

# SteamDry

## D1.2 Ethics Plan

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**GRANT AGREEMENT NUMER:** 101137906

**PROJECT NAME:** Superheated steam drying for sustainable and recyclable web-like materials

**PROJECT ACRONYM:** SteamDry

## EXECUTIVE SUMMARY

This Ethics Plan provides a jointly agreed framework for the SteamDry ethics management. The deliverable outlines the ethical issues and procedures related to the research activities to be performed in SteamDry. In particular, the Plan details the forthcoming actions and responsibilities of the consortium members to ensure that ethics requirements are carefully fulfilled.

As a whole, the SteamDry project is carried out according to the highest ethical standards and the applicable EU, international and national law on ethical and research integrity principles. Moreover, the beneficiaries are devoted to ensuring the respect of fundamental EU values, such as respect for human dignity, freedom, democracy, equality, and the rule of law and human rights, including the rights of minorities.

In addition to the general ethics principles and relevant legislation, the consortium commits to following the practices jointly agreed in this document. This includes, for example, that all consortium members are responsible for immediately informing the Coordinator if they notice an unexpected or new ethical issue. 'Ethics' will be included as a fixed agenda point for each SteamDry General Assembly meeting to ensure that any ethics-related questions and issues raised during the project can be addressed in a timely manner collaboratively by consortium members.

We begin with definitions of general research ethics and research integrity principles. Then, a statement of the consortium's compliance with the principles is provided. This is followed by separate sections where the specific ethical dimensions relevant to SteamDry are addressed. Then, the ethics monitoring process in SteamDry is discussed. Finally, the deliverable ends with conclusions.

The document is a core part of Task 1.3 (T1.3) Ethics management (and RRI) which aims to ensure that the ethics regulations and rules are respected. The task is led by VTT who is also responsible for this deliverable. As task leader, VTT acts as an Ethics Mentor, monitoring the ethics issues involved in the project and how they are handled. While VTT coordinates T1.3, all consortium members are responsible for behaving and working according to the highest ethical principles and in good faith.

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## 1 INTRODUCTION

This Ethics Plan outlines the ethical aspects and procedures related to the research activities to be performed in SteamDry. It also acts as a plan for ethics management for the project. The plan has been prepared by VTT with the guidance of relevant sections from the EC's guide on How to complete your ethics self-assessment. VTT monitors the ethics processes throughout the project, and the whole consortium is proactively involved in ethics management.

The SteamDry project is carried out in line with the highest ethical standards and the applicable EU, international and national law on ethical principles, and the provisions set out in the Grant Agreement. In parallel, the SteamDry Ethics Plan is based on the ethical principles and relevant Union, national and international legislation, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols. In addition, it is expected that the work of the SteamDry consortium is carried out in good faith and goodwill.

The following sections of this deliverable address the core aspects of ethics monitoring and management in the SteamDry project. We begin by defining general research ethics and research integrity principles. This is followed by a statement of the consortium's compliance with the general principles and regulations. Then, the relevant ethical dimensions identified in the proposal phase of SteamDry are addressed. This section is followed by a presentation of the project's ethics monitoring process. Finally, conclusions are presented.

## 2 ETHICAL RESEARCH PRACTICES

### 2.1 RESEARCH ETHICS

The term research ethics is a general concept that covers all ethical viewpoints and evaluations that are related to science and research. In general, ethics are norms of conduct that distinguish between acceptable and unacceptable behavior. As people can interpret ethical norms in different ways in light of their own values and life experiences, it is necessary to establish common definitions and rules in the framework of the project.

In the SteamDry project, 'ethics' is perceived as defined by the European Commission (EC)<sup>1</sup> according to which, ethics

"includ[e] questions of legal and regulatory compliance as well as a branch of philosophy. It is part of a process of 'governance'. The consideration of ethical issues, starting at the conceptual stage of a proposal, enhances the quality of research, increases its likely social impact, promotes research integrity, promotes a better alignment of research with social needs and expectations and, finally, supports the societal uptake of the fruits of research because high ethical standards generally merit public trust. In this spirit, the Commission aims to build a relationship between the research process and ethics that is collaborative and constructive (rather than negative and inhibitive)."

