

FEACT

***FREE FLOAT***

SHEET

*OUR MOST ADVANCED SOFTWARE TECHNOLOGY TO DATE*

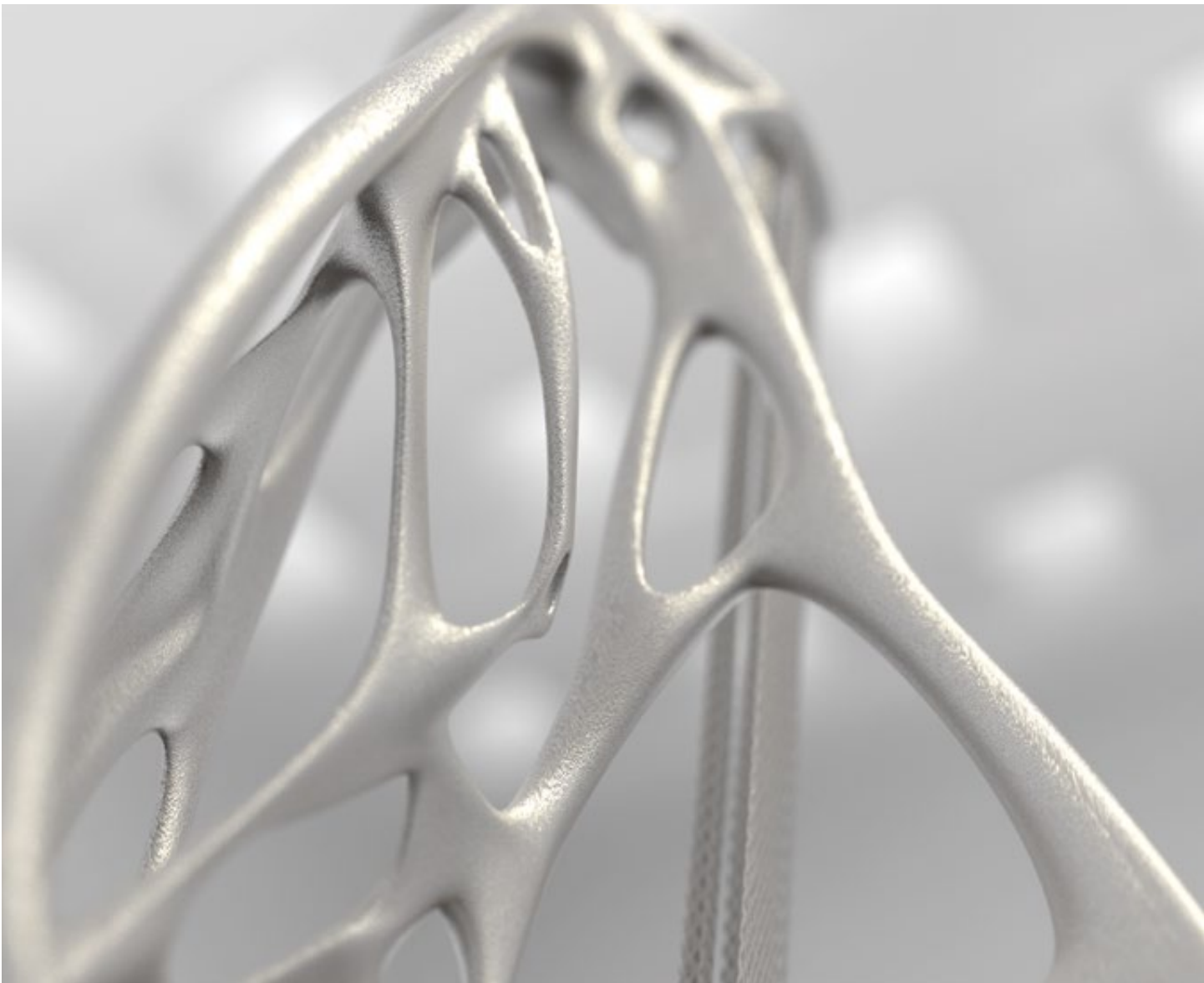
**SLM**  
SOLUTIONS

# **SUPPORT STRUCTURES**

## *AN INTRODUCTION*

Additive Manufacturing has opened up endless possibilities in the way we conceptualize, design, and produce parts. With such a modern approach to manufacturing at our fingertips, everything seems possible. In fact, many think

that such complexity also comes with total freedom of design – except this isn't the case. While new designs are indeed possible, a historic limitation has been holding your vision, and design freedom back: support structures.



