

LABORATORY

CALEVA

# MIXER - GRANULATOR - BLENDER

Effectively mix, blend or granulate small batches of your powders, wet masses, gels, waxes, slurries and pastes and other similar materials on your bench top

## OPTIONS AND COMPANION EQUIPMENT

One unit, many uses



IF YOU WANT TO....	THEN YOU SHOULD....
<b>DE-LUMPING AND DE-AGGLOMERATION OF COMPACTED PRODUCTS</b>	
De-lump or de-aggregate compacted product before use.	Consider the standard high shear bowl and blades running at high speed as this will often completely separate compacted powders. Allow us to try it with your troublesome products.
<b>BLENDING MIXTURES OF VISCOUS LIQUIDS</b>	
Blend viscous liquids in various proportions without incorporating excess air bubbles.	The standard high shear bowl and blades running at low speed will efficiently blend viscous liquids. Mixing slowly will gently blend the liquids together without dragging excessive air into the mix. If the liquids are very viscous then consider the sigma blades as an option.
<b>BLEND POWDER MIXERS OR BLEND SMALL QUANTITIES LIQUIDS THROUGHOUT A SOLID MATRIX</b>	
Blend and mix two dry powders in proportions ranging from 1:1 to about 100:1.	Powders can be mixed very quickly with the high shear blades running a high speed. About 1 minute of mixing is often sufficient to give a homogeneous mix.
Disperse small quantity of a liquid evenly through a powder matrix.	Use the standard bowl and blade set choosing the size to suit your batch size. Mix the powder at high speed and slowly add the right amount of liquid with a 1ml (or less) syringe.
Disperse small quantity of a waxy solid evenly through a dry powder matrix.	Mix at the highest speed with the standard bowl and blade set whilst adding the warmed (and liquid) wax.
<b>GRANULATION OF SMALL BATCHES</b>	
Examine the effect of adding different amounts of liquid binder or mixing a set amount of binder for different times.	This will give you a qualitative indication but this will not be as accurate or as useful as using the <a href="#">Caleva Mixer Torque Rheometer</a> that is designed specifically for this use.
<b>ADD OR REMOVE HEAT FROM THE MIXING CHAMBER</b>	
Add or remove heat from the mixing process.	Consider the use of mixing bowls with optional water jackets. These can be used to add or move heat to or from the mixing bowl to give the results that you need.

## THE MOST FLEXIBLE AND ADAPTABLE SMALL MIXER FOR YOUR LABORATORY

## OPTIONS AND COMPANION EQUIPMENT FOR THE CALEVA MIXER - GRANULATOR - BLENDER

### OPTIONS

The base unit is supplied as a stand alone unit. At least one mixing bowl and blade set must be selected for the system to operate. There is a range of optional bowls and blades. The most appropriate for your needs will depend on the characteristics of your products and what is that you want to achieve with them. In some cases more than one bowl may be recommended to enhance the process options that are available to you. The range of options is given below.

### ✓ BOWL CONFIGURATIONS

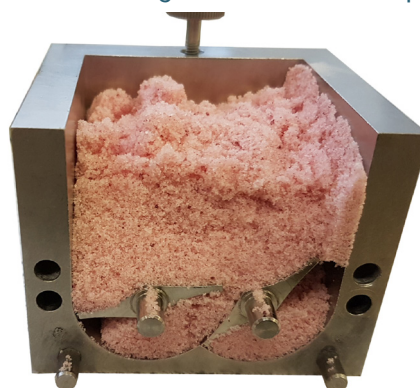
#### ○ Full size bowl

**Mixing chamber open volume with blades inserted: 275 cc without insert, 241 cc with insert.** This is not the operating volume (batch size) as this will depend on the characteristics of the material being mixed and it will be less than this.

**Main uses:** Mixing of suitable materials where high shear and maximum mixing activity is required in larger batches. Examples would be granulation to develop wet masses, high efficiency mixing of powders of similar or very different batch sizes, high shear mixing of powders with waxy solids that require melting before mixing. Any other mixing that required high efficiency and rapid action

**Our recommendation:** This is the standard and most versatile set-up. If you are unclear and wish to have the widest range of operating options available.

**Other comments:** Can be used with or without the insert depending on batch sizes. Batch sizes can generally be from approximately 10 to 50 grams. These figures cannot be exact for all materials of varying bulk density and are given as a guide only.



