

Deliverable D1.2

Data Management Plan

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ABBREVIATIONS

Abbreviation	Definition
DMP	Data Management Plan



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Executive Summary

The preparation of this document is linked to the participation of the HEATERNAL project in the Open Research Data Pilot, a feature of Horizon Europe. The aim of this document is to describe the data management life cycle for the data sets that will be collected, processed, or generated by the project. It specifies what data will be generated and what methodology and standards will be followed, whether and how the data will be exploited and/or made accessible for verification and re-use, and how they will be archived and preserved. For all those data that will not be publicly disclosed, the explanation is provided.

Nevertheless, it is necessary to mention that the disclosure of the project's data should never jeopardize HEATERNAL's main objectives. The protection of generated intellectual property, the confidentiality obligations, and the obligations to protect personal data will always be considered before making the data openly accessible



1. Introduction

The current deliverable is part of the Task 1.2 Operational management. The preparation of this document is linked to the project's participation in the Open Research Data Pilot in the frame of Horizon Europe. The purpose of the document is to describe the data management life cycle for the data sets that will be collected, processed or generated by the HEATERNAL project. It specifies which data will be generated, which methodology and standards will be followed, whether and how the data will be exploited and/or made accessible for verification and re-use, and how they will be curated and preserved. For all those data that will not be publicly disclosed, the Data Management Plan (DMP) will provide an explanation for it.

The DMP has been developed in line with the article 17 of the Grant Agreement and EC's Guidelines on Data Management in Horizon Europe and Guidelines on Open Access to Scientific Publications and Research Data in Horizon Europe. As it is not considered as a fixed document, updated and more precise versions of the DMP may be delivered at later stages of the project, especially when important changes to the project occur.

It is necessary to mention that the disclosure of the project's data should never jeopardize the project's main objective and the potential protection of generated intellectual property (e.g., patent, product design) and further industrial application. The confidentiality obligations, the security obligations, and the obligations to protect personal data still apply. In case of conflict, the data will not be made openly accessible.



2. HEATERNAL Data Management Plan

The Data Management Plan applies to two types of data, as specified in the EC Guidelines on Open Access to Scientific Publications and Research Data in Horizon Europe:

1. The data, including associated metadata, needed to validate the results presented in scientific publications.
2. Other data, including associated metadata, as specified in this document.

The types of data that will be generated by HEATERNAL are:

1. Data generated during the development (including materials selection & characterization and modelling activities), thermal storage prototype manufacturing and testing.
2. Data collected from three partners (Alcoa, Torrecid, Ugitech) through use cases (operating conditions) ; economic, social and technical data collected for Techno-economic analysis, Environmental & LCA, and Social acceptance evaluation (all partners and End-Users).

There will be decisions for each type of data about whether to protect/exploit it, or whether to make it publicly available in publications in accordance with HEATERNAL dissemination strategy, or by depositing data without a publication (but only where partners agree this would be a good idea). All partners will receive a prior notice of any planned publication or planned data deposition at least 30 calendar days before the intended date of publication in accordance with Article 8.4 of the Consortium Agreement and Article 17.4 of the Grant Agreement.

Figure 1 shows the open access to HEATERNAL data in the wider context of dissemination and exploitation.

