

# IKA

designed to work perfectly

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CONICAL DRYER CD & CONICAL MIXER CM

## Conical Dryer CD & Conical Mixer CM

/// Intensive and efficient drying and mixing of bulk materials

**Efficient but gentle mixing of free-flowing solids with different bulk densities and particle sizes: This is made possible by the Conical Dryer CD and the Conical Mixer CM by IKA. The user-friendly and intelligent design of the two machines, their flexible equipment with a large number of freely-selectable options, and the possibility of a scale-up from laboratory scale to production scale make our conical dryer and conical mixer the ideal companion for your process.**

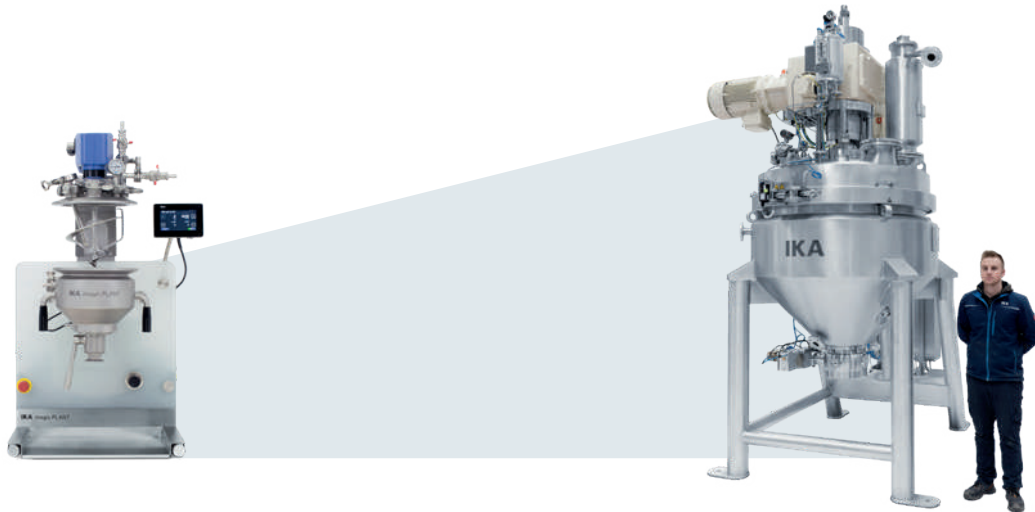
The intensive mixing of the product is done by means of a special combination of spiral stirrer and flow breaker, integrated into both the CD and the CM. The unique shape of the agitator moves and mixes the solid materials throughout the entire effective volume, without causing it to be destroyed. The quality of mixing is further improved by the optional vessel slewing system, where the complete mixing vessel can be slewed up to 45°. The inclined positioning offers critical benefits in the mixing of the entire load, since gravity also acts on the products to be mixed.

The tilting mechanism for the vessel lid (with stirrer) enables easy opening of the vessel and thus provides for user-friendly inspection of the internal compartment. Thanks to the conical drying and mixing vessel, the product can be discharged completely after the process and the vessel itself is easy to clean. Available in both GMP and ATEX design, the machines are ideally suited to a pharmaceutical environment, and to the chemical, food or cosmetic sectors.



## Ingenious scale-up

Optimum operability is ensured throughout the entire series as a result of the compact design. IKA's product portfolio of dryers and mixers starts with sizes from 2 l with the magic PLANT powder and extends via various different sizes up to 10,000 l production machines. This provides you with a seamless scale-up, with the same process technologies, from the development to the production phase.



magic PLANT powder

Conical Dryer CD 1000

## Flexible design with freely selectable options

The Conical Dryer CD and the Conical Mixer CM are available in various different versions and with the widest variety of options. The cost-effective basic models permit execution of standard processes, and their space-saving design is of particular benefit. Both machine types can be upgraded with a wide variety of options for more complex tasks and for greater operator comfort. The lid tilting and vessel slewing function ensures efficient mixing or drying and provides user-friendly access to the inside of the vessel. Fitting of several movable spare vessels ensures maximum process flexibility. Additional options are listed on Page 8.