A typical mix application where a mix of two dissimilar powder components are mixed with a 4% liquid binder (with food colour added to check liquid dispersion). Used without the insert.

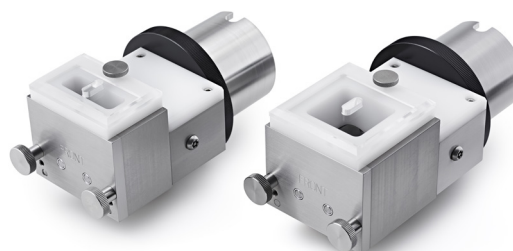
#### ○ Full size bowl with water jacket

Used as above but in situations where heat has to be added to, or removed from the mixing system.

#### ○ Reduced size bowl

**Mixing chamber open volume with blades inserted: 71 cc without insert and 52 ml with insert.**

Used as above but when working with smaller batch sizes (from about 10 g).



Full size and reduced size bowls

○ **Reduced size bowl with water jacket and insert**

**Mixing chamber open volume with blades and insert inserted: 52 cc**

Used as above but when working with smaller batch sizes (from about 10 g) and where it is required to remove, or add heat to the mixing system



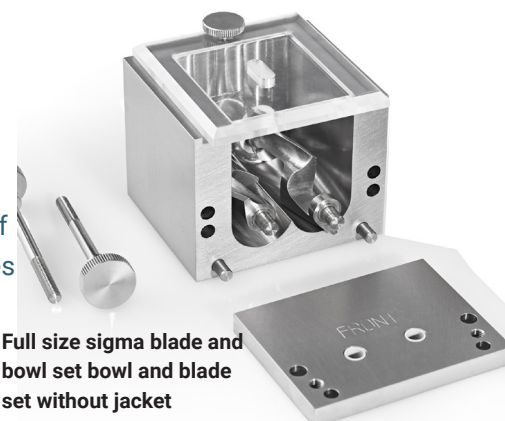
Reduced size standard bowl and blade set with water jacket and insert.

○ **Full sized bowl with Sigma blades**

**Mixing chamber open volume with blades inserted: 113 cc without insert, 74 cc with insert.**

**Main uses:** The sigma blade system is designed for mixing and granulation of materials that are highly viscous. Many petrochemical and catalyst products are highly viscous and this efficient low shear mixer system works better with this type of material. Mixing is thorough but sometimes a little more time is required for the mixing to complete.

Our recommendation: If you have materials that might become quite stiff with a very low viscosity then the sigma bowl and blade set is likely to be your preferred choice.

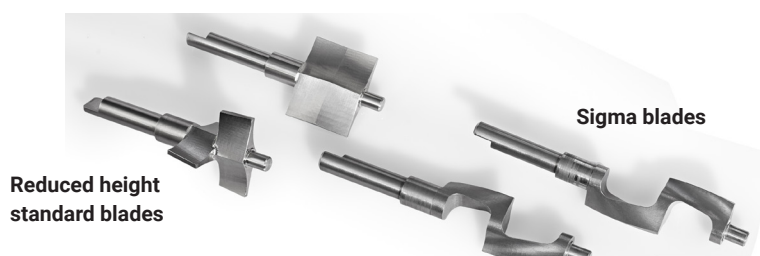


Full size sigma blade and bowl set bowl and blade set without jacket

○ **Full size bowl with sigma blades with water jacket**

**Open volume with blades inserted: 113 cc without insert, 74 cc with insert.**

Used as above but in situations where heat has to be added to, or removed from the mixing system.



○ **An additional advantage of the smaller sized bowls:**

For some applications where an increase in mixing power is needed (for example in the case of very stiff materials) then a smaller bowl might provide a solution. Using the smallest bowl and using smaller blades relatively provides more power to be applied to a smaller mixing surface. Mixing bowls can be used with or without inserts as required.

In the case of very scarce or expensive materials then a small bowl will help to run trials with smaller amounts of material.

