Job Title: Process Simulation Engineer (KTP Associate)
Job Description & Specification

JOB DETAILS

Department:	Engineering	Salary Band:	£35,000 to £43,300 subject to experience
Hours of Work	Full Time (37.5 hours)	Contract Type:	Fixed Term – 25 months
Responsible To:	Dr Marcelo Precoppe, Reader in Agricultural Engineering, Harper Adams University. Mr Barry Jehu (Epwin Window Systems)		
Work Location:	Epwin Window Systems, Stafford Park 6, Telford, TF3 3AT		
Holiday Allowance:	24 days		

JOB PURPOSE

The Process Simulation Engineer (KTP Associate) will lead the development of advanced Discrete Element Method (DEM) simulation capabilities to optimise uPVC compound blending processes at Epwin Window Systems, the UK's leading uPVC profile manufacturer. The role aims to deliver measurable operational improvements, reducing mixing time, lowering waste, enhancing product consistency, and minimising unplanned downtime, contributing to estimated annual savings of approximately £280,000.

Working collaboratively with academic experts and industrial partners, the Associate will develop, calibrate, and validate high-accuracy simulation models; implement real-time data acquisition systems; and lead production trials that translate simulation insights into practical process enhancements.

The role will also support wider organisational transformation by embedding simulation-driven decision making, training staff in digital tools and modelling methods, and establishing communication frameworks that promote data-driven continuous improvement.
This position offers a unique opportunity to apply advanced engineering modelling and optimisation techniques directly within a live manufacturing environment, generating sustainable commercial impact.

MAIN ACTIVITIES & RESPONSIBILITIES

Simulation Development & Validation
- Develop, refine, and maintain high-fidelity DEM simulation models that accurately represent uPVC compound blending behaviour and support process optimisation.
- Calibrate models to achieve 95% predictive accuracy using empirical performance data.
- Implement iterative refinement protocols based on validation outcomes, sensitivity analyses, and real-world operational feedback.
- Measure actual production outcomes against simulation predictions, establishing confidence intervals and accuracy thresholds.

Process Optimisation & Production Trials
- Lead controlled production trials to validate simulation-based recommendations and quantify resulting performance improvements.
- Deliver trials that demonstrate targeted improvements, including:
    - *15% reduction in mixing time*
    - *25% reduction in waste*
    - *30% reduction in unplanned downtime*
- Implement optimisation protocols, such as enhancing blade geometry, adjusting mixing parameters, and supporting development of automated control algorithms.
- Support ongoing assessment of commercial benefits and identify further optimisation opportunities.

Real-Time Data Acquisition & System Integration
- Establish and configure sensor systems across mixing plants, including torque, temperature, power monitoring, and particle tracking devices.
- Ensure reliability and accuracy of measurement systems to support model calibration and validation.
- Create and deploy data management infrastructure that enables automated adjustments of mixing parameters based on real-time data, material properties, and environmental conditions.

Training, Knowledge Transfer & Capability Building
- Design and deliver a comprehensive training programme on simulation software, modelling workflows, and optimisation methodologies.
- Create structured learning materials, including classroom content, hands-on workshops, and practical training modules.
- Support long-term capability development by documenting modelling procedures, optimisation protocols, and data workflows.

Communication, Engagement & Culture Building
- Establish regular communication channels—newsletters, briefings, project updates—to ensure consistent information flow across departments.
- Foster a culture of data-driven decision-making and continuous improvement aligned with project outcomes.
- Present project progress, technical findings, and risk updates at quarterly Local Management Committee meetings.

Collaboration, Reporting & Professional Conduct
- Work with academic and industrial supervisors to deliver project stages in line with the KTP workplan.
- Prepare technical reports, documentation, and presentations for stakeholders.
- Contribute to collaborative frameworks that support future student projects, research activity, and innovation partnerships between Harper Adams University and Epwin.
- Represent the partnership professionally at internal and external events.

Professional Development
- Engage fully in the KTP training programme, including residential modules, Associate conferences, and relevant technical development opportunities to enhance capability throughout the project.

PERSON SPECIFICATION

	Essential	Desirable
Qualifications	Master's degree in Engineering, Physics, Materials Science, Computational Science or related discipline. Evidence of technical competency in computational methods or engineering simulation. Strong mathematical foundation with practical application experience.	PhD in Engineering or related discipline. Experience with Discrete Element Method or particle-based simulation software. Knowledge of Computational Fluid Dynamics or multiphysics simulation. Familiarity with process control systems or industrial automation.
Experience	Demonstrated ability to develop and validate technical models. Experience with data analysis and interpretation in engineering contexts.	Experience with industrial process optimisation or manufacturing engineering. Involvement in technology transfer or commercialisation projects. Experience with sensor systems or real-time data acquisition. Background in polymer processing or materials engineering. Experience with multiphysics coupling and co-simulation methodologies.
Knowledge/Skills	Strong problem-solving capabilities with systematic approach to technical challenges. Competent technical writing and communication of	Knowledge of digital twin concepts and implementation. Familiarity with industrial data management systems. Understanding of manufacturing

	complex concepts. Ability to work effectively in collaborative interdisciplinary teams. Project management and self-organisation skills. Understanding of engineering principles applied to particle dynamics and process control.	quality assurance and validation protocols. Experience with sensor integration and real-time monitoring systems.
Personal Qualities	Conscientious approach to technical work with attention to detail. Motivation for continuous learning and professional development. Adaptability and flexibility when facing technical challenges. Effective communication with both technical and non-technical stakeholders. Professional conduct and commitment to project objectives. Willingness to engage with industrial partners and manufacturing environments.	Initiative in problem-solving and solution development. Strong analytical mindset with critical evaluation of results. Enthusiasm for knowledge transfer and skills development. Commercial awareness and understanding of business drivers. Leadership potential in embedding new technologies and practices.