INCREASED YIELD AND PROFITS: IMPROVE YOUR ROI

Generate in-depth and precise quantitative data about your wet granulation with the

Mixer Torque Rheometer (MTR)

caleva

www.caleva.com

Mixer Torque Rheometer (MTR)

Accelerate and enhance your research, development, and production projects

About the Mixer Torque Rheometer

The Mixer Torque Rheometer (MTR) is a unique and valuable formulation development instrument designed to measure and characterise wet granulation properties for tabletting, extrusion, and spheronization outcomes. With uses across multiple industries, the MTR can provide you with an optimum starting point for your formulation, helping you to reduce trial and error experiments, with precise and repeatable data.

It can also be used as a production line instrument to monitor wet granulation quality and consistency, helping to maintain, and even increase, useable yield.

Key Benefits at a Glance

- Save time and materials using just 10-40 g samples
- Replace subjective 'hand squeeze' tests with quantitative torque measurements
- Define robust design space with real data
- Ensure reproducible and consistent formulations
- Support reliable scale-up from lab to production
- Monitor experiments live and make decisions faster
- Export data for deeper analysis and validation

Understanding Wet Granulations: The MTR's Three Key Tests Explained

The Mixer Torque Rheometer performs three experiments that help to optimise your wet granulation by providing precise, repeatable data.

Multiple Addition Test

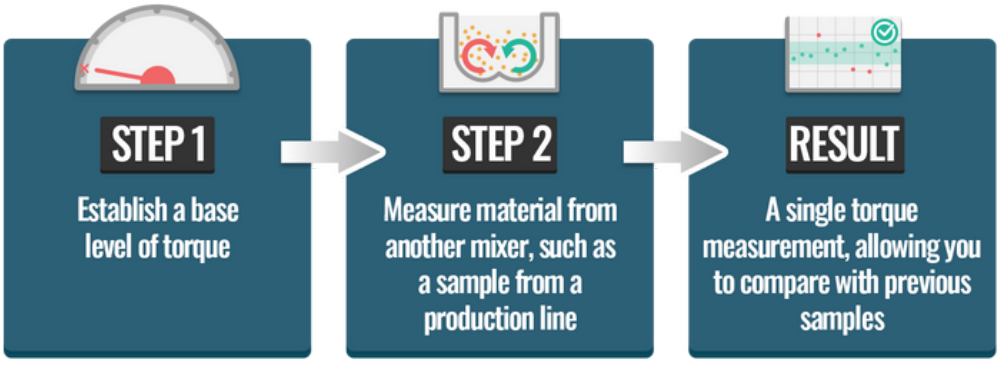
Reduce material waste and speed up formulation development.
Remove the guesswork from your experiments and predict the optimal binder-to-powder ratio for your wet granulation.

Variable Mix Time Test

Prevent under or over mixing. Identify the influence of mixing duration to provide an understanding of the robustness of the formulation.

Consistency Test

Maintain product quality and usable yield. Monitor your wet granulation's consistency as part of a scale-up strategy or during production to enable quick corrections.



Precise quantitative data about your wet granulation provided by the MTR helps to accelerate and enhance your research, development and production projects, **reducing material, time and costs.**

ARE YOU EXPERIENCING THESE COMMON FORMULATION ISSUES?

Poor control of mixing and moisture leads to unpredictable results and process defects. The MTR helps define clear processing windows to minimise these common problems.

