



Sustainable manufacturing and optimized materials and interfaces for lithium metal batteries with digital quality control

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D8.1: Project Quality Management Plan PQMP

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0.1	17.10.2022	L. Pires Da Veiga	Review
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1.0	2.11.2022	M. Vilkmán	Finalization

Abstract

This report explains the quality management procedures of the SOLiD project, including instructions for management structure, meetings, reporting, data handling, communication, and risk management. This will help the consortium to have common understanding on the procedures and enable efficient and clear working methods.

Publishable Summary

The SOLiD Consortium has prepared a quality management plan for the project. This document covers topics related to quality of project management and communication, as well as technical quality of the project. In addition, it contains instructions for risk assessment. Clear and efficient communication, as well as careful follow-up of the risks are of high importance. The tools to handle the risks, and to take care of quality, include *e.g.*, frequent, and efficient online meetings to discuss the progress together with the Consortium, as well as online platforms and databases for reporting, communication, and data handling. With these methods, we can secure progress of the project.



Deliverable content

General overview

The *General Assembly (GA)* consists of all partners in the SOLiD project, and it coordinates and ensures the quality assurance management. To help the Consortium with quality assurance, a Contingency Plan will be prepared and updated continuously. The Contingency Plan will be stored in the SOLiD MS Teams platform.

Regular biannual *General Assembly (GA) meetings* will follow-up the overall implementation and performance of the project. In these meetings, project participants will present their proceeding during the period between GA meetings in the work package (WP) level. Situation assessment of deliverables and reports taken place between meetings will be looked over to meet the requirements and timeline of the project. In addition, before selected GA meetings (at least once a year), VTT (as the coordinator) will collect information about used funding and person months/partner/WP and present a summary of the overall status to the GA. In case there are deviations from the original plan (*e.g.*, significant overspending or underspending), the GA will discuss and decide how to ensure that there are enough resources to perform all the planned work. GA meetings are planned to be held face-to-face/hybrid at least in the beginning of the project. Later, every second GA meeting may be held online.

Monthly status meetings will strengthen the communication and interaction between project participants and comprise overview of the progress during the past month. Any open questions or request to other partners will be shared and discussed. The coordinator will also share information from the collaborative actions with other projects and greetings/actions from the European Commission/BATT4EU/Batteries Europe (if any) during these meetings. In each monthly meeting, the Consortium will discuss about one jointly selected technical topic in more detail and reserve enough time for the discussion. The aim of the monthly meetings is to ensure the conformity and quality of project progress.

VTT has quality assurance procedures to ensure the quality and integrity of research and compliance with local, national and EU regulations. VTT has i) Quality Management System Standard ISO 9001:2000, valid for research, testing, analysis, consulting services and the development of new technologies, and ii) Environmental management certificate ISO14001. Furthermore, OHSAS 18001-standard is applied to VTT's operating system, where applicable.

Project-related documentation and communication

In order to guarantee efficient communication and sharing/preparing of documents, the Coordinator has set up a *shared MS Teams platform* where we store all relevant documents. The platform contains *e.g.*, folders for each WP and an easy-to-use place to report all dissemination activities to be used and followed in WP7. All agreements, deliverables, reports, meeting documents etc. will be modified and stored in Teams. We have also a dedicated folder to store and share important papers from literature, linked to the SOLiD project.



The Coordinator has created a common email list for the whole consortium. In addition, the Coordinator will create separate email lists for each WP. If a partner/person wants to be included in or removed from the email lists, he/she is asked to inform the Coordinator who will then modify the lists.

Communication between the SOLiD consortium and the European Commission will be handled by the Coordinator. If any of the SOLiD partners wants to contact the European Commission, the Coordinator will inform the Project Officer.

The Consortium has made a preliminary plan about material flows and equipment installations, and it is stored in SOLiD MS Teams. The plan will ensure that all partners have a clear understanding about who will buy/prepare and use the materials and equipment used and developed in the project. This will help to avoid misunderstanding about the ownership of installed equipment also after the project. This plan will be updated during the project when needed.