Basic Version of the Conical Mixer



Upgraded Version CD

## Conical Mixer CM

/// Perfect for mixing of sensitive bulk materials

**The Conical Mixer CM from IKA is perfectly suited for mixing all free-flowing solids, including products with different bulk densities and particle sizes. The special spiral stirrer intensively mixes the product in tangential and radial direction.**

The spiral stirrer is mounted in an overhung position and thus does not require any shaft seals in contact with the product. The speed of the spiral stirrer is continuously adjustable and can thus be flexibly adapted to the product behavior. The top-mounted flow breaker ensures additional turbulence in the product area.

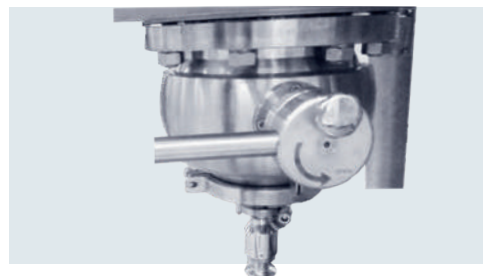
The interior can be easily cleaned thanks to the compact design of the product vessel and the integrated CIP spray nozzles. The standard version includes mounting of the mixing vessel on tubular feet. Their sturdy footplates are used to fasten them to the floor. If the customer requests, the system can be equipped with several identical movable vessels. During the process, they serve as replacement, storage, or reaction vessels. In combination with this, it is possible to tilt the vessel lid, including the stirring unit, electronically. This permits optimum inspection of the product area. Sampling systems mounted at the side provide for in-process testing and ensuring of the mixing quality.





#### Flow breaker

The flow breaker mounted on the lid prevents rotation of the product with the stirrer and generates additional turbulences. The integrated PT100 temperature sensor measures the temperature in the middle of the bulk material, thus ensuring that temperature-distorting wall effects are precluded.



#### Segmented ball valve

The segmented ball valve is located at floor level and provides a reliable seal. Thanks to its full-flow cross-section, CIP cleaning option, and the absence of dead spaces, the ball valve is also ideally suited to aseptic applications in the pharmaceutical industry.

