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Award winning animation studio relies on ETEC to help create characters.

CASE STUDY / STOOPID BUDDY STOODIOS

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01 / Overview

Established in 2011, Stoopid Buddy Stoodios is an award-winning production company and animation studio that specializes in stop motion, computer generated and 2D animated content for television, film and the web.

Primarily based in Burbank, California, the studio in 2021 opened a second office, in Toronto, Canada in an effort to tap into the region's deep well of animation talent.

02 / The Challenge

For almost as long as film has existed, stop-motion has been used to make objects and characters move on screen.

And for most of that time, the challenges in producing it have remained the same.

Those challenges start with the fact that, when compared to traditional cel and modern computer animation, stop-motion animation is incredibly tedious and difficult to produce.

While early, crude stop-motion may have included only a few characters or objects, current productions require animators to build elaborate sets, as well as potentially dozens of character puppets, all of which must be moved in tiny increments, frame-by-frame to create the illusion of movement.

While that extensive catalog of products means the company has to maintain a vast inventory of thousands of production molds, QSR must also be able to quickly create new tooling for prototype and custom parts.

To do it, the company invested in a new technology that's rapidly rewriting the rules of traditional manufacturing - 3D printing.

03 / New Techniques, New Challenges

In older stop-motion films, animators primarily used clay to create characters because they could easily manipulate the material to morph faces and mouths as they animated.

In later years, however, many productions instead turned to rigged puppets with replacement mouths - a technique commonly seen in Stoopid Buddy's Robot Chicken series on Adult Swim.

To create the highly-customized characters seen in modern animation productions, however, many studios today create characters digitally, and then rely on 3D printers to produce the parts that make up the puppets used in animation.

While that newer approach can streamline the animation process in some ways, it also comes with new challenges.

Rather than attempting to move characters' mouths and other facial features by hand, modern productions typically use what's called "replacement animation," a technique in which animators swap interchangeable body parts - like mouths, eyes, hands and more - between frames.

By swapping out parts with different mouth shapes, for example, animators can not only create the illusion that characters are not only speaking, but displaying a full suite of emotions, from anger to happiness to sadness and everything in between.

While it sounds simple enough, the underlying challenges can be significant - beginning with volume.

Until recently, producing the hundreds - or in some cases, thousands - of interchangeable body parts needed to animate even a single character was an enormously time- and labor-intensive process, requiring hand-sculpting models which were used to create molds, and then casting each individual part.

The process was so slow it actually limited Stoopid Buddy's ability to take on new productions - depending on how complex the animation is, it could take weeks to complete.

To address those challenges and speed up the process, Stoopid Buddy turned to 3D printing, and the envisionTEC D4K.

04 / The ETEC Solution

Using an envisionTEC D4K printer, Stoopid Buddy staff have been able to print a wide range of parts - including faces, eyes and eyebrows, and even hands and feet - for different character puppets.

Among the most significant benefits 3D printing brings to the company is speed.

Even at resolutions as low as 25 µm, parts could be affordably printed in just hours, helping to ensure productions stayed on schedule and on budget.

The ability to print parts with incredibly fine resolution reduces the need for post-processing - like sanding away layer lines or printing support artifacts - meaning the studio can quickly send parts for painting and other finishing steps.

The ability to rapidly produce parts also allows Stoopid Buddy to remain highly nimble and quickly adapt to production changes - as character designs change and evolve, the company can simply adjust digital character models and have new designs printed and on camera in just days.

Another key benefit for animators is 3D printing's repeatability, which makes it easy to create multiple versions of the interchangeable character parts used in stop-motion.

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05 / Why ETEC?

While Stoopid Buddy uses a number of 3D printers, the D4K's advantages - in terms of speed, resolution and material compatibility - have helped it become a key part of the studio's workflow.

Even when printing at extremely fine resolutions - as low as 25 µm - the D4K is able to produce parts in less time than other printers running at far less fine resolutions.

