



LAVA DROPS IN HARMONY

Rapolas Gražys' Journey from
SOLIDWORKS Student to Instrument Designer



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THE ART OF DESIGN

Rapolas Gražys is the visionary behind Lava Drops, a boutique electric guitar line with a mission to inspire creativity and be a mediator between humans and nature. A former SOLIDWORKS student, Rapolas used the CAD software to build both his business and his incredible instruments.



JOURNEY FROM SOLIDWORKS STUDENT TO INSTRUMENT DESIGNER

In 1969, Jimi Hendrix electrified the crowd at Woodstock, cementing his place in rock history with a legendary set played on his famous white Fender Stratocaster. Over three decades later, an inspired teen in Vilnius, Lithuania, picked up his own white Stratocaster and began teaching himself how to shred. Fast forward fifteen years and now Rapolas Gražys designs and builds instruments the likes of which Hendrix and his contemporaries couldn't begin to imagine.

Rapolas is the visionary behind Lava Drops, a boutique electric guitar line with a mission to inspire creativity and be a mediator between humans and nature. Lava Drops are distinct in many ways: the sounds they're capable of making, the rare materials from which they are crafted, their artistic and ergonomic design. Rapolas bases his designs on the naturally occurring drop shape, like a raindrop falling from the sky or lava exploding out of a volcano. With instruments shaped from rare woods like sapele and ebony, and true art pieces like the Black Amber Drops, electric guitars made from 50-million-year old black amber, Rapolas is making astonishing innovations with both technology and art.



The SOLIDWORKS community first met Rapolas at SOLIDWORKS World 2016, where he headed a small breakout session discussing his time as an industrial design student and how he created Lava Drops. But they were reintroduced when he appeared on the main stage at SOLIDWORKS World 2019. He appeared in front of 6,000 people and presented his latest piece, the Lava Drop X xDesign Edition. When his colleague, professional musician Robertas Semeniukas started playing, the show was beyond stolen.

His journey from industrial design student to the top Lithuanian designer/luthier was only part of the story. His love of art, nature, design, and how all those elements made up the whole of his philosophy as an entrepreneur, using SOLIDWORKS and SOLIDWORKS xDesign to create hand-made pieces; made up the rest.

INSTRUMENTAL BEGINNINGS

Born into a family of artists—his mother is an actress, his father is a modern artist, with a long list of artists and actors on both sides of the family tree—Rapolas easily could have joined his relatives and become a more traditional artist, or continued down the path of a professional musician. But while he shares a familial passion for art and beauty, he decided to drive his career towards something a little less bohemian, while still relating to his love of music and instruments: industrial product design.

The first Lava Drop was born when Rapolas was an undergraduate student at the Vilnius Academy of Art. He describes playing the guitar as, “my hobby, my passion, my narcotic.” So when it came time to pick a project and complete his bachelor’s degree in industrial design, there was one obvious choice. “I thought, Why not make a guitar? Not a guitar, but a musical instrument. And I came up with the idea of a fretless guitar,” he said. Normally a guitar has frets raised out of the fingerboard, and when a player presses the strings on a fret they can achieve an exact note. In a fretless instrument, like a violin, the player needs to press the string directly into the fingerboard and vibrate the strings along the neck, sliding up and down to switch from one note to another. Rapolas’ original fretless electric guitar, the Lava Unibody Drop, emulated classical fretless instruments, like the sitar or the rabab. And to design it, he needed SOLIDWORKS.

“SOLIDWORKS was a main part of my journey at Vilnius Academy of Arts,” Rapolas explained. He considers it his partner in the 3D world. Rapolas learned how to use SOLIDWORKS as an undergrad student at the Vilnius Academy of Arts. As a student, he designed his first guitars with SOLIDWORKS, turning his sketched ideas into 3D shapes and building them using the school’s fab lab. And Rapolas continues to use SOLIDWORKS today. “I love to create by myself on paper and then transform everything in the digital world,” he said. “In SOLIDWORKS, you can take a photo of your drawing, put it [in SOLIDWORKS], vectorize it, and make a 3D shape.” Today, Lava Drops is sponsored by the SOLIDWORKS for Entrepreneurs program, allowing Rapolas to continue his use of SOLIDWORKS and utilize the SOLIDWORKS community for support.

After graduating with his bachelor’s degree, Rapolas spent some time at the Royal Academy of Art in Copenhagen, Denmark, then returned to the Vilnius Academy of Art for his master’s degree. Grad school was dedicated to developing a line of electric guitars that would become Lava Drops. “I developed three models,” recalled Rapolas. “One, the Lava Unibody Drop, the fretless one. Then I developed the simple Lava Drop model, which is a bit more like a modern guitar, but has a drop shape. And the third model is the Lava Drop X with an aluminum contour, and the first laser MIDI controller in the world.” The laser MIDI controller allows the player to control the electric tone with a laser light, similar to how one would use a theremin. The laser controller creates otherworldly electronic sounds, complimenting the rich tones of the guitar.

