



Project co-funded by the European Commission within the Seventh Framework Program for Research and Technological Development (FP7)

## SAWHOT PROJECT

Surface Acoustic Waveform wireless sensors for High Operating Temperature environments

# FINAL REPORT



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## Partners of the project

***Consortium of the SAWHOT project:***

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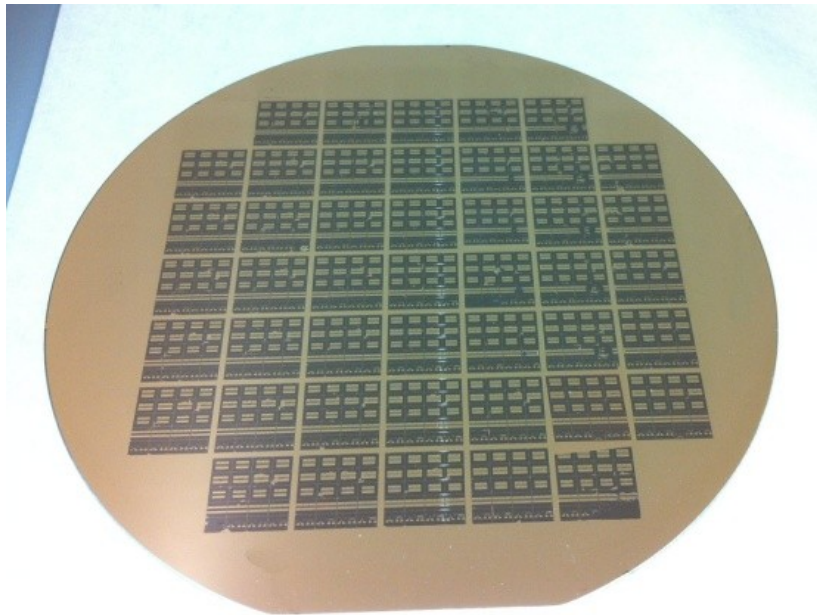
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## Executive summary

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## Project context and objectives



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## Main S&T results/foreground of the SAWHOT Project

### *Specifications and design:*

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	High-temperature properties	Commercial availability	Suitable for SAW	Knowledge about material properties	Comment
Langasite	+	++	++	++	
GaPO <sub>4</sub>	++	o	o	+	Very good high temperature properties up to 970 °C
LiNbO <sub>3</sub>	-	++	++	++	
LiNbO <sub>3</sub> (stoichiometric)	+	o	?	o	
AlN	+	--	+	o	No bulk single crystals available commercially
Langatate	+	+	+	+	Only few studies regarding SAW properties yet
High-temperature piezoceramics	o	o	-	+	

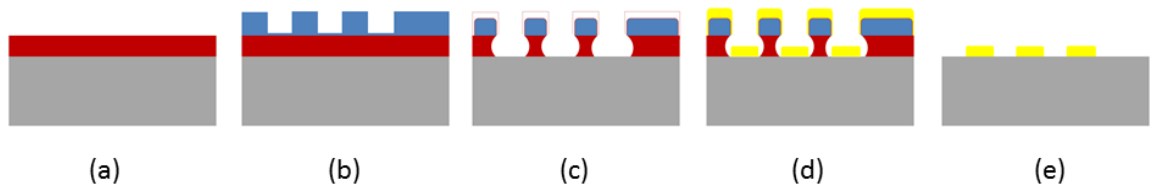
in large amounts and wafers (2"), a growing demand for this material may change the

