

### Formulation Scale-up Assessment

Merlin can help identify potential manufacturing compression issues at the product formulation stage while there is still time to make changes, making costly scale-up disasters a thing of the past.

De-risk your chances of scale-up issues by compressing the powder at production speeds using production press profiles. You can assess the suitability of your product with as little as 20g of development formulation, compared with manufacturing much larger quantities of expensive material required to run a press only to find that it does not make a good tablet.

### Bespoke Testing

For those tricky compression problems, contact **Merlin Powder Characterisation**. We will work with you to deliver a customised programme of testing, designed to answer your questions, and solve your problems using the latest technology and expertise in compaction science.

We can help you design more robust tablet formulations on small scales to assess the suitability of early prototype formulations.

### Powder Flowability

For tablet manufacturing, there are many processes in which powder has to flow, for example from the hopper into the die. Characterising flow is important to ensure ease of handling. Merlin have a number of flow characterisation techniques to measure flowability of powders and granules.

Shear cell powder testing aims to measure how much energy is required to initiate powder flow, for example, from a silo or hopper into a receptacle. Wall friction testing measures the change in flow from a polished surface. The angle of friction measured and can be used to design appropriate hoppers for problem materials.

### Outsourcing

Already have your own in-house capability but struggling with resource? Merlin can help, with flexibility and capability to adapt methods to match your preferred protocols.

### Equipment

- Phoenix Hydraulic Compaction Simulator with full range of accessories
- Schulze Shear Cell for powder flow and wall friction testing
- Turbula blender and small-scale formulation capabilities
- Helium Pycnometry for true density measurement
- Tapped Density- For Carr's Index
- IR moisture balance and humidity chambers
- Friability tester
- Disintegration tester
- Kraemer Tablet Tester



**Cutting edge material science techniques to predict manufacturability.**

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### Compression science on demand

Compression science

Manufacturability prediction



Adhesion measurement

API characterisation

Temperature sensitivity assessment



Bespoke testing



## Have you considered the manufacturability of your product?

Merlin Powder Characterisation has a unique service offering compression science on demand, giving access to cutting edge materials science and compression knowledge on a sample by sample basis.

Using our independent, expert, sub-contract service will enable you to optimise the compressibility of your product to meet your specific manufacturing requirements.

Merlin provides exceptional service working hard to support to global customers in industries including pharmaceutical, chemical and food. Merlin is the best independent facility of its kind worldwide.

### API Characterisation

Material and API characterisation helps you understand the compressibility properties and tabletability of your materials. We can run a Heckel test to help you characterise the compaction behaviour of your APIs, excipients, and new materials.

Early identification of challenging manufacturing properties such as elasticity, poor strength and sticking will enable you to make informed choices and expedite successful formulation development.



### Temperature Sensitivity

During compression of powder, temperatures rise in the compressed powder which can affect the physicochemical properties. As the production press runs, the temperature of the press increases due to friction.

At Merlin we can replicate these conditions to simulate the real production press operating temperatures (-10°C up to 70°C) to assess the impact of temperature on the behaviour of the formulation during compaction and ejection.

### Sticking

Punch sticking in tablet production is a costly problem that often appears unexpectedly late in the process and can be difficult to solve. Merlin has developed a world leading test to accurately quantify punch adhesion, enabling scientists to understand the causes of sticking.

The tests can be used to quantify the risk of sticking of new formulations or to troubleshoot solutions for existing products. Additionally, the service includes an option to evaluate the most effective punch coatings to prevent sticking.

### Roller Compaction Simulation

Merlin can help you design your optimal roller compaction product. We can simulate the roller densification process to generate data on small quantities of powder. This is especially useful if material is in short supply or there are time constraints. We can measure key density and compression factors to guide your development process.

The compaction simulator can be used to prepare small numbers of compacts of known density to create simulated ribbons. They can be coarsely milled to form granules. The ability of the granules to form tablets can be measured using high speed testing methods.