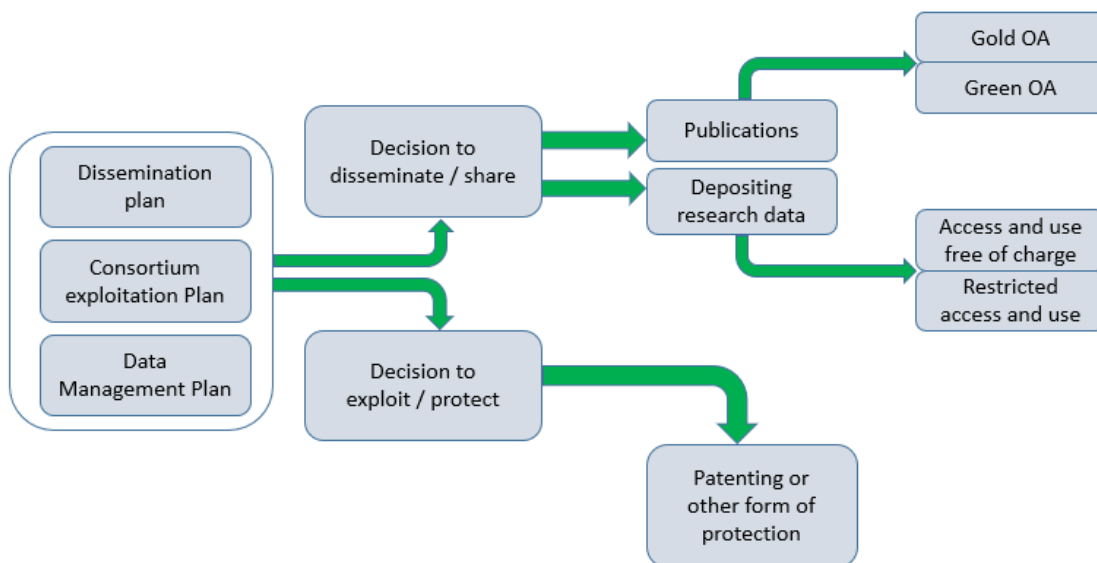


Figure 1 HEATERNAL data in the wider context of dissemination and exploitation

The open HEATERNAL data are planned to be deposited and stored on the internal project repository tool (Own Cloud). It has yet to be discussed within the consortium which openly accessible research data repository could be used for depositing the data.



The first draft of the Data Management Plan is shown in the **Erreur ! Source du renvoi introuvable.** where the data and the metadata which will be generated by the consortium are identified. The following information is also provided in the table:

- What methodology and standards will be applied for generating the data.
- How the data will be exploited/made accessible.
- Explanation as to why the data won't be accessible if this is the case.
- How the data will be archived and preserved.
- Information on tools and instruments necessary for validating the results.



2.1 CEA

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
CEA	WP3, T3.1 : Metal alloys formulation as PCMs for high temperature thermal storage in the temperature range [600-900°C]	PCMs formulations inferred from phase diagrams for metal alloys (CALPHAD method) and from literature review. Data could be useful for scientific research and industry. These data could be the object for scientific publications. These metal alloys PCMs will be tested in WP5.	Calculation by CALPHAD method (CALCulation of Phase Diagrams) and extensive knowledge of materials reported in the literature.	Documents that will contain the metal alloys phase diagrams.	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.	NA	Heaternal collaborative platform If applicable: all data will be stored and archived for 5 years.	NA
	WP3, T3.1 : Wettability measurement of refractory materials	Wettability tests in a HT furnace. Data could be useful for the industry. These data could be the object for scientific publications.	Contact angle measurement between the liquid PCM and the refractory substrate during heat treatment in a furnace	Documents that will contain the wettability measurement. Report (excel, word)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.	NA	Heaternal collaborative platform If applicable: all data will be stored and archived for 5 years.	NA

Table 1. CEA Data Management Plan



Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
CEA	WP3, T3.2 : Mechanical properties of refractory materials	Measurement of Young's modulus, mechanical strength, creep in the target temperature range 600-900°C. Data could be useful for the industry. These data could be the object for scientific publications. These data will be used for WP4.	Tensile and bending tests	Documents that will contain the mechanical properties measurement. Report (excel, word)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.	NA	Heaternal collaborative platform If applicable: all data will be stored and archived for 5 years.	NA
	WP3, T3.3 : Thermo-mechanical characterization of novel PCMs	Measurement of Young's modulus, Poisson's ration in the target temperature range 600-900°C. Measurement of phase transition temperature and associated enthalpy. Data could be useful for scientific research and the industry. These data could be the object for scientific publications. These data will be used for WP4.	Tensile tests Internal protocol used for DSC techniques	Documents that will contain the mechanical properties measurement. Report (excel, word)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository. Sensitive data for IPR will not be accessible.	Sensitive data for IPR. Data relating to innovative PCMs will not be made available since this is economically damaging	Non-sensitive data will be stored in Heaternal collaborative platform. If applicable: all data will be stored and archived for 5 years.	Calibration with reference material for DSC analysis



Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
CEA	WP4, T4.2 & T4.3 Development and optimization of thermal modelling for LTES unit (brick/PCM).	Numerical simulation results from modelling of the LTES unit. Data could be useful for scientific research. These data could be the object for scientific publications	Internal method of CEA	Documents that will include sets of parameters of the different simulation cases, figures and tables (excel, word)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.	The models developed during the project are proprietary and will not be delivered with data sets.	Non-sensitive data will be stored in Heaternal collaborative platform If applicable: all data will be stored and archived for 5 years.	NA
	WP5, T5.2 & T5.3 Experimental testing plan & tests results for the 50 kWh prototype	Thermal performances (outlet temperature, pressure drop...) for different operating conditions These data could be the object for scientific publications.	NA	Documents that will contains thermo-hydraulic measurement (mass flow rate, pressure, temperature). Report (excel, word)	Direct access to data is available in the internal repository.	NA	Heaternal collaborative platform If applicable: all data will be stored and archived for 5 years.	NA
	WP5, T5.4 Experimental tests results for the smaller scale 3D-printing prototype	Thermal performances (outlet temperature, pressure drop...) for different operating conditions. These data could be the object for scientific publications	NA	Documents that will contains thermo-hydraulic measurement (mass flow rate, pressure, temperature). Report (excel, word)	Direct access to data is available in the internal repository.	NA	Heaternal collaborative platform If applicable: all data will be stored and archived for 5 years.	NA

(*) Metadata can be considered information resources/data about data (i.e. References and information that describes, explains and locates an information resource)



2.2 CICE

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
CICE	WP 3.1 – Material selection (metal alloys+ ss-PCMs)	-Calculations of phase diagrams for metal alloys and salt-systems (sulfates, nitrates...) looking for potential PCMs (solid-liquid and solid-solid) -Data will be useful for the scientific community and the industry -Data can be object for scientific publications	Calculations by CALPHAD (CALculation of PHase Diagrams) method	Documents that will include the phase diagrams. “.phas” files with calculations, obtained by FACTSAGE software	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.		Heaternal collaborative platform	FACTSAGE software
CICE	WP 3.2- Thermo-physical properties of refractory bricks	-Characterization of porosity and pore size distribution, specific heat capacity, thermal expansion, and thermal diffusivity of refractory materials. -Data will be useful for the industry -Data can be object for scientific publications	Internal protocols based on the following techniques: - Porosity and pore size: He-pycnometer and Hg-porosimeter - Specific heat capacity: DSC - Thermal expansion: Dilatometer - Thermal diffusivity: Laser flash	Documents containing the material characterization measurements. Report (Word and Excel)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.		Heaternal collaborative platform	Calibration with reference materials in: -Hg-porosimeter - He-pycnometer -Dilatometer -Laser Flash -DSC



Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
CICE	WP 3.3-thermos-physical characterization of PCMs	-Protocols for the preparation of metal alloys and SS-PCMs -Characterization of PCMs, including microstructural and morphological analysis; true density, apparent density, and porosity; main thermal properties. -Data will be useful for the scientific community and the industry -Data can be object for scientific publications	Internal protocols based on the following techniques: - XRD, SEM, He-pycnometer. Protocols followed for the measurements of the main thermal properties related to PCMs are based on RAL_GZ_896_Phase_Change_Material_Edition_March_2018	Documents containing protocols for the metal alloy synthesis and the material characterization measurements. Report (Word and Excel)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository. Sensitive data for IPR- will not be made accessible.	Sensitive data for IPR. Data relating to innovative PCMs will not be made available since this is economically damaging	Non-sensitive data will be stored in Heaternal collaborative platform.	Calibration with reference materials in: -Hg-porosimeter - He-pycnometer -Dilatometer -Laser Flash -DSC
	WP 3.4 – Ceramic/PCM Compatibility studies	-Determination of PCM-ceramic compatibility through pre- and post-analysis techniques. -Data will be useful for the scientific community and the industry -Data can be object for scientific publications	Internal protocols defined in previous publications and Protocols proposed by CALDERYS.	Documents containing characterization of material before and after compatibility test.	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.		Heaternal collaborative platform	N/A

(*) Metadata can be considered information resources/data about data (i.e. References and information that describes, explains and locates an information resource)



2.3 UGENT

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
UGent	WP 4.3 Thermomechanical modelling results	The data set is the result of the thermomechanical model with as an input the temperature profiles and as an output the mechanical stress and strain in the component. The data set could be useful for scientific publication.	Numerical modelling techniques.	The used modelling methods, discretization and grid.	The goal is to publish a journal article on the thermomechanical modelling and the results. The dataset would be made open source.	/	Public online repository (Zenodo, Open Resource Platform)	N.A.
UGent	WP 5.3 Modelling parameters for the TES system.	Parameters of the sizing model developed for WP 5.3.	UGent inhouse TES modelling techniques.	Modelling structure.	A journal publication will be written on the topic.	/	N.A.	N.A.

