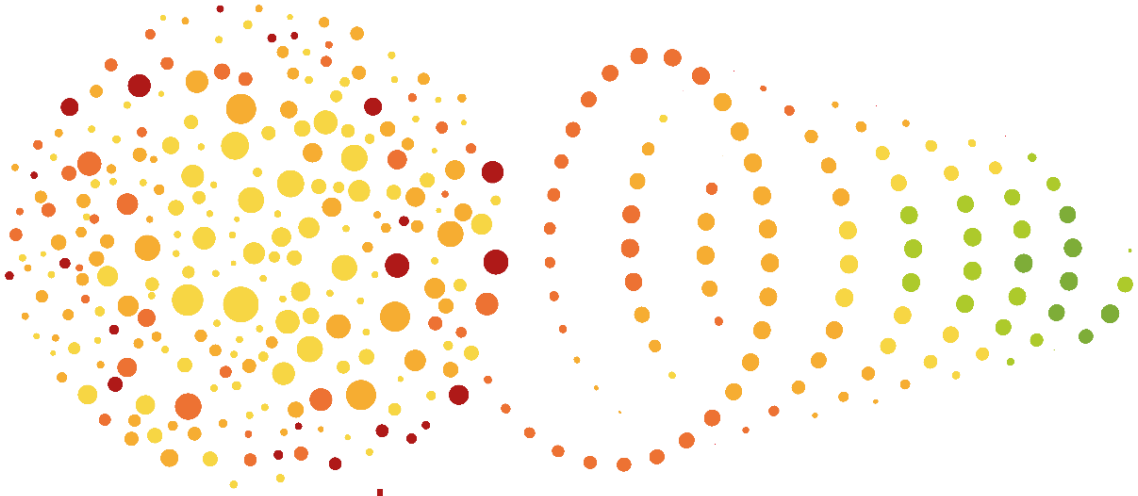

powder2power

MW-scale fluidized particle-driven CSP prototype demonstration

Grant Agreement n° 101122347

D2.2 Report on Erosion Assessment

WP2 – Particle Behavior, Transport and Handling

Due date of delivery:	30/09/2024	**Leading institution:**	EPPT
Actual delivery date:	30/09/2024	**Contributor(s):**	KUL

Funded by the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101122347.

Deliverable Information

Deliverable Identification	POWDER2POWER_WP2_D2.2	
Deliverable title	Report on Erosion Assessment	
Related WP(s)	WP2 – Particle behavior, transport and handling	
Responsible Beneficiary	EPPT	
Author(s)	EPPT	Jan BAEYENS, Yimin DENG
	KU Leuven	Raf DEWIL, Heidi LIEKENS, Lise APPELS
Reviewer(s)	CNRS	Gilles FLAMANT, Alex LE GAL, Sergio MARIN ZAPATA, Emmanuel GUILLOT
Due delivery date	30/09/2024	
Actual delivery date	30/09/2024	
Version - Date	V1.0 – 30/09/2024	
Deliverable type	R – Report	
Dissemination level	SEN – Sensitive	
Repository	Online repository	

Document History and Approval

Version	Date	Action	Name & Organization
V0.1	15/09/2024	Draft created	Jan BAEYENS (EPPT) Yimin DENG (EPPT)
V0.2	21/09/2024	Modifications	Yimin DENG (EPPT) Raf DEWIL (KUL)
V0.3	30/09/2024	Final scientific and technical version	Jan BAEYENS (EPPT)
V1.0	30/09/2024	COORD edition	Gilles FLAMANT, Alex LE GAL, Sergio MARIN ZAPATA, Emmanuel GUILLOT (CNRS)

Acknowledgment and legal disclaimer

This report is part of the project that has received funding from the European Union's Horizon Europe research and innovation programme under the grant agreement No 101122347. The content of this publication is the sole responsibility of the POWDER2POWER project.

POWDER2POWER Project Factsheet

Grant Agreement n°	101122347	Project Acronym	POWDER2POWER
Project Full Title	MW-scale fluidized particle-driven CSP prototype demonstration		
Call identifier	HORIZON-CL5-2022-D3-03 "Innovative components and/or sub-systems for CSP plants and/or concentrating solar thermal installations"		
Funding instrument	Innovation Action		
Project start date	01/09/2023	**Duration**	48 months
Website	www.powder2power-project.eu		
Partners Short Name	• PROMES-CNRS • EDF	• EPPT • JCR	• B2Z • POLIMI • KTH • CSPB • SEI • KUL

Public summary

As part of the POWDER2POWER (P2P) project, Deliverable D2.2 investigates particle erosion, attrition, and dust emission — key challenges in using solid particles as a heat transfer medium in Concentrated Solar Power (CSP) systems. The goal is to ensure the durability and efficiency of system components while operating at high temperatures.

Key Findings:

- **Particle Attrition:** Studied in both mechanical and pneumatic conveying systems. While attrition occurs, it does not significantly impact the overall performance of the particles.
- **Erosion of Materials:** Standard high-temperature construction materials were tested, with results indicating minimal erosion rates, ensuring long-term reliability.
- **Dust Emission Control:** Dust emissions can be effectively managed using common gas-solid separation techniques, achieving high filtration efficiency.
- **Construction Recommendations:** Guidelines for material selection and system design are provided to optimize durability and operational efficiency.

This deliverable builds on the results of D2.1 and supports the ongoing development of D2.3, D2.4, and D2.5, which focus on particle transport and system design.