



**3D SYSTEMS®**

# Hybrid manufacturing

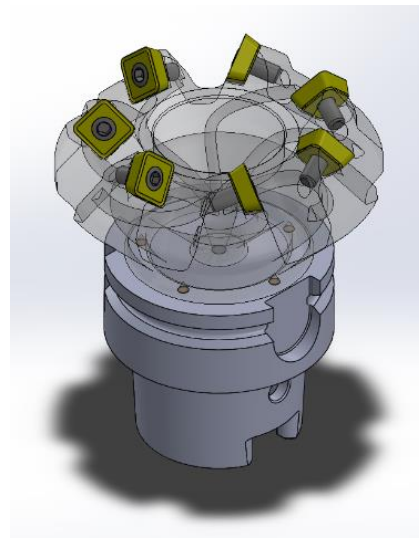
MTC – 16/April/2024

Iñigo Marco - Application Development Engineer -AIG

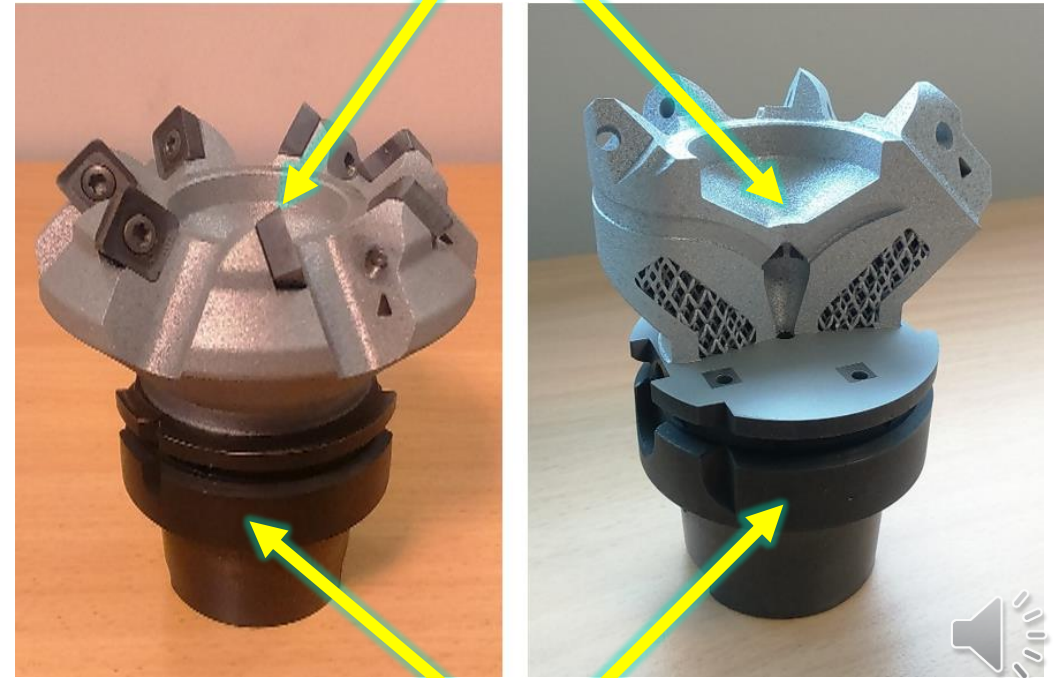


# What is “Hybrid manufacturing”?

- In additive manufacturing (AM) of metal parts, hybrid manufacturing is typically used for the **combination** of both metal **3D printing** and subtractive techniques, such as **machining**, turning or milling.
- Example of tooling industry application.
- This offers a lower price per part with the added value that AM can offer, i.e. adjusted cutting fluid flow towards the cutting edge.