DRY FORMULATION

Moisture content falls below that required for plasticity and bonding

Tabletting

- Poor compressibility
- Capping and lamination
- High friability

Extrudate

- Brittle extrudates
- Extrusion die blockage
- Unstable extrusion pressure

Pellets

- Fragile pellets
- Excess fines
- Poor coating performance

WET FORMULATION

Binder addition exceeds the optimal liquid to solid ratio

Tabletting

- Prolonged drying times
- API migration during drying
- Hard, poorly disintegrating tablets

Extrudate

- Sticky extrusion behaviour
- Strand collapse or flattening
- Die fouling

Pellets

- Oversized pellets
- Agglomeration
- Pellet collapse during drying

UNDER MIXED FORMULATION

Binder and liquid are unevenly distributed, creating local wet and dry zones

Tabletting

- Content uniformity failures
- Variable tablet weight
- Capping and lamination due to weak granules

Extrudate

- Intermittent or unstable extrusion
- Crumbling or fractured strands
- Inconsistent extrudate diameter

Pellets

- Broad size distribution
- Excess fines
- Inconsistent and unsatisfactory shape

OVER MIXED FORMULATION

Granules are over-worked after reaching their optimum structure

Tabletting

- Reduced tablet hardness
- Increased friability
- Slower or inconsistent dissolution

Extrudate

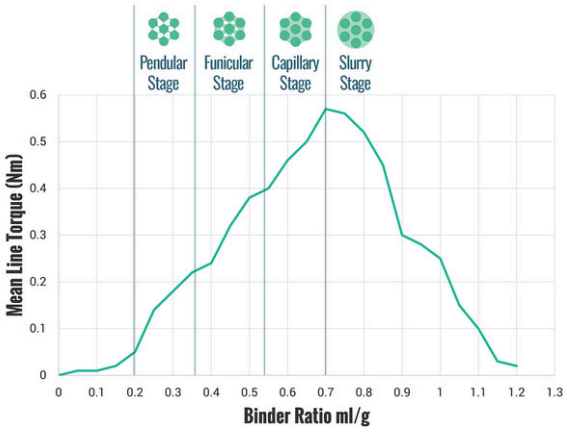
- Over-dense extrudates
- Reduced porosity
- Difficult breaking and downstream handling

Pellets

- Deformed or flattened pellets
- Agglomeration
- Reduced mechanical strength

In less than **60 minutes**, you can define...

- The optimum starting point for your formulation's liquid binder ratio
- Mixing design space to prevent over or under-mixing
- Quantitative data to inform scale-up decisions

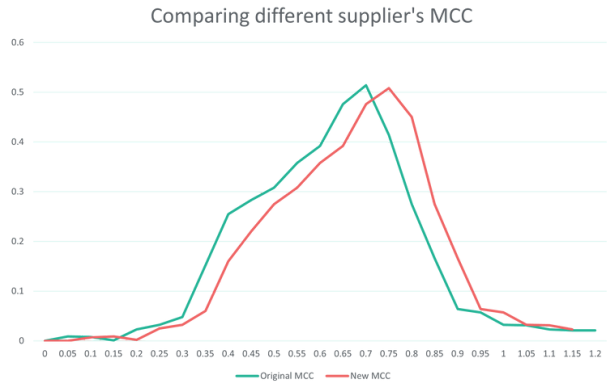


Repeatable and accurate testing

Skip weeks of trial-and-error

Reliable Formulation Robustness

The Mixer Torque Rheometer Case Study: Increasing Yield and Profits



A pharmaceutical manufacturer producing a high-value granulation worth millions each year saw production yields suddenly fall below acceptable limits. Their process, equipment, and staff all remained the same during this time. However, the losses were immediate and costly.

Initial investigations provided no answers. Even after repeated hand squeeze tests and full end-to-end supervision of the process, the cause of the yield loss remained unclear.

The only recent change was a new excipient supplier, but the data sheet that accompanied the excipients indicated the new supply was the same as before.

Using the MTR, the production manager tested excipients from both suppliers. Just 15 g of each material was mixed, with liquid binder added incrementally while torque response was measured in real time.

Using the data provided by the MTR, and despite matching data sheets, the new excipient required a different binder addition profile to achieve the same granulation behaviour.

With this data the formulation was adjusted, production yield recovered, and profitability returned to normal.

Book your free 1-on-1 online demonstration with a Caleva specialist here: caleva.com/demo

caleva

+44 (0) 1258 471122

info@caleva.com

www.caleva.com