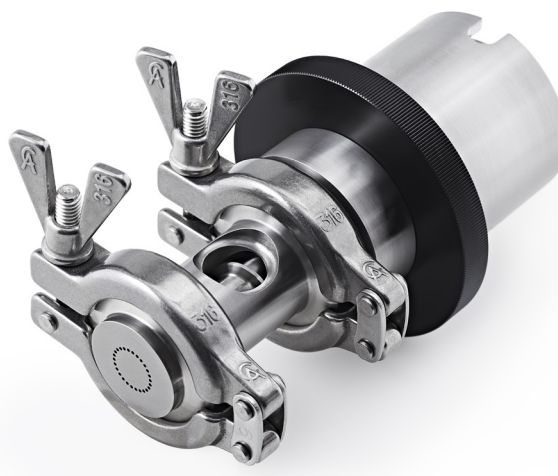
## ADDITIONAL ATTACHMENTS AVAILABLE FOR THE BASE UNIT.

### ✓ EXTRUDER ATTACHMENT

An extruder attachment is available to enhance and widen the range of applications that are possible for the Caleva Mixer - Blender - Granulator

A small extruder with options for dies with holes of different depths, diameters and hole types is available to enhance the utility of the base unit.

This extruder will work effectively with batches from about 5 grams.



Contact us for additional details or if you want discover if this is suitable for your product and what you are trying to achieve or if you want to try your product and application in our laboratory.

### ✓ SPHERONIZER ATTACHMENT

A spheronizer attachment is available for use with the same base unit.

Spheronization (sometimes call Marumerization or Spheroidization) is the process widely used to produce small round pellets of many materials in many industries such as cosmetics, pharmaceutical, catalyst, industrial chemistry, foods etc.

If you think this process might be suitable for your needs contact us without any obligation for a discussion and our best advice.





## COMPANION EQUIPMENT

### ✓ CALEVA MINI COATER DRIER

#### ○ Coating small batches of pellets

If you are producing small quantities of pellets with the Caleva Multi Lab and these require drying or coating then the only drying and spraying equipment that can operate with such small sample sizes is the Caleva Mini Coater Drier. Small quantities of spheroids (from a few grams) can be coated and dried in minutes. Other pellet coaters might require a minimum batch of between 300 g and 500 g to work effectively, but this robust, simple-to-operate, bench-top unit provides a cost-effective solution for drying and coating particles. The practical unit, which is fully compliant with principles of GLP, can satisfy other applications such as the experimental coating of granules with catalytic material, food material and fluid-filled gelatine capsules. Please talk to us for more information.



### ✓ CALEVA MIXER TORQUE RHEOMETER

#### ○ The Caleva MTR is well established as a valuable formulation development, formulation research and production quality control tool

It provides a quantitative and reproducible measurement of the wet mass in terms of the torque produced when shearing the granulation within the pivoted mixing bowl.

This ability allows formulations to be optimised and product and excipient quality issues to be identified. A valuable tool for formulation development.



#### ○ Please talk to us about the Mixer Torque Rheometer and ask us about available case studies.

## OPTIONS AND COMPANION EQUIPMENT FOR THE CALEVA MIXER - GRANULATOR - BLENDER

### ✓ **VALIDATION AND TRAINING**

#### ○ **INSTALLATION AND TRAINING AT THE CUSTOMER SITE**

**Training can be arranged within the UK, any other European country or outside Europe**

Including one day installation and training and up to four days travelling depending on the location. Includes installation, commissioning and training at customer site of up to one day, but does not include IQ/OQ which is separately chargeable. The customer will assist with local transport for the Caleva technician if required (generally not required). The customer will supply the consumable products as required.

#### ✓ **FACTORY ACCEPTANCE TEST AT THE CALEVA SITE**

We make our own quality check before the equipment is shipped (a copy is supplied to the customer) and thus a separate FAT is not normally necessary but can be completed with the customer if required.

#### ✓ **CUSTOMER TRAINING AT THE CALEVA SITE (OVERSEAS CUSTOMERS)**

Training is recommended if extrusion and spheronization is a relatively new technique to the company or if new staff would benefit from it.

Customers from outside the UK can be collected at any London main airport, accommodation and all meals for one trainee whilst with Caleva. Transport to and from the Caleva site is included. Any extras (such as phone calls etc.) at hotel are for guest's account. One night bed & breakfast in London hotel before return flight to home country can be included if requested. Up to two days training (as required) at the Caleva site on customer's own equipment prior to shipment.

#### ○ **If more than one item is purchased then training can be done together with considerable savings in cost. Contact us for details.**

#### ✓ **VALIDATION AND IQ/OQ DOCUMENTATION PACKAGE**

Recommended if required for regulatory purposes.

