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# THERMAL SENSORS FOR AIRBUS HELICOPTERS

#thermal #industrial process #shaping # sensor development  
#aeronautics #metrology solutions

Ceramic tools are used to perform surface grinding operations on metal parts; this produces heat that can damage the parts to be ground. Airbus Helicopters chose Capacités' experts to optimize these operations – which have important economic implications – because they are reputed for mastering precise thermal instrumentation. Their objective was to find a way to measure heating directly at the interface between the grinding machine and the part.

## CAPACITÉS' EXPERTS PUSH THE LIMITS OF THERMAL MEASUREMENT

Some of Airbus Helicopters' metal parts undergo a thermo-chemical hardening treatment called nitriding, and then they are ground with a ceramic abrasive. Problems arise when the surface-grinding operation heats the material; this damages the surface treatment if unmanaged. To avoid this risk, the industrial company needed more precise control over the heat produced from grinding. Airbus Helicopters chose to collaborate with Capacités' thermal engineers to solve this problem. They worked together to find a way to measure heating directly at the interface between the grinding machine and the part.

Laboratory tests of the three types of technology led to they worked with Airbus Helicopters' engineers to design three prototypes of thermal sensors improved precision and response time and minimized the sensors' intrusiveness.

Finally, the three new sensors were approved in realistic conditions that represented the process. The features and data obtained from this project have proven conclusive – and promising for Airbus Helicopters' future developments adapted to other types of materials.

First, Capacités' experts conducted a state of the art that highlighted existing solutions at the research stage and technological limitations of the sensors on the market. After this 1st level of analysis, that were custom adapted to meet this need.

To complete this project, the Capacités' experts benefited from support and technical equipment from the LTeN laboratory (Heat Transfer and Energy Laboratory), joint research unit of Nantes Université and the CNRS. ■

Project carried out for:



Linked expertises:

- Metrology
- Thermal Instrumentation

### CAPACITÉS SAS :

CAPACITÉS SAS is engineering and research valorisation subsidiary of Nantes Université. Working in the field of innovation, it employs near by hundred staff members and carries out over 350 projects per year. CAPACITÉS works alongside with the researchers in scientific laboratories in order to provide tailor-made solutions and expertises.