PlasmaSolution

A Data Management Plan created using DMPonline

Creators: Sebastian Dahle, PLEASE UPDATE YOUR DETAILS

Affiliation: Other

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ORCID iD: http://orcid.org/0000-0001-7568-0483

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Project abstract:

This action will implement the new Plasma-Enhanced Chemical Solution Deposition (PECSD) technique for coating of wood and wood-based substrates. This technique synergistically employs plasma-chemistry in the gas phase and polymer chemistry in the liquid formulation, thus combining all benefits of conventional surface coatings and plasma-based deposition technologies. The implementation is divided into three main objectives: Objective I: Building the integrated device, Objective II: Optimization of the deposition parameters, and Objective III: Demonstrating the technique’s capability and priming the industrial implementation. These objectives will lead to the generation of data: (I) on the construction, setup, and ongoing improvements of the device, (II) on the experimental protocols for film deposition and the properties of the resulting coatings, and (III) on the effectiveness of the demonstrated applications towards commercialization. Various kinds and forms of data will be generated throughout the project. No previous works on this specific kind of approach are known from the literature, hence no reuse of existing data is foreseen.

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PlasmaSolution - Initial DMP

1. Data summary

Purpose of the data collection

The raw data on plasma-treated and plasma-coated wood substrates will be helpful for readers of our scientific articles, that are to be published, to verify our findings. Further, the data may help to form a more complete view on the effects of different plasma treatments on wood surfaces, and thus might enable to generate a general model covering all different plasma treatments.

Relation to the objectives of the project

The three main objectives of the action are: (I) Building an integrated device, (II) optimizating the parameters of PMMA deposition for exterior use, thereby further improving the understanding of the processes, and (III) demonstrating the technique's capability and priming the industrial implementation. The published data will therefore include:

(I) construction details and CAD drawings,

(II) coating deposition protocols, plasma diagnostic data, and data for the characterisation of the deposited coatings, as well as

(III) aging, wheathering and cross-cut tests of the coatings, amongst other measurements, that indicate the industrial usability.

Specify the types and formats of data generated/collected

(I) Construction details, CAD drawings, simulations:

- CAD drawings: SolidWorks; .sldprt, .sldasm, .slddrw / .pdf, .jpg
- Simulations: COMSOL Multiphysics; .mph / .pdf, .jpg

(II) Coating deposition protocols, plasma diagnostic data, and data for the characterisation of the deposited coatings:

- Protocols: Word; .docx / .txt
- OES spectra: .xls / .pdf
- Tensiometer: KRÜSS Laboratory Desktop; .xls / .mdb
- Goniometer: Attension; .xls / .bmp, .png, .jpg
- FTIR Spectrometer: Spectrum; .xls / .bmp, .png., jpg, .gif, .tif
- SEM microscope: xTmicroscope server; .tif
- Zwick Z100: Testxpert II; .xls files

(III) Aging, wheathering and cross-cut tests of the coatings, amongst other measurements, that indicate the industrial usability:

- Images (Photographs); .jpg, .bmp

No existing data is expected to be re-used.

Origin and expected size of the data (if known)

(I) Construction details, CAD drawings, simulations:

- CAD drawings: proprietory files (SolidWorks) as well as images and PDF; each file will amount to few 100 kB
- Simulations: proprietory files (COMSOL Multiphysics) as well as images and PDF; proprietory files few 100 MB, PDF files few MB

(II) Coating deposition protocols, plasma diagnostic data, and data for the characterisation of the deposited coatings:

- Protocols: original notes; each file will amount to few 100 kB
- OES spectra: original measurements; each file will amount to few 100 kB
- Tensiometer: original measurements; each file will amount to few 100 kB
- Goniometer: original measurements; each file will amount to few 100 kB
- FTIR Spectrometer: original measurements; each file will amount to few 10 kB
- SEM microscope: original measurements; each file will amount to few MB
- Zwick Z100: Testxpert II: original measurements; each file will amount to few 100 kB

(III) Aging, wheathering and cross-cut tests of the coatings, amongst other measurements, that indicate the industrial usability:

- Image from photo camery; each file will amount to few 100 kB

Outline the data utility: to whom will it be useful

(I) Construction details and CAD drawings:

- CAD drawings: academia and industry for reproduction and utilization for applications
- Simulations: academia and industry for adaption for further applications

(II) Coating deposition protocols, plasma diagnostic data, and data for the characterisation of the deposited coatings:

- Protocols: academia and industry for adaption and reproduction
- OES, Tensiometer, Goniometer, FTIR, SEM, and Zwick: academia for reproduction and verification

(III) Aging, wheathering and cross-cut tests of the coatings, i.a.: academia for reproduction and verification

2. FAIR data

Discoverability

All data will be uploaded together with the relating metadata, including project context and labbook entries. These collections will be linked to scientific articles, conference proceedings, reports, and other sources to be published. For this, we will make use of persistent and unique Digital Object Identifiers (DOI) via the data storage facility. A description of available data collections will also be added to the PIs website.

