Dyndrite First to Support New LPBF Open Vector Format (OVF)

SEATTLE, WA, Monday October 31, 2022. — Today, Dyndrite™, providers of the GPU-accelerated computation engine used to create next-generation digital manufacturing hardware and software, announced support for the new Open Vector Format (.ovf), developed by the RWTH Aachen University Chair Digital Additive Production DAP, within its Dyndrite Laser Powder Bed Fusion (LPBF) software. OVF provides a streamlined yet info-rich data link between the digital and physical process, enabling robust and efficient manufacturing processes and offers a number of advantages over existing formats, such as CLI and 3MF.

"We developed OVF because there was no satisfactory format for 2.5-dimensional data that was both open-readable and contained additional information besides the actual toolpath," said Moritz Kolter, Group Manager Digital Production, RWTH Aachen University Chair Digital Additive Production DAP. "OVF however is able to process data after slicing in a performant, readable manner and is also able to link other information such as 3D part data or metadata. This is especially important in order to have a fully linked end-to-end data chain that will drive the industrialization of AM. For example, we use it for advanced production planning or part orientation algorithms to further promote the sustainable and efficient use of technologies such as LPBF."

What is Open Vector Format (OVF)?

OVF is an open-source data format developed by scientists at RWTH Aachen University Chair Digital Additive Production DAP in cooperation with the Fraunhofer Institute for Laser Technology ILT. It is technically based on the widely used serialization technology Protocol Buffers ("Protobuf") which handles the transfer of information from complex structured data objects into a byte stream. OVF provides an open, flexible format for controlling a laser in combination with a galvanometer scanner. It supports multi scanfield arrays as well as additional machine axis controls.

OVF offers compact binary storage of all data, as well as flexible forward and backward compatibility. It efficiently transports LPBF process-relevant metadata, such as the manufacturing parameters, laser power, and scanning speed, along the process chain.

OVF structures are flexible and can be extended to support the latest digital developments. A broad portfolio of tools such as converters for legacy formats, e.g. converting CLI to OVF files, or integrity check routines, e.g. checking whether contours are closed, parameters are assigned and layers are without gaps, are available on the OVF Github.

“Dyndrite’s core vision is to change how geometry is created, transformed and transmitted on a computer. The OVF format is a very logical step towards improving how complex structured toolpath data can be transmitted in a performant and compact way,” said Harshil Goel, CEO, Dyndrite. “Only through open source advances like OVF can additive manufacturing improve its adoption, democratization and industrialization rate”

“As we developed our internal metadata models to provide a rational and robust API to generate toolpath strategies for many different machine types, machine configurations, or specific component classes, we discovered that the OVF format was aligned with our intent to enable new parameter and exposure strategies using flexible, and user extensible data structures,” said Steve Walton, Head of Product at Dyndrite. “Further, the ability to stream this data format will enable the real time generation, transport, and modification of toolpaths from process sensors.”

OVF is one of the only formats that can receive the level of toolpath complexity, and flexibility, that Dyndrite provides. Partnering with Aachen to make these strategies available to the end user accelerates this availability, as most existing formats are optimized and generally restricted for the stock machine configuration and legacy toolpath approaches.

A standard format for the output data of the LPBF process currently does not exist. Instead, numerous formats, which are either proprietary or were developed for other production processes, are used. Accordingly, these disparate formats lack the relevant information for production using LPBF. Open Vector Format (OVF) solves this problem.

Dyndrite has incorporated OVF export directly within its ADK and LPBF products.

OVF Github repository

About Dyndrite:

Dyndrite’s mission is to fundamentally affect how geometry is created, transformed and transmitted on a computer. Our Application Development Kit (ADK), gives hardware and software companies the power, freedom and control necessary to deliver on the potential of digital manufacturing.

The Dyndrite Accelerated Computation Engine (ACE) is the world’s first multi-threaded, GPU-accelerated Geometry Software Developer Kit (SDK). Accessible via both C/C++ and Python interfaces, the Dyndrite Engine democratizes access to a hyper-scalable, geometry-agnostic set of digital manufacturing software tools that deliver eyebrow-raising performance. The company licenses the Engine to hardware, software

and enterprise customers. Dyndrite's team of mathematicians, computer scientists, and engineers exist to help our partners and licensees solve the toughest geometry, compute and automation problems so they can deliver production at scale. We aim to ignite their purpose.

Investors include Gradient Ventures, Google's AI-focused Investment Fund and former Autodesk CEO Carl Bass. The company was founded in 2015 and is headquartered in Seattle, WA. Dyndrite was named a World Economic Forum Technology Pioneer for 2021.

For more information visit: www.dyndrite.com

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About RWTH Aachen University:

The Chair Digital Additive Production DAP was founded at RWTH Aachen University in August 2016 with the appointment of Prof. Johannes Henrich Schleifenbaum. In a strong network, about 120 motivated and talented employees develop technological excellent solutions in the Additive Manufacturing (AM), product as well as production digitalization topic fields. In its basic and applied research, the chair pays particular attention to the economic as well as ecological impact of its work and the potential benefits for its partners. Beyond the chair´s framework, the DAP Chair actively engages in numerous networks to exchange and expand bundled knowledge from industry as well as basic and applied research in an interdisciplinary manner. Additionally, the chair provides tomorrow´s AM specialists and excellently trained Digital Natives. It prepares them for their contribution to the industry´s AMification and digitalization in practical projects.

This way, it aims to sustainably strengthen and advance the developing and production industries. From production digitalization and networking to materials and manufacturing to post-processing and quality assurance: the chair's research activities are geared to preserve value creation and industrial production as an essential part of prosperity, put it on the AM track and, thus, contribute to a better tomorrow.