

DATA MANAGEMENT PLAN (DMP)

Deliverable 1.3



**Embedded Life-Cycle Management
for Smart Multimaterials Structures:
Application to Engine Components**



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No GA 101006854

Deliverable D1.3

Title: Data Management Plan (DMP)

Due date (as planned in DoA): M6 – September 2021

Actual submission date: 29/09/2021

Work package: WP1 – Project Management & Coordination

Lead partner: FEUGA

Authors' List: Ángela Muñiz (FEUGA), Lucía Novoa (FEUGA), Carmen Coteló (FEUGA)

Reviewed by Leader and/or Co-leader of Work Package: Ioannis STASINOPOULOS (SAFRAN)

Type: ORDP

Version: 1.0

Dissemination Level		
<input checked="" type="checkbox"/>	PU	Public
<input type="checkbox"/>	CO	Confidential, only for members of the consortium (including the Commission Services)

Disclaimer: *The contents of this deliverable are the sole responsibility of one or more Parties of the MORPHO consortium and can under no circumstances be regarded as reflecting the position of the Research Executive Agency and European Commission under the European Union's Horizon 2020 programme.*

Copyright and Reprint Permissions

"You may freely reproduce all or part of this paper for non-commercial purposes, provided that the following conditions are fulfilled: (i) to cite the authors, as the copyright owners (ii) to cite the MORPHO Project and mention that the EC co-finances it, by means of including this statement "Embedded Life-Cycle Management for Smart Multimaterials Structures: Application to Engine Components" — MORPHO Project no. H2020-101006854 co financed by EC H2020 programme" and (iii) not to alter the information."

ABSTRACT

This document contains the first version of the MORPHO Data Management Plan (DMP), which describes the life cycle of the data and how it is generated, collected and processed by the project.

The first part presents the different kind of data that are being collected and studied on the project. Secondly, it defines the normative for protection and storage both for research and management data. In addition, the plan explains the methods to be used in order to ensure a Findable, Accessible, Interoperable and Re-usable data (FAIR data). Finally, it establishes the data security and ethics.

The DMP is an evolving document. It will be updated during the project as often as required, as a function of potential changes in the data management strategy, of decision made for data management during the project, and of new datasets, either produced or used, that had not been anticipated at the start of the project.

Type of data, storage, confidentiality, ownership, management of intellectual property and access; procedures that will be implemented for data collection, storage, access, sharing policies, protection, retention and destruction will be in line with EU standards as described in the Grant Agreement and the Consortium Agreement.

CONTENT

CONTENT	4
Glossary	5
1. Introduction	6
2. Data purpose	6
3. Data principles	8
3.1. Open Access	8
3.2. Scientific Publications.....	9
3.3. Research Data.....	10
3.4. FAIR Data	10
3.5. Findable, including provisions for metadata.....	11
3.6. Accessible	11
3.7. Interoperable.....	12
3.8. Re-usable	12
4. Data Life Cycle	12
4.1. Data Collection	13
4.2. Data Processing	13
4.3. Data Storage and data security	14
4.4. Data Share	15
5. Allocation of resources	16
6.Ethics	16
Annex 1. DMP Questionnaire	18

List of tables

Table 1 Acronyms	5
Table 2 Main research data produced/collected and objectives	7
Table 3 DMP Questionnaire	18

List of figures

Figure 1 Open access to scientific publications and research data	9
Figure 2 FAIR Data principles.....	11

Glossary

Table 1 Acronyms

Acronym	Meaning
DMP	<i>Data Management Plan</i>
DOI	<i>Digital Object Identifier</i>
EC	<i>European Commission</i>
EU	<i>European Union</i>
FAIR	<i>Findable, Accessible, Interoperable and Re-usable</i>
GA	<i>Grant Agreement</i>
GDPR	<i>General Data Protection Regulation</i>
H2020	<i>Horizon 2020</i>
IP	<i>Intellectual Property</i>
IPR	<i>Intellectual Property Rights</i>
LEAP	<i>Leading Edge Aviation Propulsion</i>
LCM	<i>Life Cycle Management</i>
OA	<i>Open Access</i>
OpenAIRE	<i>Open Access Infrastructure for Research in Europe</i>
ORD	<i>Open Research Data</i>

1. Introduction

This deliverable D1.3 is the first version of the MORPHO Data Management Plan (DMP). It describes the strategy for data management as planned within six months of the project beginning. The objective of the DMP is to outline in detail the approach planned for the management of each dataset to be produced or used in the project.

The DMP describes the data management life cycle for the data to be collected, processed and/or generated by the MORPHO project. As part of making research data Findable, Accessible, Interoperable and Re-usable (FAIR), it includes information on:

- what data will be collected, processed and/or generated;
- the handling of data during and after the end of the project;
- which methodology and standards will be applied;
- whether data will be shared/made open access and
- how data will be curated and preserved (including after the end of the project)

The DMP addresses all the data produced or used by the project, i.e. all information stored in a numerical format, having a value for any purpose. Consistent data are grouped within datasets, subjected to specific data management strategies.

