Project number: 785337
Project duration: March 2018 – February 2020
Project Coordinator: Daniel Nilsen Wright, SINTEF

Horizon 2020 / Clean Sky JU
JTI-CS2-2017-CFP06-SYS-01-04
Clean Sky 2 Call for Proposals 06
INNOVATION ACTION

Website: www.sintef.no/en/projects/mupia

D6.2 – Public

Manufacturing process for ultimate performance inertial MEMS gyrometer (MUPIA)

Plan for Communication, Dissemination and Exploitation of project results

VERSION	DATE
Version 1.0	28-02-2019

ABSTRACT

This report will outline a plan for how the project will handle results obtained in the project. These results might be of public interest and thus disseminated in journals etc, while other results might be of confidential manner, in which a commercial exploitation is foreseen.

KEYWORDS: Communication, dissemination, exploitation, MEMS, gyrometer,

DELIVERABLE ID	SYGMA ID	DISSEMINATION LEVEL	DELIVERABLE TYPE
D6.2	D7	PU	R

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020) under grant agreement n° 785337.

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ETHICS BOARD REVIEW REQUIRED?	SECURITY BOARD REVIEW REQUIRED?
NO	NO

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Release history

VERSION	DATE	VERSION DESCRIPTION
01	28-02-2019	Submitted to CS2

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Table of contents

List of Tables

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020) under grant agreement n° 785337.

List of Abbreviations

Table 1: List of abbreviations

Term	Explanation
SotA	State of the Art
TSV	Through silicon via
SME	Small medium enterprise
TRL	Technology readiness level
MRL	Market readiness level

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Executive Summary

This deliverable is a short report on the plans for dissemination, communication and exploitation of project results in the MUPIA project. The design and performance of the finished MUPIA gyro will not be disseminated. However, the project partners envisage that many of the processing advances necessary in the project are relevant for publication.

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1 Introduction

1.1 Purpose of the document

This report will outline a plan for how the project will handle results obtained in the project. These results might be of public interest and thus disseminated in journals etc, while other results might be of confidential manner, in which a commercial exploitation is foreseen.

1.2 Authorship and Intellectual Property Rights (IPR)

The stakeholders in the MUPIA project are two consortium partners, SINTEF and Micross, and the topic manager. The IPR of the final product of the MUPIA project belongs to the topic manager and will therefore not be disseminated. However, the challenging specifications set forth in the project for the device to work properly have produced interesting challenges for the project consortium and will therefore produce results that can be interesting for the scientific community.

The table below lists some of the processing challenges that SINTEF and Micross have identified as interesting for public dissemination. As this document is being prepared prior to the first round of fabrication of the MUPIA gyro, other aspects of the production process might also be included at a later stage.

Key Results	**Asset (IP)**	**IPR Principle**	**Primary Exploitation Partner**	**Secondary Exploitation Partner**
p-type TSV	Direct connection to sealed MEMS devices made of p-type Si	Processing parameters kept by SINTEF, key results disseminated	SINTEF	Customers
High resolution DRIE processing for MEMS	Accuracy in MEMS devices	Processing parameters kept by SINTEF	SINTEF	Customers
n-type TSV	Direct connection to sealed MEMS devices made of n-type Si	Processing parameters kept by SINTEF, key results disseminated	SINTEF	Customers
Topography measurement and statistical analysis	Automated analysis of a large sample of topography data to verify process specifications	Analysis principle disseminated, code kept by SINTEF	SINTEF	Scientific community
High vacuum package level sealing	Enabling open structure MEMS devices to operate in vacuum	Processing parameters kept by Micross	Micross	Customers

1.3 Intended readership

This report is publicly available and is intended for those who are interested in the development of MEMS processes and packaging.

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1.4 Structure of this document

The main part of this document is in sections 2-4, with communication, dissemination and exploitation having their own sections. The content is mainly taken from the MUPIA proposal and altered to match the current status of the project.

1.5 Stakeholder involvement

The stakeholders involved in the preparation of this document is SINTEF and Micross. As the former has a larger stake in the project, the topics covered are primarily related to the development work at SINTEF.

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2 Plan for communication of project results

Any communication will follow the progress of results. Early announcements will be made for local interests whereas communication targeting the European or global market will await suitable results. SINTEF will advise on which communication channels to access. For any communication, acknowledgment to the funding authorities will be included.

A public website has been set up for the project (https://www.sintef.no/mupia) and is maintained by SINTEF. The website contains simplified and basic information about the project and its progress targeting communication with a broad audience.

