## Modix

## LARGE 3D PRINTING INNOVATORS MAGAZINE

Made-on-Mars Spacesuits A NASA funded research



Aptera, The most efficient electric car

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Forte3D's reengineered sound of Cello

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WYVE disrupting the surfboard Industry

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## A MESSAGE FROM THE CEO: WELCOME TO THE FUTURE

In the realm of innovation, while high-profile figures often grab the most of the public attention, the true engine of progress is driven by countless lesser-known individuals. These dedicated people, working tirelessly behind the scenes, are the backbone of innovation. Their collective efforts to introduce new concepts, refine manufacturing techniques, and enhance sustainability shape our future.

At Modix, we specialize in large-scale 3D printers, serving major industry players like NASA, SpaceX, Boeing, Porsche and more. However, our greatest inspiration comes from smaller innovation teams that dare to think big. These are the agile startups and the spearhead units within larger corporations that frequently develop transformative ideas capable of disrupting entire markets. With our cost-effective solutions, we are uniquely positioned to support both.

Our 3D printers stand out for their modularity and ease of customization, characteristics that are crucial when the aim is to create life-sized products. This flexibility allows our clients to adjust the hardware to meet the specific demands of their projects, accelerating the development and deployment of new ideas.



In the following pages, you'll find case studies and stories that showcase various types of innovation. Some are eye-catching, product-based advancements, while others are process-oriented breakthroughs that might not be immediately obvious but are equally impactful.

We invite you to explore these narratives and, in doing so, find inspiration for your next significant project.

Best Regards,

Shachar Gafni

CEO Modix Modular Technologies LTD.



## STRIKING A NEW CHORD: FORTE3D'S 3D REVOLUTION WITH MODIX'S MODERN MELODY

The cello is an instrument that has existed since before the classical period and has been the subject of numerous composers' most beautiful pieces. Traditionally made of wood, this instrument produces a sweet sound in the same register as the human voice, allowing for the composition and performance of beautiful pieces such as Faure's Sicilienne or Saint-Saens' The Swan. The method of construction of the cello has stayed the same for most of its history, but, given advancements in 3D printing and materials technology, it was only a matter of time before intelligent cellists and luthiers modernized cello manufacturing.

#### THE COMPANY

Forte3D, a cello-making company, has innovated on this centuries-old instrument with 21st century materials to make the world's first 3D printed carbon fiber cello. Using machined carbon fiber for its back and front panels, as well as 3D printed components along the body, neck, and pegbox, Forte3D builds a modernized cello that the company founder Alfred Goodrich states delivers "a world class sound for a fraction of the price."

#### THE CHALLENGES AND SOLUTION

A significant challenge that can limit any carbon fiber project is the difficulty in creating molded carbon fiber parts. Any carbon fiber part that is not shell-shaped, such as a cello neck or tailpiece, requires significant investment in custom tools that are made for one specific design. By using Modix's large-format 3D printers, this tooling investment can be eliminated, and more complex parts can be created for fractions of the cost and tooling requirements.

Another benefit of using Modix's large-volume 3D printers to create parts for the carbon fiber cello is that the polycarbonate filament used by Forte3D is softer than the wood and resin that is traditionally used to manufacture the parts that Forte3D 3D prints. This allows the ribs and neck to absorb ancillary frequencies that would otherwise take away from the sound quality of the instrument.

#### THE SOCIAL IMPACT



Forte3D has made waves in the additive manufacturing and music industry.

Their internationally patent-pending design employs innovative physics to enable the tops of the cellos to have a shape more akin to the cone of a speaker, with a concave profile rather than a convex one seen in traditional wooden cellos. Instead of utilizing a rigidly arched top, as is customary in traditional cellos, Forte3D tops rely on tensile strength to support the bridge, flexing inward in a manner similar to the surface of a trampoline. This unique hybrid design incorporates two flat pieces of carbon fiber, precision-cut using CNC technology, serving as both the top and back of the instrument. This groundbreaking evolution in instrument making enhances the propagation of vibrations and sound, resulting in a rich and finely-tuned tone. Due to the significantly reduced mass of our cello's top and back, as compared to traditional cellos, this reduction in weight is transformed into pure acoustic energy.

The ribs shape is completely asymmetrical. On the A string side of the cello the ribs bow out significantly like a whiskey barrel. This gives significantly more power and volume on the second lowest string (the G string). Additionally there is an asymmetrical cutout on the C string side of the upper bout on the back (only) of the instrument. So, the upper bout on the TOP of the instrument is symmetrical, but the upper bout on the BACK of the instrument is asymmetrical. This actually gives the higher strings incredible complexity and power.

Forte3D patent-pending design has been brought to the attention of famous cellists such as Yoyo Ma, who has placed an order for this carefully-made assemble-at-home instrument. Forte3D is also using Modix's 3D scalable 3D printing capabilities to fulfill bulk pricing orders for musical institutions, enabling the advancement of music education and the development of future cellist virtuosi.

Forte3D uses the Modix BIG-60 to create the smaller and difficult-to-print components of the cello, such as the fingerboard and tailpiece. While not all components of the cello are 3D printed (notably, the bridge is wood and the front/back panels are carbon fiber, for sound quality purposes), most structural and technical components are 3D printed out of black polycarbonate, giving the cello a dark finish to complement the dark tones of the carbon fiber panels.

The ribs of the cello, which give the cello its internal support, are 3D printed on a Modix 120X, due to the large size of a cello requiring one of the largest consumer 3D printers available.

**Other tips:** Hiding the Z-seam near the bottom of the cello (near the end pin, which raises the cello off of the ground while supporting it at the tail gut) prevents it from being seen during a performance. Most FDM slicers allow the user to determine how the Z-seam is placed.



COMPANY Forte3D

WEBSITE https://www.forte3D.com/

APPLICATION Musical Instrument Industry

VERTICAL End-Use Product

#### PRINTERS

Modix 120-X, Modix BIG-60 V3







#### THE COMPANY

Wyve

WEBSITE https://wyvesurf.com VERTICALS

**B2C** manufacturing

**APPLICATION** Production of tailored final goods

THE PRINTER A fleet of Modix BIG-180X



#### THE COMPANY

Wyve Surf is a French startup that has invented a revolutionary 3D printing process that allows tailoring surf boards designed to match each surfer's needs and surfing style. Wyve is leading the surfboard industry into a new era of mass customization and digital fabrication of final goods with Modix 3D printers.

Wyve is also using Modix 3D printers to create environmentally friendly surfboards. The surfboards are made from a variety of sustainable materials, including recycled plastics and plant-based plastics. Wyve's surfboards are currently available for purchase online and through a select number of retailers.

#### THE CHALLENGES

The conventional manufacturing of surfboards is labor intensive and highly polluting. The process typically involves the use of toxic chemicals, such as resins and foams, which can release pollutants into the air and water. For example, the conventional manufacturing process for surfboards can release up to 100 pounds of pollutants into the environment per board. This pollution can contribute to air and water pollution, and it can also harm marine life.

Additionally, the mass production of one-size-fits-all boards does not meet the needs of many surfers. Different surfers have different preferences for shape, size, and flex, and mass-produced boards often do not offer the level of customization that surfers need to perform at their best. Moreover, the mass production of one-size-fits-all boards means that many surfers are forced to use boards that are not the best fit for their individual needs, for example their body weight and height. This can lead to decreased performance and increased risk of injury.







#### THE SOLUTION

Wyve's 3D printing process offers a sustainable and customizable alternative to conventional surfboard manufacturing. The company uses recycled plastics and plant-based resins, which are much less polluting than the materials used in conventional manufacturing.

For example, Wyve's surfboards are made from recycled plastics, such as PET bottles and fishing nets. These materials are much less polluting than the petroleum-based foams and resins used in conventional surfboard manufacturing. Additionally, Wyve owns multiple Modix's 3D printers that allows the company to create surfboards with a variety of shapes and designs, including longboards, shortboards, and fishboards. Surfers can also customize their surfboards to the specific needs of their surfing style and body type. This means that surfers can get a board that is perfectly suited to their individual style and needs, without having to compromise on sustainability.

In addition to being sustainable and customizable, Wyvesurf's 3D printed surfboards are also durable and high performing. Thanks to the Modix's printers generous print volume, Wyve can print the boards as a single piece, saving time on post processing and the result is sturdier and stronger.

