**Check One: ☒Project ☐Review ☐Collaboration**

 **☐Workshop ☐Other**

| **Descriptive Title** | Sticking/Adhesion of materials to contact surfaces |
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| **Working Title[[1]](#footnote-0)** |  |
| **Technical Area[[2]](#footnote-1)** | Characterization / Dry systems |
| **Date** | June 2025 |
| **Short Description** | Solid material build-up in industrial equipment is a critical problem that industrials face. The aim of the project should be to study the underlying mechanisms of adhesion of materials to contact surfaces including the surface properties of both the material and contact surfaces. |
| **Objectives** | * Identify suitable test method to identify and rank material with respect to degree of sticking propensity
* Study underlying properties of both the material and the contact surface with a focus on surface properties
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| **Scope** | Solid material build-up in industrial equipment (e.g. feeder screws, piping, nozzles, punches covering a range of stress situations) is a critical problem that industrials face. The aim of the project should be to study the underlying mechanisms of adhesion of materials to contact surfaces including the surface properties of both the material and contact surfaces.* Identify / develop suitable method to measure and rank material with respect to sticking propensity against different contact materials.
* Study underlying relation between sticking index and properties of both the material and the contact surface with a focus on particle & surface properties (incl. surface chemistry).

Potential materials to test:* Organic crystalline, organic amorphous and inorganic materials (aligned with industrial project liaisons) of single, non-agglomerated particles; particle shape as applicable, different rel. expression of crystal facets/surface chemistry
* Particle size average range of 10 to 500 µm with temperature of about 10 to 60°C, when appropriate
* Potential surfaces to test:

Stainless steel incl. surface finishes and coatings.* Stress conditions: Compression stress between rigid walls (single particle and powder bed), shear stress against rigid wall (single particle and powder bed), combination of compression stress and shear stress against rigid walls (single particle and powder bed), all at different levels of stress and strain rate, when appropriate.
* Atmospheric conditions: Temperature of about 10 to 60°C, rel. humidity of about 0 to 80% rh and nitrogen and air gas, when appropriate
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| **Recommended Contractors (2 or 3)** |
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1. Title used in meeting agendas and file archives [↑](#footnote-ref-0)
2. One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering [↑](#footnote-ref-1)