(*) Metadata can be considered information resources/data about data (i.e. References and information that describes, explains and locates an information resource)



2.4 LEITAT

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
LEITAT	WP3.2 – Material formulation for production of polymeric filament with refractory charges	Percentage of polymer matrix employed, additives and refractory material. Thermal and mechanical properties of several formulation. Extrusion process parameters recipe (temperature, time, etc.) Data will be useful for 3D printing filament producers and scientific community. Data can be object for a scientific publication.	DOE methodology for the selection of formulations. Standards: ISO 178, ISO 1133, ISO 11357, ISO 11358, ISO 6721.	Evaluation of data from material characterisation measurements. Report (Word format) Lab protocols (OneNote, Excel, Word)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.	Data will be protected and made available through a scientific publication.	Internal LeitAt database accessible to partners and upon request by external scientist.	Statistical analysis of results. Reference values from scientific publications.
	WP 3.2 – Filament 3D printing procedure and material properties.	3D printing and post-processing parameters recipe. Material thermal, mechanical and density characterization. Data will be useful for 3D printing scientific community and industry. Data can be object for a scientific publication.	DOE methodology for the selection of processing parameters. Standards: ISO 11358, ISO 1133, ISO 11357, ISO 527. ASTM D2320.	Evaluation of data from material characterisation measurements. Report (Word) Lab protocols (OneNote, Excel, Word)	Supplementary data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.	Data will be protected and made available through a scientific publication.		Heaternal Own Cloud / Heaternal collaborative platform All data will be stored and archived for 5 years
	WP 4.1 – FFF 3D printing constraints for use cases.	Geometrical design and material constraints for FFF 3D printing. Data will be useful for 3D printing scientific community.	DOE methodology for the selection of processing parameters. Online scientific research.	Report gathering all data (Word format)	Due to public access, the data will be always available in the future.	Data will be protected and made available through a scientific publication.		Empirical analysis of results



Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
LEITAT	WP 5.2 – TES Unit design for 3D printing fabrication	Optimized CAD geometry for FFF fabrication. Data will be useful for 3D printing scientific community and industry.	Definition of geometry under requested variables for FFF fabrication (DfAM) Design optimization based on final part characterization.	CAD file and GCODE file	Sensitive data for IPR- will not be made accessible until IPR protection has been granted.	Data relating to use cases and/or prototypes will not be made available since this is economically damaging.	Internal Leitlat database accessible to partners and upon request by external scientist. Heaternal Own Cloud / Heaternal collaborative platform All data will be stored and archived for 5 years	Empirical analysis of results

(*) Metadata can be considered information resources/data about data (i.e. References and information that describes, explains and locates an information resource)



2.5 TORRECID

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results	Data security	Ethical aspects
TorreCID	WP2 t2.1&t2.2 Specifications	Specifications on process at, ceramic smelter operation and heat recovery to ceramic pigment furnace Data will be used to define initial requirements on TESS system	Internal data, process information. Questionnaires to partners	Word files with explanation on process. Excel files with numerical data on process parameters Image of process	Horizon 101103921, public deliverable D2.1 Public summaries on any press release	Sensitive data -will not be made accessible. Public version will be available Internal meetings with partners. Document sharing- It contains specific parameters on industrial use cases.	Data in HEATERNAL server, public deliverables, partners documents Even if it is encouraged to work under a dedicated shareable platform the suggested size for documents should not overpass 15 Mb in order to not generate conflicts with emails recipients	N/A	Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository.	Not applicable



