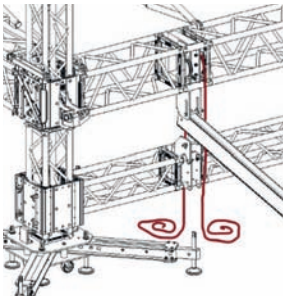
Integrated system for vertical keder profiles

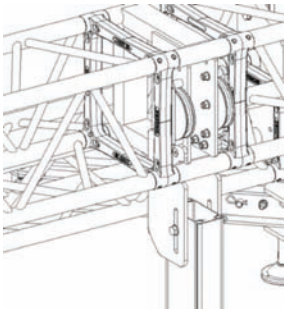
Ombretta Lovato

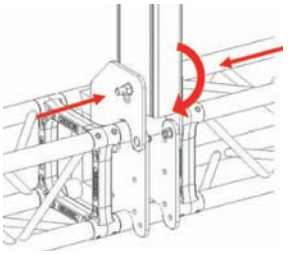
Structural Engineer

Our R&D Team has designed a new system for the connection of vertical keder profiles to the main roof grid. This system is suitable for end-plated truss and creates a safer and smarter solution compared with previous approach. The development of this product came from a customer's enquiry about a side walls roof. In A4I Italia we took a cue to improve our products and delivered a suitable structure in terms of payload. The system designed is shown in the pictures here below. This solution has the advantage to be integrated with the main roof structure. Customers can decide to install keder profiles or not. This module is 50 cm long, constituting a comfortable base unit for the roof grid. The pulleys that help lift the side walls are set so as to take advantage of the truss section inner empty space. The components of this unit are demountable and therefore replaceable in case of damage. The direct connection between the 50 cm module and keder profile is reached by means of two plates and the transversal pin. Although the use of clamps could be cheaper, they could not easily be attached near the truss nodes as the standard requires. Moreover, clamps are not certified for horizontal forces as the ones on side walls due to the wind.
On the righ you can find some drawings that illustrate the assembling steps of our integrated system.
This project was manufactured in 2021, but the solution is currently available for all customers who require a similar system.









Milos. Works better.

MILOS Certifications

Vladimír Zeman

Technical Director

As an important part of due diligence, all MILOS products require certification proving their compliance with strict safety legislation. We asked Vladimir Zeman (MILOS), A4I-CZ's Head of Engineering, what exactly these certifications entail and, of course, what benefits they hold for those working with MILOS products.

So can you tell us more about MILOS certifications?

Certifications help us set up processes within our company. For example, the standards governing certification direct us how to receive orders for shipping products in a fully compliant manner. These processes include:

- Receipt of orders: indicated within the system are what orders we can accept with regard to the size of products, material requirements, trained personnel, and company authorization.
- Purchase of material: we have a system for purchasing material so that the material is purchased in the prescribed quality and with the necessary quality control documents (attestations).
- Construction: this uses the most modern systems for creating production documentation, processing documentation, and its management. The staff provides product designs, static calculations, and participates in product instructions for use and production technology.
- Production: workers are trained or certified as required. Equipment in the production process is regularly inspected, reviewed, validated, and maintained.
- Control Department: ensures the control of input materials (dimensions, quality, inspection of attestations). Further checks are in-process and inspection of finished products. The department also provides metrology in the company. All staff are trained and certified.
- Welding supervision: designs and manages the above „process". It cooperates with all departments of our company. All workers have technical education and education in the field of welding including higher welding staff.

Thanks to this demanding process in our plant, we provide our customers with products of high quality and reliability. The customer can be confident that our products meet the requirements for material excellence, quality of workmanship, product dimensions, product safety and reliability. We ensure the packaging and dispatch of products so that the product reaches the customer undamaged and within the required deadline.

We have been cooperating on certifications with TÜV Nord, which is one of the most respected companies in its field in the world. TÜV Nord is represented in many countries around the world. It provides certification in a wide range of activities over various sectors. Our mutual cooperation helps both of us to follow and implement the latest trends. It brings the expansion of knowledge and innovations in our industry. We try to apply this information to our products and thus increase their quality.

These certifications ensure that MILOS products have passed the highest level of testing and certification to achieve top quality, safety and reliability.

This means that all Milos trusses and cells are verified by the world-renowned company TUV. In short, all of the above products are certified by an independent body according to the new „Eurocode" regulations.