Overall, Wyvesurf's 3D printed surfboards offer a number of advantages over traditional surfboards. They are more sustainable, customizable, durable, and high-performing. As a result, Wyvesurf is well-positioned to lead the way in the development of sustainable customized surfboard manufacturing.

Wyve has received positive feedback for its Hexa surfboard. Surfers have praised the board's durability, performance, and customization options. Wyve has also been recognized for its environmentally friendly manufacturing process. In 2020, Wyve was awarded the Greentech Innovation Award for its Hexa surfboard.







## WAVEAEROSPACE USES MODIX 3D PRINTERS TO BUILD **DRONES FOR EXTREME WEATHER**

#### THE COMPANY

WaveAerospace is a company that designs and builds drones for extreme weather conditions. Their drones are used by first responders, commercial operators, and military organizations to conduct search and rescue operations, deliver supplies in disaster areas, and monitor critical infrastructure.

#### THE CHALLENGE

One of the challenges that WaveAerospace faced was the need to rapidly prototype new drone designs. They needed to be able to iterate on their designs quickly in order to meet the demands of their customers.



#### THE COMPANY

WaveAerospace

**WEBSITE** waveaerospace.com

VERTICAL Aviation - Drones development

**APPLICATION** Large scale rapid prototyping

Modix BIG-60 version 3





#### THE SOLUTION AND OUTCOME

WaveAerospace found that the Modix 3D Printers' BIG 60 V3 was the perfect solution for their rapid prototyping needs. The BIG 60 V3 is a large-format 3D printer that can print complex parts quickly and accurately. This allowed WaveAerospace to bring new drone designs to market faster than ever before.

The BIG 60 V3 has also helped WaveAerospace to improve the performance of their drones. By using 3D printing, WaveAerospace has been able to create drones that are lighter, stronger, and more durable than traditional drones. This makes their drones more capable of operating in extreme weather conditions.





HOW WOULD YOU MAKE SPACESUITS WHILE ON MARS? A NASA FUNDED RESEARCH SUGGESTS MODIX

#### INSTITUTION

Department of Space Studies under a NASA project, University of North Dakota and led by Professor Pablo de León.

WEBSITE https://und.edu

**VERTICAL** Aerospace , Educational

**APPLICATION** Prototypes, End-use parts.

**PRINTER** Modix BIG-120, Modix BIG-60

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#### THE INSTITUTION

The University of North Dakota (UND) is collaborating with NASA on spacesuit research at the Human Spaceflight Laboratory. Led by Professor Pablo de León, Chair of UND's Department of Space Studies, they have secured a NASA grant to develop a 3D-printed spacesuit prototype. UND has previously received grants that supported space habitat system projects.

#### THE CHALLENGE

For the past seven decades, spacesuits have been handcrafted using traditional sewing methods, taking thousands of hours by skilled artisans and costing \$2 million each. These custom suits won't be practical for Mars and other deep space missions, where there's no on-site tailoring or quick replacements from Mission Control. The challenge therefore is to create pressurized spacesuits on-site and on-demand for such missions.

#### THE SOLUTION

The Department of Space Studies, University of North Dakota is using Modix BIG-120 and BIG-60 printers to print large sections of the spacesuit using innovative new materials and designs. For example, the department is using new 3D printable materials that are stronger and lighter than traditional spacesuit materials, such as carbon fiber and Kevlar filled filaments. The department is also developing new designs that use less material and are easier to assemble and repair. The 3D printed spacesuit is still in the prototype stage, but the department team is confident that it has the potential to revolutionize the space industry.

#### SENDING 3D PRINTERS KITS TO OUTER SPACE

Modix printers are delivered as self assembly kits that could be packed tightly for space travels. It will be way more efficient to send a self assembly kit to space rather than sending an assembled large 3D printer due to the mostly unused empty space inside it.

#### THE POTENTIAL IMPACT

Once the design is finalized, the Modix-printed spacesuit has the potential to revolutionize space exploration by making it more accessible and affordable. This could lead to a more diverse range of people participating in space exploration, which could spark new discoveries and technological advancements.

Prof. Pablo de León, Professor and Chair, Department of Space Studies, University of North Dakota: "We have been using Modix printers for a couple of years now with fairly good results. While we primarily use the Modix for printing of large sections (the hard upper torso, which is the black portion in the photos) we also have been using it to print flexible TPU plastics for large sections, like the brief, or 'pants' section''.

"We believe that this project has the potential to make space exploration more accessible and affordable, and to help us to protect our astronauts from the harsh environment of space"





Modix

# INNOVATION IN THE AUTOMOTIVE INDUSTRY





VITAL AUTO INNOVATES AUTOMOTIVE DESIGN WITH A FARM OF MODIX 3D PRINTERS



#### THE COMPANY Vital <u>Auto</u>

WEBSITE https://www.vital-auto.com

#### PRINTER

A farm of 16 Modix 3D printers including BIG-60, Big Meter and Big-120X

**VERTICAL** Automotive

**APPLICATION** Prototype & Manufacture





#### THE COMPANY

Vital Auto is a UK-based design studio specializing in creating full-scale 1:1 3D printed prototypes, demonstrators & concept vehicles predominantly for the automotive industry. Their clients include some of the world's leading OEMs and start-ups.

#### THE CHALLENGE

Vital faces many challenges within its workflows. One challenge is the need to produce large-scale prototypes within the automotive sector. Another challenge is the need to make high-quality parts that are accurate and durable.

#### THE SOLUTION AND OUTCOME

To meet these challenges, Vital Auto uses multiple Modix 3D printers of various sizes, including BIG-60, BIG-Meter and BIG-120X of various versions. Modix 3D printers have a large build volume, which allows Vital to print large-scale parts in a single piece. This process eliminates the need for assembly and expedites the workflow, saving clients time and money.

The Modix BIG-60 also produces high-quality parts that are accurate and durable. The Modix BIG-60 is essential for Vital, as their clients expect the highest quality physical properties and prototypes.

Vital has been using Modix for several years. Their large 3D printing farm includes several Modix BIG-60 V2 that are still running, continuing with V3 models and up to the latest Generation 4.0.

The company's Modix fleet was repainted in line with Vital's corporate colour system, incorporating RAL 1023 – Traffic Light Yellow, giving the printers an overall distinctive and impressive look and feel.

The machines are constantly printing parts for their various projects and working around the clock, seven days a week.





## ACCELERATING DEVELOPMENT OF THE MOST EFFICIENT ELECTRIC CAR

Aptera Motors Uses Modix 3D Printers to accelerate development of their innovative vehicle. Aptera: "We're up to 44,000 orders for our vehicles now, has all happened with Modix's help"

COMPANY Aptera Motors

WEBSITE https://www.aptera.us

VERTICAL Automotive Industry

APPLICATION Rapid prototyping

PRINTER Modix BIG-120X v3



#### THE COMPANY

<u>Aptera</u> Motors, founded by passionate individuals in California, is fervently dedicated to forging a sustainable transportation future. Leading the charge in innovation, they are not only transforming the landscape of automotive design but are also establishing new standards for vehicle efficiency. Their innovative car can travel up to 1,000 miles on a single charge and it is capable of up to 40 miles of solar powered driving per day. With a rapidly growing customer base and garnering global attention, Aptera is uniquely positioned to spearhead the green mobility revolution.

#### THE CHALLENGE

Aptera Motors faced several challenges in the development of its Alpha vehicle builds. One challenge was the need to create complex parts in house and quickly. Another challenge was that as a startup, Aptera's budget was tight and needed to be spent wisely.



#### THE SOLUTION: & OUTCOME

Aptera Motors turned to Modix 3D printers to help them overcome these challenges. Modix printers can create large parts with high precision and fast speed. As the development for their vehicles moved ahead, Aptera could ramp up their prototyping speed with the Modix 3D printer. Modix 3D printers are relatively affordable, making them a cost-effective solution for Aptera Motors, freeing up budget for other needs.



"We're up to 44,000 orders for our vehicles now and pushing towards first production next summer. It has all happened with Modix's help," said Chris Anthony, CEO of Aptera Motors. "Modix printers have given us the flexibility, speed, and precision we need to bring our vision to life."



In conclusion, Aptera Motors is a prime example of how Modix 3D printing can be used to overcome challenges in the development of new products. By using Modix 3D printers, Aptera Motors has been able to create complex parts with high precision, quickly and cost-effectively. This has helped them to accelerate the development of their Alpha vehicle builds and bring their vision to life.