Torrecid

WP3 TASK 3.2 Ceramic composition for 3D printed refractories and properties	Ceramic compositions for refractories and ceramic pastes to be used for 3D printing Ceramic-polymer compositions and specifications suitable for 3D printing	Internal developments on compositions. Result of developments within HEATERNAL, ceramic testing (material synthesis, characterization tests) 3D printing tests. Sintering tests	Measurements in Excel (.xlsx) or other numeric format (.csv, .dat), text (.docx, .txt), images (.jpg, .tif, technical drawings (.jpg, .pdf),	Horizon 101103921, public deliverable D3.3 Public summaries on any press release Internal use within consortium	Sensitive data will not be public D3.2. Internal meetings with partners. Document sharings. Ceramic proprietary compositions as well a knowledge on polymers for 3D printing by partners.	Data in HEATERNAL server, public deliverables, partners documents, partners servers	XRD, SEM-EDAX, Thermal expansion coefficient, ceramic sintering tests	Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository	Material safety data sheets
WP3 Task 3.4 Study on Ceramic-PCM compatibility	Ceramic -PCM compatibility studies and their results	Study on physicochemical interaction between ceramic and PCM	Measurements in Excel (.xlsx) or other numeric format (.csv, .dat), text (.docx, .txt), images (.jpg, .tif, technical drawings (.jpg, .pdf),	Horizon 101103921, Internal use within consortium		Data in HEATERNAL server, public deliverables, partners documents, partners servers Even if it is encouraged to work under a dedicated shareable platform the suggested size for documents should not overpass 15 Mb in order to not generate conflicts with emails recipients	XRD, SEM-EDAX, Thermal expansion coefficient measurement, immersion tests	Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository	NA

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results	Data security	Ethical aspects
Wp5 T5.4	Results on validation of interaction PCM printed ceramics refractories	Thermomechanical testing, thermal stress evaluation, printability and compatibility of materials	Measurements in Excel (.xlsx) or other numeric format (.csv, .dat), text (.docx, .txt), images (.jpg, .tif, technical drawings (.jpg, .pdf),	Horizon 101103921, Internal use within consortium, HEATERNAL repository	Sensitive data will not be public D5.3 Internal meetings with partners. Document sharing. Foreground data , involves developed materials	Data in HEATERNAL server, public deliverables , partners documents, partners servers Even if it is encouraged to work under a dedicated shareable platform the suggested size for documents should not overpass 15 Mb in order to not generate conflicts with emails recipients	XRD, SEM-EDAX, Thermal expansion coefficient measurement, mechanical tests,	Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository		Material safety data sheets

<p>WP6 T6.2 Implementation designs for TES</p>	<p>TES system design for 3 use cases, Blueprints, engineering drawings, material specifications for TESS integration</p>	<p>Use of modelling data obtained in T6.1 and WP5 to define and design TES system</p>	<p>Measurements in Excel (.xlsx) or other numeric format (.csv, .dat), text (.docx, .txt), images (.jpg, .tif, technical drawings (.jpg, .pdf), cad cam drawings</p>	<p>Horizon 101103921, Internal use within consortium, HEATERNAL repository</p>	<p>D6.2 Confidential, only for Commission and partners. Internal meetings with partners. Document sharings . Specific designs for end users</p>	<p>Data in HEATERNAL server, public deliverables , partners documents, partners servers. Even if it is encouraged to work under a dedicated shareable platform the suggested size for documents should not overpass 15 Mb in order to not generate conflicts with emails recipients</p>	<p>Cad Cam drawings, structural assessing and design</p>	<p>Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository</p>	<p>NA</p>
<p>Wp6 T6.3 Implementation in other industries guidelines</p>	<p>Material performance and requirements for scalability and future integration of TES systems in other use cases</p>	<p>Material specifications result of WP4, WP5. Result of corrosion test, thermal stability, bill of materials</p>	<p>Measurements in Excel (.xlsx) or other numeric format (.csv, .dat), text (.docx, .txt), images (.jpg, .tif, technical drawings (.jpg, .pdf),</p>	<p>Horizon 101103921, Internal use within consortium, HEATERNAL repository D6.3 public Press release webinars</p>		<p>Data in HEATERNAL server, public deliverables , partners documents, partners servers</p>		<p>Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository</p>	<p>NA</p>