“And after graduating from Vilnius Academy of Arts, I started my company called Lava Drops,” Rapolas stated. Lava Drops officially launched in 2015. While working on building his brand and spreading the word about his instruments, Rapolas also did freelance design work, helping companies create branding and marketing strategies from a design perspective. Anything to keep him within the world of design while Lava Drops took off.



HARMONY OF WHISPERING NATURE

It's easy to find and purchase a guitar, but they're complicated instruments and the prices can be steep. A good electric guitar will be made out of wood, usually a hardwood like mahogany or ash, with a neck made from wood that allows for good resonance and tone. The factors that go into an electric guitar's pricing and level of luxury—materials for the body, neck, and pick-ups, the instrument's actual design, what brand name it's attached to—vary wildly, but they are all made of wood and in the right hands they can sound incredible.

Every hear the sound a black amber guitar makes?

Rapolas Gražys' Lava Drops are crafted from rare and interesting materials, and he takes the sounds those materials are capable of making very seriously. "The idea is to use materials that have history," he said. "Each material gives a different resonance. And with combined materials you can get different tonal possibilities." Case in point, 50-million-year old black amber sourced from the Baltic Sea of his home country, Lithuania. His reverence for build elements stems from his love of nature and the natural world. Rapolas has consciously incorporated nature into his Lava Drops, both in their substance and their design.

When asked about his relationship with nature, Rapolas said, "When I need to be calm, I go to nature. I'm not sitting in the city with a lot of cars and dust and sounds. I'm going to nature to relax. We're born from nature and we're going to be gone in nature. Nature is always around us. And to have something that is built from natural resources is great." Rapolas can talk at length about the tonal possibilities of different woods, metals, and rocks. Mahogany



family woods have warm tones, while maple has a darker feeling. Ebony and black wood create good, clear notes, but physically they are heavier materials. Black amber is millions of years old, and combining amber stone resin with aluminum to make up a guitar body can give you very long, sustained notes that resonate within the instrument. Aircraft grade aluminum used for a guitar's contour can lift up the tone, allowing for a beautifully clear sound. The possibilities are endless, and Rapolas loves experimenting with different, exotic materials and utilizing them to transform an instrument into art.

The usage of such disparate materials requires a lot of testing, and that requires SOLIDWORKS. Rapolas developed his basic instrument designs with the software, and he also uses it to digitally test build materials. "You can see the strength [of the materials]," Rapolas said. "The main part of guitar making is more about calculating the bending possibilities of different materials, different wood combinations, and different constructions." As an example, he talked about calculating how much the neck of a guitar could bend—if a guitar neck does indeed bend, it is no longer playable—and how his testing and calculations led him to insert carbon fiber into each Lava Drops' neck. "It's very strong, it's always stable. It's always straight. It's very good for professionals," he said of the carbon fiber. Another way to incorporate the new with the old.

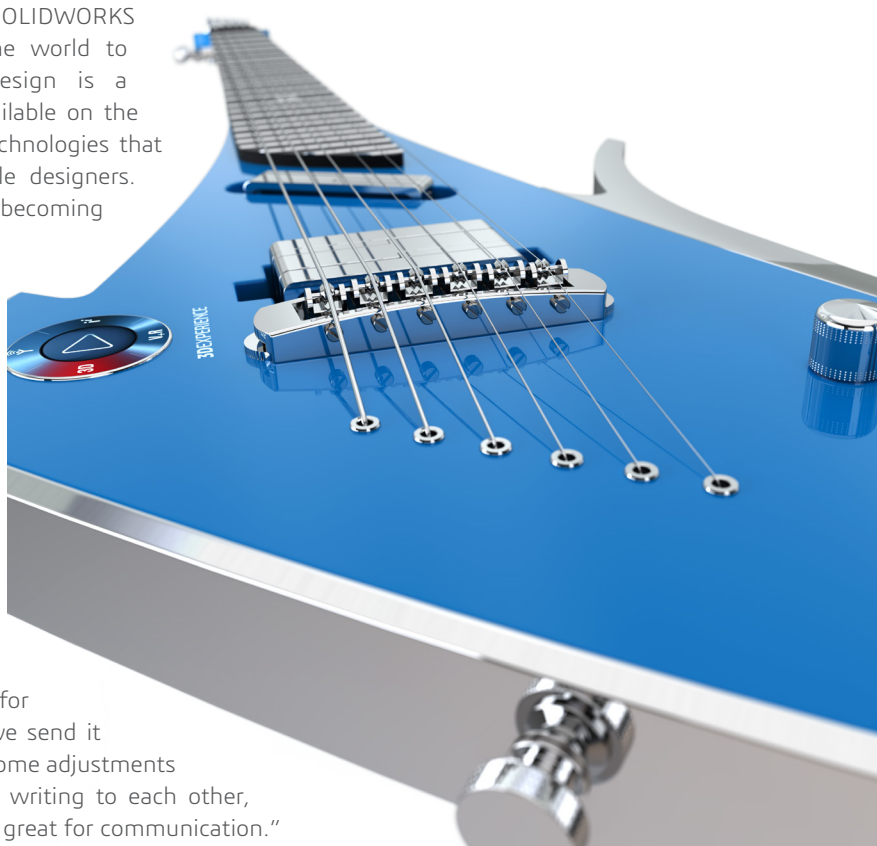
Lava Drops are meant to be a mediator between humans and nature, born from mixing modern technologies with ancient elements. By virtue of his boutique business model, Rapolas is able to stay true to his mission. Every guitar is hand crafted. With his three basic design shapes created in SOLIDWORKS at the ready, he is easily able to customize each of his guitars to the customer's taste. "Each instrument is different, with a different perspective, different building materials, different methods of making it, different times spent making it, so each one is an art piece," Rapolas said.