MORPHO DPM is a living document that changes together with the needs of the project and its participants. It will be updated throughout the project to make sure that it tracks such changes over time and that reflects the latest state of the project. MORPHO DMP might be updated in case:

- partners of the project make the decision to change the strategy for the management of a given data set, for any reason not anticipated at the start of the project;
- more information becomes available for a given data set (e.g. about the format of a data set, or about the technical details for collecting data);
- a new type of data or a new dataset is produced or used, not anticipated at the start of the project.

2. Data purpose

The main purpose for data gathered is to meet the objectives of the MORPHO project to develop a solution for the recycling problem linked to the current design and composition of the LEAP Engine. In addition, it focuses its efforts on reducing the vulnerability of components to the impact of objects, increasing reliability, safety and useful life and to enable a customized maintenance. For this, the project proposes to implement fibre-optic sensors and printed sensors in the engine fan blades during manufacturing. On the other hand, through the development, and subsequent use, of digital or hybrid models, it is expected to improve the Life Cycle Management (LCM) of the components.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.

D1.3 – Data Management Plan (DMP)

MORPHO's ambition is to increase the efficiency and profitability of the manufacturing and maintenance processes of the components, allowing to improve the LCM and subsequent recycling of the new generation of smart motors.

Framed under the name Industry 4.0, the development of techniques that allow adding native connectivity to the parts of the aircraft is the key technology to promote this transformation. By incorporating software embedded in the engine components and featuring cognitive capabilities, it allows the optimization of manufacturing processes and, at the same time, increases operational availability and safety.

The specific objectives of the MORPHO project are:

- deployment of connectivity capabilities to aircraft engines components;
- implementation of cognitive capabilities to engine parts in order to improve their manufacturing process, operational, maintenance and furthermore recycle;
- reinforce the captivity and environmental friendly aerospace industry through Industry 4.0.

The data collected, stored, protected and analysed throughout this project consist of:

- **personal data** gathered for management and communication purposes such as newsletters subscriptions forms and events participation and,
- **technical data** to facilitate development of technology.

The table below summarizes the main typology of data the consortium is going to generate.

Table 2 Main research data produced/collected and objectives

WP	Objective	Research data
WP2/WP3	Resin Transfer Molding simulation process	Filling factor, filling time, viscosity, temperature, degree of cure, curing rate, equivalent permeability, material age, fiber content, porosity, flow front velocity, hydrostatic pressure
WP4/WP5	Sensor data generation	Resistance, temperature, glass transition temperature (Tg). Electric resistance, temperature and Tg metadata in MOhm (resistance) and deg C (temperature and Tg)
WP4/WP5	Fiber Bragg Grating measurements & electric resistance of printed sensors	Strain, wavelength and temperature metadata in $\mu\epsilon$ (microstrain), pm (wavelength shift) and C (temperature), Temperature and strain
WP3/WP5	Digital twin for the Foreign Object Damage panel and health management database	Mechanical stresses and strains, failure indicators (progressive damage modelling), impactors velocities and masses (impact energies), loading envelopes, Structural Health Monitoring data

3. Data principles

Participants of the MORPHO consortium must follow this DMP when describing the types of data that will be produced or collected, how the data will be exploited and shared, the standards that will be applied, how the data will be preserved allowing their security, and how will it be provided all the information, procedures, tools and instruments required for access, extraction, exploitation and reproduction of MORPHO data. The data management follows the European Commission (EC) guidelines and the following data principles:

- Open Access
- FAIR Data
- IPR Management
- Compliance with non-EU Partners

3.1. Open Access

The Open Access movement began in the 1990s when access to the Internet became available. Open Access means that scientific information must be publicly available and free of charge so that everyone can read, download, copy, distribute, print, search and consult without facing any financial, legal or technical barriers. Making research results accessible to everyone provides faster progress in innovation, improves the quality of results, inspires partnerships involving and enhances society and the public and private sectors.

This movement gained even more notoriety in a meeting in October 2003 that brought together several international experts that aspired to develop a web-based search environment using the Open Access paradigm. From this meeting results the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, which is also based on the Budapest Open Access Initiative and the subsequent annual conferences have increasingly sensitized other entities to the accessibility of scientific information.

This Declaration has been signed by nearly 300 research institutions, libraries, archives, museums, funding agencies, and governments from around the world.

In the research & development context, Open Access to Scientific Information refers to two main categories: scientific publications and research data.

The following Figure 1 presents the context of dissemination and exploitation of Open Access Policy to scientific publications and to research data.