WP7 T7.1 TEC report	Techno economic analysis of TRS solution based on data generated in WP3,6.	Data gathering, questionnaires	Measurements in Excel (.xlsx) or other numeric format (.csv, .dat), text (.docx, .txt), images (.jpg, .tif, technical drawings (.jpg, .pdf), Word documents	Horizon 101103921, Internal use within consortium, HEATERNAL repository	D7.1 sensitive information. Data on technical economical feasibility.	Data in HEATERNAL server, public deliverables , partners documents, partners servers		Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository	Data on stakeholders interviews/ value chain partners
Wp7 T7.2 LCA data	Data gathering within the LCA is driven by an intensive literature research, collection of experimental data, parameters, process chains, data bases for thermodynamic simulation, ground . Mass flow and energy analysis, sustainability analysis and others will be reported in different formats such as Excel (.xlsx), (.csv,.dat, .m), text (.docx, .txt), images (.jpg,.tif, .jpg, .pdf), .pptx, .opj,	Collection of background data, results of WP3,4,5,6	Mass flow and energy analysis, sustainability analysis and others will be reported in different formats such as Excel (.xlsx), (.csv,.dat, .m), text (.docx, .txt), images (.jpg,.tif, .jpg, .pdf), .pptx, .opj	Horizon 101103921, Internal use within consortium, HEATERNAL repository Press release webinars	Sensitive information d7.1	Data in HEATERNAL server, public deliverables , partners documents, partners servers		Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository	N.A

WP7 T7.4	Exploitation plan assessment, identification of IPR and exploitation of project	Interviews, stakeholder s questionnaires, partners needs, analysis of project	Word, pdf,	Horizon 101103921, Internal use within consortium, HEATERNAL repository Press release webinars	Sensitive information d7.3 on exploitation activities	Data in HEATERNAL server, public deliverables , partners documents, partners servers		Partners keep records on their data and copy on server. Deliverables and internal records on HEATERNAL repository	Data on stakeholder' s interviews/ value chain partners
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2.6 LOMARTOV

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
LOM	WP2-T2.1 Characterization of use cases and operational environment	-Definition of use cases for the three partners: Alcoa, Torrecid and Ugitech. -Technical information gathering related to the operation of the use cases. Variable setting as a first approach like: Temperature, drop pressure and material flow.	-Internal method from Lomartov	-Text document to detail all the process related to the use cases. -Spreadsheet with the calculation that supports the process operative described in the text document.	-Sensitive data for IPR-will not be made accessible until IPR protection has been granted	-Sensitive data regarding process variables and KPIs from the three use cases.	-Heaternal Own Cloud / Heaternal collaborative platform	N/A



LOM	WP7- T7.1 Techno-economic analysis	-Economic and technical data gathering from all the partners in WP2 to WP6. -Several sources: simulations, calculations. Measurements, scientific and economic reviews.	-Internal method from Lomartov	-Deliverable to be submitted on D7.1/D7.2	-Sensitive data for IPR will not be made accessible until IPR protection has been granted	-Sensitive data for market development.	-Heaternal Own Cloud / Heaternal collaborative platform	N/A
	WP7 T7.2 Environmental Life Cycle Assessment	-Technical data gathering for environmental assessment development.	-Internal method from Lomartov, based on guidelines from ISO 14040	-Deliverable to be submitted D7.1/D7.2	-Sensitive data for IPR will not be made accessible until IPR protection has been granted	-Sensitive data for market development.	-Heaternal Own Cloud / Heaternal collaborative platform	N/A



LOM	WP7 T7.3- Social sustainability: Responsible R&I, acceptance & awareness	Data collection and input from partners for the evaluation of Social Readiness Level, development and implementation of RRI practice and the performance of a social Life Cycle Assessment	-Internal process and methodology from Lomartov	Deliverable to be submitted D7.3 <i>RRI and societal acceptance for the HEATERNAL process</i>	Public version will be available. Internal version sensitive as it may contain information on costs from the SLCA and TEA.	May contain information on costs from the SLCA and TEA.	-Heaternal Own Cloud / Heaternal collaborative platform	N/A
	LOM	WP8 T8.5 End-User group	Prototype data, use cases, TEA and LCA will be used, plus other content will be provided by the partners.	-Internal methodology from Lomartov	Deliverable to be submitted D8.5. <i>Report on the replicability of the HEATERNAL solutions</i>	Public version will be available.	-Heaternal Own Cloud / Heaternal collaborative platform	N/A