*Technological and technical foreground*

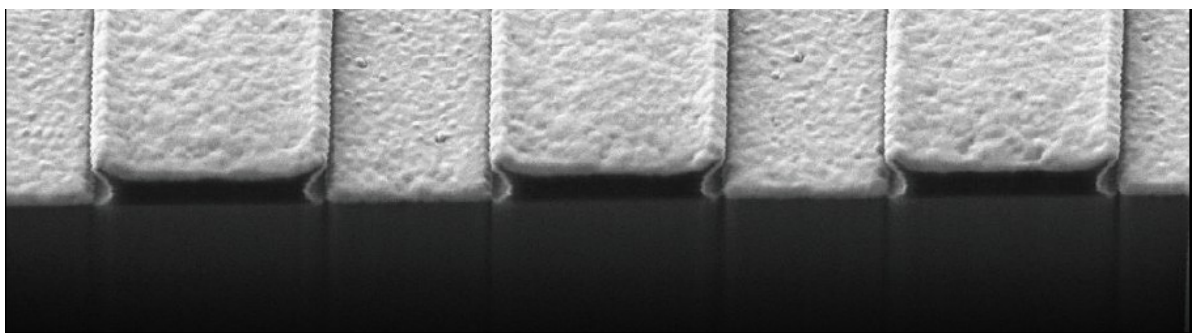
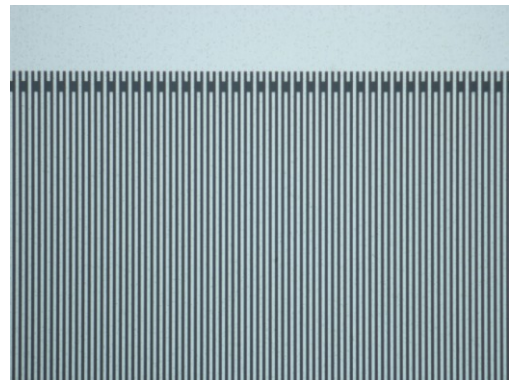
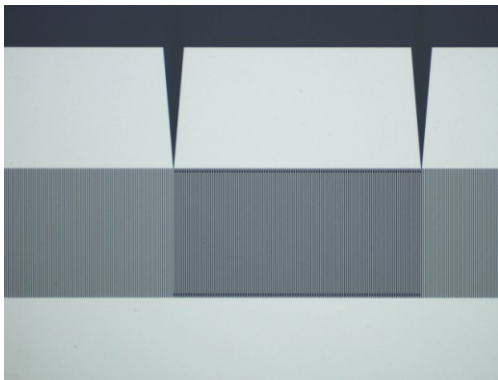
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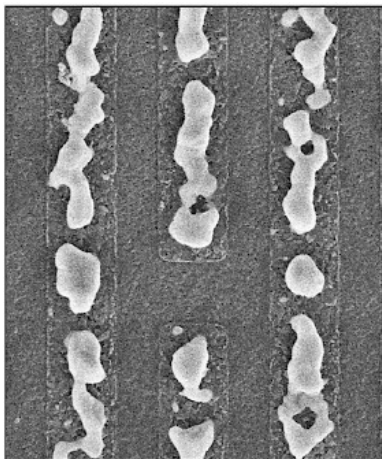
The SAW device manufacturing relies on the process described above: a first sacrificial photo-resist layer is deposited on the Langasite substrate (a), a second resist is deposited and patterned via nano-imprint lithography (b), a dry etch process is implemented to transfer the pattern in the first resist which is anisotropically etched (c), metal is deposited on the whole structure, resist is eliminated, leaving metal only at the electrode location (e).



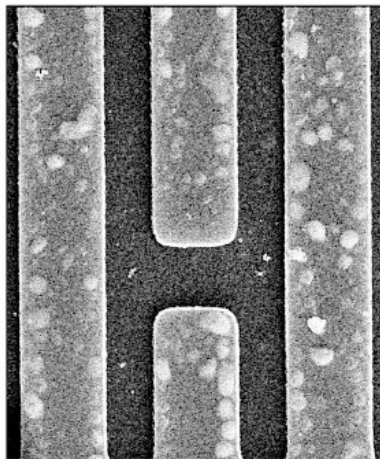
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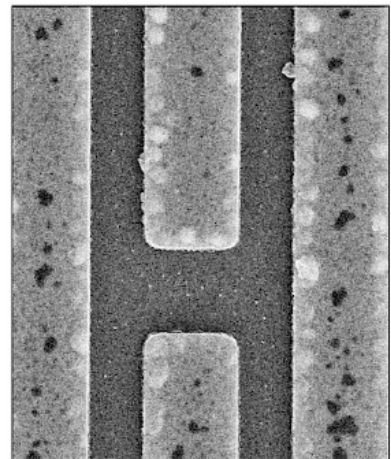
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no protection