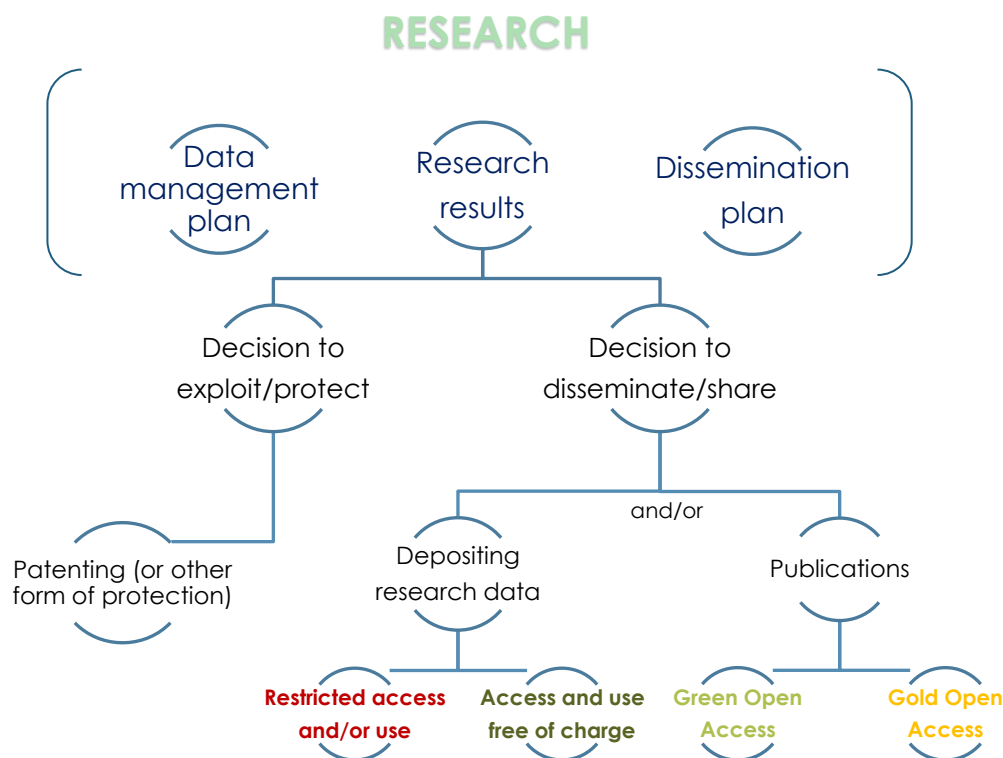


Figure 1 Open access to scientific publications and research data

3.2. Scientific Publications

Scientific Publications is referred to peer-reviewed scientific research articles that are firstly published in academic journals and Open Access to scientific publications signifies the free access for everyone, including the rights to read, download, print and also the right to copy, distribute, search, link, trace and extract. Open Access does not imply an obligation to publish results since this decision is entirely the responsibility of the partners and does not also affect the decision to commercially exploit the results. It can only become an issue if the publication is chosen as the means of dissemination. The decision to publish (or not) through Open Access should only come after a more general decision on whether to publish directly or to first seek IP protection.

The free access through the repository must be guaranteed using one of two main methods of Open Access:

- **“Green” OA (Self-archiving)** – the author, or a representative, archives (deposits) the published article or the final peer-reviewed manuscript in an online repository before, at the same time as, or after publication. It can be request that open access be granted only after an embargo period has elapsed, as established in the Open Access Publishing Agreement (usually between 6 and 12 months depending on the type of publication).
- **“Gold” OA (Open access publishing)** – the author can publish in open access journals,

D1.3 – Data Management Plan (DMP)

that sell signatures and offer the option of making individual articles openly accessible. These articles are eligible for reimbursement during the project but once the project is completed they cannot be reimbursed (see Article 6 of Grant Agreement (GA)).

3.3. Research Data

Research data refers to data from underlying publications (underlying data) and/or other data collected such as statistics, experiment results, measurements, observations, and others. Open Access to Research Data is the right to access and re-use data under the conditions established in the GA.

The access and re-use of research data generated in H2020 projects such as MORPHO is facilitated through the flexible Open Research Data (ORD) Pilot. The ORD Pilot aims to make the research data available with few restrictions as possible and also to protect sensitive data from possible inappropriate accesses. Research data needs to be monitored with the objective to develop the policy regarding open science.

However not all research data needs to be open under the ORD Pilot and during the project lifetime, different accesses policy's (public, restricted, closed, private) to the data can be chosen, where it needs to involve two steps:

- **Deposit Research Data** - Project research data (and underlying data) should be deposited whenever possible into an online data repository. It is advisable that the repository allows to deposit both publications and underlying data with tools to "link" them (such persistent identifiers and citations of data). OpenAIRE also provides supplementary information and support for linking publications with underlying research data.
- **Provide Access** - All the effort and procedures must be taken to enable third parties to access, exploit, reproduce and disseminate (for free) the data. To do so, it is necessary to attach licenses to the deposited research data.

3.4. FAIR Data

Making research data *Findable, Accessible, Interoperable and Re-usable* (FAIR) is an integral part of the process of open science and research. In addition, FAIR research data enables both scientific research and society to leverage the benefits of such data and also make a significant contribution to economic growth. The FAIR principles, presented in Figure 2, are particularly helpful since allow:

- support to knowledge discovery and innovation;
- data and knowledge integration support;
- allow sharing and data re-use;
- support data and metadata to be machine-readable;
- allow data discoveries through the harvest and analysis of multiple datasets.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.



Figure 2 FAIR Data principles

When managing research data, these principles should be heeded to ensure that the MORPHO research data will be shared in a way that enables and enhances re-use, by humans and machines.

3.5. Findable, including provisions for metadata

MORPHO research data must be easily discovered and locatable in order to be used and re-used. Both MORPHO data and metadata should be easy to find for humans and computers. The use of machine-readable metadata is essential for datasets to be discovered automatically. To be findable:

- research data and metadata must be given a unique, persistent, global identifier;
- research data should be described with well-founded metadata;
- research data and metadata must be registered/indexed in a searchable resource (repository);
- metadata must specify the identifier for the research data.