## Conical Dryer CD

/// Inclined position for perfect drying results

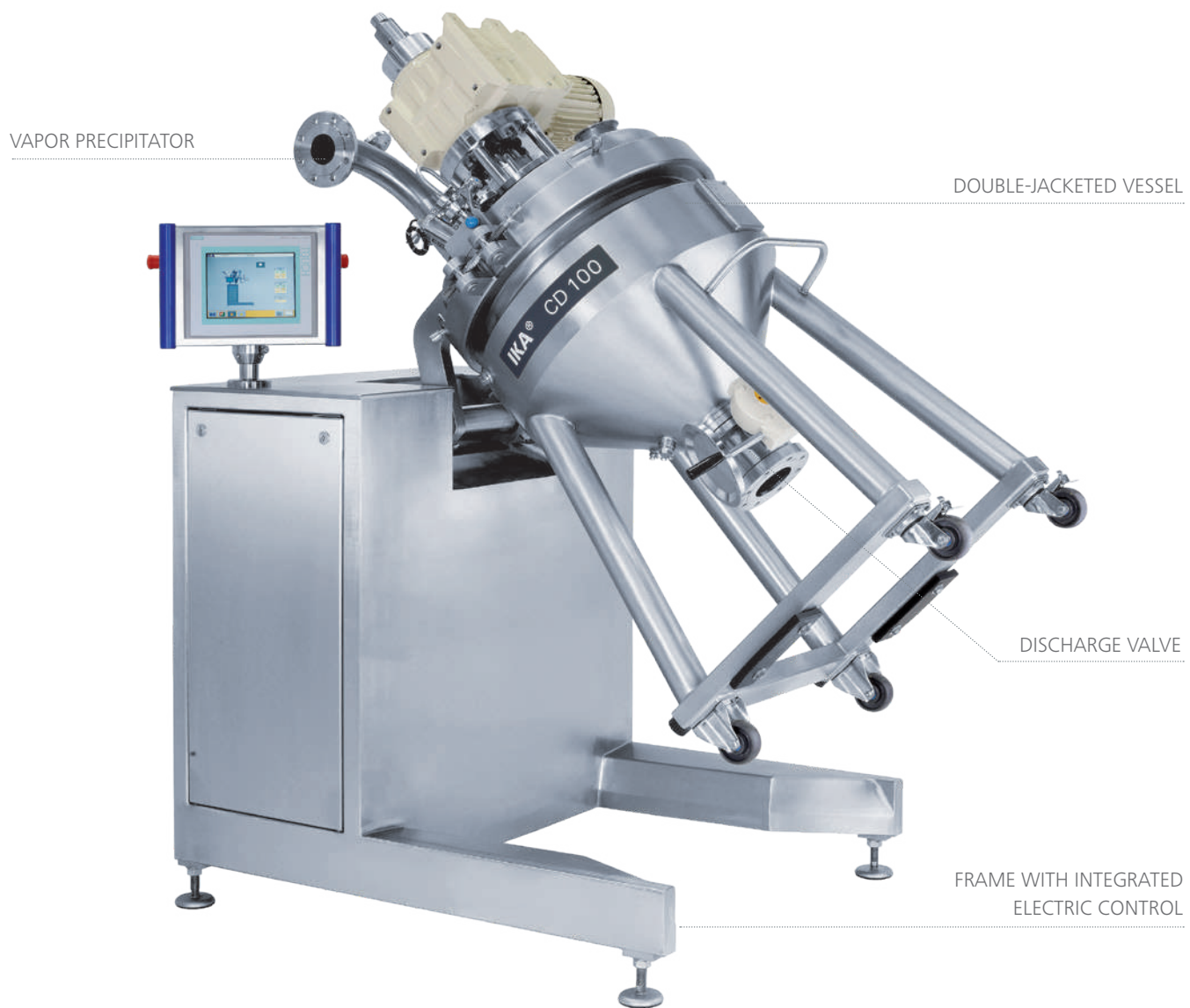
**The IKA Conical Dryer CD is suited for vacuum-contact drying of various solvent-moistened solids of different free flow properties and bulk densities. The CD ensures uniform humidity and temperature distribution over the entire product area.**

The drying principle of the Conical Dryer is based on gentle mixing, combined with even heating of the humid raw materials via the vessel wall, the stirrer, and the lid. Your bulk material is effectively dried at temperatures up to 200 °C and under vacuum. The resulting solvent vapors are extracted by a back-flushing dust filter. A top-mounted lump breaker with cutter blades reliably prevents the forming of agglomerates. In a similar way to the Conical Mixer, the Conical Dryer can also be fitted with the practical and efficient tilting or slewing devices.

### Typical applications

The Conical Dryer offers a wide range of possible applications: It can be used, with constant mixing, for the drying of metal powders, pigments, salts as well as other powders in the chemical industry. You can separate solvents from suspensions very gently by thermal contact drying and careful mixing. Typical applications extend from active ingredients in the pharmaceutical industry (API), via the treatment of tea mixtures, coffee powder products, powdered soups and sauces, up to baby food.





#### THE ADVANTAGES OF THE CONICAL DRYER CD

- > Shorter drying times due to a heated stirrer as well as double-jacketed vessel and vessel lid
- > Vessel design suited for operation under vacuum and pressure up to 6 bar
- > Admissible operating temperatures from -10 to +200 °C
- > Flow breaker with integrated PT 100 temperature sensor
- > Overhung lump breaker for disintegration of any agglomerates
- > Compact design with low installation height