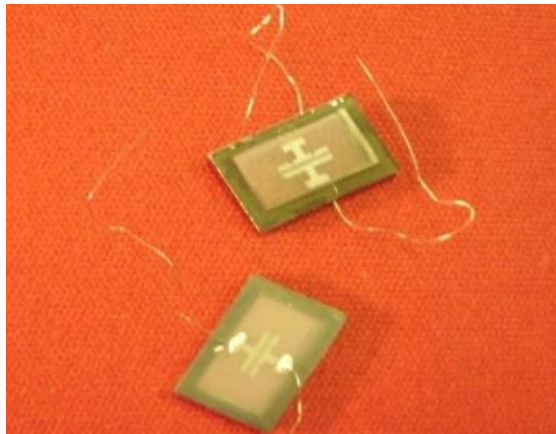
15 nm Al<sub>2</sub>O<sub>3</sub>



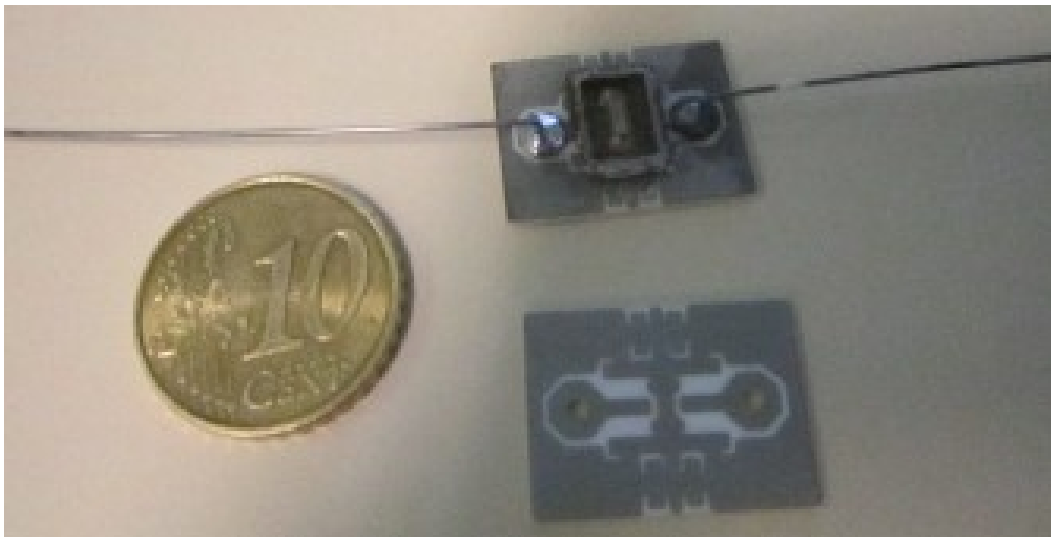
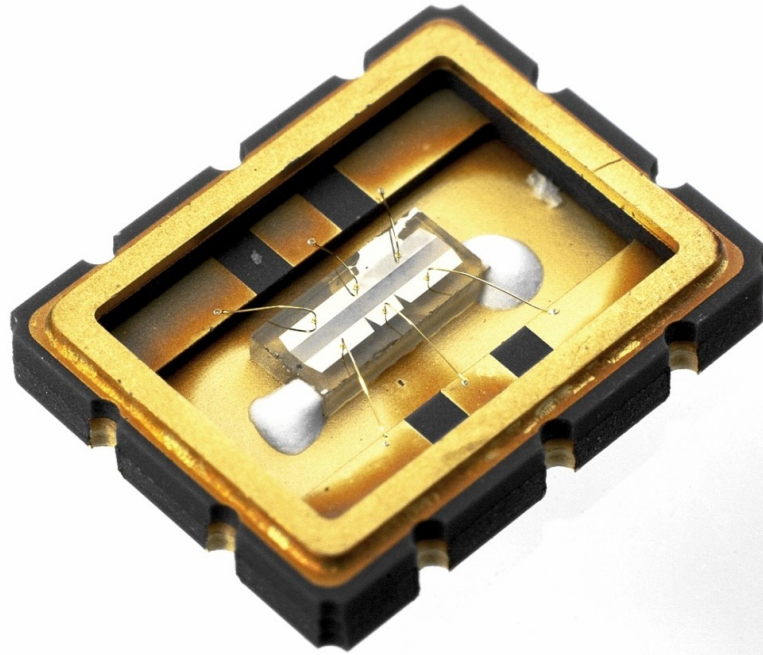
30 nm Al<sub>2</sub>O<sub>3</sub>