The data produced and/or used in the project, and stored on the projects' collaborative platform should be identifiable and locatable by means of a standard identification mechanism. The assignment of keywords to each dataset and subsets will facilitate their re-use. These keywords must include: date, country, type of data (interview, questionnaires, etc.), type of actors concerned.

3.6. Accessible

All the necessary information to access the MORPHO research data must be provided and, if existing, all authentication/authorization methods must also be provided. Data do not need to be necessarily open if there are good reasons such as privacy concerns or commercial interests and there must be transparency in the conditions of access and reuse. To be accessible:

- MORPHO research data and metadata need to be recoverable through their identifier using a standardized communication protocol that needs to be open and free allowing, if required, authentication and authorization procedures;
- Metadata must be accessible, even when MORPHO data is no longer available.

3.7. Interoperable

Interoperability allows the exchange of data between several entities such as researchers, institutions and organizations. To be interoperable, MORPHO research data and metadata need to use community agreed formats and should be also interoperable with applications or workflows for analysis, storage, and processing. In order to be interoperable:

- research data and metadata must use a formal, accessible, shared, and widely applicable language for knowledge representation;
- research and metadata should have vocabularies that follow the FAIR principles;
- research data and metadata should include qualified references to other research data or metadata.

3.8. Re-usable

Optimize data re-use is the basic purpose of the FAIR data principles. MORPHO research data should maintain its initial richness and must be clearly described. In order to be reusable, data and metadata:

- must have a plurality of precise and relevant attributes;
- must be released with a clear and accessible data usage license;
- need to be associated with their origin;
- must be aligned with the community standards and relevant to their domain.

4. Data Life Cycle

In a typical project data lifecycle, there are some key steps that must be considered:

- **Data Collection** – The first step is data collection/creation. Data needs to be collected from his origin and kept in a workspace (it is always recommended to make a backup);
- **Data Processing** – At this stage, the data must be identified, analysed and processed, as well as its quality ensured. It is also advisable to always make a copy of the raw data before start working with it. The analysis of the research data may also require the collection of new data for the same or for other project purposes;
- **Data Storage** – The data need to be organized by specifying and choosing the file formats, their access policy, their metadata and also must be deposited in an online (and also local) repository. When the data is on a repository all the efforts need to be made to allow their long-term preservation;
- **Data Share** – After depositing the data in an online repository, it is available to be accessed and discovered by third parties, and then can be used for other purposes (re-use).

The following sections present the baseline for MORPHO's DMP, outlining how the data collected, processed and/or generated during the project life cycle will be organized, stored and shared and what the FAIR principles are.

D1.3 – Data Management Plan (DMP)

The aim of this plan is to ensure that MORPHO's information, data and results will be managed suitably. To this end, the project partners have filled a survey in answer to the questions stated in the template provided by the EC in the "Guidelines on FAIR Data Management in Horizon 2020".

4.1. Data Collection

The estimated size of the data created by MORPHO partners is ranging between 1,6 -28GB. This estimation is excluding TUDELFT who, due to experimental efforts to measure the mechanical response of the FOD panel, is going to generate around 100TB.

The estimated size of the communication data considering the audio-visual part is undetermined, but it might be in the order of 10GB.

The consortium will mainly work with data from primary sources, directly collected by researchers from main sources. Secondary data collected from multiple sources relevant for the project will be of use as well for partners such as Synthesites or Comet.

The codes that will be generated throughout the project will be mainly in Matlab, Abaqus, COMSOL, ANSYS, LS-DYNA, PAM RTM, LabView, and OriginPro.

In most cases, these programs are used because there is no alternative open source available. This licensed software is broadly used in the engineering community, and it is already available to the partners involved in the research.

As an alternative to Matlab, Octave is an open-source similar software that partners can also use. Also, OpenFOAM can be used as open-source alternative to the ANYS program as it is broadly used for the research community. To ease the collaboration and exchanges among partners, when needed, documentation to access the data will be included.

Regarding document production, MS Office -mainly Excel but also Word and PPT- will be also used by the whole consortium to process the data.

As for programming language, Python will function as a useful tool for research consortium members.

For communication purposes, the programs that will be used are the Adobe Creative Cloud (Illustrator, Photoshop, InDesign, Premiere...) and Canva. The website has been created using WordPress.

Once generated (or collected), these data will be stored in several formats, which mainly are: Documents, Images, Data, and Numerical codes. More detail on the type of data & extensions produced within the MORPHO project can be found in Annex 1.

4.2. Data Processing

As the project progresses and data is identified and collected, further information on making data interoperable will be outlined in subsequent versions of the DMP. In specific, information on data and metadata vocabularies, standards or methodology to follow to facilitate



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.

D1.3 – Data Management Plan (DMP)

interoperability and whether the project uses standard vocabulary for all data types present to allow interdisciplinary interoperability. The first analysis outlines that the initially data sets generated will not be re-used outside of the MORPHO project.

Using common formats and standards, controlled vocabularies, community-agreed schemas, keywords or ontologies, where possible, will make MORPHO data interoperable at consortium level. This will allow, if it is so decided in the following versions of the DMP, the data generated within the project to be integrated with other data, applications and workflows. When possible, data will not be created with proprietary software, making it available in OA formats.