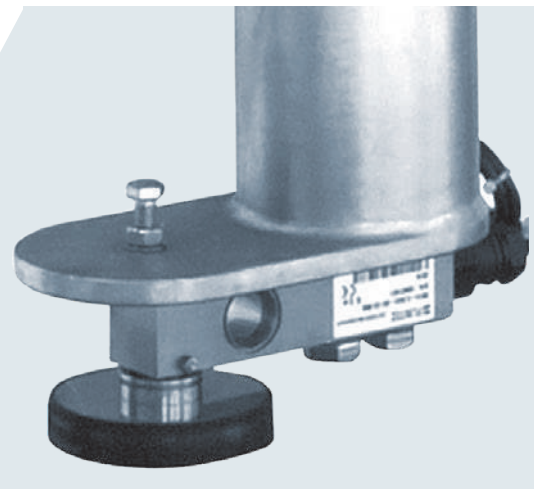
## A wide range of options

/// Comfortable and efficient processing of bulk materials

The Conical Dryer and the Conical Mixer can be supplemented with a large number of different optional components and additional functions.

### Dual-action mechanical seal for the spiral stirrer and the lump breaker

For critical products, the spiral stirrer and the lump breaker can be fitted with a dual-action mechanical seal.



### Load cells

The electric load cells are mounted under the feet of the vessel. The weighing range depends on the system size and has a weighing accuracy of  $\pm 0.5\%$  of the total mass. If a vessel slewing device is used, then the load cells are integrated under the frame in the system.





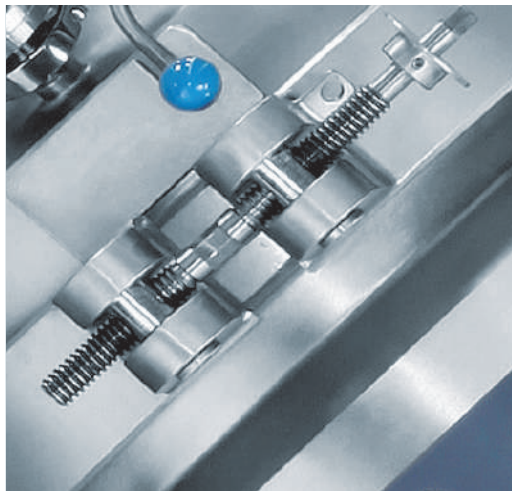
### Sampling valve

The manual ball valve with integrated blind hole is embedded in the side wall of the mixing vessel. This valve permits safe sampling whilst the machine is running, even if the vessel is pressurized or is under a vacuum.

As an alternative, we can also provide different sampling systems (e.g. for toxic products).

### Ultrasound vibration system for the inner wall of the vessel

The ultrasound vibration system is connected via a sound conductor. This is permanently welded in position on the outside of the inner wall of the vessel. The electronically-controlled sound generator generates a continuous varying frequency. This frequency is introduced into the walls of the vessel via the sound conductor. The inner wall is thus set into a gentle vibration, which reduces the adhesion of the product on the walls and improves product discharge.



### Clamping ring

A lid clamping ring permits rapid mechanical opening and closing of the vessel lid with the vessel. The user does not need to change position. The height of the lid clamping ring permits ergonomic working without the need for high levels of force.



### Vapor precipitator (for the Conical Dryer CD)

The metallic vapor precipitator is located on the inside of the lid in the vessel. The filter system keeps the product particles in the vessel, thereby protecting the vacuum system from fine particles. It contains a venturi nozzle for cleaning the filter using gas (min. 4 bar).