<sup>1</sup> Roles and Functions of Ethics Advisors/Ethics Advisory Boards in EC-funded Projects.  
[https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/ethics-guide-advisors\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/ethics-guide-advisors_en.pdf)

The SteamDry consortium acts in line with this notion and sees complying with research ethics as the core for conducting high-quality research. In particular, the ethical norms sustained in SteamDry are Impartiality, Reliability, Integrity, and Responsibility. These norms stress the importance of good and responsible practices and lay the foundations for sincere, reliable, and confidential cooperation among the consortium members and other stakeholders. The norms are closely tied with the notion of research integrity which is addressed next.

## 2.2 RESEARCH INTEGRITY

In addition to research ethics, good research practices are based on fundamental principles of research integrity. Research integrity emphasizes the honesty and integrity that all researchers are required to adopt in their research activities. The research integrity principles guide researchers in their work as well as in their engagement with the practical, ethical, and intellectual challenges inherent in research.

The beneficiaries are committed to respecting the fundamental principle of research integrity as set out in the European Code of Conduct for Research Integrity<sup>2</sup> document provided by ALLEA - All European Academies -group. The ALLEA document states that "good research practices are based on fundamental principles of research integrity. They guide researchers in their work as well as in their engagement with the practical, ethical, and intellectual challenges inherent in research".

According to the European Code of Conduct for Research Integrity, the fundamental principles of research integrity are:

- reliability in ensuring the quality of research reflected in the design, the methodology, the analysis, and the use of resources
- honesty in developing, undertaking, reviewing, reporting, and communicating research in a transparent, fair, full, and unbiased way
- respect for colleagues, research participants, society, ecosystems, cultural heritage, and the environment
- accountability for the research from idea to publication, for its management and organisation, for training, supervision, and mentoring, and for its wider impacts.

In addition to the European Code of Conduct for Research Integrity, the beneficiaries are committed to following other relevant international and national research integrity guidelines. For example, VTT has committed to complying with the guidance of The Finnish National Board on Research Integrity TENK's Responsible Conduct of Research, RCR<sup>3</sup>. VTT expects all beneficiaries to respect ethical principles and advices in ethical questions.

## 2.3 CONTEXTS OF ETHICAL RESEARCH PRACTICES

Good research practices – which are based on the previously addressed research ethics and research integrity – apply to different contexts of the project's processes. These contexts are defined by ALLEA as follows:

<sup>2</sup> European Code of Conduct for Research Integrity of ALLEA (All European Academies) <https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf>

<sup>3</sup> The official website of the Finnish National Board of Research Integrity TENK for the Responsible Conduct of Research (RCR) <https://tenk.fi/en/research-misconduct/responsible-conduct-research-rcr>

- Research Environment
- Training, Supervision and Mentoring
- Research Procedures
- Safeguards
- Data Practices and Management
- Collaborative Working
- Publication and Dissemination
- Reviewing, Evaluating and Editing

Continuous supervision and guidance are done by the management of the project to ensure that good research practices are sustained in all these contexts. Notably, all participating organisations as well as individual researchers and management staff are responsible for following good research practices in all the relevant contexts. This includes reporting any misconduct that might be detected (addressed in more detail in Section 2.5).

## 2.4 NOTES ON COMMUNICATION, PUBLICATION, AND DISSEMINATION ACTIVITIES

The SteamDry general communication, publication and dissemination principles are based by design on high ethical conduct. The basic principles of these activities are defined in the Deliverable 1.1 Project Quality Management Plan which was completed and submitted in February 2024. The details of these principles are addressed in depth in the Deliverable 13.1 "Initial Dissemination & Exploitation Plan including Communication activities (DEC)" of which the first version is to be submitted to the EC in June 2024. Therefore, in this section, we limit to mention a few fundamental aspects of ethics in the communication, publication, and dissemination activities of the project.

Regarding the content of research, the SteamDry researchers acknowledge that, unless otherwise specified, they are fully responsible for it from the beginning to publication. The authors should ensure that their work is made available to colleagues in a timely, open, transparent, and accurate manner, unless otherwise agreed. When communicating with the general public and the media, the SteamDry consortium members are fully committed to honesty and impartiality.

Regarding authorship, the SteamDry researchers have committed to acknowledging that authorship itself is based on a significant contribution to the design of the research, relevant data collection, or the analysis or interpretation of the results. The consortium members must acknowledge the work and intellectual contributions of others, including collaborators, assistants, and funders.

