



# AM Metal Filaments Essential for Unique Bike Components

3D printing offers mass customization and small series options for durable bike frames



Photo Credit: Kike Molares

## OVERVIEW

Huhn Cycles has teamed up with Forward AM to create essential frame components through additive manufacturing. These will support the high-durability, longevity and timelessness expected from the bicycle frames produced by the German-based company. With the tube connectors needed for the construction of each customized and small series frame being unique, Huhn chose to utilize 3D printing with metal filaments in order to achieve the custom-designed, cost-efficient and highly accurate part required. Additive Manufacturing technologies offer a more straightforward and easier approach when it comes to iteration and adaptation compared to traditional manufacturing.

## QUICK FACTS

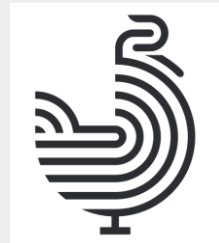
### Material:

- Ultrafuse® 17-4 PH

### Technology:

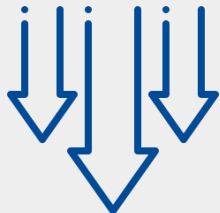
- Metal Fused Filament Fabrication

### Partners:

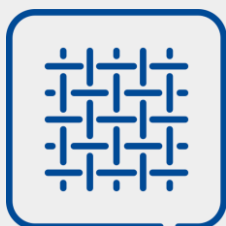


Huhn is headquartered in Fichtelgebirge, Germany in a converted barn, which a few years ago was used as a small herb shop. Huhn Cycles is committed to a vision for mountain biking and enjoying the outdoors in a way that is sustainable for our environment and community. They design, test and manufacture under one roof, in a few spaces that enables a close link between design and manufacturing. Each Huhn frame is built for a quality ride in nature, being durable and long-lasting so it can be passed down to the next generation of outdoor enthusiasts.

[HUHNCYCLES.COM](http://HUHNCYCLES.COM)



Reduced deviation to less than 1%



Ability to manufacture full metal parts with closed and reduced infill



Ultrafuse® 17-4 PH Connector Green Part



Welding Ultrafuse® 17-4 PH Connector

Frame with Welded Connectors

## Challenge: Develop and create a unique design to easily manufacture a frame at an affordable price.

By utilizing [Ultrafuse® 17-4 PH](#), a material which is compatible with the other metal bike frame components, Huhn was able to achieve the individual geometry adaptation of the bicycle frame to meet the customized needs of the individual end user. This specific metal filament was chosen because it is more cost-efficient to process compared to binder jetting and SLM, due to the low Total Cost of Ownership (TCO) through production on FFF printers utilizing metal filaments.

*In moving beyond traditional manufacturing, companies can not only print assembly aids but also integrate their own designs which are adapted to the respective customer for a customized frame building. This allows them to stand out from the competition, create solutions alongside their own designs and greatly reduce the time required to manufacture a custom frame.”*

*– Tim Ahnsorge, Bike Project Manager*

## Challenge: Implement a simplistic manufacturing process while maintaining a high-level of accuracy.

Ultrafuse® 17-4 PH also fits perfectly to standard stainless steel bicycle tubing and exhibits the same technical properties as other conventional manufacturing materials. The ability to produce a 3D printed part which is 100% metal allows for the successful utilization of standard treatments for metal parts such as weldability and solderability. These printed components can also be powder-coated and painted allowing for a polished and visually appealing final product. **Forward AM is the only company within the AM industry offering metal filament printed parts produced with a reduced deviation of 1% or less.** Meeting this goal ensured that all printed parts could be easily installed on the bike frame as well as bring additional advantages to the frame building process.

For more information, read the full Use Case here.

### Learn more about Ultrafuse® 17-4 PH

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