In MILOS, our primary goal is to simply produce the highest quality truss and staging products that are superbly made, durable, and most importantly, SAFE. To ensure these goals are achieved, it is necessary for MILOS to strictly follow the rules, regulations and procedures that govern our production processes. Among these procedures is close adherence to the European Directive (EN 1090-1,2,3) that requires special certification of all our highly-experienced workers, in particular welders, who are certified in accordance with ISO 3834. The requirements of ISO 3834 form part of the requirements related to the harmonizing standard EN 1090-1 for structural metal components when placed on the market, and standards setting out the requirements for the assembly of metal structures. EN 1090-2 is the secondary part of the EN 1090 series of standards and specifies requirements for the execution of steel structures.

EN 1090-3 is the third part of the EN 1090 series of standards and specifies requirements for the execution of aluminum structures.

We are working in accordance with the European Directive: (EN 1090-1,2,3) in order to ensure adequate levels of mechanical resistance and stability, serviceability, and durability .

These standards assume that the work is carried out with the necessary skill and adequate equipment and resources to perform the work in accordance with the execution specification and requirements of the European Standard.

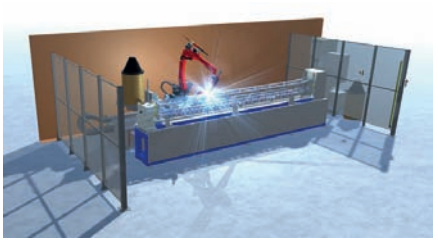
MILOS is certified in accordance with Execution Class 3, which means we are in the same category as companies building railway bridges and buildings over 15 floors in height. We can demonstrate that MILOS products contain welds that have been tested and are in line with documented research regimes. We can also demonstrate that all MILOS materials and welding equipment is independently serviced and tested to ensure that the highest quality welding can be consistently repeated in our factory.

Area Four Industries

Innovation

Robots in Area Four Industries

We would like to introduce you to the new way that Area Four Industries is heading.



You will have certainly heard about the Industry 4.0 digitization and the related automation of production. Even traditional manufacturers of aluminium structures are increasingly moving in this direction.

There are various reasons for choosing to automate although we of course want to continue working on special projects for our highly-qualified welders. But we also want to leave the repetitive standard type of construction (for which there is still a high demand) to machines.

Because we were looking for a complete range of possibilities, we approached Valk Welding, a leader in innovative welding robot technologies. Valk was able to offer a concept that corresponds to our ideas, and meets our requirements for quality of workmanship and the final product.

A significant part of our decision was the customer's legitimate demand for accuracy of construction and repeatable weld quality.

For example, for the welding of complicated lattice structures we even had to develop a unique patented profile that replaced the original circular pipe.

This patented profile surpasses the conventional tube in several respects: the loading of string tubes before welding is more accurate, the contact surface between the string tube and the profile is larger, and we now know that the string will always be seated in the correct position. And all this without compromising on the load capacity of the structure.

Our robotic workplaces are ready to produce several types of structures in all standard lengths and, due to increasing customer demand on the capacity of our production, we currently have three robotic workplaces in Area Four Industries! So, just as Area Four Industries is the undisputed leader in the aluminum construction market, it will immediately become a leader in the operation of robotic workplaces in this segment of production.