In this line, all communication, publication, and dissemination activities must include (whenever possible) the following EC acknowledgment of funding including the following disclaimer:

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the granting authority HADEA. Neither the European Union nor the granting authority can be held responsible for them.

The texts should be translated into local languages, where appropriate.

In addition to acknowledging the received funding and the contribution of fellow researchers and sources of information, the SteamDry consortium members have committed to disclosing any conflicts of interest and financial or other types of support for the research or for the publication of its results.

## 2.5 RESEARCH MISCONDUCT AND OTHER UNACCEPTABLE PRACTICES

The SteamDry consortium has a zero-tolerance policy for research misconduct, disregard for responsible conduct of research and other unacceptable practices in research.

Research misconduct can be, for example (the list is not exhaustive),

- fabrication, i.e., making up results and recording them as if they were real.
- falsification, i.e., manipulating research materials, equipment or processes or changing, omitting, or suppressing data or results without justification.
- plagiarism, i.e., using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs.
- misappropriation, i.e., unlawful presentation of another person's result, idea, plan, observation, or data as one's own research.

Sometimes, research violations are not as distinct in which cases they can be seen as disregarding the responsible conduct of research. Examples of these can be (the list is not exhaustive):

- denigrating the role of other researchers in publications
- reporting results and methods in a careless manner, resulting in misleading claims
- inadequate record keeping and storage of results and data
- publishing the same results many times as novel results (self-plagiarism)
- misleading the research community in other ways.

In addition, there are other unacceptable research practices which are condemned. These can be, for instance,

- manipulating authorship
- exaggerating one's own achievements (e.g., in CV)
- re-publishing substantive parts of one's own earlier publications without duly acknowledging it ('self-plagiarism')
- citing selectively to enhance own findings or to please editors, reviewers, or colleagues
- withholding research results
- delaying the work of other researchers e.g., in the peer-review process
- allowing funders/sponsors to jeopardize independence in the research process or reporting of results
- accusing a researcher of misconduct or other violations in a malicious way
- exaggerating the importance and practical applicability of findings

To prevent any kind of misconduct, disregard, or other unacceptable practice from taking place, the SteamDry consortium expects responsible behaviour and work from all its researchers and implements clear ethics monitoring processes. These are defined in Section 5 of this document.



### 3 COMPLIANCE WITH GENERAL ETHICAL PRINCIPLES AND RELEVANT LEGISLATION

In line with *Article 14 – Ethics and Values* of the Grant Agreement, the project is carried out according to the highest ethical standards and the applicable EU, international and national law on ethical and research integrity principles. This includes the EU Charter of Fundamental Rights and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols. Moreover, the beneficiaries are devoted to ensuring the respect of basic EU values (such as respect for human dignity, freedom, democracy, equality, the rule of law and human rights, including the rights of minorities).

Throughout the project lifecycle, the beneficiaries are committed to paying particular attention to the principle of proportionality (no harm approach), the right to privacy, the right to the protection of personal data, the right to the physical and mental integrity of persons, the right to non-discrimination, the need to ensure the protection of the environment, and high levels of human health protection. The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

The consortium confirms will respect national and EU legislation, including:

- Machinery Directive (2006/42/EC) is followed throughout the project during piloting and constructing new machinery
- EU Directive on the Protection of Data: 95/46/EC.
- The Charter of Fundamental Rights of the European Union.
- ETS N. 164 of 04/04/1997. Convention for the Protection of Human Rights and Dignity of the Human

In addition, the consortium states that none of the foreseen work requires authorization under the Nagoya protocol.

All samples used within SteamDry are certified “free of pathogens” and all of them are considered to pose no (bio-safety level 1 (BSL 1)) or moderate (BSL 2) potential hazard. In SteamDry, no biological materials with BSL higher than 2 will be used. Moreover, the consortium confirms that all research staff involved in the handling and disposal of biological materials will or has already received training that is compliant with the standard guidelines for working with BSL 2 agents (as defined by the WHO).

### 4 SPECIFIC ETHICAL DIMENSIONS RELEVANT TO STEAMDRIY

Risks identified are monitored regularly in Executive Board meetings. Risk table is stored in Teams with version history. The preliminary risk table is in the project plan.