The answers provided by the partners in regard to the interoperability of their data are gathered in the Annex I. The survey specifically requested information about any specific tools (including software) related to the data, and whether these respected data accessibility and interoperability.

4.3. Data Storage and data security

This section addresses data recovery as well as secure storage and transfer of sensitive data. In order to keep data safe for the long term, MORPHO has selected a trustworthy repository (*We Share*), managed by Safran. This intranet is the main information storage and exchange place for the project. All the project participants have individual credentials to access.

Moreover, the partners will store their data in their own servers and data storage systems. The providers of cloud storage and cloud computation resources and tools employed by the partners guarantee data security (e.g., Secured NAS drive, SharePoint) keeping it protected against unauthorized access. The hardware (i.e., laptops) where data is stored are also password protected. Overall, MORPHO partners will rely on the data security guaranteed by their service providers and their internal security procedures for data storage.

Special attention will be paid to the management of sensitive data throughout the research process. Sensitive data must be protected against unwanted disclosure and its accessibility should hence be safeguarded. The protection of sensitive data may be required for legal or ethical reasons, for issues pertaining to personal privacy, or for proprietary considerations. In particular, MORPHO will comply with EU regulations regarding personal (GDPR16) and sensitive non-personal data. Sensitive data can still meet the FAIR principles and be processed in a way that the needed protection is guaranteed also in the future. Thus, the public outcomes of workshops and events linked to the communication and dissemination activities, unless an informed consent is given, will be free of any personal reference.

Sensitive data should be archived under a closed license in a trustworthy repository. Nevertheless, it should be noted that it is not always necessary to keep all the data, as it will depend on criteria such as its uniqueness, long-term value, reuse potential and the necessity to validate results.

Scientific journal publications or conference proceedings published (in Open Access), will be publicly archived for the long term on online archives, following their metadata standards.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.

4.4. Data Share

The MORPHO consortium will participate to the Open Research Data programme as it strongly believes that the sharing of the information gathered during the project can allow a better understanding of functional structures with efficient, economical and environmentally friendly manufacturing, and thus improving scientific knowledge. Moreover, to foster the fact that the results will benefit European stakeholders, key outputs of the project will be made public, posted on the project website and, in applicable, stored in the repositories of the participating institutions.

The requirements for open access do not imply an obligation to publish all the project results because this decision is entirely the responsibility of MORPHO partners. In addition, open access also does not affect the decision to commercially exploit the results.

As an exception, the beneficiaries do not have to ensure open access to specific parts of their research data if the achievement of the action's main objective would be jeopardized by making those specific parts of the research data openly accessible. For this reason, the research data produced under the MORPHO project will remain confidential, only accessible for the consortium members for safety and commercial reasons. Apart from the consortium, when relevant, a member of the Advisory Board can review a MORPHO Deliverable, after signing a non-disclosure agreement.

For MORPHO's scientific publications the "golden" open access model will be chosen, preferable in a fast-moving scientific field. All scientific publications will either be deposited via OpenAIRE, in the lead authors' institutions repositories or, if such a repository does not exist, in the centralized, EC-supported, Zenodo repository. MORPHO beneficiaries will also check that the metadata of the publication is adequate for EU funded projects.

In accordance with the GA, each MORPHO partner must ensure open access to all peer-reviewed scientific publications relating to its results. In particular, it must:

- **Deposit publication.** As soon as possible and at the latest on publication, deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in a repository for scientific publications. The OpenAIRE (Open Access Infrastructure for Research in Europe) is a suggested entry point to choose and select a repository.
- **Research Data.** Moreover, the beneficiary must aim to deposit at the same time the research data needed to validate the results presented in the deposited scientific publications.
- **Open Access.** Ensure open access to the deposited publication — via the repository — at the latest: on publication, if an electronic version is available for free via the publisher, or within six months of publication (twelve months for publications in the social sciences and humanities) in any other case.
- **Metadata Open Access.** Ensure open access — via the repository — to the bibliographic metadata that identify the deposited publication. The bibliographic metadata must be in a standard format and must include all of the following:
 1. the terms “European Union (EU)” and “Horizon 2020”;

D1.3 – Data Management Plan (DMP)

2. the name of the action, acronym and grant number;
3. the publication date, and length of embargo period if applicable, and
4. a persistent identifier Deposit Publications.

Nevertheless, as the DMP will be updated throughout the project lifetime, the partners will continuously evaluate if the digital research data generated in the MORPHO project can be deposited in a research data repository to third parties to access, mine, exploit, reproduce, and disseminate.

Thus, among the different research conducted under the program at least the following will be Open Access:

- Project deliverables D1.3, D5.3, D7.4, D8.1, D8.2, D8.3, D8.4;
- Articles published in Open Access scientific journal;
- Conference and Workshop abstracts/articles.

The beneficiaries must process personal data under the Agreement in compliance with applicable EU and national law on data protection (including authorizations or notification requirements). The beneficiaries may grant their personnel access only to data that is strictly necessary for implementing, managing, and monitoring the Agreement. The beneficiaries must inform the personnel whose personal data are collected and processed by the Agency or the Commission.