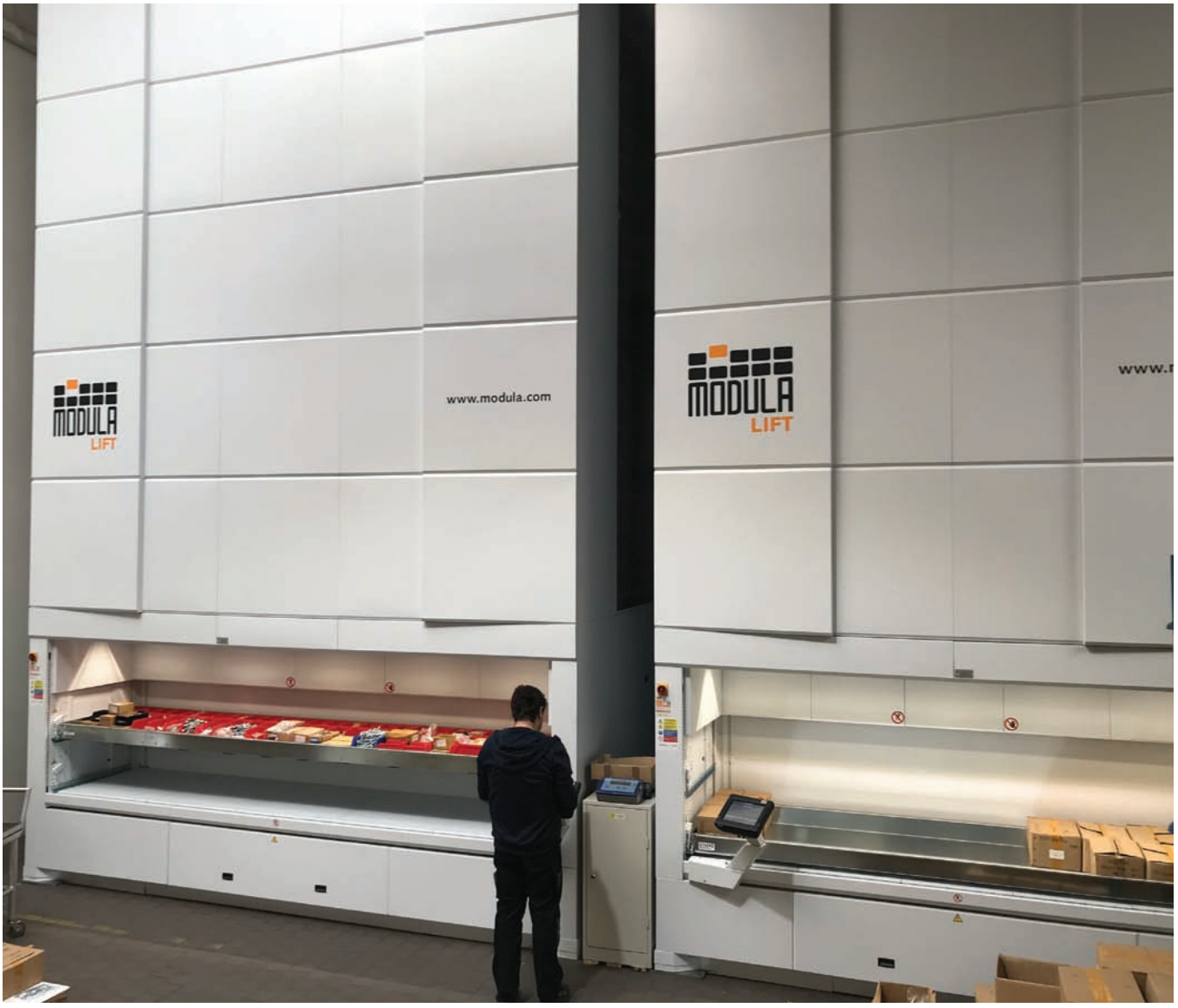
We already have three fully armed robotic workplaces for welding lattice structures to the highest quality, and by implementing these workplaces into the flow of normal production, we have increased the demands on the preparation of semi-finished products and therefore packaging and storage. So we had to deal with this and expand the workplace to fully utilise the potential of robotic helpers.

In this and other ways, Area Four Industries, the market leader in aluminum construction, continues its efforts to offer only the best for its burgeoning family of customers.

Area Four Industries

Vertical Stocks

At Area Four Industries, we also switched to using the Automata automated vertical warehouse this year. This allows us to store goods within a an organized, clean, safe, and quick system, thereby reducing the number of tasks the operator has to perform.
Our operators no longer have to go through the warehouse to pick up the goods because the selected production parts are concentrated in one place and then immediately transported to the dispensary.
The biggest advantages of such vertical warehouses are saving time and space, safe and accurate storage of products and, last but by no means least, the ergonomics and safety of our operators.
All this, together with other innovations, 'moves' the Area Four Industries brands closer and faster to our customers.



PRODUCT NAME:
BASEPLATE-DOLLY

MILOS
Safely Transporting Base Plates

Available in

The New Base Plate Cart

The Milos BASEPLATE-DOLLY-M-B-K-600x600 Cart is the ultimate sturdy base plate storage and transport system that allows easy loading and unloading of your plates.It can hold up to 8 600x600mm steel base plates. It helps you optimize transport space and its easy to handle. Cart is very durable due to all-welded aluminium construction. Castor wheels with brakes come as standard to hold firm once you need it. In addition all carts are fitted with polyamid runners, so you can avoid easily any scratching or damaging of base plates.The cart has user friendly laser marking to indicate correct storage your plates. Empty baseplate dollies can be stacked to save storage space.

Milos. Works better.

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