Naming conventions, keywords and versioning

We ascertain that the data will be easily recognized and correlated to experiments via the following naming conventions:

- Raw data: YYMMDD_[experiment]_[technique]_XXX.*
- Processed results: YYMMDD_[experiment]_[technique]_XXX_analysis_ZZZ.*

Herein, symbols represent the following:

YYMMDD - the inverted date of the day the experiment was conducted
[experiment] - a short title for the experimental series
[technique] - a unique denominator for each technique, such as CLSM, SEM
XXX - a running number for individual measurements
ZZZ - a running number for separate processes of analysis

Same naming formats will be used for other data, such as CAD and COMSOL files.

Metadata creation

No standards are known to the PI at the point of the DMP creation. As metadata, we will thus provide:

- Publication date,
- Title,
- Authors including contact information,
- Description,
- Version,
- Language,
- Keywords,
- Grant acknowledgement, and
- References to all publications referring to the dataset.

Further, we will include complete lab notebook excerpts, as well as protocols for measurements and analysis within the dataset.

Specify which data will be made openly available? If some data is kept closed provide rationale for doing so

- All data used in any publication (journal article, conference contribution, BLOG post etc.) will be made openly available and linked to via DOI from the original publication.

Specify how the data will be made available and where the data and associated metadata, documentation and code are deposited

- Unless provided with better options in special cases (like some publishers offer), we will use Zenogo.org to store data, metadata, and documentation.
- No restrictions will be imposed.

Specify what methods or software tools are needed to access the data? Is documentation about the software needed to access the data included? Is it possible to include the relevant software (e.g. in open source code)?

Although it is not possible to include proprietory software, we will provide suitable open export formats along with a description of the required software to access the data, e.g. Adobe Reader for PDF exports.

Assess the interoperability of your data. Specify what data and metadata vocabularies, standards or methodologies you will follow to facilitate interoperability.

- Where proprietory formats are not open or interoperable, we will use exports in interoperable formats, such as PDF or TXT

Specify whether you will be using standard vocabulary for all data types present in your data set, to allow inter-disciplinary interoperability? If not, will you provide mapping to more commonly used ontologies?

- Not relevant to the technical datasets yielded within this project.

Specify how the data will be licenced to permit the widest reuse possible

- Data will be licenced as CC-BY.

Specify when the data will be made available for re-use. If applicable, specify why and for what period a data embargo is needed

- The data will be made available upon accceptance of any publication. In no case is an embargo period foreseen.

Specify whether the data produced and/or used in the project is useable by third parties, in particular after the end of the project? If the re-use of some data is restricted, explain why

- No restrictions are foreseen, all published data is useable by third parties during the project and after the end of the project.

Describe data quality assurance processes

- Data formats and contents are given by the equipment and software manufacturers.
- Loss of data is avoided through the secure storing procedures.
- Manipulation or loss of raw data is avoided through storing raw files after recording and only processing copies of the datasets, that are stored in a different location.
- Procedures for data recording, storing, handling, and processing are unified via protocols.

Specify the length of time for which the data will remain re-usable

- The data will remain re-usable for at least 20 years, as to the repository's policy.

3. Allocation of resources

Estimate the costs for making your data FAIR. Describe how you intend to cover these costs

Using Zenodo, no costs are foreseen for making our data FAIR.

Clearly identify responsibilities for data management in your project

Responsibilities for data management are taken over by the fellow.

Describe costs and potential value of long term preservation

Since the project's results shall be conserved FAIR-ly, this includes the data used for every publication. Thus, reusibility and cross-usibility of the produced data will be ensured.

4. Data security

Address data recovery as well as secure storage and transfer of sensitive data

- Original data will be stored on a network area storage with appropriate security and backup functionalities.
- No sensitive data is foreseen to be recorded during the course of the project.
- Data recovery will be eased by the naming convention.
- Raw data are stored in a folder structure, sorted by year, month, and day. Results of data processing and analysis are grouped in separate folders bearing the names of the correlating experimental series.

5. Ethical aspects

To be covered in the context of the ethics review, ethics section of DoA and ethics deliverables. Include references and related technical aspects if not covered by the former

- Not relevant to the technical datasets yielded within this project.

6. Other

Currently we don´t use any national, funder, sectorial, or departmental procedures for data management.