## MODIX TRANSFORMS HARLEY-DAVIDSON AFTER-MARKET ACCESSORIES

Meet the Chuck Taggart's custom loudspeakers housing

#### THE CREATOR Chuck Taggart

OFFICIAL YOUTUBE CHANNEL: https://www.youtube.com/@CLTaggart

VERTICAL Automotive Aaftermarket

APPLICATION Motorcycle loudspeakers

THE PRINTER Modix 120X V2

#### THE CREATOR

Chuck Taggart is a custom motorcycle parts maker and popular YouTube channel creator (<u>@CLTaggart</u>) who has been creating custom lowers (loudspeakers) for Harley-Davidson Road Glides. He is passionate about creating high-quality parts that are both stylish and functional.

Chuck's YouTube channel, CLTaggart, features a variety of videos about custom motorcycle parts, including his own set of lowers for the Harley-Davidson Road Glide.

#### THE CHALLENGES

Chuck was challenged to create a new set of lowers for the Harley-Davidson Road Glide that would address several of the shortcomings of the original lowers. He wanted to create lowers that were wider at the top, sat further out from the bike, and had a cavity inside that could be used to store speakers or other items. He also wanted to make the lowers easier to install and use.

#### THE SOLUTION AND OUTCOME:

Chuck owns two Modix 3D printers, Modix BIG 120X and BIG-40. These large-format 3D printers can produce parts up to 2 feet wide, 2 feet high, and 4 feet long. The printer is also known for its reliability and ease of use.

Chuck used a Modix 3D printer to solve both challenges and produce his own speaker housing based on this innovative design. The Modix 3D printers' large format and versatility in materials allowed Chuck to print the lowers in one piece, eliminating seams and joints for a stronger, more durable product.

In addition, the Modix 3D printer also allowed him to create a complex and lightweight design for the folding hard top that would have been difficult or impossible to produce using traditional techniques.

The Modix 3D printer was essential to the development of both of these products, as it allowed Chuck to create complex and lightweight designs that would not have been possible using traditional manufacturing methods. It also helps the creator to manufacture a small in-house batch of speakers to kick start production without investing in expensive molds required for injection molding parts.







## MAKING AN AFTERMARKET HARDTOP CONVERTIBLE FOR JEEPS WITH MODIX

Chalres Taggart





#### THE CHALLENGE

Chuck was challenged to make the world's first hardtop convertible for a Jeep (and a Bronco). Instead of having multiple people take off a hard top for their Jeep or having a hoist in their garage, what if they could just fold it into the bed of a Gladiator or into the cargo area of a Rubicon or other standard Jeep?

What if instead of traveling and wishing you could take off your hard top but can't, you were able to fold it down?

#### THE SOLUTION AND OUTCOME

Using his Modix BIG 120X 3D printer Chuck could develop his own unique solution. At less than a foot thick and under 35 pounds (16 kg), the 3D printed hard top consists of a series of panels connected by high end, tungsten zero profile hinges making the hard top solid and durable. He was also able to incorporate recovery boards into the top panels, and he added access ports for a GoPro camera, wiring, or other ideas for them. This entire hard top prototype was 3D printed using a Modix Big 120 and PETG material

**In conclusion,** The Modix 3D printer was essential to the development of both of these products (speakers and **sardtops**) as it allowed Chuck to create complex and lightweight designs that would not have been possible using traditional manufacturing methods. It also helps the creator to manufacture a small in-house batch of speakers to kick start production without investing in expensive molds required for injection molding parts.







## ILLUMAESTHETIC'S CUSTOM 3D PRINTED AUTOMOTIVE PARTS

### PART 1:

RACE CAR BUMPERS - A REVOLUTION IN BRAKE COOLING



#### THE CREATOR

Illumaesthetic

WEBSITE www.illumaesthetic.com

**VERTICAL** Automotive, Mass customization, Product development

**APPLICATION** Custom car parts, Prototypes, Tooling, Repairs

**PRINTERS** Modix BIG 180X, 120Xs, 60X.

#### THE CHALLENGE

THE COMPANY:

Illumaesthetic, founded by Adam in 2015, has evolved from a college project into a global force in automotive parts production. With a commitment to innovative designs and unwavering customer service, Illumaesthetic operates on a global scale, catering to car enthusiasts worldwide.



Adam wanted to make a custom bumper for his drag race car that would fit a larger intake duct and direct more air to the brakes. This was a challenge because most bumpers are not designed to accommodate larger intake ducts or to direct air to the brakes. Adam also wanted to make sure that the bumper was aerodynamic and would not negatively impact the car's performance.

By overcoming these challenges, Adam could create a bumper that improves engine performance, brake cooling, and aesthetics, making it ideal for race car.







#### THE SOLUTION:

Adam used a 3D scanner to scan the front of his car and printed it using a Modix 3D printer.

The bumper includes a larger intake duct that is specifically designed to direct air to the brakes, as well as a number of aerodynamic features that help to reduce drag and improve fuel efficiency.

Adam printed the bumper in only five pieces using a Modix 3D printer. Once the pieces were printed, he glued them together and tested the bumper on the car. He made some minor changes to the design to ensure that the bumper fit perfectly and that the air was being directed to the brakes effectively.

Adam's custom bumper enhances the car's power, cooling, and appearance, making it a popular choice for racing enthusiasts.



### **PART 2:**

DESIGNING RECORD-BREAKING MOTORBIKE WITH MODIX 3D PRINTERS





#### THE CHALLENGE

With more than 8 million subscribers, Donut, a top-tier YouTube channel specializing in automotive content, aimed to maximize the speed of a Walmart minibike. Initial efforts focused on enhancing the engine, yet there remained a need to further increase horsepower and minimize aerodynamics drag resistance.

#### THE SOLUTION

Donut turned to 3D printing and teamed up with Illumaesthetic, a California company that specializes in 3d printed custom car parts and owns a fleet of Modix large 3D printers. Illumaesthetic scanned the minibike and crafted a fairing tailored to both the bike and its rider for better aerodynamics. Over a week and a half, they divided 25 total days of print time across three different Modix 3D printers. They printed four main parts: the front nose, engine mount, front wheel cover, and rear fairing, all weighing in at 10 pounds (4.5 KG) and made from PETG filament.







#### THE RESULTS

Donut turned to 3D printing and teamed up with Illumaesthetic, a California company that specializes in 3d printed custom car parts and owns a fleet of Modix large 3D printers. Illumaesthetic scanned the minibike and crafted a fairing tailored to both the bike and its rider for better aerodynamics. Over a week and a half, they divided 25 total days of print time across three different Modix 3D printers. They printed four main parts: the front nose, engine mount, front wheel cover, and rear fairing, all weighing in at 10 pounds (4.5 KG) and made from PETG filament.



### PART 3:

CLASSIC CARS RESTORATIOS-

OVERCOME RARE PARTS SHORTAGE WITH MODIX 3D PRINTERS



#### THE CHALLENGE

As classic cars age, parts become rare and expensive. This can make it difficult to find replacements that are in good condition, and it can also lead to gatekeeping in the classic car community. Gatekeeping is when people who have been in a community for a long time try to control who is allowed to participate in that community. In the classic car community, this can manifest as people refusing to sell rare parts to newcomers, or as people charging exorbitant prices for those parts.

#### THE SOLUTION

3D printing can be a valuable tool for restoring old cars and breaking down the barriers of gatekeeping in the classic car community. By 3D printing rare parts, restorers can avoid the high cost of buying them from aftermarket suppliers. They can also create custom parts that are not available anywhere else. This means that anyone, regardless of their experience or status in the community, can have access to the parts they need to restore their classic car. Eventually, by using a large scale Modix 3D printer, restorers can save money and get the parts they need to bring their classic cars back to life.

For example a team of restorers used a Modix 3D printer to print a number parts for a Nissan S13. These parts included a front bumper and a rear bumper. As you can see, the 3D printed parts were indistinguishable from the original parts, and they saved the restorers a significant amount of money and time searching for such parts.

In another example, an original broken grill was purchased in Ebay, scanned and printed with Modix. Later the broken original part was placed back to the market.







### **PART 4:**

CUSTOM CAR BODY PARTS & KITS MADE POSSIBLE WITH MODIX LARGE 3D PRINTERS.