5. Allocation of resources

Costs related to open-access to research data in Horizon 2020 are eligible for reimbursement under the conditions defined in the H2020 Grant Agreement. Project beneficiaries will be responsible for applying for reimbursement for costs related to making data accessible to others beyond the consortium. The costs for making data FAIR includes:

- Fees associated with the publication of scientific articles containing project's research data in "Gold" Open access journals. The cost sharing, in case of multiple authors, shall be decided among the authors on a case-by-case basis;
- Project Website operation;
- Data archiving at ZENODO and on other on line data base: free of charge;
- Copyright licensing with Creative Commons: free of charge.

6. Ethics

MORPHO partners adhere to the guidelines recommended by the European Commission in line with the ethical requirements outlined in the General Data Protection Regulation (GDPR) . The personal data information collected by each MORPHO partner must be pseudonymised by



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.

D1.3 – Data Management Plan (DMP)

the partner responsible for its collection. Participant names / addresses (obvious identifiers) are replaced by indirect identifiers (e.g. numbers) in the main database. Indirect identifiers and obvious identifiers are stored in a separate data set, hereinafter called "key" (according to the GDPR rules for pseudonymised data). Each partner securely stores the "key" table (password protected or encrypted, and in a different location from the database) and is not shared.

All the information obtained from secondary/tertiary sources must be quoted appropriately.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.

Annex 1. DMP Questionnaire

Table 3 DMP Questionnaire

FiSens GmbH	
Project/tasks objectives related to data generated	WP4/WP5 sensor data generation (strain, temperature)
DATA type & extensions produced within the project	<ul style="list-style-type: none"> - comma separated values (.csv) - text documents (.doc, .txt) - images (.jpeg, .png, etc.) - presentations (.odp, .ppt, .pdf) - spreadsheets (.ods, .xlsx)
Expected size of the data	10-100mb
Origin of the data (Generated / Raw Data)	Both raw data/generated
Primary data or Secondary Data	Primary data
Methods or software tools are needed to access the data	LabView (National Instruments), Excel (Microsoft)
Synthesites	
Project/tasks objectives related to data generated	WP4/WP5 sensor data generation (resistance, temperature, Tg)
DATA type & extensions produced within the project	<ul style="list-style-type: none"> - comma separated values (.txt) - text documents (.doc, .txt) - images (.jpeg, .png, etc.) - presentations (.pptx, .pdf) - spreadsheets (.xlsx) - source code (programming language) - binary datasets (.omd)
Expected size of the data	500mb
Origin of the data (Generated / Raw Data)	Both
Primary data or Secondary Data	Primary data
Methods or software tools are needed to access the data	Excel (Microsoft)

D1.3 – Data Management Plan (DMP)

Re-used data (if any)	Not planned
Outline the data utility: to whom will it be useful	Data to characterize materials and processes, All partners
DISSEMINATION LEVEL	CONSORTIUM
Open Access type	Gold
Repositories	Hard drive
What procedure will you use to make the data openly available?	Upload to the Intranet
If some data will not be openly available, explain which one and why	Exclude datasets that are not useful to partners
Metadata	Scripts, spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes, by given timestamp
What naming conventions do you follow?	optimold_c_SENSORNR_YYMMDD_HHMMSS
Will you provide clear version numbers?	No
Will search keywords be provided that optimize possibilities for RE-USE?	No
What metadata will be created?	Electric resistance, temperature and Tg metadata in MOhm (resistance) and deg C (temperature and Tg)
FEUGA	
DATA type & extensions produced within the project	<ul style="list-style-type: none"> - web (html, css, javascript,..) - text documents (.doc, .txt) - images (.jpeg, .png, etc.) - presentations (.odp, .ppt, .pdf) - spreadsheets (.ods, .xlsx) - interviews (.txt, .odt, .pdf, .mp3, .mp4)
Expected size of the data	The final size will mainly depend on the number of videos, images and presentations produced.
Origin of the data (Generated / Raw Data)	Most of the Communication and Dissemination materials produced will be result the data gathered from the different Morpho technical WPs. Scientific papers/presentations/diagrams used for C&D activities (and website) will be produced under the rest of WPs and shared through C&D activities and channels. Analytics form the web server will be also gathered for analysis and web optimization.
Primary data or Secondary Data	Mostly Secondary Data collected by Morpho 's researches.

D1.3 – Data Management Plan (DMP)

Methods or software tools are needed to access the data	Microsoft Word, Excel and Power Point Word Press (Web site management) Canva, Photoshop, Illustrator (design) Adobe InDesign
Re-used data (if any)	No.
Outline the data utility: to whom will it be useful	It will be useful to the whole consortium in order to disseminate their project results, to other related projects and research community (presentations, scientific and technical papers, etc..) and the wide public in general to know about the project topic (infographics, social media, ...).
DISSEMINATION LEVEL	OPEN
Open Access type	Public domain for the Communication and Dissemination materials.
Repositories	Morpho's Website and Safran WeShare
What procedure will you use to make the data openly available?	Public Communication and Dissemination material will be openly available at Morpho's Website.
If some data will not be openly available, explain which one and why	Private data (newsletter subscription or events registration)
Metadata	spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	NA
What naming conventions do you follow?	name_date_version
Will you provide clear version numbers?	NA
Will search keywords be provided that optimize possibilities for RE-USE?	NA
What metadata will be created?	Keywords and descriptions (as HTML meta tags) will be added to the Morpho website. Specific hashtags are used for Social Media as keywords. *Other metadata for scientific and technical papers/reports (other WPs) will be managed by the publications' authors.
Safran Tech	
Project/tasks objectives related to data generated	WP4/WP5/WP7
DATA type & extensions produced within the project	- comma separated values (.csv); .mat; .txt; .stp; .igs - text documents (.doc) - images (.jpeg, .png, etc.) - presentations (.odp, .ppt, .pdf)