#### ○ **At Caleva site**

The IQ/OQ package can be completed at the Caleva site by us in so far as this is practically possible. The customer can attend if he or she wishes to do so at their own cost. An additional set of blank documents will be provided to allow the customer to re-do the IQ/OQ in their own facility.

#### ○ **At customer site**

IQ/OQ and installation completed at the customer site at the same time as installation and training (training will be charged separately). The cost shown is an additional cost for the IQ/OQ in addition to the costs for installation and training.

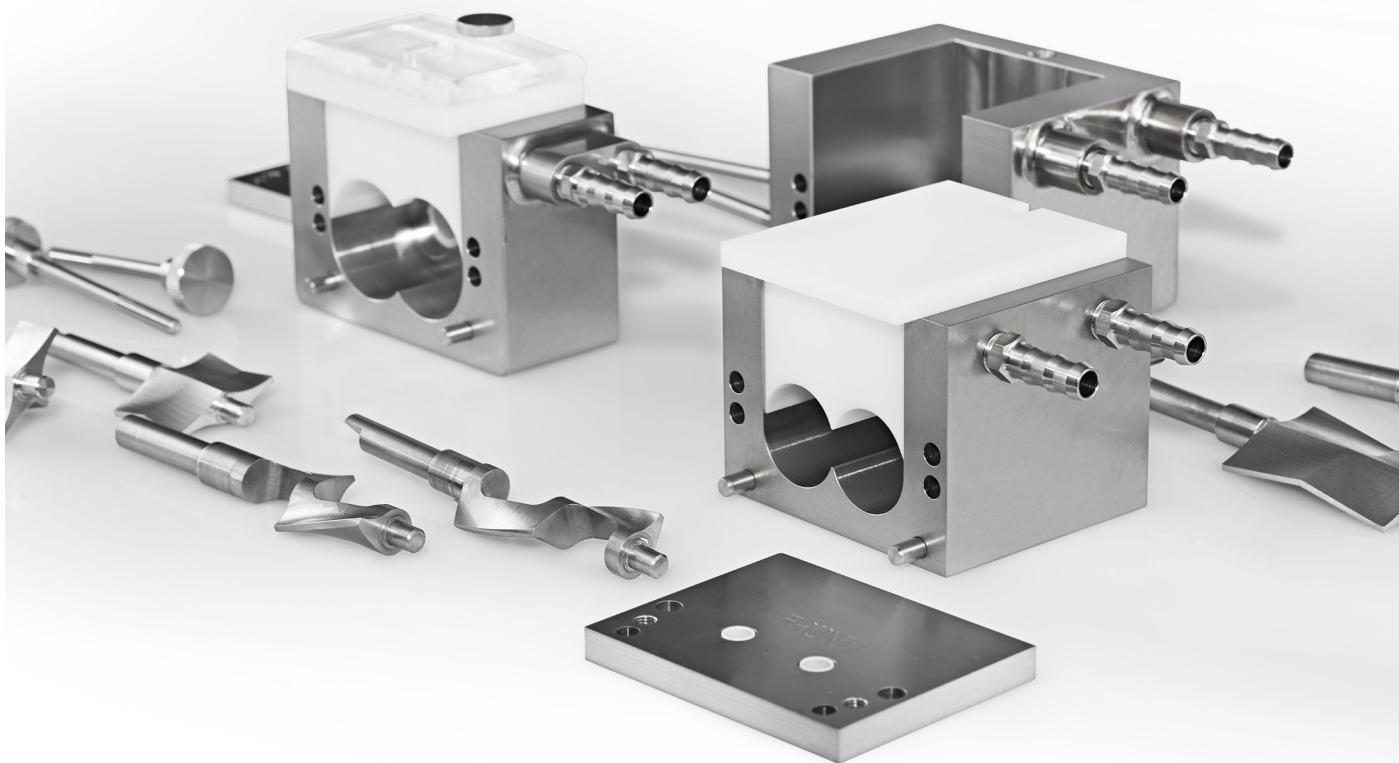


### MATERIAL CERTIFICATES (INCLUDED IN IQ/OQ)

In line with current standards Caleva does not automatically supply copies of material certificates for product contact parts. Caleva can provide free of charge a certificate naming the product contact parts and confirming that we or our suppliers can provide full traceability to original certificates if this is requested.



**If certified copies of material certificates are required then these can be provided at an additional cost.**



## TALK TO US

Please call us without obligation

+44 (0) 1258 471122

info@caleva.com



Certificate Number: 1503