That speed has been critical for Stoopid Buddy, because it allows the studio to quickly produce parts like eyelids and eye brackets for a wide range of character puppets at the volumes needed for demanding productions.

But even when it is not set up to print extremely fine features, the D4K not only prints parts extremely fast, but produces parts that are comparable to other systems printing at higher resolutions.

By allowing the company to quickly produce high-quality printed parts, the D4K reduced the need for time-consuming post-processing - like sanding away layer lines and other printing artifacts - ensuring Stoopid Buddy productions could stay on schedule.

The ability to print a wide variety of materials was also a consideration for Stoopid Buddy.

Using envisionTEC's broad material library, Stoopid Buddy can tailor their prints to their exact needs, whether it's the rapid production of test parts or extremely accurate, high-resolution parts for use on camera.

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06 / Part Fabrication & Comparison

Using the envisionTEC D4K, Stoopid Buddy animators can not only quickly and easily print dozens of character faces (like those above,) but can also print other parts, like hands and feet, and do it all in a single build.

REPLACEMENT ANIMATION PARTS

The ability to produce a wide range of parts in just hours is crucial for stop motion, and “replacement animation” - a stop-motion technique in which, rather than animating a character’s face by incrementally moving it between frames, animators simply swap one face for another, slightly different one.

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While those parts would traditionally be cast by hand, the process is laboriously slow, making it impractical for creating the hundreds - or in some cases thousands - of parts required for modern animation.

The D4K dramatically simplifies the process of creating the same parts.

With its combination of speed and high resolution, the D4K allows animators to not only produce parts in the volumes needed for different productions, but also to ensure the parts are accurate enough to reduce the need for extensive post-processing.

The D4K has also allowed Stoopid Buddies to be far more nimble than is possible with traditional casting when it comes to producing parts.

As the needs of productions change, a character design may be altered or a character may be dropped altogether in favor of a different design.

To avoid costly delays, animators and model makers must be able to quickly pivot from producing one character to another as needs dictate.

While that can be challenging - and expensive - for traditional casting, requiring the creation of new master models and new molds, it is easy for the D4K - by simply uploading a new design to the printer, animators can shift from making one character to another in minutes.

Faces and other character parts, however, were only the beginning.

The D4K’s ability to create exceptionally fine details - with accuracy down to 25 µm, the system is the highest resolution professional grade desktop 3D printer - allows animators to create a huge range of props (bottom left) and other objects for on-camera use.

06 / Evaluation

For Stoopid Buddy Stoodios, the envisionTEC D4K has been a success, and has quickly become an invaluable tool for creating a wide range of parts - from character faces and other body parts to props - for use in stop-motion animation.

The speed of the D4K allowed animators to quickly and affordably print large numbers of parts - a crucial consideration for replacement animation, which requires multiple versions of hundreds, or even thousands, of subtly different character parts.

Even at resolutions as fine as 25 µm, the D4K is able to produce parts in less time than other printers running at lower resolution, helping productions stay on time and on budget.

In addition to speed, the D4K is extremely accurate, helping to reduce the time animators spend post-processing parts to ready them for use on camera.

With a broad range of available materials, the company can tailor prints to their exact needs, from rapid production of test parts to extremely accurate, high-resolution parts for use on camera.

07/ About Stoopid Buddy Stoodios

Stoopid Buddy Stoodios is an award-winning production company and animation studio that specializes in stop motion, computer generated and 2D animated content for television, film and the web.

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08 / About ETEC

ETEC (pronounced ē-tek) is a leading global provider of professional-grade 3D printing solutions.

As the original inventor of digital light processing (DLP) 3D printing technology, ETEC has one of the most advanced portfolios of precision polymer printers and materials in the market today.

Supported by more than 140 issued and pending patents, ETEC also has more than 190 qualified materials for its platforms. In all thousands of customers across a broad range of industries, including automotive, aerospace, medical devices, and jewelry have relied on ETEC solutions for more than two decades. The company's solutions are used for prototypes, tooling and low-volume to mass production.