D1.3 – Data Management Plan (DMP)

	- spreadsheets (.xlsx) - interviews (.pdf, .mp3, .mp4)
Expected size of the data	10Mb-1Gb
Origin of the data (Generated / Raw Data)	Raw data
Primary data or Secondary Data	Primary data
Methods or software tools are needed to access the data	Matlab, Python, MS office, CATIA
Re-used data (if any)	NA
Outline the data utility: to whom will it be useful	Partners
DISSEMINATION LEVEL	Consortium only
Open Access type	NA
Repositories	MORPHO Weshare; Managed file transfer solution
What procedure will you use to make the data openly available?	NA
If some data will not be openly available, explain which one and why	Exclude datasets that are not useful to partners
Metadata	Scripts, spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes
What naming conventions do you follow?	Version_Date_Checked by
Will you provide clear version numbers?	Yes
Will search keywords be provided that optimize possibilities for RE-USE?	NA
What metadata will be created?	Monitored physical parameters
ESI	
Project/tasks objectives related to data generated	WP2/WP3
DATA type & extensions produced within the project	- comma separated values (.csv) - text documents (.doc, .txt) - presentations (.pptx, .pdf) - images (.jpeg, .png,)

D1.3 – Data Management Plan (DMP)

	<ul style="list-style-type: none"> - spreadsheets (.xlsx) - videos (.mp4, .avi, .gif) - source code (programming language, .vdb, g.unf, .pc, .ori, .inc, .erfh5)
Expected size of the data	100Mb-3Gb
Origin of the data (Generated / Raw Data)	Both
Primary data or Secondary Data	Primary Data
Methods or software tools are needed to access the data	PAM RTM Documentation and license needed to access input data erfh5 output open viewer
Re-used data (if any)	NA
Outline the data utility: to whom will it be useful	
DISSEMINATION LEVEL	CONSORTIUM
Open Access type	Gold
Repositories	HARD DRIVE / MORPHO WESHARE
What procedure will you use to make the data openly available?	INTRANET
If some data will not be openly available, explain which one and why	Non-useful datasets for partners
Metadata	Scripts, spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes
What naming conventions do you follow?	Date_name_version
Will you provide clear version numbers?	Yes
Will search keywords be provided that optimize possibilities for RE-USE?	No
What metadata will be created?	RTM simulation process output values: filling factor, filling time, viscosity, temperature, degree of cure, curing rate, equivalent permeability, material age, fiber content, porosity, flow front velocity, hydrostatic pressure
UPAT	
Project/tasks objectives related to data generated	WP3/WP5

D1.3 – Data Management Plan (DMP)

DATA type & extensions produced within the project	<ul style="list-style-type: none"> - comma separated values (.csv) - text documents (.doc, .txt) - presentations (.pptx, .pdf) - images (.jpeg, .png,) - spreadsheets (.xlsx) - videos (.mp4, .avi, .gif) - matlab files (.mat) - FEM related files (.odb, .wbpz etc)
Expected size of the data	Up to 1Gb
Origin of the data (Generated / Raw Data)	Both
Primary data or Secondary Data	Both
Methods or software tools are needed to access the data	Matlab, Office, ANSYS, ABAQUS, LS-DYNA No documentation required No open source available
Re-used data (if any)	No
Outline the data utility: to whom will it be useful	CONSORTIUM, RESEARCH COMMUNITY
DISSEMINATION LEVEL	CONSORTIUM
Open Access type	Probably both
Repositories	HARD DRIVE / MORPHO WESHARE
What procedure will you use to make the data openly available?	INTRANET
If some data will not be openly available, explain which one and why	NON-USEFUL DATASETS FOR PARTNERS
Metadata	Scripts, spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes
What naming conventions do you follow?	Date_name_version
Will you provide clear version numbers?	Yes
Will search keywords be provided that optimize possibilities for RE-USE?	Yes
What metadata will be created?	Metrics, features, health indicators from raw sensor data

ENSAM



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.