#### THE CHALLENGE

Illumaesthetic was facing the challenge of finding custom car parts that met their customers' unique needs and own vision. They wanted to be able to create a unique and personalized look for their customers, but they didn't want to spend a fortune or make their customers spend a fortune.

#### THE SOLUTION

The company decided to use Modix 3D printing to create their products, which allowed them to produce them quickly and affordably. They were able to print a wide variety of custom and special designs of car parts, including bumpers, spoilers, and intakes, and more.

Today Illumaesthetic owns five different Modix large 3D printers ranging from BIG-60 all the way up to BIG-180X. Their fleet of printers is constantly producing parts to their clients as well as for internal projects.







#### THE IMPACT

Illumaesthetic has had a positive impact on the automotive industry. The company has made it possible for people to customize their cars without having to spend a fortune. They have also helped to raise awareness of the benefits of 3D printing in the automotive industry.

Are you looking for a way to customize your car without breaking the bank? Modix 3D printers are the perfect solution. Visit the Modix website today and see how you can create the car of your dreams.







## **REDEFINING CARBON-FIBER MOLDS FOR CAR RACING**

#### THE ORGANIZATION

St. Thomas Academy's Experimental Vehicle Team is a high-performing team of high school students that produce and compete in experimental wheeled vehicles. The team uses alternative power sources and composite skins to increase vehicle efficiency and qualify for races, such as Hydrogen Fuel Cells and carbon fiber skins.

#### THE CHALLENGE

The challenge at hand lies in the traditional methods used for crafting large carbon fiber layup molds, which are inherently time-consuming and expensive when outsourced. Additionally, there is a need to address the limitations of these molds making methods in terms of design iterations. Furthermore, the educational sector, with its focus on budget constraints, presents a specific challenge in finding cost-effective solutions.







#### THE ORGANIZATION:

St. Thomas Academy's Experimental Vehicle Team

#### WEBSITE

XXXX

#### VERTICAL

Education, automotive, Student Engineering Competition

#### **APPLICATION**

Carbon fiber mold manufacturing

#### PRINTER

Modix BIG METER



#### **THE SOLUTION & OUTCOME**

The Modix BIG METER turned out to be an incredible cost-saving solution to the alternative of traditional molds making. After developing the skin for their experimental Urban Concept vehicle inhouse, they were able to 3D print negatives of the skin panels to act as mold surfaces for a carbon fiber layup for each panel. After producing all panels in this way, they were able to try out their innovative vehicle at several races, notably the <u>Shell Eco-Marathon</u> in which they placed first in their division, prevailing against even several University teams.

#### THE SOCIAL IMPACT

Needless to say, the BIG METER can do so much when in the right hands. This team of student engineers has gone beyond impressing their colleagues at races with their level of engineering prowess, and the Big Meter has served as a critical tool in helping bring their impressive designs to the racetrack.





## GOODYEAR FARM TIRES ARE NOW DESIGNED WITH MODIX BIG-60

#### **COMPANY** Titan International

WEBSITE www.titan-intl.com

VERTICAL Engineering Design (tires)

APPLICATION Rapid Prototyping

THE PRINTER Modix BIG-60





#### THE COMPANY

Titan International is one of the world's largest tire manufacturers, as well as a global leader with a full line of tires and wheels for off-road vehicles. The company provides high-quality services and customized products for agriculture, construction, forestry, and mining industries. Titan International is the owner of both Titan & Goodyear® Farm Tire brands, and develops designs for these tires in-house.



#### THE CHALLENGE

Tire makers are no different from other manufacturers of modern tools and equipment; tires need continuous improvement. Naturally, this requires constantly making and testing new designs of tires. Creating an entire mold just to make one single tire tread for testing or display, though, is prohibitively expensive. To solve this problem, Titan International invested in a Modix to create models of their tire treads for tractors and other vehicles.

#### THE SOLUTION AND OUTCOME

Titan's Modix has proven a great asset for the team. Within only 72 hours of 3D prints since assembly, they've been able to produce several model tire treads out of PLA, and for a fraction of the price of cutting out a section of a larger tire (which would effectively ruin it), which is also less than the price of making a mold for the section of tire.

Titan is also using Modix to help engineers innovate on vehicle tires via rapid prototyping. In particular, Titan is working on a new tire technology called LSW (Low Side Wall) tires, which allow agricultural professionals to take certain wheeled vehicles to places where, previously, only tracked vehicles could have gone.



## INNOVATION IN ART & DESIGN







## BRONZE SCULPTING MADE EASY WITH MODIX LARGE 3D PRINTERS, THE CASE OF EFES BRONZE

#### **COMPANY** Efes Bronze

WEBSITE https://efesbronze.com/tr

VERTICAL Art & Design Manufacturing

#### APPLICATION Artists Art schools

Manufacturing companies

THE PRINTER Modix BIG-60

#### THE COMPANY

Efes Bronze is a leader in the bronze sculpting art world, with pieces set in many countries around the world like horse sculptures, fountains, animal and wildlife models, men and women sculptures and more. The company is based in Turkey.

#### THE CHALLENGE

Creating a bronze sculpture involves a long and complex lost-wax casting process. In addition, printing large sculpture models in parts can be challenging because the parts must later on be aligned precisely and the glue must be strong enough to hold the parts together.



#### THE SOLUTION AND OUTCOME

Efes Bronze is using the large print volume of the Modix BIG-60 to print large models (in large parts or in one piece), which are then glued together, covered with silicon in order to create the mold, filled with wax that later smoothed, detailed, and covered in plaster before finally being cast in bronze using the lost-wax technique.

In addition, the Modix BIG-60 printers are reliable and easy to use, which saves Efes Bronze time and money.

In conclusion, Efes Bronze is now able to create large, high-quality bronze sculptures with greater precision and accuracy, using the Modix BIG-60 printers.

 With Modix, our work has become easier and faster. This is how we run the printer: we print with PLA and while the bed temperature is 55 Celsius. The print layer is 0.3mm at the base, 0.2mm for the body parts and 0.1mm for the face. We use the 0.4mm nozzle and 7-8% infill. After 100-150 layers, we change the infill to 2-3% only. Some parts are 3 perimeters and some just 2.

Serdar Eraol, Owner of Efes Bronze



HARNESSING THE POWER OF THE MODIX 3D PRINTER IN THE ART OF KIM FARKAS

**THE CREATOR** 

VERTICAL

Sculpting

PRINTER

**APPLICATION** 

**Artistic Elements** 

Super Volcano

Kim Farkas, France

Art & Design, Lighting,

Scuplting, Lighting fixures,

BIG-120Z, Griffin print head +



#### THE ARTISTS

Kim Farkas, a noted French artist and graduate of Beaux-Arts de Paris, melds traditional mold-making with contemporary 3D printing. Initiating with a 15x15 Printrbot in 2013, Kim's dedication to innovation is evident. "I always wanted to change the shapes before even making multiple pulls and ended up making new one-use molds," he shares. With a profound interest in fablab/maker culture, Kim's artistry resonates throughout Europe.

#### THE CHALLENGE

Kim Farkas, in his signature art pieces, crafts large tubular shells that are subsequently layered and coated. Yet, with his earlier printers, he was bound by a 30x30x40cm build volume, compelling him to assemble up to eight distinct parts. Each assembly posed its unique challenges, from file preparation to the assembly process itself. "I constantly had to think about the build volume which limited my possibilities," the artist reflects.





## "With Modix, we can explore designs, textures and finishes. Size is not an issue."

#### THE SOLUTION AND OUTCOME

Utilizing the Modix 3D printer, specifically the 120Z model equipped with the Griffin printhead and SuperVolcano, Kim Farkas has experienced a significant transformation in his artistic process. This high-performance printer has not only empowered him to create larger structures in fewer pieces, but also enhanced the efficiency of his work through faster extrusion and the ability to create thicker walls. Kim particularly values the ability to use vase mode with nearly 2mm perimeters, a crucial feature for his transparent pieces that require a strong perimeter to support the large build volume.

The Modix 120Z has effectively liberated Kim from the constraints of previous machinery, allowing him to approach his art with a newfound focus on creativity and expression, treating each piece more akin to a drawing. The reliability of the Modix printer stands out, serving as a dependable tool that complements and enhances his creative journey.

Looking ahead, Kim is excited about the potential future enhancements to his setup, given the open platform of the Modix 120Z. He anticipates the possibility of upgrading with new parts and technologies, ensuring his artistic practice continues to evolve and thrive.