# Technical Data

## /// Conical Dryer CD & Conical Mixer CM

PLANT TYPE	magic PLANT powder	CM 10 CD 10	CM 25 CD 25	CM 50 CD 50	CM 100 CD 100
<b>GENERAL CHARACTERISTICS</b>					
Effective volume min. l	0,5	3	7,5	15	30
Effective volume max. l	2	10	25	50	100
Feed spigot (size)	1"	2"	3"	3"	4"
Discharge valve	DN 25	DN 65	DN 65	DN 100	DN 100
<b>STIRRER FOR CD</b>					
Engine power, kW	0,4	0,37	0,75	1,5	3
Directly heated stirrer	-	+	+	+	+
Speed range, min <sup>-1</sup>	0 - 350	30 - 112	22 - 83	18 - 68	14 - 54
<b>OPTIONAL ACCESSORIES</b>					
Vessel slewing device	+	+	+	+	+
Lid tilting device	+	+	+	+	+
Clamping ring	+	+	+	+	+
Dual-action mechanical seal spiral stirrer	-	+	+	+	+
Sampling valve	-	-	+	+	+
Ultrasound vessel inner wall vibration system	-	+	+	+	+
Load cells	-	+	+	+	+
<b>LUMP BREAKER</b>					
Power, kW	0,8	-	1,1	1,1	2,2
Drive speed, min <sup>-1</sup>	3 000 - 25 000	-	3 000	1 500	1 500
Dual-action mechanical seal	-	-	+	+	+

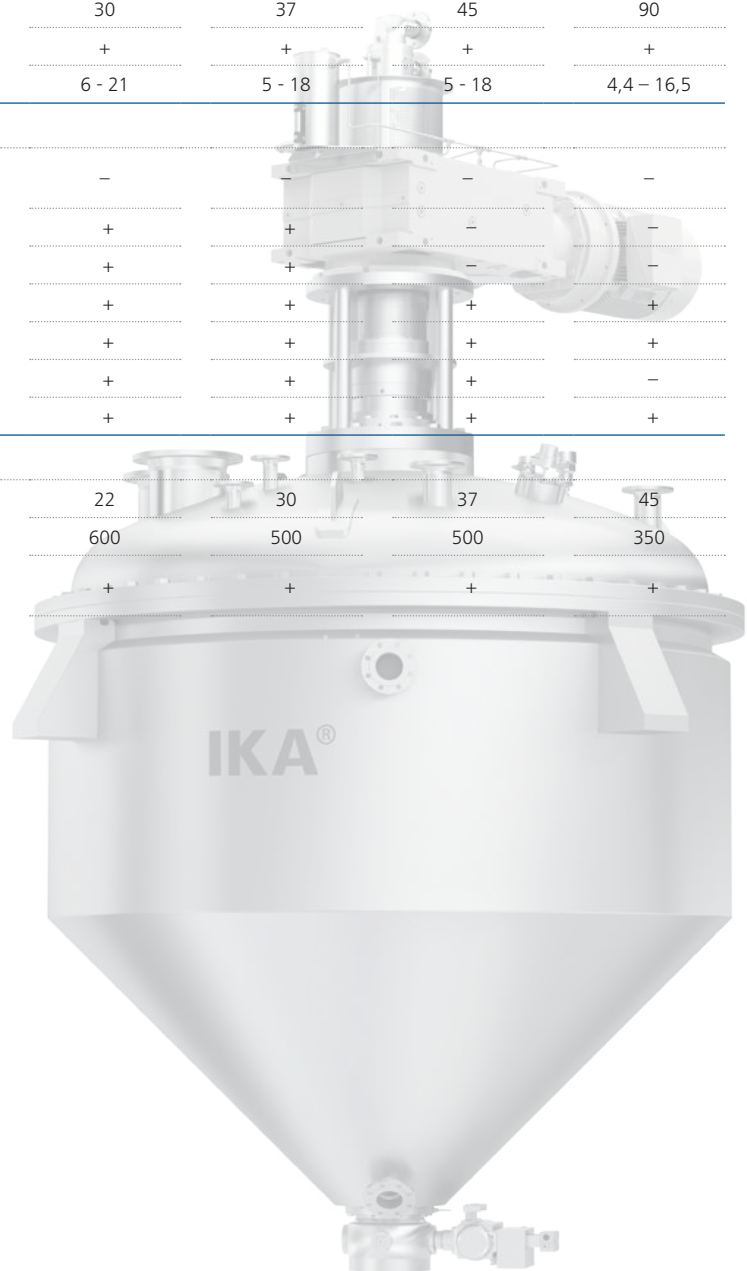
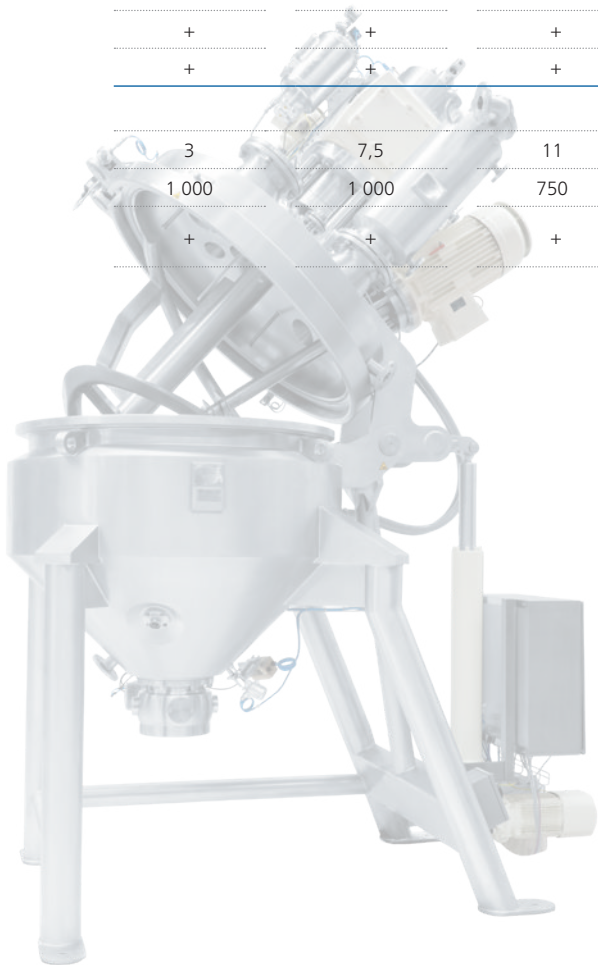