D1.3 – Data Management Plan (DMP)

Project/tasks objectives related to data generated	WP1/WP3/WP4/WP5/WP6
DATA type & extensions produced within the project	<ul style="list-style-type: none"> - comma separated values (.csv) - text documents (.doc, .txt) - presentations (.pptx, .pdf) - images (.jpeg, .png,) - spreadsheets (.xlsx) - videos (.mp4, .avi, .gif) - source code (programming language: Matlab, Python, C++) - other data (.mat)
Expected size of the data	1Gb-20Gb
Origin of the data (Generated / Raw Data)	Both
Primary data or Secondary Data	Primary Data
Methods or software tools are needed to access the data	Matlab, Python, Abaqus, COMSOL Documentation to access the data will be included Octave is an open-source alternative to Matlab
Re-used data (if any)	Non-applicable
Outline the data utility: to whom will it be useful	
DISSEMINATION LEVEL	Confidential for the Consortium
Open Access type	Green and Gold
Repositories	Secured NAS drive / SAFRAN We Share
What procedure will you use to make the data openly available?	Non-applicable
If some data will not be openly available, explain which one and why	Non-applicable
Metadata	Scripts, spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes
What naming conventions do you follow?	name_date_version
Will you provide clear version numbers?	Yes
Will search keywords be provided that optimize possibilities for RE-USE?	No
What metadata will be created?	All the standard metadata necessary to reproduce the experiments.

TECHNISCHE UNIVERSITEIT DELFT



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006854.

D1.3 – Data Management Plan (DMP)

Project/tasks objectives related to data generated	WP3/WP5 digital twin for the FOD panel and health management database
DATA type & extensions produced within the project	<ul style="list-style-type: none"> - comma separated values (.txt) - text documents (.doc, .txt) - images (.jpeg, .png, etc.) - presentations (.pptx, .pdf) - spreadsheets (.xlsx) - source code (programming language) - finite element models (.cae) - datasets (SQL, NoSQL, Blockchain, Timeseries, etc.)
Expected size of the data	In the rates of 100 TBs (due to experimental efforts)
Origin of the data (Generated / Raw Data)	Both
Primary data or Secondary Data	Primary data
Methods or software tools are needed to access the data	Excel (Microsoft) Notepad Abaqus Python Matlab
Re-used data (if any)	Not planned
Outline the data utility: to whom will it be useful	Data for the mechanical response of the FOD panel, All partners
DISSEMINATION LEVEL	OPEN
Open Access type	Gold
Repositories	Hard drive, MORPHO Intranet, dataverse.nl
What procedure will you use to make the data openly available?	Upload to the Intranet
If some data will not be openly available, explain which one and why	Exclude datasets that are not useful to partners
Metadata	Scripts, spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes, by given record name
What naming conventions do you follow?	“type of data”_”number of experiment” (i.e. type of data could be stresses, strains, failure indicators, etc.)
Will you provide clear version numbers?	Yes
Will search keywords be provided that optimize possibilities for RE-USE?	Yes
What metadata will be created?	Mechanical stresses and strains, failure indicators (progressive damage modelling), impactors velocities and masses (impact

D1.3 – Data Management Plan (DMP)

	energies), loading envelopes, Structural Health Monitoring data
COMET TRAITEMENTS	
Project/tasks objectives related to data generated	WP6
DATA type & extensions produced within the project	<ul style="list-style-type: none"> - comma separated values (.csv) - text documents (.doc) - images (.jpeg, .png, etc.) - presentations (.ppt, .pdf) - spreadsheets (.xlsx) - interviews (.txt, .pdf, .mp3, .mp4)
Expected size of the data	1Mb-1Gb
Origin of the data (Generated / Raw Data)	Both
Primary data or Secondary Data	Primary data and Secondary Data
Methods or software tools are needed to access the data	MS office
Re-used data (if any)	NA
Outline the data utility: to whom will it be useful	Partners
DISSEMINATION LEVEL	Consortium
Open Access type	NA
Repositories	Morpho platform; Sharepoint
What procedure will you use to make the data openly available?	NA
If some data will not be openly available, explain which one and why	Data which contain confidential information and that are not necessary for the completion of the project won't be shared.
Metadata	Scripts, spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes
What naming conventions do you follow?	Date_Version
Will you provide clear version numbers?	Yes
Will search keywords be provided that optimize possibilities for RE-USE?	NA

D1.3 – Data Management Plan (DMP)

What metadata will be created?	
IFAM	
Project/tasks objectives related to data generated	WP4 / WP5
DATA type & extensions produced within the project	<ul style="list-style-type: none"> - comma separated values (.csv) - documents (.doc, .txt) - presentations (.pptx, .pdf) - images (.jpeg, .png,) - spreadsheets (.xlsx) - videos (.mp4, .avi, .gif)
Expected size of the data	0,1Mb-2Gb
Origin of the data (Generated / Raw Data)	Both
Primary data or Secondary Data	Primary Data
Methods or software tools are needed to access the data	Excel (MS Office) OriginPro (OriginLab)
Re-used data (if any)	No
Outline the data utility: to whom will it be useful	
DISSEMINATION LEVEL	Consortium
Open Access type	Gold
Repositories	Hard drive, morpho weshare
What procedure will you use to make the data openly available?	Intranet
If some data will not be openly available, explain which one and why	Non usefull datasets for partners
Metadata	Spreadsheets
Are the data produced and/or used in the project FINDABLE/discoverable with metadata, identifiable and locatable by means of a standard identification mechanism?	Yes (timestamp)
What naming conventions do you follow?	Date_time_name_version
Will you provide clear version numbers?	Yes
Will search keywords be provided that optimize possibilities for RE-USE?	No

D1.3 – Data Management Plan (DMP)

What metadata will be created?	Temperature and strain as results of FBG measurements; electric resistance of printed sensors
---------------------------------------	--