DATA MANAGEMENT PLAN

# 1. Data description and collection or re-use of existing data

## How will new data be collected or produced and/or how will existing data be re-used?

During ongoing experiments the new data will be generated and collected by PC’s connected directly to the instruments used. The research procedures along with the measurements conditions and setup will be gathered in labbooks. The raw data from the experiments and also results of the analysis will be stored on the PC’s.

## What data (for example the types, formats, and volumes) will be collected or produced?

The following formats will be used during measurements and analysis: \*.TIFF, \*.xrdml, \*.dat, \*.txt, \*.opj, \*.csv, \*.txt, \*.docx, \*.xlsx. All data selected for long-term archiving and sharing, will be in suitable open format like: txt, pdf, TIFF. We expect to have 10 GB of data in these formats.

# 2. Documentation and data quality

## What metadata and documentation (for example methodology or data collection and way of organising data) will accompany data?

The results will be stored in specifically created folders organized as follows: Name\_of\_the\_project/Experiment\_type(sythesis path)/Date/Sample\_name. Only selected data will be shared by the MOST Wiedzy Open Research Catalog from Gdańsk University of Technology and described using attributes compatible with general metadata standards, such as DataCite Metadata descriptions will be stored in JSON-LD format. Metadata description will be stored in JSON-LD format. The contributor will be authorized and identified by an ORCID number.

## What data quality control measures will be used?

High care of sample characterization will be undertaken fulfilling the FAIR standards. Measuring data will be mostly created and collected automatically by measuring instruments, which will be calibrated according to manufacturer requests. Before performing tests the measuring unit will be tested using standard materials delivered by manufacturer. If needed, we will define a way to detect file or sample swaps, e.g. by measuring something independently.

# 3. Storage and backup during the research process

## How will data and metadata be stored and backed up during the research process?

The PI and hired co-workers will be responsible for creating and collecting data in raw and also processed form after the analysis on their personal computers and shared workspace. The data collected from the measurements will also be stored on the PC’s. The backup process will be conducted once a month and backup files will be stored on external hard drive.

## How will data security and protection of sensitive data be taken care of during the research?

Only project members will have read access; only selected project members will be able to write data. Intranet disc space (array) governed by Gdańsk Tech and protected by passwords, will be used for sharing data with coworkers. The backup of all the data will be done during the whole project duration.

# 4. Legal requirements, codes of conduct

## If personal data are processed, how will compliance with legislation on personal data and on data security be ensured?

No personal data will be collected nor processed.

## How will other legal issues, such as intelectual property rights and ownership, be managed? What legislation is applicable?

The right to all generated data will be In line with university policy (Resolution of the Senate of the Gdańsk University of Technology No. 117/2021/XXV of 19 May 2021) https://link.pg.edu.pl/GdańskTech\_intprop) Due to project requirements and with the Gdańsk Tech authorities consent the data and results will be published in the open-access model under CC0 or CC BY. Metadata will always be available without any restrictions (CC0).

# 5. Data sharing and long-term preservation

## How and when will data be shared? Are there possible restrictions to data sharing or embargo reasons?

The data will be stored in: MOST Wiedzy Open Research Catalog. We have contacted the repository. The dataset will be kept as long as technically possible. Data will be systematically uploaded to the MOST Wiedzy repository in accordance with the publication dates of the articles that are derived from this data.

## How will data for preservation be selected, and where will data be preserved long-term (for example a data repository or archive)?

The MOST Wiedzy Open Research Data Catalog will be the main data repository. The repository is CoreTrustSeal certified, which means that it has established good preservation and dissemination practices.The data provided in the repository will fulfill FAIR requirements. During the research team meetings will discuss the gathered data and will decide on what part of research data is worth being included in repository and whether it is self-explanatory in its current form or will need an additional processing. Moreover, all data not selected for sharing and preservation in the MOST Wiedzy repository will also be stored for at least 10 years after the project is finished and access to them will be possible only with the PI consent.

## What methods or software tools will be needed to access and use the data?

The shared data will be in open formats, so there will be no need for specialized software by recipients.

## How will the application of a unique and persistent identifier (such us a Digital Object Identifier (DOI)) to each data set be ensured?

The datasets provided in the repository will have the DOI assigned.

# 6. Data management responsibilities and resources

## Who (for example role, position, and institution) will be responsible for data management (i.e the data steward)?

Open Science Competence Center (pg.edu.pl/openscience) - established by Gdańsk Tech will be responsible for DMP and quality of metadata descriptions of datasets deposited in MOST Wiedzy repository. Beata Barczak, the project PI, will be responsible for the procedures assessment and overall data quality.

## What resources (for example financial and time) will be dedicated to data management and ensuring the data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

Each member of the research team is expected to follow the data acquisition and storage guidelines. PI will monitor the implementation of the data management plant and, if necessary, make corrections during the project. He will also provide necessary training to the involved students.