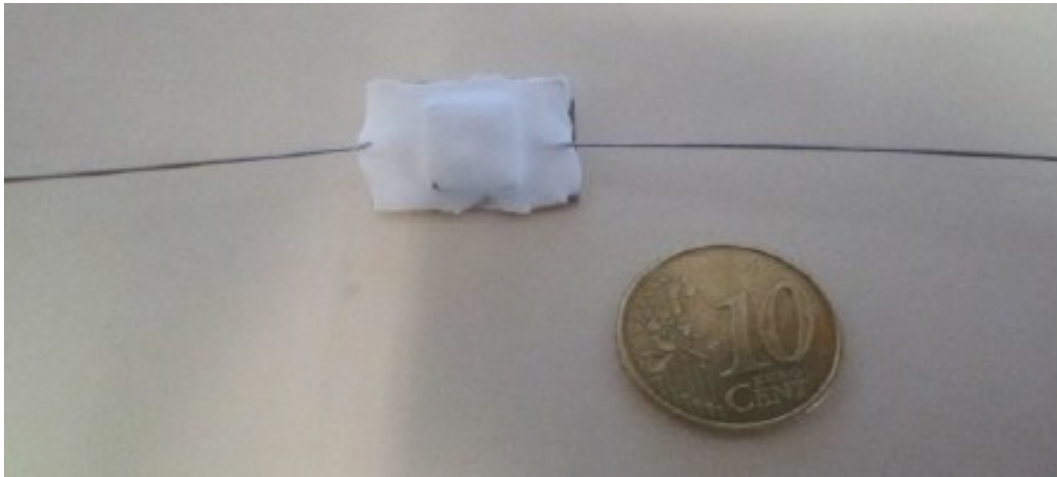
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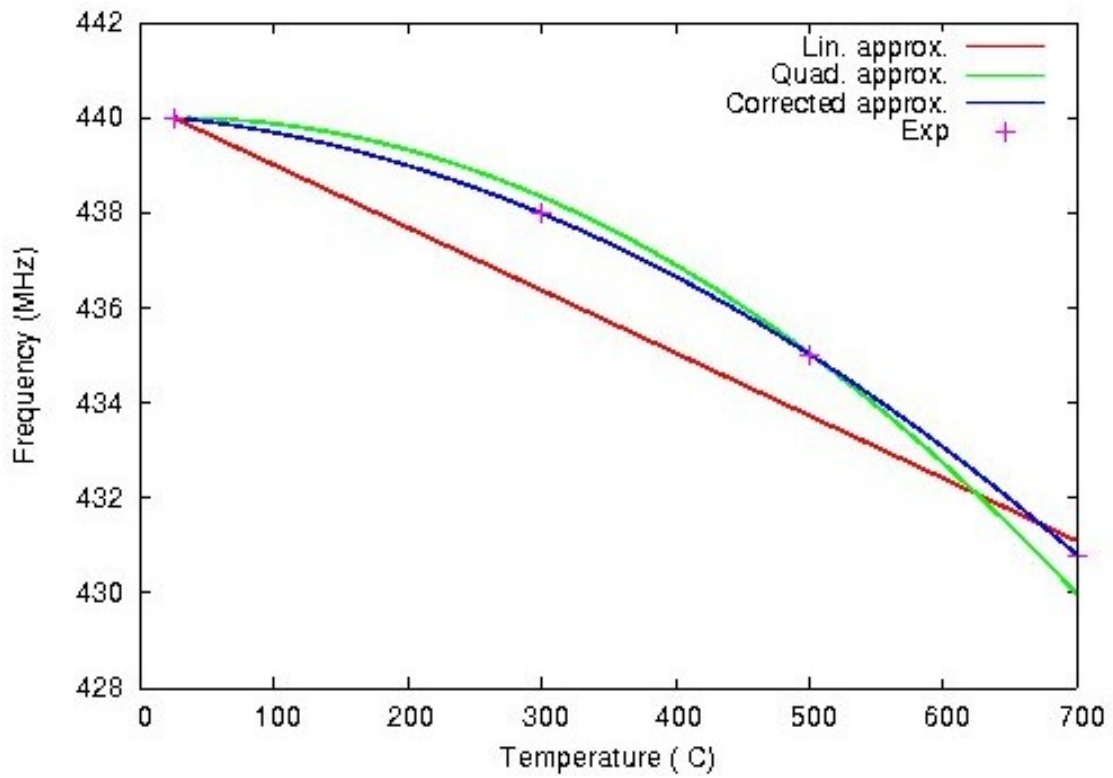
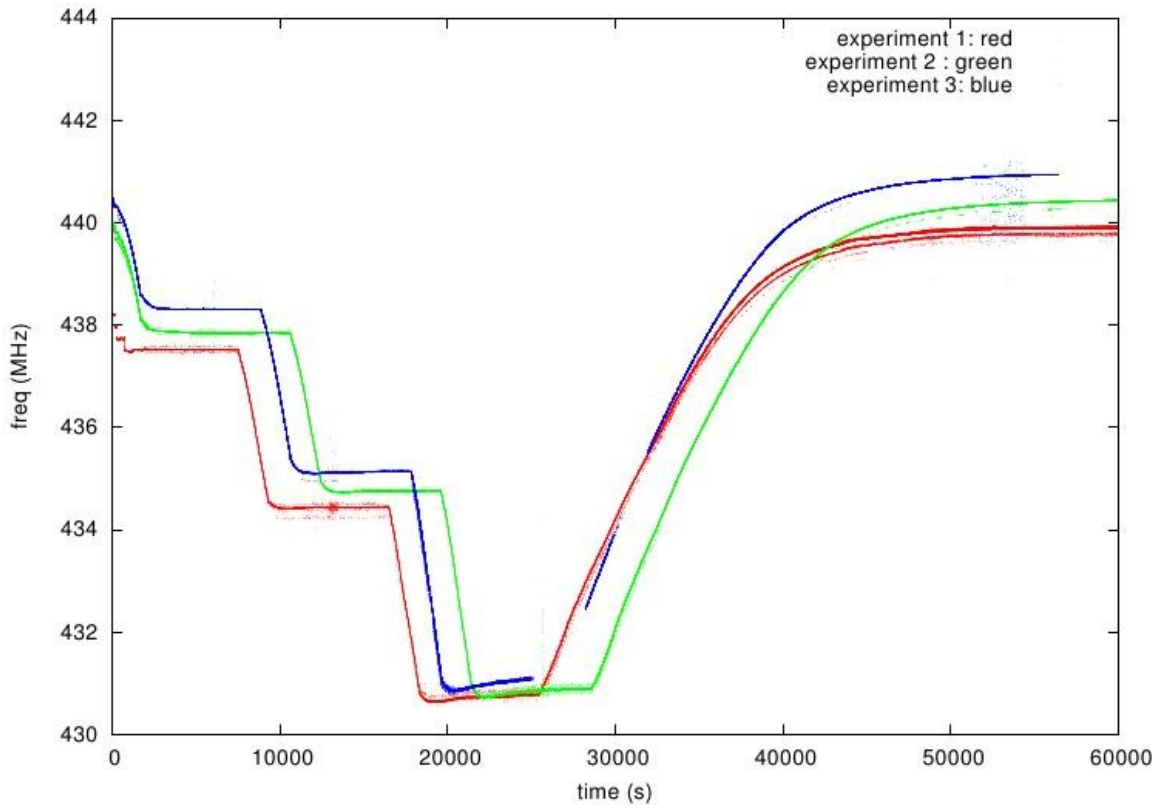
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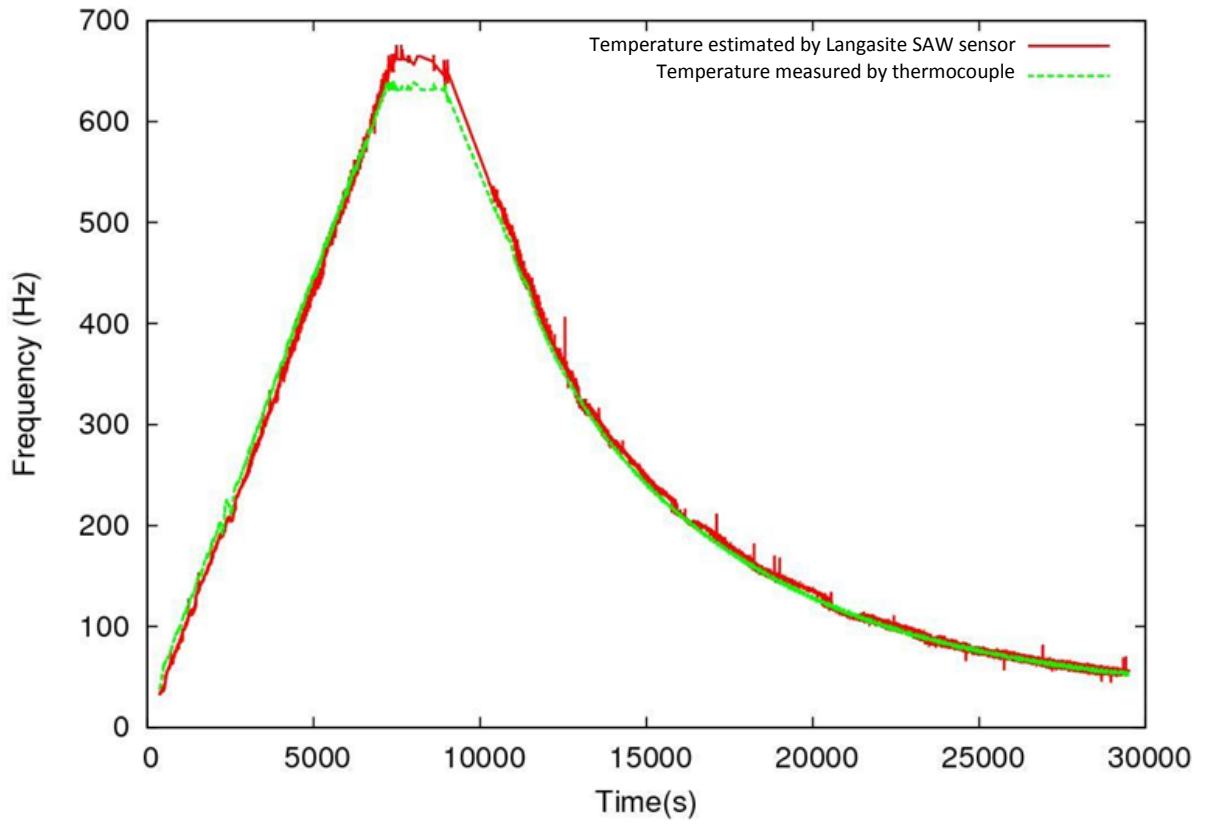
*System and Demonstration:*

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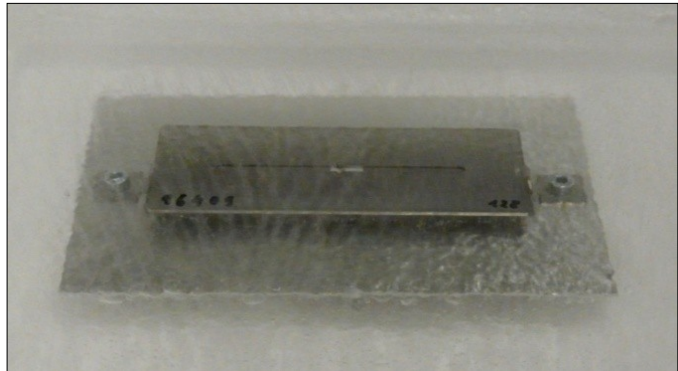


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regarding the sensor's

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*Promotion and dissemination:*

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- a “reference” tool.
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**Potential impact (including the socio-economic impact and the wider societal implications of the project so far) and the main dissemination activities and exploitation of results.**

temperature level targeted (900°C) hasn't been validated through a full operating

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