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Author: Tobias Frischmuth Michael Schneider Daniel Maurer<ce:author id="aut0020" biographyid="vt0020" orcid="0000-0003-3963-6295"> Thomas Grille Ulrich Schmid



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# **Inductively-coupled plasma-enhanced chemical vapour deposition of hydrogenated amorphous silicon carbide thin films for MEMS**

**Tobias Frischmuth<sup>1</sup>, Michael Schneider<sup>1</sup>, Daniel Maurer<sup>2</sup>, Thomas Grille<sup>2</sup>, Ulrich Schmid<sup>1</sup>**

<sup>1</sup> TU Wien, Institute for Sensor and Actuator Systems, Gusshausstrasse 27-29, 1040 Vienna, Austria.

<sup>2</sup> Infineon Technologies Austria AG, Siemensstraße 2, 9500 Villach, Austria

## **Corresponding author:**

Tobias Frischmuth, TU Wien, Institute for Sensor and Actuator Systems,  
Gusshausstrasse 27-29, 1040 Vienna, Austria.

Tel.: +43(1) 58801 36647;

Fax.: +43(1) 58801 36698;

Email: tobias.frischmuth@tuwien.ac.at

## **Abstract**

In this study, the impact of various deposition parameters such as the reactive gas flow ratio, plasma power, substrate temperature and chamber back pressure of ICP-CVD deposited a-SiC:H thin films is investigated and the influence on important MEMS-related properties like residual stress, Young's modulus, hardness, mass density and refractive index is evaluated. Basically, tailoring of the as-deposited a-SiC:H characteristics is possible to a great extent with residual stress values ranging from -16 up to -808 MPa, Young's modulus values between 36 and 209 GPa or deposition of layers with hardness values ranging from 5.3 to 27.2 GPa is feasible. Especially the mechanical parameters are strongly linked to both the Si-C bond density and the amount of incorporated hydrogen obtained from Fourier transform infrared spectroscopy analyses.

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