SINTEF may share information from the project of interest for a broad audience by using their Twitter feed (https://twitter.com/sintef) and blog posts (https://blog.sintef.com/). The visibility of the posts will be recorded and reported (D6.4 due M30).

3 Plan for dissemination of project results

The project partners will strive for selecting channels allowing Open Access for the scientific publications of MUPIA, according to the golden open access model, or at least allowing self-archiving, according to the green open access model.

Dissemination of specific process details where SotA is moved beyond, e.g. within dry etching or TSV development, is of particular interest to an academic audience and will maximize impact on a longer term through strengthening the partners reputation of performing research based innovations. However, care will be taken not to disseminate IP sensitive details possibly restricting commercial applications. On the other hand, dissemination of the manufacturing of the overall device, and its solution for packaging, is of interest to a broader audience including end-users and potential future partners needing the same level of cost-efficiency and performance of sensors. Such publications will thus support in maximizing the impact of the objectives set with respect to manufacturing yield, throughput and overall cost.

Dissemination for peers in medium to highly ranked scientific channels will be targeted, but with a careful balance between IPR protection, dissemination and communication. Dissemination for industry, commercial interests and political decision-makers will primarily be made through more popular science articles in magazines. Publications are foreseen, but are not intended to be limited to, the channels mentioned in Table 2. A certain number of publications are planned. Based on experience, management of journal articles and popular science articles are most efficiently managed by SINTEF with contributions from Micross, whereas conference articles are manageable for Micross as well. To be present at conferences can be highly valuable for both partners of MUPIA for direct interaction with potential business partners and groups of interest, but all proposed channels are considered as valuable for visibility and for the formation of a solid documented platform of results, typically needed for credibility of further sales activities or further funding requests. Moderate numbers of publications are foreseen due to the high TRL/MRL levels of the project.

Due to the restricted time schedule of the project the dissemination will not necessarily be completed within the project period.

Table 2: Channels considered as relevant for dissemination of results from MUPIA and an indication of expected number of publications.

Channel	Targeted#	Name of suitable journal/conference/magazine/trade fair
Key journals (scientific)	1-2	MDPI Sensors (Open Access) Journal of Micromechanics and Microengineering (JMM) Sensors and Actuators A: Physical (supports Open Access) IEEE Transactions on Components, Packaging, and Manufacturing

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		Technology
Key Conferences (scientific community, industry contact)	1-2	IEEE Micro Electro Mechanical Systems (MEMS) IEEE 67th Electronic Components and Technology Conference (ECTC) NordPac (IMAPS Nordic & IEEE EPS) SMTA International Wafer-Level Packaging Conference (IWLPC) IEEE Electronic System-Integration Technology Conference (ESTC)
Key Magazines	1-2	Advancing Microelectronics (iMAPS) Chip Scale Review (SMTA) Forskning.no, Elektronikk, Gemini (Norway)

4 Plan for Exploitation of project results

4.1 Exploitation plan for SINTEF

SINTEF already manufactures and delivers MEMS products (pressure sensors) to the aeronautics industry. Another product line with high-precision gyrometers for aeronautics will fit well to SINTEF's manufacturing strategy of small and medium scale production of high value MEMS products. Standardized process blocks, which result from this project, will also be exploited in other research, innovation and manufacturing projects. This is an important strategy for SINTEF, to build a wide set of standard, well-controlled, advanced process steps, gaining steps for every new project that is being run. The control of the processes is built on a research-based innovation strategy where empirical work is performed in parallel with simulations and theoretical evaluations.

4.2 Exploitation plan for MICROSS

Through MUPIA, Micross expects to increase its UK based capability and technical knowledge of this branch of semiconductor packaging and thus be in a position to introduce the increased capacity necessary to service an increasing market demand for such specialist packaging. The technology fits well alongside other high reliability components already sold into the same market place. Micross operates and sells its products and services to a global market place and will be seeking to gain new business from its existing OEM customer base within Europe but also new customers from the Asia Pacific region and the Americas, utilising its existing global sales channels.

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5 Conclusions

This deliverable is a brief report on the plans for the MUPIA project to communicate, disseminate and exploit project results. Communication will mainly be done via direct contact with local interest and the project web site. Dissemination will be concentrated on the advances in processing needed for a successful project and these advances will be disseminated in a mix of journals, conferences and key magazines. Both SINTEF and Micross will exploit the project results by offering customers new services and better processing control.

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