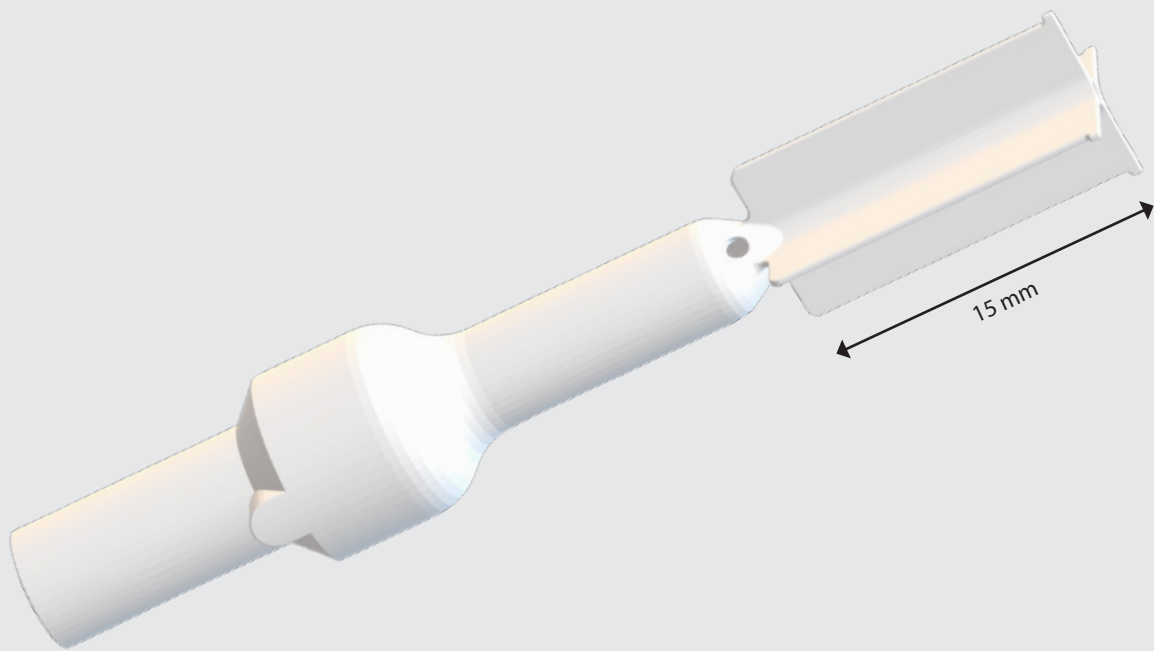


3D-Printed Temperature Sensor-Head from Zirconia for Aerospace & Aviation with Wall Thickness of 0.3 mm



Printed by **CADdent[®]**



Since 2023, CADdent has been a manufacturing service provider for the German Aerospace Center (DLR) for development and subsequently manufacturing small series parts for the measurement and sensor technology group of the Flight Experiments facility. This PT100 sensor is required for flight experiments with the "HALO" aircraft (High Altitude and Long Range Research Aircraft).



ADLR "HALO" aircraft. Source: DLR

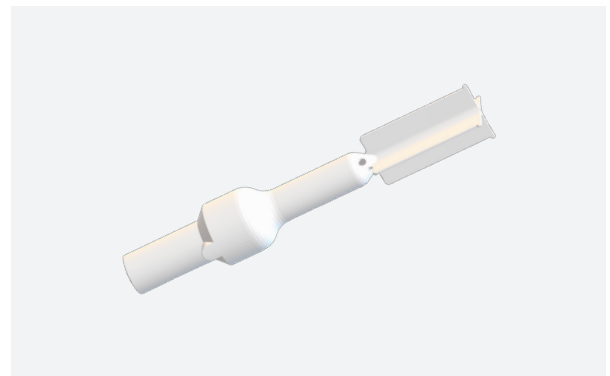
This temperature sensor is partly made of platinum (Pt) and has a resistance of 100 ohm (Ω) at 0 °C. Through intensive research and development efforts, it was made possible to adjust the design and optimize the topology of the sensor.

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“Before choosing Lithoz as our partner in ceramic 3D printing, we thoroughly researched the market and had various test parts produced. The results of these tests clearly showed us that only Lithoz could be considered as our partner in ceramic 3D printing.”

MANFRED GOTH
MANAGING DIRECTOR CADDENT GMBH

A special feature of this PT100 sensor developed for the aerospace industry is that its head was made from zirconia using ceramic 3D printing. Thanks to additive manufacturing, it was possible to reduce the wall thickness of the sensor to just 0.3 mm in the head area and 0.5 mm in the remaining area. A 0.025 mm thin platinum wire was then wound around the head area and soldered to the copper wire.



Innovative temperature sensor 3D printed by CADdent

The PT100 sensor benefits from the outstanding material properties of zirconia, such as very low thermal conductivity (2.5 - 3.0 W/m*K) and extremely high temperature resistance. In addition, the sensor connector is made of alumina and the connection is made of cobalt-chrome using 3D printing technology.



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Read the
full case study
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