

Background

- **Sustainable growth:** increasing use of secondary plastic materials
- **Challenges:** unpredictable flow behavior due to irregular shapes and particle size distributions
- **Current methods:** Inefficient, inadequate, trial-and-error based, leading to unstable processes
- **RQ1:** Can powder rheology be a viable alternative?
- **RQ2:** Are DEM simulations feasible?

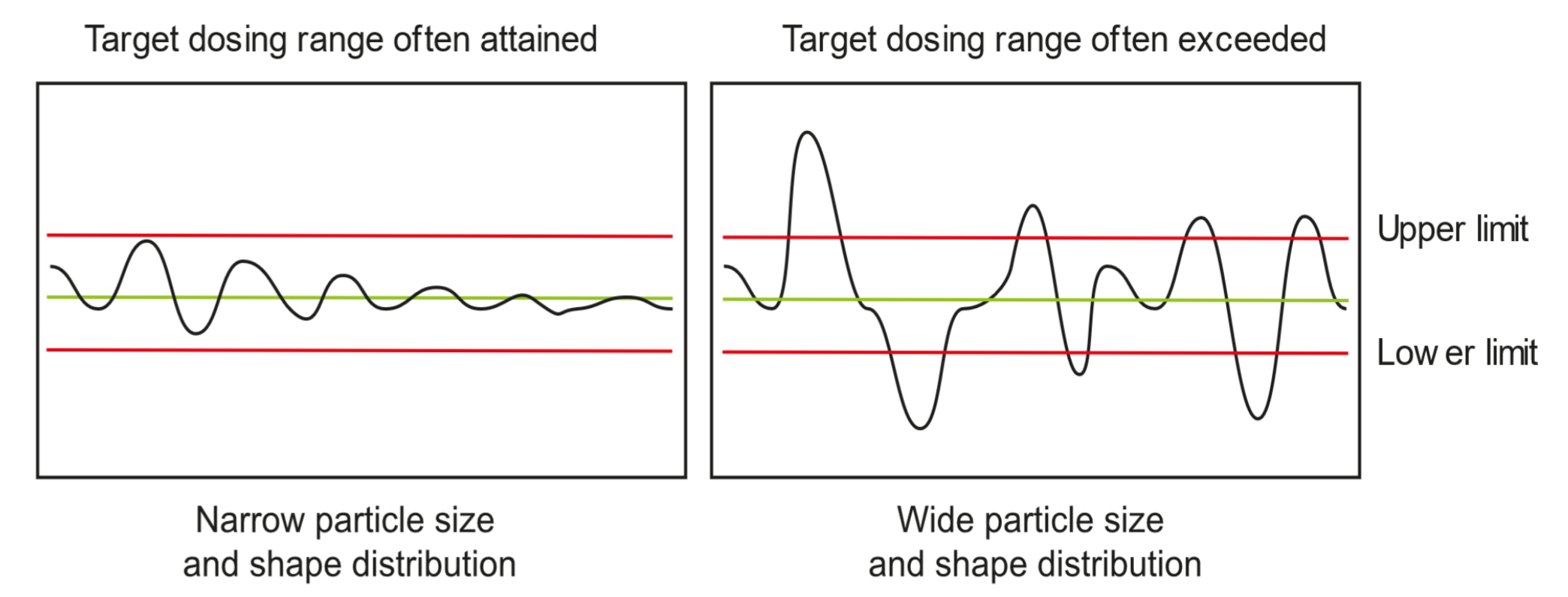
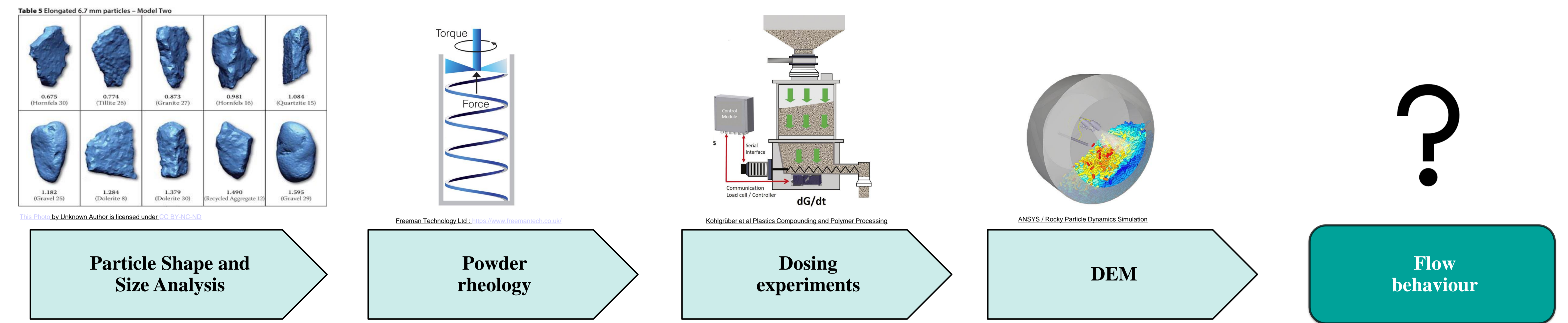
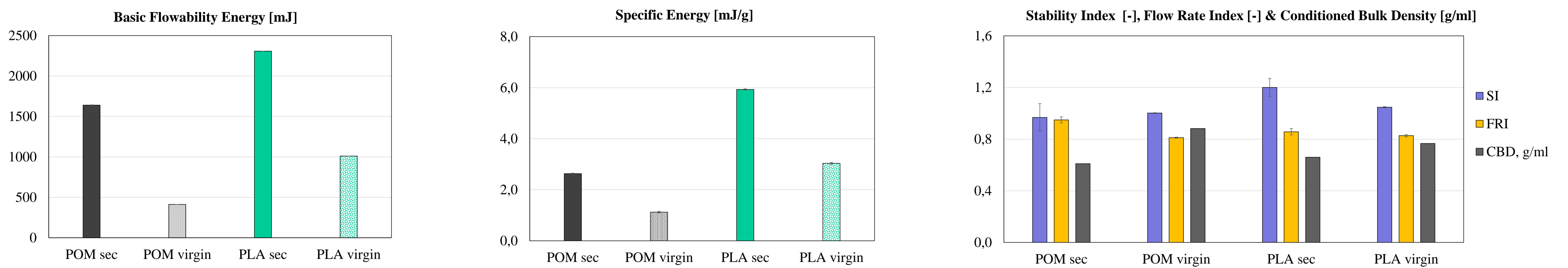