In summary, the Modix 120Z has not only simplified Kim's workflow by reducing the need for assembly but has also provided him with a reliable and upgradable tool, allowing him to delve deeper into his artistry and explore new creative horizons.





"With Modix, I can easily make a very small model or a large model. I can produce a chess-size piece or I can produce state of the art furniture or just experiment with new ideas. All with the same machine. This is an infinite way of doing things."





## THE IMPACT OF LARGE-SCALE 3D PRINTING ON ART AND ARTISTS

#### Patrick Laroche, a leading French sculptor: "3D Printing is a whole new and exciting dimension for the modern artists"

#### THE ARTIST

Patrick Laroche is a world renown artist, sculptor and furniture designer. Laroche is well known for his famous extremely large sized vegetables, painted in vivid chrome colors and is recognized by his unique ability to turn the ordinary daily objects into a magnificent celebration of colors and shapes. He has a deep understanding of traditional sculpting techniques, but he is also always interested in exploring new technologies to combine in his art and designs.

#### THE CHALLENGE

Laroche and his team's challenge was both to produce outstanding and unique designs for various displays, and in parallel, to adapt and embrace 3D technologies techniques to become a vital working tool for artists.

Laroche aimed to leverage the potential of modern technologies to amplify his artistic capabilities. His goals included exploring the integration of new techniques, such as digital modeling, 3D scanning, and printing, while maintaining the artistic integrity and handcrafted essence that defined his sculptures. He envisioned a harmonious blend of the ancient and the contemporary.

"3D printing has become a crucial part of our daily routine. We can preserve our handmade artwork for future reference and use in a digital format. For many years, 2D 'flat' artists could preserve and copy their work easily. Making photocopies and using other printing techniques. Finally, thanks to 3D scanning and 3D printing, sculptures can enjoy the same benefits of commercialization and archiving", Mr.Laroche says.

"3D printing has become a crucial part of our daily routine. We can preserve our handmade artwork for future reference and use in a digital format. Patrick Laroche

### ARTIST

Patrick Laroche, France

WEBSITE www.patricklarochesculpteur.com

VERTICAL Art & Design

APPLICATION Sculpting, Artistic Elements

PRINTER Modix BIG-60





"With Modix, I can easily make a very small model or a large model. I can produce a chess-size piece or I can produce state of the art furniture or just experiment with new ideas. All with the same machine. This is an infinite way of doing things." Patrick Laroche

#### **THE SOLUTION & OUTCOME**

The studio purchased Modix BIG-60. The workshop has implemented working with the Modix Big-60. After the objects are scanned or prepared with dedicated 3D printing software, the team uses the printer to execute the models and designs. These can be prototypes, casts for molds or the actual sculptures themselves. Most importantly, the models created can be scanned and then preserved for any future need.

"With Modix, we can explore designs,textures and finishes, Size is not an issue.", **says Laroche**.





"I have completely converted and attempted just to push the boundary in what's possible in the additive manufacturing space to increase the amount of precision that I can apply to these prosthetics. At every level it's improved my practice, there's no question. It is a revolution."





HOW 3D PRINTING IS REVOLUTIONIZING CUSTOM WOODWORKING: THE SQUID WORKS STUDIO CASE STUDY

#### THE COMPANY

Squid Works Studio is a custom woodworking company that specializes in restoring and creating unique pieces of furniture. The company is owned and operated by Shawn Hicks, a longtime shipwright with a passion for woodworking.

#### THE CHALLENGE

Shawn Hicks, the owner of Squid Works, needed a way to create architectural components quickly and easily. He also wanted to be able to create custom designs that were not available off-the-shelf. Part of this effort, bending wood for round corners with boiled water is a time consuming process and not a very pleasant work.





#### THE SOLUTION AND OUTCOME

Shawn decided to use a Modix BIG-60 V1 3D printer to create his architectural components. The Modix BIG-60 is a large-format 3D printer that is capable of printing complex objects with high accuracy. This allowed Shawn to create custom designs that were not available off-the-shelf. The Modix BIG-60 is also a fast printer, which allowed Shawn to create his architectural components quickly.

In addition to these benefits, 3D printing has also allowed Hicks to save a significant amount of money and time. This has allowed him to reinvest in his business and expand his offerings.

Overall, 3D printing has been a major boon for Hicks's business. It has allowed him to create high-quality, custom furniture that is both affordable and sustainable. It has also allowed him to save time and money, which he can then reinvest in his business.

#### COMPANY

Squid Works Studio

VERTICAL

Art design

**APPLICATION** Architectural Interior design

THE PRINTER Modix BIG-60 V1 3D printer



Learn more about how 3D printing can help you to revolutionize your custom woodworking business at <u>www.modix3d.com</u>

## 3D PRINTING SERVICE FOR ARCHITECTURAL MODELING & ART





COMPANY Tony3D

WEBSITE www.tony3d.net

VERTICALS Modeling, Architecture ,Art

APPLICATION Production of tailored final goods

**THE PRINTER** BIG-60 V1 upgraded to V2.



#### THE COMPANY:

Tony3D.net is a 3D printing service company located in Israel focused mainly on printing highly detailed architecture models and other industrial modeling services.

#### THE CHALLENGE

Tony3D.net was facing a number of challenges in creating architecture and art models. First, the company was limited by the size of the models that it could print with its existing 3D printers. Second, the company was spending a lot of time and money on manual labor needed to connect smaller parts into bigger models when needed.

#### THE SOLUTION AND OUTCOME

During 2017 Tony3D.net decided to invest in a Modix Big-60 V1 3D printer. The Modix BIG-60 is a large-format 3D printer that can print models up to 600 X 600 X 660 mm (XYZ). Modix BIG-60 allowed Tony3D.net to create larger and more complex models than ever before. Additionally, due to the generous size of the printer, Tony3D team could print the models in one piece and did not have to spend time gluing smaller pieces together and additional post processing labor demanding tasks. This freed up Tony3D.net's employees to focus on other tasks, such as designing new models and interacting with customers. Thanks to Modix BIG-60 printer capabilities, for example, models created topographic the company of neighborhoods in sizes of 2.5 meters by 2.5 meters using fewer parts, giant art sculptures, and more. Over the time Tony3D has upgraded its BIG-60 to version 2 which allowed them to extend the lifetime of the machine, enjoy new features and as a result this machine is still printing on a daily basis.





Tony3D.net is now able to offer its customers a wider range of 3D models, including large-format models, complex models, and models with a high level of detail. The company has also been able to reduce its turnaround times and improve its customer satisfaction.

The Modix BIG-60 has been a valuable asset for Tony3D.net. The printer has helped the company to overcome a number of challenges and grow its business.

If you are a 3D printing company that is looking to create large-format models, the Modix BIG-60 is a great option.



I have been using modix3d printers since the first model, and I am extremely satisfied", says Mr. Arik Yusupov, Tony3D's CEO. "Firstly, the cost-effectiveness of using the printers is excellent. Secondly, the reliability level is very high, and thirdly, it allows us to create especially large models. If used correctly, it is an excellent solution. I highly recommend Modix's printers.





## **Preserving History in Full Scale:** FloatScans' Innovative 3D Scanner

#### THE COMPANY

FloatScans is an Amsterdam-based 3D scanning startup. The company has developed a unique, human size 3d scanner that captures objects' geometry, color and interaction with light, and creates a new dimension for digital experiences and real-world realism. The company provides endless new interactive stories, by digitally preserving art relics and historical items for future generations. Its main clients are museums, private collectors, and auction houses.

#### THE CHALLENGE

FloatScans faces a dual set of challenges where large-scale 3D printing proves indispensable:

- The 3D scanners are deployed in varied physical locations, each with unique requirements for space, positioning, and size. Consequently, scanner parts are custom-made using Modix machines to optimize their functionality.
- The artifacts to be replicated often match human dimensions. This necessitates a printer with substantial build capabilities for rendering such relics and replicas.



#### COMPANY

FloatScans, The Netherlands

#### VERTICAL

Mechanical , Engineering Creative Industry & Arts. Product development

#### APPLICATION

3D Scanning, Digital Inventory, Prototyping, Art & Design

**THE PRINTER** BIG-60, Big Meter

#### THE SOLUTIONS AND OUTCOME

FloatScans invested in both the Modix Big-60 and Big Meter printers to meet these challenges. The company employs these machines for:

1. Engineering and fabricating essential components of their 3D scanners, sometimes producing parts as large as 600 millimeters.