CM 250 CD 250	CM 500 CD 500	CM 1 000 CD 1 000	CM 2 000 CD 2 000	CM 4 000 CD 4 000	CM 7 000 CD 7 000	CM 10 000 CD 10 000
75	150	300	600	1 200	2 100	–
250	500	1 000	2 000	4 000	7 000	10 000
4"	6"	6"	8"	8"	8"	DN 300
DN 150	DN 150	DN 150	DN 200	DN 200	DN 200	DN 250

5,5	11	18,5	30	37	45	90
+	+	+	+	+	+	+
11 - 41	8 - 32	7 - 26	6 - 21	5 - 18	5 - 18	4,4 - 16,5

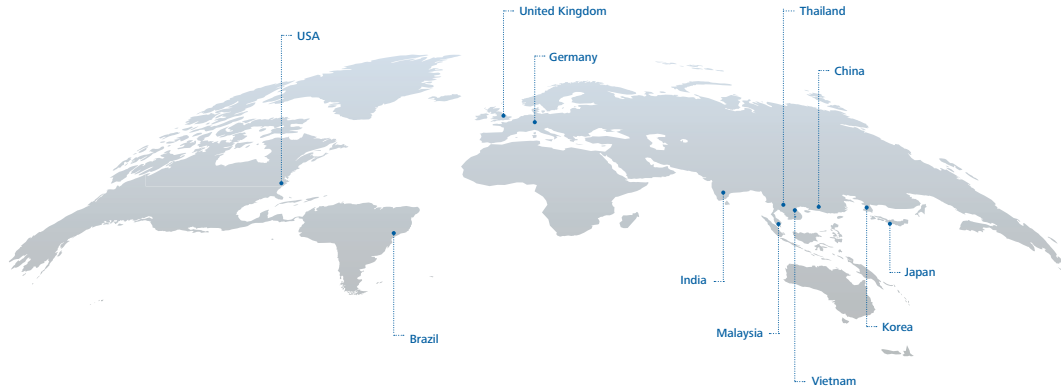
+	+	+	–	–	–	–
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+	+	+	+	+	+	+

3	7,5	11	22	30	37	45
1 000	1 000	750	600	500	500	350
+	+	+	+	+	+	+





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