Fig 1: Effect of wide particle shape- and size distribution on the flow behaviour of a bulk solid

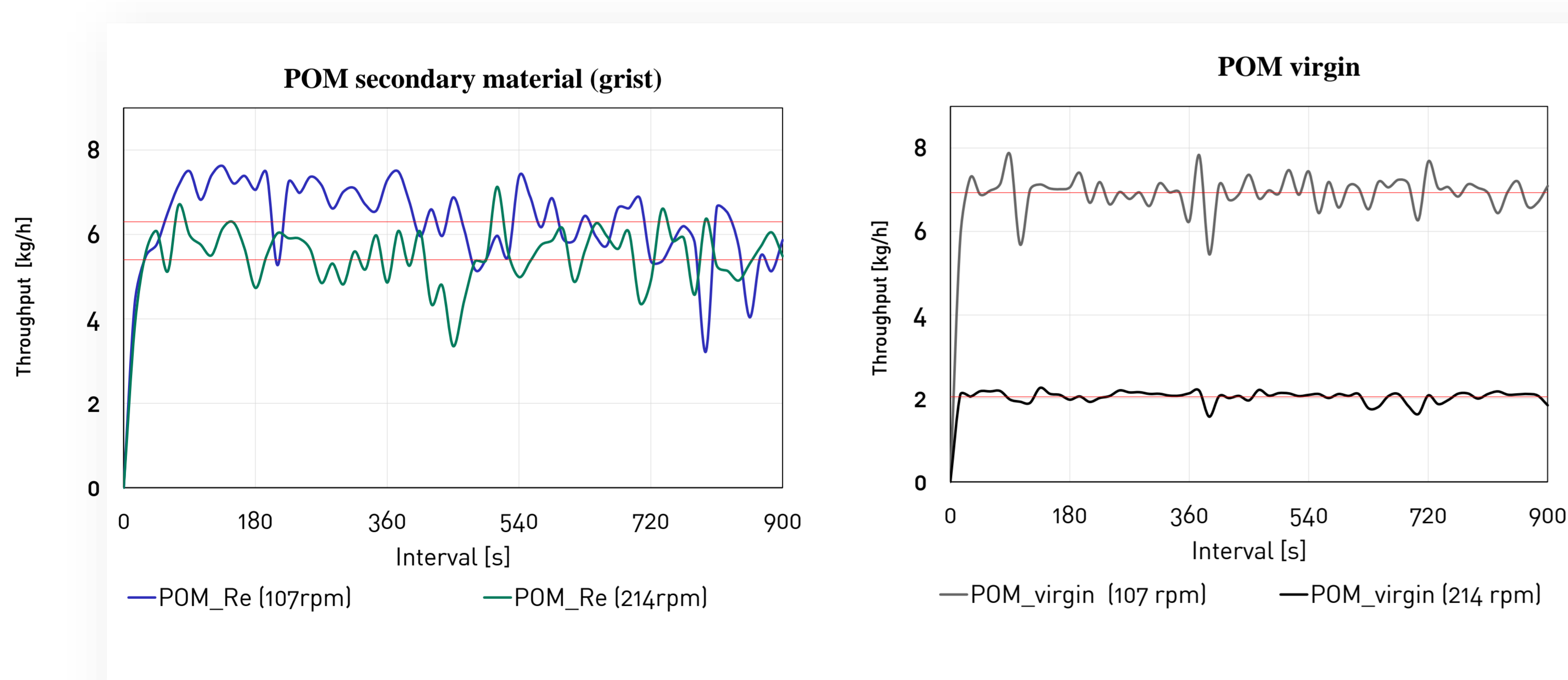
Methods



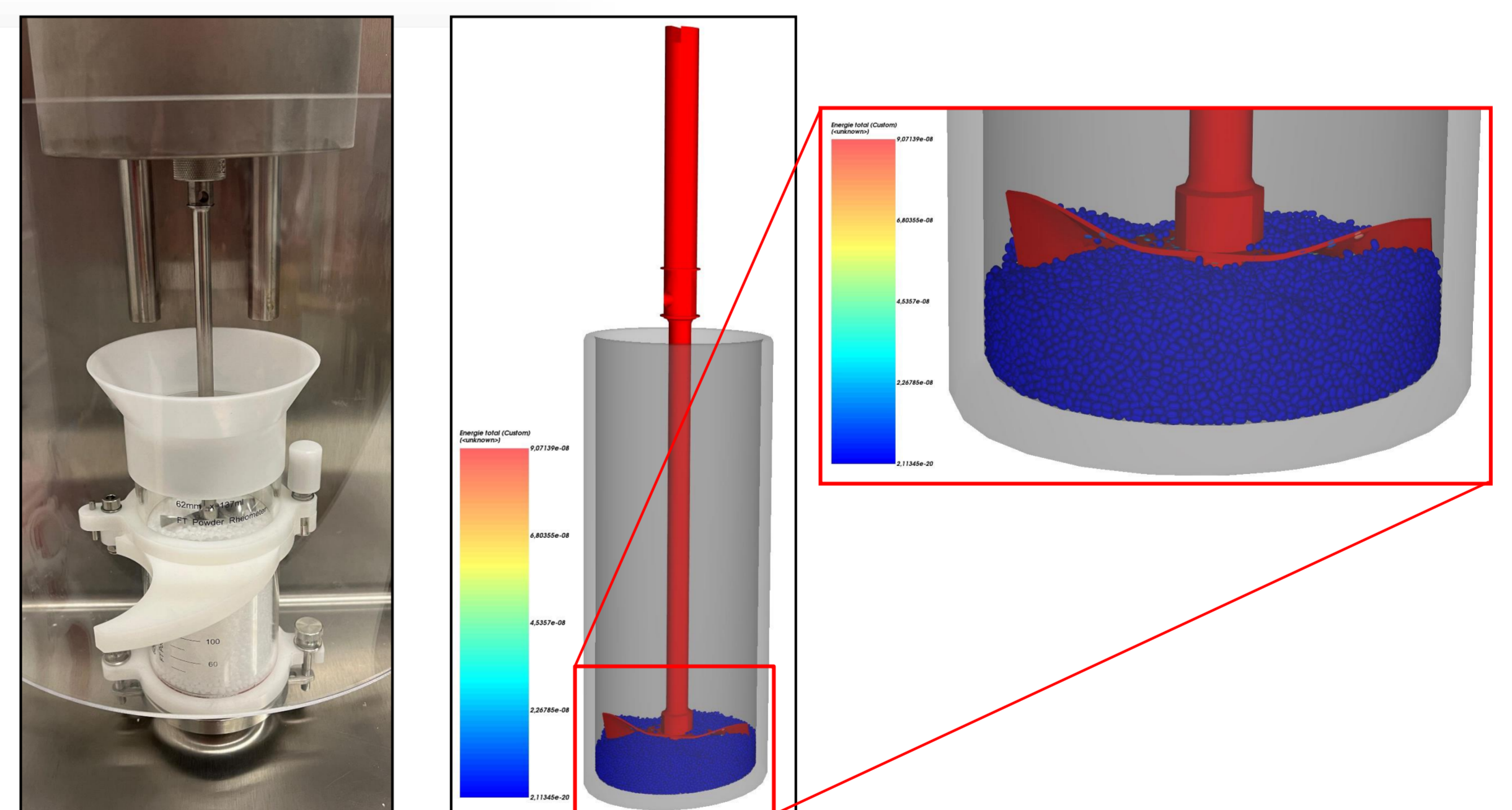
Result 1: Dynamic bulk properties : SE, FRI, SI & BFE



Result 2: Dosing performance: throughput, accuracy, constancy

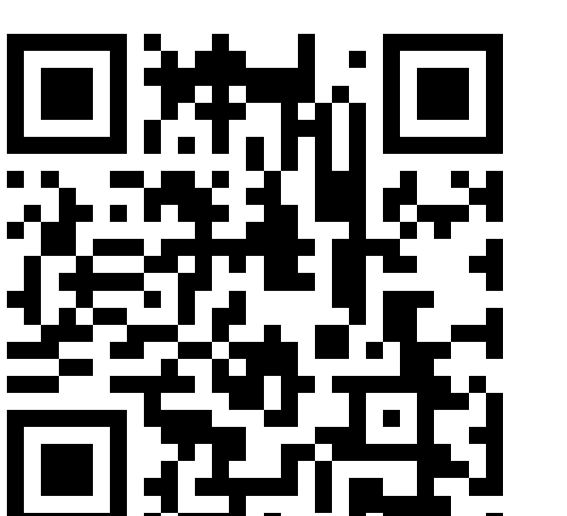


Result 3: DEM Simulations



Conclusion

- Powder rheology can expand the limited characterization methods for the flow behaviour of secondary plastics.
- The observed dosing inaccuracies for the tested secondary materials were up to 25%.
- Specific Energy and Flow Rate Index are good initial indicators for the flow behaviour of secondary plastics.
- DEM simulations are feasible albeit being resource intensive → (simulation & calibration durations)



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