2. Producing a variety of smaller parts in larger quantities, such as unique cable management solutions or hooks.

3. Creating life-sized or larger-than-life relics and sculptures, thereby diversifying its business offerings and accepting more projects.

Max Roest, CEO of the company ,explains prototyping advantages using Modix 3D: "For Prototyping - we went as far as skipping a manufacturing stage. For example, we'll need to create a new housing for some complex components, which is pretty difficult. Typically, we would create a first version to see how the tolerances work, and if the components actually fit nicely or we need some adaptations or some margins -we just change it. With Modix, prototyping reduced turnaround time - sometimes within a day - we got a new version in the hands of the engineer. In terms of material we don't even need to make metal parts. The PLA prints already give enough structural rigidity to hold stuff in place. The plastic part is more than sufficient for us to work with".



"With Modix, prototyping reduced turnaround time - sometimes within a day - we got a new version in the hands of the engineer. In terms of material we don't even need to make metal parts" says Max Roest, FloatScans' CEO.





DINOSAURS REVIVED: TRIEBOLD'S JURASSIC JOURNEYS WITH MODIX LARGE 3D PRINTERS

#### THE COMPANY

Triebold Paleontology, Inc. (TPI) has been a beacon in the world of paleontology for over 30 years. They specialize in providing fossil skeletons, skeleton casts, and a plethora of paleontological and exhibit-related services to global institutions, including museums and universities. Founded by Mike Triebold, TPI is renowned for its world-class skeletons and its collaborations with major

institutions, which allow them to offer some of the most unique cast fossil skeletons available.

#### THE CHALLENGE

Printing large and intricate fossil specimens in a manner that maintains their authenticity and detail has always been a challenge. Traditional methods, which involved printing fossils in smaller sections followed by reassembly, were time-consuming and often lacked the desired precision.

#### **THE COMPANY** Triebold Paleontology, Inc.

#### WEBSITE

www.trieboldpaleontology.com

#### VERTICALS

Museum Exhibitions and Displays Educational Institutions Research and Development Cultural and Historical Preservation

#### **APPLICATIONS**

Fossil Replication Interactive Exhibits Academic Tools Restoration Projects Merchandising

#### PRINTER

Modix BIG Meter



#### THE SOLUTION AND OUTCOME

To overcome these challenges, Triebold Paleontology employed the Modix BIG Meter 3D printer. This printer, with its extensive build volume, enabled Triebold Paleontology to print vast fossils in their entirety, removing the need for segmented printing and subsequent assembly. Their success was vividly captured in a timelapse video of a Duckbill Sacrum being printed. The Modix team's unwavering support ensured that any challenges, especially those related to printing organic shapes, were promptly addressed.



"Triebold Paleontology, Inc. has very much appreciated the Modix BIG Meter for its cost and build volume. It has also allowed us to print HUGE fossils whole, which previously we had to print in small sections and reassemble. Most importantly, the Modix team has been promptly responsive to the various problems that we encounter when printing organic shapes and has worked closely and generously with us to ensure we can keep producing", Evan Sonnenberg, Triebold Paleontology

Modix

# INNOVATION IN THE HEALTH ε MEDICAL INDUSTRIES







## PROTECTING MEDICAL TEAMS WITH A 3D PRINTED REMOTE CT SCANNER

#### THE COMPANY

Mr. R. Kulas, is an engineer at one of the world's largest suppliers of healthcare technologies and diagnostic imaging. During the Covid-19 pandemic, he was tasked with designing and prototyping a remote control panel device for their popular CT scanners. This device would allow clinicians to do CT scans in safety and at a safe distance from potentially infected patients.

#### THE CHALLENGE

The challenge was that the control panels for CT scanners are typically located on the face of the scanner, putting clinicians at risk of exposure to the virus. Kulas used Modix to design a large remote control panel that could be 3D printed and used to control the scanner from a safe distance.

#### THE RESULTS

Kulas's design for the remote control panel is being shared with the team so that they can go into production. The designed control panel is a large element of plastic equipped with sensors and led lights that can instruct patients remotely to move according to the scanning procedure and needs. Hospitals are lining up for this device but there are still some regulatory hurdles that need to be cleared before it can be approved for use.

Kulas is grateful for the opportunity to work on this project and to use his skills to help protect healthcare workers. He believes that using Modix 3D printing abilities is key to this project, as it allows the device to be printed quickly and easily in various locations around the world.



#### THE CREATOR

Mr R. Kulas, Engineer, for Diagnostic Imaging

#### VERTICALS

Med-Tech

#### **APPLICATIONS**

Medical devices and implants Telemedicine and remote healthcare Production of final goods

#### PRINTER

Modix BIG-120X







EMPOWERING PATIENTS WITH CUSTOMIZED PROSTHETICS IN RECORD TIME

How large 3D Printing makes a Social Impact: Prosthetics & Orthotics

**COMPANY** Emerge Prosthetics Arts, LLC

WEBSITE www.emergeprosthetics.com

**VERTICAL** Prosthetics & Orthotics

**APPLICATION** Digital Manufacturing

PRINTER Modix BIG-120X



#### THE COMPANY

Emerge Prosthetics Arts is a dedicated workshop/company providing masterpiece prosthetics for daily use. The company operates and serves clients from all over the USA, providing them with a tailor-made, livable solution for a more improved functioning with the use of prosthetics.

#### THE CHALLENGE

There are a number of significant factors when dealing with printing prosthetics. Size, material, speed. The goal within making any prosthesis is that you will effectively be able to treat everyone that comes in, and within a reasonable timeframe.

#### **THE SOLUTION & OUTCOME**

The company has purchased Modix BIG 120-X as a production solution, turning the workshop into a digital manufacturing hub. Objects are scanned or prepared with dedicated 3D printing software, and the team uses the printer to execute the models and designs fast and efficiently.

"I wanted a 'lights out' production machine. The ability to print large and lots of items all at once. I can literally run the printer all week, and just replace the filament as I need to!", says the company CEO.

"Taking prints and gluing them together is a whole other engineering problem. Making things that fit well, or that are perfect or seamless, is actually quite difficult. Modix enables us to overcome this and print in one seamless print."

"We can print casts for molds, or the actual skin (of the prosthesis). Size is not an issue, neither is volume - we can have 30 objects printed on the bed simultaneously. The quality I've gotten on the parts is just improving every iteration that I have got so far."



"Taking prints and gluing them together is a whole other engineering problem. Making things that fit well, or that are perfect or seamless, is actually quite difficult. Modix enables us to overcome this and print in one seamless print."

#### THE SOCIAL IMPACT:

As for the industry and patients, the impact of 3D printed prosthetics is huge. It has created a whole new capability for manufacturers and for patients. From special skin-like materials from which the prostheses are printed with, to texture, color, design, and functionality. All these can be achieved fast, giving the patients real relief and reducing anxiety of having to deal with the sometimes tedious process of purchasing and fitting a prosthetic.

"Utilizing 3D printers for the prosthetics industry is a game-changer. We can achieve higher levels of execution in almost every aspect. It really gives us the possibility to anticipate people's expectations as well as treat their symptoms."





"I have completely converted and attempted just to push the boundary in what's possible in the additive manufacturing space to increase the amount of precision that I can apply to these prosthetics. At every level it's improved my practice, there's no question. It is a revolution."





## ANCIENT NEEDLES, MODERN MAGIC: 3D-PRINTING ACUPUNCTURE'S OLD WISDOM AT HONG KONG MUSEUM.

#### THE COMPANY

The Hong Kong Museum of Medical Sciences, established in 1996 in the historic Old Pathological Institute, is dedicated to educating the public on the evolution of both traditional Chinese and western medicine. As a research and preservation hub, the museum emphasizes Hong Kong's medical history and its battles against infectious diseases. In collaboration with the Acuman Project, the museum merges the ancient wisdom of Chinese medicine with modern technology, underscoring its commitment to preserving and highlighting the profound history and practices of medical sciences.

#### THE ORGANIZATION

The Hong Kong Museum of Medical Sciences

THE PRINTER Modix BIG-60 V2 and V3 3D

#### VERTICAL

Museum and Exhibition Design Education Medical Research Cultural Preservation Technology and Innovation

#### APPLICATION

Artifact Restoration Interactive Exhibits Medical Training Research and Development Cultural Events

#### THE CHALLENGES

The museum aimed to create a detailed and realistic representation of acupuncture points and techniques for professional studies. The challenge lay in ensuring the precision, scale, and authenticity of these restorations, especially for the 3D Acuman acupuncture model, which was intended to be a 1:1 scale representation.