3D Printed Portion



Machined Portion



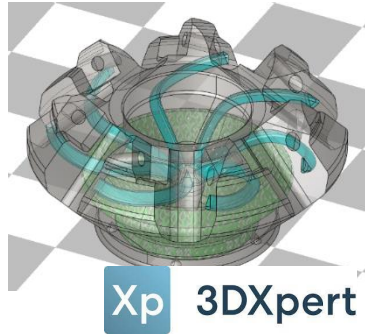
# Step by step



3DXpert



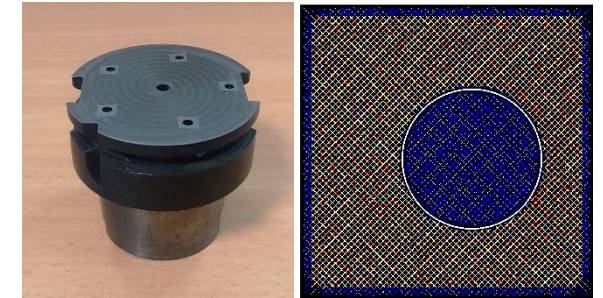
Manufacture the preform



Design for AM



Clamp the part inside the DMP 350



Perform the alignment



Start printing



Remove your finished part from the plate



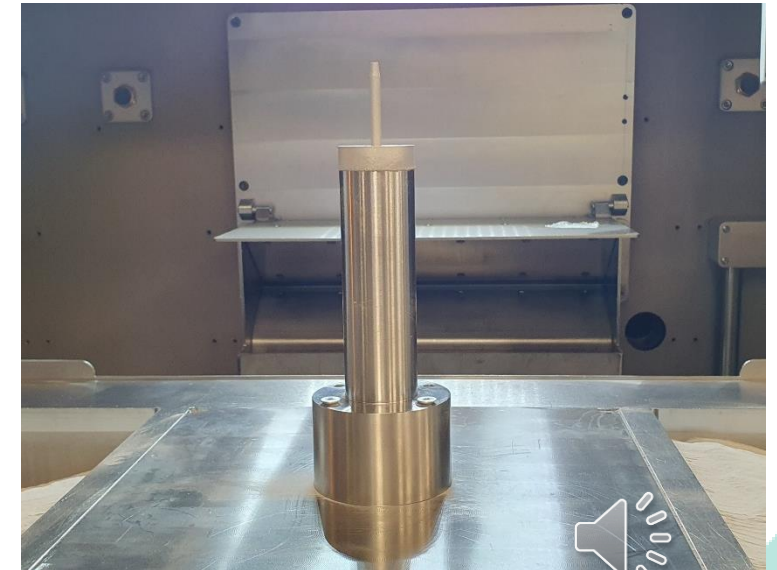
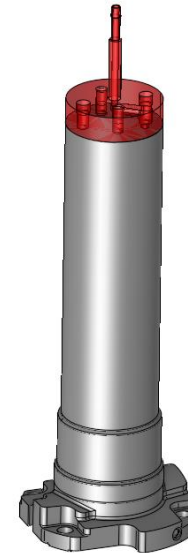
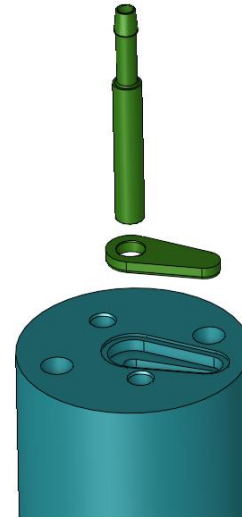
Apply any needed postprocessing





# Semicon applications

- Initial idea: machining of 3 parts and then apply welding for assembling it
- Hybrid concept: pre machine a cylindrical block (in grey), 3D print the red top with cooling channels and the post machine the entire part.
- Lead time and cost can be reduced
- Less risks for leakages
- Potentially flow improvement with organic channel shape could be applied



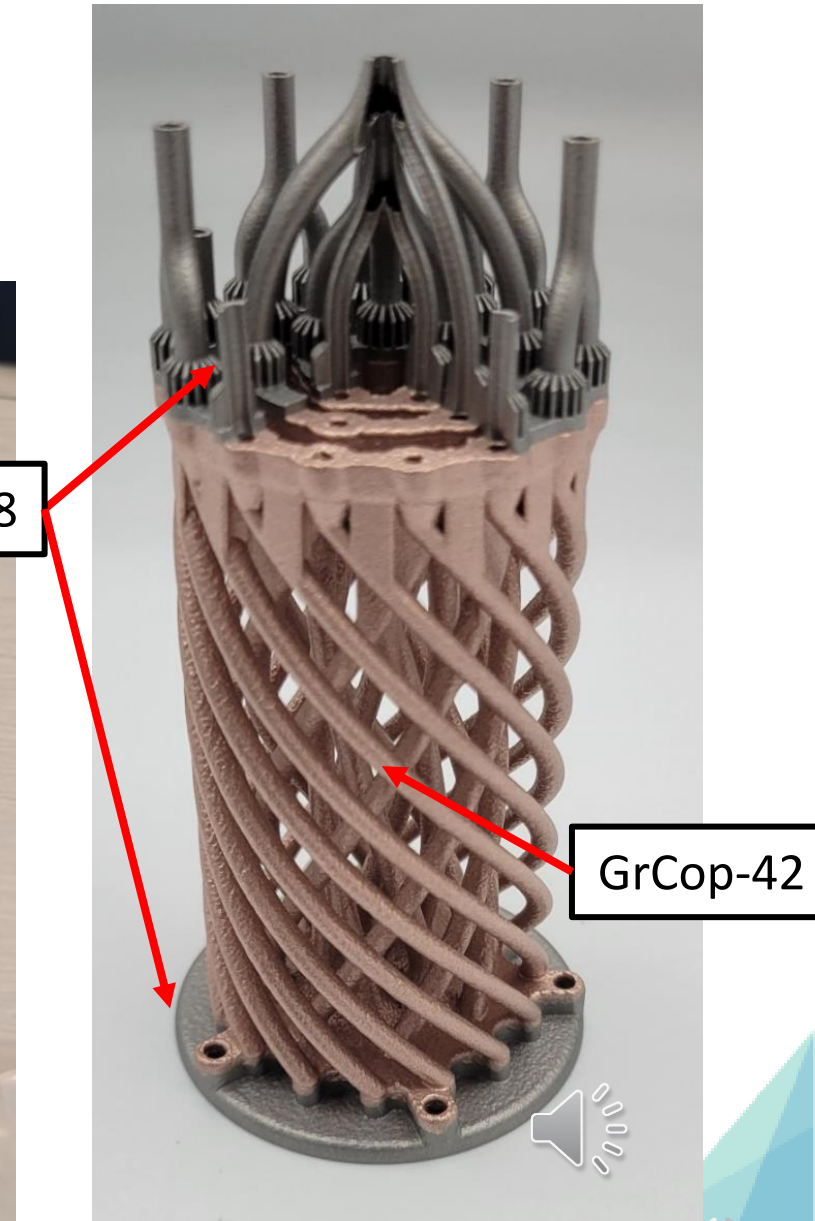
# One step further



# Multimaterial and alignment

GRCop-41 and Ni718

- **GRCop-42** is designed for liquid cooled, high temperature applications.
- **Ni718** is historically used for combustion applications due to **high strength, corrosion resistance, and high operating temperatures**
- Cu and Ni are extremely soluble in each other and have complementary properties



GrCop-42



# Thank you



Inigo Marco, PhD  
Senior Application Development  
Engineer -AIG  
[inigo.marco@3dsystems.com](mailto:inigo.marco@3dsystems.com)

Raph Alink  
Account & Project Manager  
[raph.alink@3DSystems.com](mailto:raph.alink@3DSystems.com)