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2.7 Calderys

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
Calderys	WP3 TASK 3.1 Specifications for the selection of the most suitable material	Specifications on product formulation in order to resist the PCM alloy. Data will be used to define initial requirements on refractory system	Technical data sheet, Safety Data Sheets, Physical Samples	Pdf files	Sensitive Internal use within consortium	Sensitive data will not be public D3.1. Internal meetings with partners.		N/A
	WP3 TASK 3.2 Refractory composition and properties and thermal transfer analysis	Refractory compositions and properties of the pieces. Thermal analysis to define the insulating properties of the TESS assembly	Technical data sheet, Safety Data Sheets, Physical Samples. PowerPoint	Pdf files, both for the refractory composition and for the thermal evaluation of the system Power point to describe the features of the products in terms of additives	Sensitive Internal use within consortium	Sensitive data will not be public D3.2. Internal meetings with partners.		XRD, SEM, FluoX Thermal evaluation software



Calderys	WP3 Task 3.4 Study on Ceramic-PCM compatibility	Ceramic -PCM compatibility studies and their results.	Supply of the refractory sample and study on physico-chemical interaction between ceramic and PCM by running crucible and corrosion test. Evaluation of the corrosion level and the interaction between the oxide and the metal alloy PCM in order to determine the sustainability of the project	Pdf, Jpg,	Sensitive Internal use within consortium	Sensitive data will not be public D3.4. Internal meetings with partners.		XRD, SEM,
	WP4 Task 4.1 Manufacturing constraint	Manufacturing constraints inherent to the manufacturing of refractory. Size and Number of holes, Hole Conicity Vs Height, Distance between the holes, Weight, Height,	Internal experience and empirical experience	Drawing	Sensitive Internal use within consortium	Sensitive data will not be public D4.1. Internal meetings with partners.		N/A

Calderys	WP4 Task 4.2 Thermal evaluation	Supply of data giving an evaluation of the thermal state of the refractory assembly and with its insulation. These data will be used in order to calculate the cycles and optimize thermal efficiency of the TESS	Modelling 1D model to frame the thermal state. Providing physical data. Empirical values coming from the field	TDS, Calculation report, pdf	Sensitive Internal use within consortium	Sensitive data will not be public D4.1. Internal meetings with partners.	FEM
	WP4 Task 4.3 Thermomechanical evaluation	Supply of product characterizations for the model creation (based on other similar products) and information on the method to simulate refractory assembly under viscoplastic law.	Lab test result and example of FEM law used Testing standard	Ppt and pdf.	Sensitive Internal use within consortium	Sensitive data will not be public D4.3. Internal meetings with partners.	FEM, physico chemical characterization at high temperature (furnaces, bending press, crushing press, conductivity test, ...)
	WP5 Task 5.1 Prototype design and manufacturing	Engineering details to build the TESS pilot	Supply of all necessary good useful to build the prototype together with drawings, TDS, MSDS and installation guidelines	technical drawings (dwg or pdf), data (pdf)	Sensitive Internal use within consortium	Sensitive data will not be public D5.1. Internal meetings with partners.	Autocad Prefabrication lab

Calderys	WP5 Task 5.2 Experimental validation and evaluation on the thermal load	Prototype performance in terms of refractory (evaluation of the thermomechanical stability)	Technical expertise on post mortem analysis on refractory assembly	Pdf	Sensitive Internal use within consortium	Sensitive data will not be public D5.2. Internal meetings with partners.		N/A
	WP6 Task 6.3 Performance and scalability evaluation	Data about industrialization and manufacturing process		pdf	Sensitive Internal use within consortium	Sensitive data will not be public D6.3. Internal meetings with partners.		