#### 4.1 OVERVIEW

In the evaluation phase, the SteamDry proposal was classified as “ethics ready” and was therefore approved for granting without further ethics clarification requests. However, in the project preparation phase, specific ethical dimensions relevant to SteamDry were identified. These will be taken into particular consideration during the lifetime of the project. The identified dimensions are:

- Humans
- Personal data
- Environment, health and safety
- Artificial intelligence

These aspects are addressed separately in the following sub-sections of this deliverable. If other ethics dimensions are identified by any consortium member throughout the lifetime of the project, they are requested to contact the Coordinator immediately and take action as defined in Section 5 of this document

## 4.2 HUMANS

SteamDry improves citizens' safety, environment, and economics through the Safe and Sustainable by Design (SSbD) ideology. Steam may cause danger to workforce in laboratories and during piloting activities. To ensure the safety of work planned the safety guidance of activities is established in WP3 T3.3 Deliverable 3.2. Ethics and safety is also considered as an essential part of QMP D1.1 (WP1) and also part of data management T1.4, D1.3. and will be updated in T2.4, D2.1. The project team has participants across the EU. Cultural interactions are highly cherished and taken into consideration in all dissemination and communication practices. Together with the projects funded from the same EU funding call, SteamDry reaches a larger group of stakeholders that will be informed of project results in a popular manner leading to more awareness of the project research and results amongst citizens across Europe.

## 4.3 PERSONAL DATA

The SteamDry partners will collect personal data for internal project management and communication purposes and stakeholder communication. The project-related personal contact information of the project group members is stored in a secured Microsoft Teams group administered by VTT. The access is available only to persons authorised by partners.

The necessary personal data will be collected and stored in line with the requirements of the Grant Agreement Article 15.2 – Data protection. Data processing by the beneficiaries. According to the Article, the project beneficiaries must ensure that personal data is:

- processed lawfully, fairly and in a transparent manner in relation to the data subjects.
- collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes.
- adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed.
- accurate and, where necessary, kept up to date.
- kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the data is processed.
- processed in a manner that ensures appropriate security of the data.

The beneficiaries will also follow the EU guideline on completing the ethics self-assessment which states that personal data must be processed in accordance with principles and conditions that aim to limit the negative impact on the persons concerned and ensure fairness, transparency and accountability of the data processing, data quality, and confidentiality.

During the project, the partners will be responsible for managing datasets securely in their possession. The project data management is addressed through the designated Task 1.4 Data management to ensure adequate data processing in the project.

The data-related procedures will be described in detail in D1.3 Data Management Plan (DMP) which will be submitted in Month 6 of the project, i.e., by the end of June 2024. The DMP will include a description of the methodology and standards to be followed, and what data sets are exploitable or made accessible for verification and re-use. The DMP will be a dynamic tool that is updated regularly throughout the project duration. This document will be based on the requirement that the project data is managed according to the highest ethical standards, and applicable international, EU and national law – in particular, the GDPR (Regulation (EU) 2016/679), the FAIR principles, national data protection laws and other relevant legislation.

#### 4.4 ENVIRONMENT, HEALTH, AND SAFETY

The health and safety of the environment and humans is a priority in the SteamDry project. Moreover, the technological solutions developed in SteamDry are expected to be Safe and Sustainable by Design (SSbD). Next, particular aspects related to the environment, health, and safety of the research are addressed:

##### **Occupational health and material handling:**

Occupational health and safety regulations will be adhered to for the handling of all materials and chemicals. All materials will be accompanied by the Material Safety Data Sheet, (MSDS) which will highlight the specific handling requirements. All workers that are working with chemicals and in pilots are obligated to accomplish an Occupational Safety Card. All SteamDry personnel will be instructed on general guidelines for the safe handling and disposal of chemicals. All materials will be disposed of according to the procedures already in place at the specific institutions.

##### **Endangered fauna and/or flora and protected areas:**

All research activities within SteamDry will take place in confined laboratories and they do not foresee any use of endangered fauna or flora.