Art inspires. It's about communicating a feeling, can be used to enrapture people with a shared passion. By taming sounds with musical instruments, mixing technology with art, Rapolas is determined to use his Lava Drops to inspire others to create, to change the way they view art, engineering, and design. That philosophy and drive is part of what drew him to SOLIDWORKS xDesign.

While Rapolas Gražys was presenting his first Lava Drops guitar at SOLIDWORKS World 2016, SOLIDWORKS CEO Gian Paolo Bassi was introducing the world to SOLIDWORKS xDesign. SOLIDWORKS xDesign is a browser-based 3D modeling tool that is available on the 3DEXPERIENCE platform, and uses cloud technologies that can facilitate collaboration between multiple designers. Since then, xDesign has grown considerably, becoming commercially available this year. Lava Drops has also grown exponentially, and when Rapolas was invited to use xDesign in 2018, he was excited by the possibilities that were now available to him and his small team. And those possibilities led to the Lava Drop X xDesign Edition, unveiled at SOLIDWORKS World 2019.

Rapolas and his team at Lava Drops used xDesign and SOLIDWORKS in tandem, uploading Rapolas' original Lava Drop X model to the cloud and making adjustments to the design. "We use it like this," he explained. "I upload a file, the engineer takes that file, he makes changes for mathematical and physics purposes. Then we send it to the manufacturing/crafting room, where some adjustments are made. [In xDesign] we're talking, we're writing to each other, saying if a change is good or not. [xDesign] is great for communication."

That communication led to an impressive instrument. A handcrafted, futuristic design constructed from Lithuanian maple, sapele wood, and the Lava Drops signature aluminum contour, with a fingerboard built from ebony wood and a special aluminum X inlay encrusted therein. Painted DASSAULT SYSTEMES blue, the Lava Drop X xDesign Edition is a true, collectible piece of art, and an amalgam of nature and tech, of old and new, ancient and modern. As Rapolas said on stage in Dallas, "For us, xDesign is a multifunctional tool. From ideas to the model simulation, and from the model to the final product. I can say that organic design inspired by aesthetics of nature meet modern technology in the future. With the sound and form of Lava Drops and with the help of xDesign, we create emotions."



LAVA DROPS LONGEVITY

When asked if you could design a guitar for anyone, living or dead, who would it be and what would it look like? "Oh man," he laughed. "Actually...I'm already doing that." In the fall of 2018, after five months of intense work, Rapolas met Jack White, world famous musician from The White Stripes and The Raconteurs, and presented him with a gift from Lithuania: The Lava Drop Jack White III. Incredible musicians worldwide have played and purchased Lava Drops; while they are art, they are also functional musical instruments, designed by fellow guitarist Rapolas to be ergonomic and playable. As the future of his company expands before him, the dreams of a young grad student are being met and changing.

"Ten years ago, I couldn't even imagine. [I watched] the best players in the world on YouTube and tried to replicate their playing. And after ten years, I'm meeting them in person and saying, 'Look! I created a guitar, maybe you can play it!'" said Rapolas. "When you can talk guy-to-guy [with a famous musician], not like a teacher and a student or a director and an employee, you realize you can create everything, anywhere, and we can make huge things."

Since starting Lava Drops, Rapolas has reached some giant milestones. But like any successful entrepreneur, he can't get too caught up in his exciting achievements. He has to keep looking forward. And he does.

"I am making a total global brand. The idea is to have it be very boutique, very small, but with global vision and ideas," Rapolas said. He plans on releasing a bass later this year, and is presenting a new guitar, the first guitar ever made out of an extremely rare material (I'm guessing jade, or straight up moon rock, but Rapolas isn't telling). He also wants to expand his line to all electric musical instruments, not just guitars, and perhaps start designing a line of classical instruments. "I want to take Lava Drops to the next level," he said. "Create something very inspiring for others."

In the right hands, the right instrument can create music that speaks truth, that can be considered art, and can motivate the listener to create their own music. In the case of Rapolas Gražys, a life spent loving art, music, design, and nature has inspired him to develop his own kind of art: Lava Drops. Jimi Hendrix is quoted as saying, "All I play is truth and emotion." The synthesis of nature and technology is inherent to the art Rapolas creates, and it helps bring truth and emotions to life.



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