# THE PROBLEM WITH SUPPORTS

Since the 1990s, support structures have been an essential component of 3D printing. They are necessary to provide support for overhanging structures and play a vital role in the cooling process by absorbing and distributing excess

heat away from the components. They also help to prevent part distortion.

Despite this, supports are still causing complications for end-users.



Supports need to be removed at a later stage, resulting in increased post-processing times



Design freedom is limited because support structures always need to be factored into the design equation



The time it takes to build supports is a significant component in the overall build time



Support structures increase material usage



THESE FACTORS PROMPTED US TO WONDER, "**IS A SUPPORT-FREE FUTURE VIABLE?**"

# ORIGINS & **INVENTION**

Around the same time, we were questioning a support-free future, Free Float was discovered as a by-product of a research project on a different topic. When working on complex geometries such as thin-walled components or sharp edges, it became apparent that the existing process would still give you a decent result, but the last few percent needed to obtain a perfect part was still missing: while reaching a good-looking part on the outside, the inside consisted of sub-surface porosities.

In 2017, we made a breakthrough in our technology which gave us that perfect missing part – and after years of rigorous research and development – Free Float was born. Unlike point-by-point exposure techniques commercially available today that increase net build time, our unique vector technology establishes thermal management that significantly decreases net build time while simultaneously enhancing part quality. It is especially the case in the overhang areas, which can now free float, much like branches of a tree. Adding to this, Free Float technology decreases powder usage leading to greater cost-per-part savings. Now, this breakthrough technology allows us to unlock true industrial-scale support-free printing.



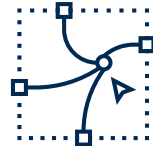
# ***AN ECOSYSTEM OF BENEFITS***



***Drastically reduce or eliminate supports***



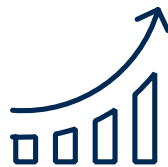
***Freeing up space for more parts***



***Retrofittable on most systems***



***Savings in metal powder***



***Productivity***



***Unlock new design possibilities***



***Less post-processing times***



***Less scrap***



***Simple solutions workflow....no PHD required!***

# **A TOOL TO BENEFIT ALL USERS**

Our main goal was to create a tool that makes it as easy as possible to apply all of the great benefits to everyone's part: reduced support structures, a more stable melt pool in thin-walled and sharp geometries leading to higher part quality. This led us to engineer user-friendly profiles which simplify your support-free journey.

But we also wanted to go further. To make it retrofittable, make it out there.



# **USER-FRIENDLY**

# FREE FLOAT PROFILES

## **A FIT FOR ANY PART**

Our team developed a tool that applied everything we learned from the development period into a convenient and easy-to-use product: Free Float. It starts with your .slm file consisting of a ready sliced part geometry, a parameter file, and support structures where they cannot be avoided. The good news: Free Float does not interfere with the vector orientation or sorting of the sliced data, nor does it manipulate process parameters allocated to a specific type, e.g., hatch or downskin. This file is then loaded into our software suite, where you can start assigning Free Float profiles right away.

These profiles correlate with the various benefits of Free Float:



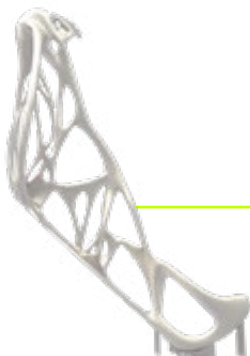
### **LOW**

Slight improvements on part quality (smoother surface, no over melting, less porosities), reduction of few necessary supports on non-critically angled sections



### **MEDIUM**

Better surface finish, increased support reduction, and medium improvements on part quality



### **HIGH**

Maximum possible reduction of supports, improved surface finish, and overall part quality

# ***A MESSAGE FROM OUR CEO***

**" Today you can design bolder. Design freer. Design with fewer limitations. Today you can work faster. Work more productively. Work better. Today you can go to the place that will take you to the next level. Now that's disruption. Every day we are pushing the limits for you, our customers. But only together can we transform the way we build. Let's do that together.**

***LET'S GO THERE. "***

***SAM O'LEARY***

*TO **LEARN MORE,***

*GET IN TOUCH WITH OUR EXPERTS*