#### 4.5 ARTIFICIAL INTELLIGENCE

The SteamDry consortium plans to build and use computational models for improving process control in WP8. Our goal is to develop and use machine learning systems in order to improve process control and guides that are safe and sustainable by design. Participants and/or end-users will be informed about the AI models through detailed documentation and examples. The documentation will contain full mathematical, technical and functional details of the AI models and software infrastructure. The examples will demonstrate different use cases, limitations of the AI models and how to avoid pitfalls. All AI models will have Explainable AI features and analysis, which we can explain how input values contributed to model outputs. Therefore, we do not foresee that these would pose critical risks or ethics issues related to AI. If or when relevant, the SteamDry consortium will follow the EC guideline Ethics By Design and Ethics of Use

Approaches for Artificial Intelligence<sup>4</sup> and sustain the European approach to artificial intelligence<sup>5</sup>.

## 5 ETHICS MANAGEMENT IN STEAMDRY

Ethics management is a horizontal theme that pierces all activities of the SteamDry project throughout its lifespan. Ethical compliance is monitored, in particular, through Task 1.3 Ethics Management which is led by VTT and supported by all project partners. The aim of all ethics activities in the project, including this Ethics Plan, is to ensure that the provisions of ethics regulations and rules are respected.

The central ethics monitoring tools and activities of SteamDry are as follows:

1. Ethics Plan: The document at hand serves as the main tool for all members of the consortium to 1) familiarise themselves with the ethical principles and regulations that the consortium is committed to as well as the ethics issues that need particular attention in the project, and 2) refer to jointly agreed ethics monitoring activities and guidelines.
2. Shared and personal responsibility: While VTT leads the ethics management task, each SteamDry consortium member is responsible for complying with the set ethical principles and relevant legislation. Moreover, everyone is expected to report on any new ethical issues they might come across during the course of the project. VTT acts as Ethics Mentor to the consortium members on a need basis.
3. Regular meetings: Ethics will be a fixed topic in each General Assembly meeting of the project. Moreover, ethical issues are going to be discussed in the more frequent Management Committee meetings whenever necessary.
4. Project Quality Management Plan (QMP): The QMP (D1.1) was developed to ensure (i) the management of project-related documentation, (ii) monitoring and quality control of project deliverables and milestones, and (iii) risk contingency management. Acting according to the agreed principles is crucial for ensuring that the SteamDry project is executed in a high-quality, timely, and ethical way.
5. Data Management: Data management is closely connected to the ethical conduct of research and therefore the Data Management Plan (DMP) acts as an important tool for ensuring good ethics practices as well. The DMP is updated regularly throughout the project. The Data Manager, appointed to the position by the SteamDry General Assembly, will monitor the project data management as a whole.
6. Risk Management Plan: Risk management is also tied closely to ethics management. The project risks are addressed as a fixed agenda point in the General Assembly meetings.
7. Process for handling allegations of research misconduct: As stated earlier in this document, the SteamDry consortium has a zero-tolerance policy for research misconduct, disregard for responsible conduct of research and other unacceptable practices in research. Should any consortium member detect such activity, they must inform the Coordinator without delays. The Coordinator then

<sup>4</sup>[https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ethics-by-design-and-ethics-of-use-approaches-for-artificial-intelligence\\_he\\_en.pdf](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ethics-by-design-and-ethics-of-use-approaches-for-artificial-intelligence_he_en.pdf)

<sup>5</sup><https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence>

investigates the matter and takes necessary actions to make sure that any potential risks, breaches of information, or harm are minimised. If necessary, the Coordinator informs the HaDEA Project Officer.

8. Record keeping: the consortium maintains detailed records of all ethical decisions and actions taken during the project, including minutes of consortium body meetings, reports on any ethical breaches, and documentation of any modifications made to the ethics plan.

Overall, the monitoring and oversight of ethics is an ongoing and dynamic process that should be tailored to the specific ethical issues and risks associated with the research project. It is essential to maintain open communication within the consortium and with stakeholders and to respond promptly to any ethical concerns that may arise.

## 6 CONCLUSIONS

This document has addressed the main ethical aspects related to the SteamDry project, from the principles of Responsible Conduct of Research and the consortium's compliance with general ethical requirements and specific ethical dimensions relevant to the project to the ethics monitoring process.

All beneficiaries commit to complying with the set requirements, regulations, and processes. If any member of the consortium sees the need to update this document, they may contact the Coordinator who takes adequate actions.