#### THE SOLUTION AND OUTCOME

To address this challenge, the museum employed the Modix Big-60 V2 and V3 3D printers, known for their precision and large-scale capabilities. These printers successfully brought the 3D Acu-man model to life, resulting in a life-sized, detailed copper acupuncture model. The 3D Acu-man Exhibition, held at the Madam Ku Kei Kwan Priscilla Gallery, won the Grand Prize in the HKIE Innovation Award 2021 and was extended due to its immense success.

#### THE SOCIAL IMPACT

The 1:1 scale 3D Acu-man model has had a profound social impact. It has provided technology experts, students of ancient Chinese medicine professionals, as well as the general public with a tangible, detailed representation of acupuncture points and techniques. This blend of ancient knowledge and modern technology has not only served as an educational tool but has also bridged the gap between traditional practices and contemporary understanding. The project has benefited countless individuals, promoting error-free learning and a deeper appreciation for the intricacies of Chinese medicine.

Modix

# INNOVATION IN THE AGRITECH INDUSTRY







### SUSTAINABLE AGRICULTURE WITH MODIX BIG 120 V3 - THE REAL MARTIAN CASE

Jeff Raymond, Chief Operations and Technology Officer at Eden Grow Systems is "working on a self sustainable agriculture system that will provide food and energy to local communities". His research is documented in a very popular youtube channel named TheRealMartian inspired by Ridley Scott's famous movie "The Martian" featuring Matt Damon as an astronaut that is trying to survive on the red planet by building a self-sustaining farm.

#### THE CHALLENGE:

Jeff wanted to create a 3D printed grow wall that would allow him, as well as anyone who wants to grow plants in their home, to do so. He was looking for a way to create a sustainable and efficient way for this, and saw Modix BIG 120X printers as a potential solution.

#### THE SOLUTION AND OUTCOME

Jeff worked with Modix BIG-120X printer to create a grow wall design that met his needs. The design included a number of features that made it ideal for growing plants, such as:

- A modular design that allowed the grow wall to be easily expanded or customized.
- A water reservoir that ensured that the plants would have a consistent supply of water.
- A drainage system that prevented the plants from becoming waterlogged.
- A lighting system that provided the plants with the necessary light.

The Modix 3D printed grow wall was a success and efficient for growing a variety of plants. The grow wall is also easy to maintain, and allows saving money on gardening expenses.

In conclusion, Modix BIG-120 V3 printers offer a promising technology for the creation of grow walls. It offers a number of advantages over traditional methods, such as customization, complexity, and cost.



## ng Growing food in harsh or challenging environments he **PRINTER** MODIX BIG -120 V3



#### THE CREATOR

TheRealMartian

WEBSITE

www.edengrowsystems.com

#### VERTICAL

Sustainable Agriculture Urban farming, Indoor agriculture, Food security, Humanitarian aid

#### APPLICATION

Growing food Providing food for people in remote or underserved areas Growing food in harsh or challenging environments

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## SOWING SEEDS OF SUCCESS: MODIX'S IMPACT ON AN AGTECH STARTUP'S GROWTH

#### Modix 3D Printer Shortens Product Development for Vegetable.Tech, Agricultural Technology startup

COMPANY

Vegtable.Tech, Estonia

WEBSITE https://vegtable.tech/

**VERTICAL** Agritech, Robotics, Automation

#### APPLICATION

Robotics, Automation, Prototyping, Rapid Prototyping, Accelerating Innovation, Technology Development

**PRINTER** Modix BIG-120X



#### THE COMPANY

Vegtable.Tech is a developer of automated greenhouse infrastructure using modern data intelligence and machine learning based systems. The company's goal is to increase grower's greenhouse yield by providing high quality produce all year round in any climate. The technology serves small farmers to major enterprises, and focuses on automated management and optimization of all natural resources.

#### THE CHALLENGE

The company faces the challenge of creating physical systems (robotic systems) that are suitable for use in a delicate greenhouse environment.



#### THE SOLUTION: & OUTCOME

Vegetable.Tech purchased a Modix 120-X 3D printer in August 2020. The Modix 3D printer has helped the company in a number of ways, including:

- Easier product development process and shorter time to market: The Modix 3D printer allows Vegetable.Tech to create prototypes quickly and easily. This has helped the company to shorten its product development process and get its products to market faster.
- Skipping stages, special needs and design alterations: The Modix 3D printer's modular design allows Vegetable. Tech to print using a variety of filaments and components. This has allowed the company to skip stages in the product development process and to make design alterations quickly and easily.
- Compliance with food-tech industry standards: The Modix 3D printer is compliant with the food-tech industry's standards. This is important for Vegetable.Tech, as they need to use food-safe filaments in their products.
- Affordability: The Modix 3D printer is a good solution for a limited budget start-up company. The printer's modular design allows Vegetable. Tech to start with the affordable components needed and expand later on.

The Modix 3D printer has helped Vegetable. Tech to overcome the challenges they faced in creating physical systems for their automated greenhouse infrastructure. The printer has allowed the company to shorten its product development process, skip stages, make design alterations quickly, and comply with the food-tech industry's standards. As a result, Vegetable. Tech is now able to bring its products to market faster and more easily.



"The Modix 120-X 3D printer has helped us by on-the-spot correction. We can see the immediate impact of the newly designed systems on the plants, and keep or perfect them as we go"



## INNOVATION IN MANUFACTURING





ESTABLISHING ENGINEERING & PRINTING SERVICES FROM HOME -BY ENGINEERING GARAGE



#### THE COMPANY

"Engineering Garage" is a small engineering & 3D printing service business from Indiana USA. With 15 years of design engineering experience, Brian Grimm, the owner, approaches each project on a job by job basis giving each client the best service.

#### THE CHALLENGE

For most home-based business owners, it would be a dream to come across an economically priced large-format 3D printer. It substantially increases the capabilities of the home makerspace, enabling personal projects such as side tables, sculptures, or musical instruments. In the case of the Engineering Garage, a large-format 3D printer was necessary to 3D print automotive and industrial components, large domestic items, and large tools for the makerspace.

#### THE SOLUTION

The Engineering Garage's Modix Big 60 is the optimal 3D printer for the Engineering Garage because its price point makes it affordable for hobbyists, who otherwise would have severely limited large-format 3D printer options. Additionally, the Modix Big 60 comes as a kit, and can be customized by at-home makers for its specific intended use. In the case of the Engineering Garage, they have been able to fit it with a timelapse camera.



#### THE SOCIAL IMPACT

The timelapses on the Engineering Garage's YouTube channel promote machine ownership and demonstrate to the wider community how 3D printing can be used to both prototype and manufacture large parts for machines and domestic use. THE COMPANY Engineering Garage

WEBSITE https://engineeringgarage.company

**VERTICAL** E3D printing services, Casting, Signs

APPLICATION Prototyping, end-use tools, tools for casting

THE PRINTER Modix BIG-60 version 3





## THE MODIX BIG-60: A GAME-CHANGER FOR THE COMPOSITE MANUFACTURING INDUSTRY

#### THE COMPANY

TCB Composite

WEBSITE tcbcomposite.com

#### VERTICALS

Aerospace, Manufacturing, Automotive, Industrial

ULKHEADS

#### APPLICATION

Mold making, Prototype creation, Rapid tooling Fixtures, End-use parts

#### THE PRINTER

Modix BIG-60



#### THE COMPANY

TCB Composite is a manufacturer and seller of commercial composite aircraft spinners and bulkheads for military and commercial aerospace applications such as Piper, Cessna & American Grumman. The company provides tailor made parts and needs to create large and robust molds for composite materials for aviation and aerospace industries.

#### THE CHALLENGE

Traditionally, TCB Composite would use CNC machining to create molds for composite materials. However, this process was time-consuming and expensive, and it often resulted in parts that were not as accurate as desired. The company also needed to find a way to create larger molds, as the demand for larger aircraft parts was growing

#### THE SOLUTION

TCB Composite turned to Modix BIG-60 printing as a solution to their challenges. The company purchased a Modix 3D BIG-60 printer, which has a large build volume of 600 X 600 X 660 mm. This allowed TCB Composite to print larger molds more quickly and accurately than ever before.

