Plan Overview

A Data Management Plan created using DMPonline.be

Title: Functionality oriented hybrid electrochemical layered micromanufacturing for wear-resistant and modular mould inserts

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Template: FWO DMP (Flemish Standard DMP)

Project abstract:

The growing trend for athermal and multifunctional manufacturing has resulted amongst others in the development of electrochemical (EC) micromanufacturing techniques. Hybrid electrochemical layered micromanufacturing involves sequential application of selective electrochemical accretion and micromachining and has demonstrated advanced capabilities in processing of electrically conductive materials regardless of their hardness. In this line, this project will conduct research investigations on sequential electrochemical accretion and micromachining of a wear-resistant high entropy alloy with potential application e.g. as modular mould inserts for ceramic powder injection moulding. The prime goal of this project is to develop and analyse a hybrid EC layered micromanufacturing process for manufacturing a high entropy alloy (HEA) three-dimensional cavity in a prototype modular mould insert and unravel the complex relationship between electrochemical accretion and removal process and the material (HEA) at the fundamental level. To fulfil this, the project will conduct systematic and comprehensive investigations on developing multiple aspects of this process ranging from identification of process requirements, process parameter regimes, electrolyte composition, in-depth analysis of accretion/removal mechanisms at macro- and micro level and functionality tests on prototype insert using ceramic powder injection moulding infrastructure.

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Functionality oriented hybrid electrochemical layered micromanufacturing for wear-resistant and modular mould inserts

Application DMP

Questionnaire

The questions in this section should only be answered if you are currently applying for FWO funding.
Are you preparing an application for funding?

- No

Functionality oriented hybrid electrochemical layered micromanufacturing for wear-resistant and modular mould inserts

DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

- Not applicable

Functionality oriented hybrid electrochemical layered micromanufacturing for wear-resistant and modular mould inserts

GDPR

GDPR

Have you registered personal data processing activities for this project?

- Not applicable

Functionality oriented hybrid electrochemical layered micromanufacturing for wear-resistant and modular mould inserts

FWO DMP (Flemish Standard DMP)

1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

				Only for digital data	Only for digital data	Only for digital data	Only for physical data
Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)	Physical volume
		Please choose from the following options: • Generate new data • Reuse existing data	*Please choose from the following options:* • Digital • Physical	*Please choose from the following options:* • Observational • Experimental • Compiled/aggregated data • Simulation data • Software • Other • NA	*Please choose from the following options:* • .por, .xml, .tab, .csv,.pdf, .txt, .rtf, .dwg, .gml, … • NA	*Please choose from the following options:* • <100MB • <1GB • <100GB • <1TB • <5TB • <10TB • <50TB • >50TB • NA	
Current signal data	Raw data on the current acquisition during electrochemical layered manufacturing	New	Digital	Experimental	.csv	< 1 GB	
Surface roughness	Raw data on surface roughness measurements	New	Digital	Experimental	.plux, .pdf, .csv	< 1 GB	
Layering experiments	SEM and EDX analysis	New	Digital	Experimental	.pdf, .tiff, .jpg	< 100 GB	
Simulation ECLM	Comsol simulation data	New	Digital	Simulation data	.mph, .png, . gif, .mp4	< 100 GB	
Videos and pictures	Video recordings and pictures during experiments	New	Digital	Observational	.jpg, .mp4	< 1 TB	
Data postprocessing and analysis	Plotting and analysis of experimental data	New	Digital	Experimental, Simulation	.m, .xlsx	< 1GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

NA

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- No

NA

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- No

NA

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- Yes

Electrochemical layered manufacturing experiments, parameters, feature dimension and surface topography analysis: The data set has the potential for creating a repair technology for moulds and other parts, thereby bringing sustainability.

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

The metadata (experiment date, user name, type of experiment, details of equipment, measurement units, etc.) will be added to the datasets for easy identification and data reuse.
Also a README.txt file will be created after the completion of the project.
Layering experiments: The data will be stored in a local I drive of the researcher and will be uploaded online on K Drive after the completion of the project.
Videos and pictures: The data will be stored in a local I drive of the researcher and will be uploaded online on K Drive after the completion of the project.

Current signal data: The data will be stored in a local I drive of the researcher and will be uploaded online on K Drive after the completion of the project.
Simulation ECLM: The data will be stored in a local I drive of the researcher and will be uploaded online on K Drive after the completion of the project.
Surface roughness: The data will be stored in a local I drive of the researcher and will be uploaded online on K Drive after the completion of the project.
Data postprocessing and analysis: The data will be stored in a local I drive of the researcher and will be uploaded online on K Drive after the completion of the project.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- Yes

Please refer to the answer above.

3. Data storage & back-up during the research project

Where will the data be stored?

I drive - KU Leuven
Teams site - private channel

How will the data be backed up?

Standard back-up provided by KU Leuven ICTS for my storage solution.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.
If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

Yes the data is stored in a segregated manner on local I drive and the Teams site in a private channel.

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

The access to the I drive is for the postdoctoral fellow only, and the Teams site has a private channel where the data will only be shared with the promoter and the fellow.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

KU Leuven provides the required data storage capacity (<1 TB) free of cost.
After the completion of the project, the expected costs for archiving in K drive are < 150 EUR/year, which will be booked as consumables on future projects.

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

All data will be preserved for 10 years according to KU Leuven RDM policy.

Where will these data be archived (stored and curated for the long-term)?

K drive

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

< 100 EUR/ year and will be paid from running projects as consumables.

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- Yes, in a restricted access repository (after approval, institutional access only, …)

As the generated data has the potential for valorization as a mould repair technology, access to the data will only be given to the promoter and specified research group members. The data will only be made openly available after valorization potential is explored. The published data will be available on the open access portal.

If access is restricted, please specify who will be able to access the data and under what conditions.

Access to the data will only be given to the promoter and specified research group members. The published data will be available on the open-access portal.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- Yes, Intellectual Property Rights

Valorization potential is foreseen for the generated data.

Where will the data be made available? If already known, please provide a repository per dataset or data type.

Teams site on a private channel

When will the data be made available?

After exploration of valorization potential.

Which data usage licenses are you going to provide? If none, please explain why.

None, because some data may be useful for the follow-up projects (C3/IOF trajectory/ VLAIO) for valorization.

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- No

What are the expected costs for data sharing? How will these costs be covered?

NA

6. Responsibilities

Who will manage data documentation and metadata during the research project?

Postdoctoral fellow (Dr. ir. Krishna Kumar Saxena)

Who will manage data storage and backup during the research project?

Postdoctoral fellow (Dr. ir. Krishna Kumar Saxena)

Who will manage data preservation and sharing?

The promoter and SET-IT service of KU Leuven

Who will update and implement this DMP?

Postdoctoral fellow (Dr. ir. Krishna Kumar Saxena)