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Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results	Data security	Ethical aspects
SPI	WP8 collects personal identification information such as the name, surname, email address, name of belonging organisation/company.	Personal data could be collected for newsletters, events (such as Conferences, Workshops and Webinars), etc., during the project lifetime through various channels (e.g. website, sign up forms, emails).	SPI will securely store and keep confidentially the data collected. The computers and servers used to store personal data are located in a secure environment, in particular on the company server, which can only be accessed via a combination of a username and a password. All collected data will only be used within the HEATERNAL project and will not be shared with third parties and other projects. The collected data will be stored for the remaining project duration.	Excel files with personal identification information such as the name, surname, email address, name of belonging organisation/company.	The personal information will be used to: 1. Inform about any changes or updates we make to the services; 2. Alert about relevant opportunities and activities (including project news, results, and event invitations); 3. Provide with other information or services to which people subscribe. The information from the newsletter subscription process is inserted into a programme that manages and sends e-mail. Only emails are used for this purpose. This programme works offline and data is not shared. The information will be used for purposes directly related to the	Contact details/data will not be made accessible. Our services, processes and communication systems aim to ensure the highest degree of compliance with the applicable law: Regulation (EU) 2016/679, The General Data Protection Regulation (GDPR).	The personal data will be kept for the minimum period of time necessary for the purposes and/or for compliance with legal obligations. The minimum time required is the duration of the project plus an additional one year (for example: in a 3-year project your data will be	N/A	The data may be processed only by internal personnel, or a data processor duly authorised and instructed to process (GDPR Art. 29).	SPI processes and communication systems aim to ensure the highest possible degree of compliance with the applicable law: Regulation (EU) 2016/679, The General Data Protection Regulation (GDPR).



				project and will never be shared with third parties (such as marketing companies).		kept for 4 years). After this period, data will be removed from the database.			
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2.9 ALCOA

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
Alcoa	2.1 Use Cases - Alcoa	Alcoa calcination use case. - The data will be useful to characterise a use case for thermal storage - The data is confidential and should not be published	Methodology is developed by Alcoa. It should be replicable by a person skilled in the art.	Documents that will include images, reference of equipment used and tables (Word, Excel)	Option 3: Sensitive data for IPR-will not be made accessible until IPR protection has been granted	Sensitive data for IPR. Data relating to use cases and/or prototypes will not be made available since this is economically damaging	Option3: Heaternal Own Cloud / Heaternal collaborative platform	Not in Alcoa scope

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2.10 UGITECH

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
UGITECH	WP2 T2.1 & T2.2 WP6 T6.1 & T6.2	To provide data from UGI use case (bloom reheating furnace): process data (temperatures, fumes flow rate, refractory lining characteristics...), NG consumption, future Oxygen and power consumption, ... To define and validate KPI	Process parameters continuous measurements from monitoring system	process related data; measured values; documents that will include images and excel files	Sensitive data for IPR- will not be made accessible until IPR protection has been granted	Sensitive data for IPR. Data relating to use cases will not be made available since this is economically damaging	Possible options: Option2: Internal partner database accessible to partners and upon request by external scientist (CEA, UGENT...) Option3: Heaternal Own Cloud / Heaternal collaborative platform	Savings on NG consumption and reduction of CO2 emissions Profitability of investment on a large scale basis

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2.11 DELAUNEY

Partner name	What data / data set (WP of reference + name) will you generate?	Data set description (its origin, nature, to whom it could be useful, object for scientific publications, existence (or not) of similar data (possibility of integration and reuse)	What methodology and standards will you apply for generating the data?	What metadata (*) will you generate?	How will the data be exploited or made accessible (access procedures, embargo period and identification of the repository)?	Explanation as to why the data will not be accessible	Archiving and preservation (procedures, timing, etc.)	Information on tools and instruments necessary for validating the results
DELAUNAY ET FILS	WP6: Technical expertise to offer industrialization advice for the solutions retained after laboratory tests.	WP6: the data will be technical opinions on the possibilities of industrial manufacturing of the final storage. They will be useful to other members of the consortium to estimate the cost of manufacturing such equipment.	Internal method (not applicable standard).	Comments and advices on Reports (Word format)	Data are available free of charge in all scientific publications. Direct access to data is available in the internal repository.	This data may include elements relating to our know-how and our intellectual property.	Internal partner database accessible to partners and upon request by external scientist.	Not applicable.

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3. Conclusions

The purpose of the Data Management Plan is to identify the data sets that will be collected, processed, or generated by the HEATERNAL project. It specifies which data will be generated, which methodology and standards will be followed, whether and how the data will be exploited and/or made accessible for verification and re-use, and how the data will be curated and preserved. For all those data which will not be made openly accessible, the explanation was provided. The reason for not making the data accessible is mostly due to the fact that those data will be subject to exploitation/protection of generated intellectual property.



4. Degree of progress

The degree of progress for this deliverable is 100%, but the Data Management Plan may be updated during the lifetime of the project.



5. Dissemination level

This Deliverable is Public. These Deliverables will be published on the project website.