Monitoring and quality control of project deliverables

The *WP leaders* monitor the quality of their respective work package activities, deliverables, and reports, and arrange *WP meetings* at least every 3 months during the periods when each WP is in progress.

To guarantee the *quality of deliverables*, the SOLiD project has internal review before submission of all deliverables. Reviewers will be such partners who were not actively involved in writing of the specific deliverable and will be named in advance and case by case in a separate document, stored in SOLiD MS Teams. All deliverables will be sent for internal review at least 2 weeks before the submission deadline. The deliverables will utilize a common template, which is also stored in the SOLiD MS Teams.

As a risk mitigation action, the WP leaders have deputy persons, as listed below:

WP	WP leader	Deputy WP leader
WP1	Giovanna Nicol	Mattia Giuliano
WP2	Katja Lahtinen	Ville Kekkonen
WP3	Mari Ylikunnari	Ville Holappa
WP4	Leonardo Pires da Veiga	Andrea Ingenito
WP5	Michael Stalder	Simon Walther
WP6	Andrea Pitillas-Martinez	Rahul Gopalakrishnan
WP7	Melinda Kuthy	Nikos Gkouveris
WP8	Marja Vilkmán	Mari Ylikunnari



The project participants will adhere to the European Code of Conduct for Research Integrity. In addition, they will take “The good practice guide for papers on batteries” -protocol’s advises in publications and experimental work.¹ The testing protocols of the SOLiD project will be further specified in WP1 and reported in Deliverable 1.1.

Quality of produced batches of material and batteries will be monitored by setting up a database of measurements (managed by the Data Manager, BFH). All the parameters, *i.e.*, preparation time and author, materials and their batches, process conditions, analysis results, and measurements among others will be summarized in a joint database that is available for project participants. Capturing this information will allow tracing eventual quality issues of a single battery back to specific manufacturing conditions and allow to formulate quality control guidelines for future manufacturing systems of SOLiD cells. Details on how this data will be managed, will be given in the data management plan (deliverable 8.2).

Risk management

The SOLiD project has made a preliminary risk management plan in the proposal writing phase, and it was reviewed and updated during the Grant Agreement Preparation phase. This plan is kept up to date by discussing the risks in the GA, monthly and WP meetings. The Coordinator will add a living document of the risk mitigation plans into the SOLiD MS Teams. Classification of risks will be done according to Figure 1 and used to identify significant and intolerable risks, if any.

PROJECT RISK EVALUATION		Impact / consequences		
		LOW (1)	HARMFUL (2)	SERIOUS (3)
Likelihood	PROBABLE (3)	3 Moderate risk	4 Significant risk	5 Intolerable risk
	POSSIBLE (2)	2 Low risk	3 Moderate risk	4 Significant risk
	UNLIKELY (1)	1 Insignificant risk	2 Low risk	3 Moderate risk

Figure 1. Assessment of risk class.

A more detailed risk mitigation plan will be made for risks with a risk class of 4-5, using the template below.

¹ J. Li, C. Arbizzani, S. Kjelstrup, J. Xiao, Y.-Y. Xia, Y. Yu, Y. Yang, I. Belharouak, T. Zawodzinski, S.-T. Myung, R. Raccichini, S. Passerini (2020) : Good practice guide for papers on batteries for the Journal of Power Sources. Journal of Power Sources, vol. 452, pp. 227824-227827.



Risk name:			
Description and impact:			
Evaluation date:	Contingency plan and decisions	Person responsible:	Schedule:
x.x.20xx		N.N.	

The possible deviations and disruptions will be communicated to the Coordinator. The corrective measures will be identified, discussed, and implemented with the participant in question. Any unresolved issues will be handled by the General Assembly (GA). The Consortium Agreement (CA) defines the measures in case of defaulting parties. The GA will decide the needed sanctions and the Coordinator will inform the European Commission.

Conclusions

The goal of this report is to gather information about the quality management methods of SOLiD project in a simple and compact form. Detailed information about the procedures can be found from the Grant Agreement and the Consortium Agreement.

This deliverable is the first version of the quality management plan. The plan will be updated if needed and stored in the SOLiD MS Teams.