

When the going gets tough,

copper gets going

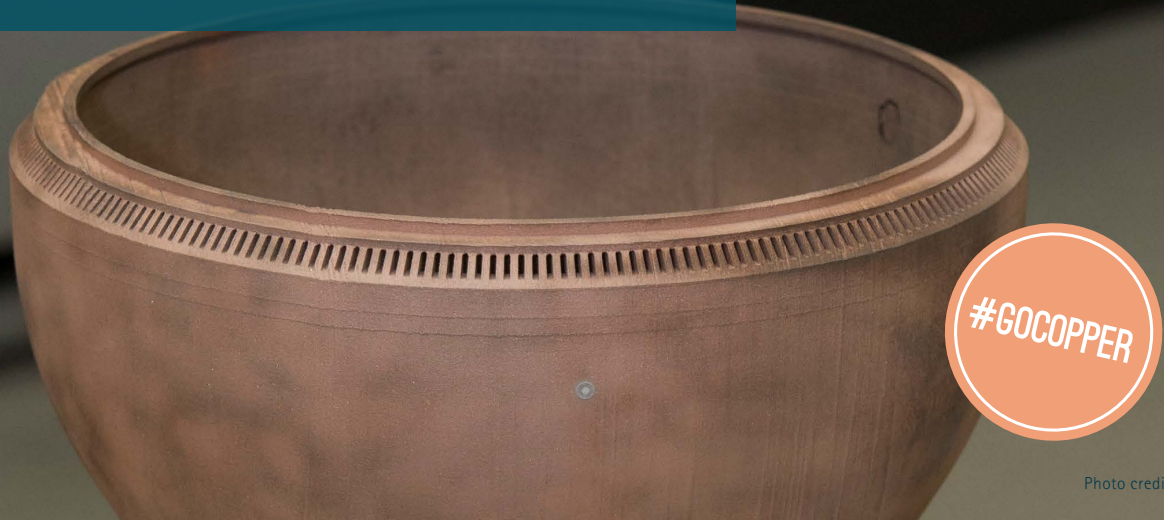


Photo credit: NASA

Copper rocket combustion chamber liner made with 3D printing – NASA, USA

copper
gets going
destination
Red Planet

**NASA's first
3D-printed
copper rocket
engine part**

 @Go_Copper

Going to 5,000 degrees Fahrenheit

NASA engineers achieved a milestone in rocket manufacturing by 3D printing the first full-scale, rocket engine part made of copper. The combustion chamber liner must withstand extreme hot and cold conditions, as inside gas temperatures can soar to over 5,000 degrees Fahrenheit. Not your everyday copper, this is a copper alloy on a mission.

Going to revolutionise rocket building

Copper is extremely good at conducting heat, making it an ideal material for lining a combustion chamber. It took over 10 days for the part – made from a special copper alloy created by NASA scientists – to have 8,255 layers of copper powder fused into its 200 intricate cooling channels by a laser machine. This groundbreaking manufacturing process will guide future 3D-printed rocket engines – to space and beyond.

Going to get fired up

After the part was manufactured, a nickel super-alloy jacket was deposited onto the exterior surface. Next, the copper liner was tested under simulated conditions to ensure it could handle the extreme temperatures and pressures inside the rocket engine during flight. 3, 2, 1 – copper is ready for blast off.

Going on future space endeavours

This is not a one-off. The goal is to reduce the time and cost of making rocket parts, and create a repeatable process for manufacturing advanced designs. Such revolutionary technologies are bringing NASA closer to a journey to Mars. The red metal is bound for the Red Planet!