In conclusion, The Modix BIG-60 has been a valuable asset to TCB Composite. The printer has allowed the company to create large and accurate molds for composite materials more quickly and easily than ever before. This has helped TCB Composite to improve their production process and meet the growing demand for larger aircraft parts.



""The fixtures in the carbon fiber part allow us to fixate it so that we can always accurately drill holes. It took about 60 hours each at 80 mm/s, PLA. The solid one is about 2.5 lbs. of plastic, the one with holes about a pound less." said Neal Crookston, Production Supervisor at TCB Composite.



## INNOVATIVE INTEGRATION: 3D-PRINTED JIGS IN PCB MANUFACTURING

**COMPANY** Francis Lorival , Engineer at CBS Industries, France

VERTICAL PCB Manufacturing

APPLICATION Industrial Fixtures

THE PRINTER Modix BIG-60 V1 and V3



#### THE COMPANY

CBS Industries, a France-based engineering company, has been using Modix BIG 60 machines as the pinnacle of their large-format 3D printer fleet.

#### THE CHALLENGE

Francois Lorival of CBS Industries has been steadily increasing his company's 3D printing volume capabilities for the past few years. His goal was to find the largest 3D printer for the best price available, so that his company could 3D print industrial parts and fixtures, as well as demonstrations and cool side projects.



#### THE SOLUTION AND OUTCOME

Modix is an obvious choice for such a challenge; by price-percubic meter metrics, it cannot be beat elsewhere in the consumer 3D printing market. It has enabled Lorival, with CBS industries, to create parts and demonstration projects. For example Francois was able to aid his company with several large PCB manufacturing fixtures as well other manufacturing tooling.

As a hobby project, Francois has used Modix to print an electric guitar body. When it comes to guitar body manufacturing, 3D printing is an ideal solution. Internal channels can be printed directly into the guitar body instead of being routed after the body's construction. In this way, the guitar is ready for electronics and neck installation immediately after being manufactured.



#### THE COMPANY Metralabs

VERTICAL Industrial robots Retail robots

**APPLICATION** Prototyping Manufacturing

THE PRINTER Modix BIG-60





## CUSTOMIZED ENCLOSURES FOR MOBILE ROBOTS TAILORED PERSONALITY, THE MASS CUSTOMIZATION STORY OF METRALABS.

#### THE COMPANY

Metralabs is a developer of autonomous navigating service robots for different applications worldwide. Applications include industrial robots, robots for retail uses, research, etc.

#### THE CHALLENGES

Metralabs faces the challenge of designing and creating robots in different sizes, for clients with different needs. Each of these designs differs in both technical details and overall look of the robot in order to meet the customers functional needs and use profile. Therefore, the company needs to utilize strong yet versatile working tools.

#### THE SOLUTION AND OUTCOME

Modix's BIG-60 3D printer provides an in-house solution for manufacturing parts, prototyping models and testing versatile robots and the products' functionality.

With Modix BIG-60 Metralab can manufacture small batches of tailored enclosures without the heavy investment needed for molds. It also helps to close more deals as clients can see a unique design that matches their needs better than a standard robot design. I.e. a robot design for a retail shop might want to look different than a robot for industrial warehouse deliveries.

The BIG-60 printer is a large-format 3D printer that can print parts up to Print volume: 600 X 600 X 660 mm. This makes it ideal for Metralabs, which needs to be able to print large parts for its robots. The BIG-60 is also very versatile, and can print with a variety of materials, including PLA, ABS, and nylon. This gives Metralabs the flexibility to choose the right material for each application.

"The print quality is improving with every print. We finished a robot for a new project recently. All the housing parts were printed with Modix BIG-60 printer. The parts were grinded, filled and painted afterwards. Also, our boss is thinking about buying a second printer, which is good.", says Alexander Kloska, Mechanical Engineer at Metralabs. "For our prototypes and small productions we normally use the 1mm nozzle and the 0.6 layer size. We usually use white PLA filament and each enclosure part takes approximately 20 hours to print."





## SPEED, VERSATILITY, AND BUDGET: TTICI'S TRIPLE CONSULTANCY WIN WITH MODIX BIG-60

#### TTICI, a technology consulting specialist, achieved triple success with the Modix BIG-60 3D printer thanks to its modular design, versatility in materials, rapid prototyping, and cost-effectiveness

#### THE COMPANY

TTICI is a Technological Automaton consulting specialist based in Germany. Operating in the fields of Robotics & Machinery, Engineering, and Electronic Engineering, TTICI focuses on developing new products and concepts, including Industrial Applications, Prototyping, Rapid Prototyping, and Product Development.

#### THE CHALLENGE

In the fast-paced world of industrial manufacturing, TTICI faced the challenge of providing customized, rapid, and cost-effective solutions to its clients. The need for a versatile and efficient 3D printer that could handle various materials and adapt to specific customer needs was paramount.

#### **THE SOLUTION & OUTCOME**

#### COMPANY

TTICI WEBSITE https://ttici.de

VERTICAL Robotics & Machinery, Engineering Electronic Engineering

#### **APPLICATION**

Industrial Applications Prototyping , Rapid Prototyping Product Development

PRINTER Modix BIG-60

To address the unique challenges faced by TTICI, the Modix BIG-60 3D printer was identified as a solution that could provide the necessary customization, efficiency, and cost-effectiveness. The key features of the printer that contributed to its success with TTICI include:

Modular Design: The Modix BIG-60's modular design allowed TTICI to tailor specific solutions to their customers, as stated by CEO Bjorn Magnussen.

Versatility in Materials: Capable of producing items in both metal and plastic, the printer offered the flexibility needed for various projects.

Rapid Prototyping: The printer's speed and efficiency facilitated rapid prototyping, essential for product development and innovation.

Cost-Effective: Quality printing within a limited budget made the Modix BIG-60 an attractive option for TTICI.

#### CONCLUSION

In the fast-paced world of industrial manufacturing, TTICI faced the challenge of providing customized, rapid, and costeffective solutions to its clients. The need for a versatile and efficient 3D printer that could handle various materials and adapt to specific customer needs was paramount.

Bjorn Magnussen, CEO, TTICI: "One of the major benefits for us is the modular design of Modix BIG-60 3D printer. This allows us to tailor specific solutions to our customers"

## DESIGNING AUTOMATED FACTORIES WITH MODIX LARGE 3D PRINTING

How SIM automation created customized feeding Balls faster for an automatic medical device factory.

#### THE COMPANY

SIM Automation is a German company specializing in manufacturing automated manufacturing lines for the medical, pharmaceutical, food, automotive and other industries. SIM Automation's services are tailored to the specific needs of each customer, ensuring that they receive the highest quality automation technology available.

#### COMPANY

SIM Automation

WEBSITE sim-automation.com

#### VERTICAL

Industrial automation Manufacturing Robotics Medical Pharmaceutical

#### APPLICATION

Prototyping Customized Production

THE PRINTER BIG-60 3D

#### THE CHALLENGES

SIM Automation wanted to create a large feeding ball that will be used for components that need to be installed in a medical device during the automated manufacturing process. These bowls oscillate in a special way that helps the components to climb along their grooves and feed the assembly robots in a very specific order, angle and speed.

Feeding balls known also as "Vibratory bowl feeders" are crucial for orienting and feeding parts in automation, present challenges due to the need for precise part orientation, effective vibration control, noise reduction, and integration with downstream equipment (i.e. a robotic arm that will pick the parts). SIM Automation was looking for an efficient, time saving, accurate and non-expansive solution for this matter.

#### THE SOLUTION AND OUTCOME

Sim Automation has purchased a Modix BIG-60 3D printer in order to expedite the development of their specially designed large feeding bowls.

Utilizing Modix expedited the production of these components by allowing rapid prototyping and testing of custom designs tailored for specific parts. This not only speeds up the design and refinement process but also reduces the lead time in manufacturing the tailored internal tooling, thereby providing a quicker and more adaptable solution to meet specific feeding needs.

These feeding bowls prototypes are printed and then tested in a development system. Final production parts are sometimes printed with medical certified ABS filament.

The Modix BIG-60 has been a game-changer for our company. It has allowed us to create custom feeding balls quickly and accurately, which has saved us a significant amount of time and money. We are now able to meet the specific needs of our customers, and we are confident that our products are of the highest quality.

Mr. Michael Wagner, SIM Automation

Modi





## www.Modix3D.com Info@modix3d.com