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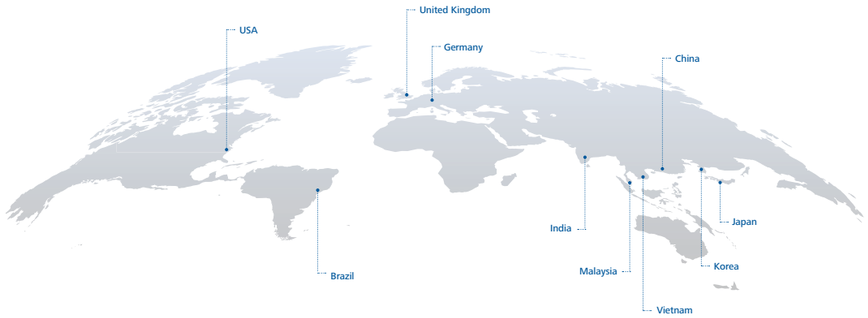

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EN

HORIZONTAL, VERTICAL & CONTINUOUS

KNEADING MACHINES

Kneading machines by IKA

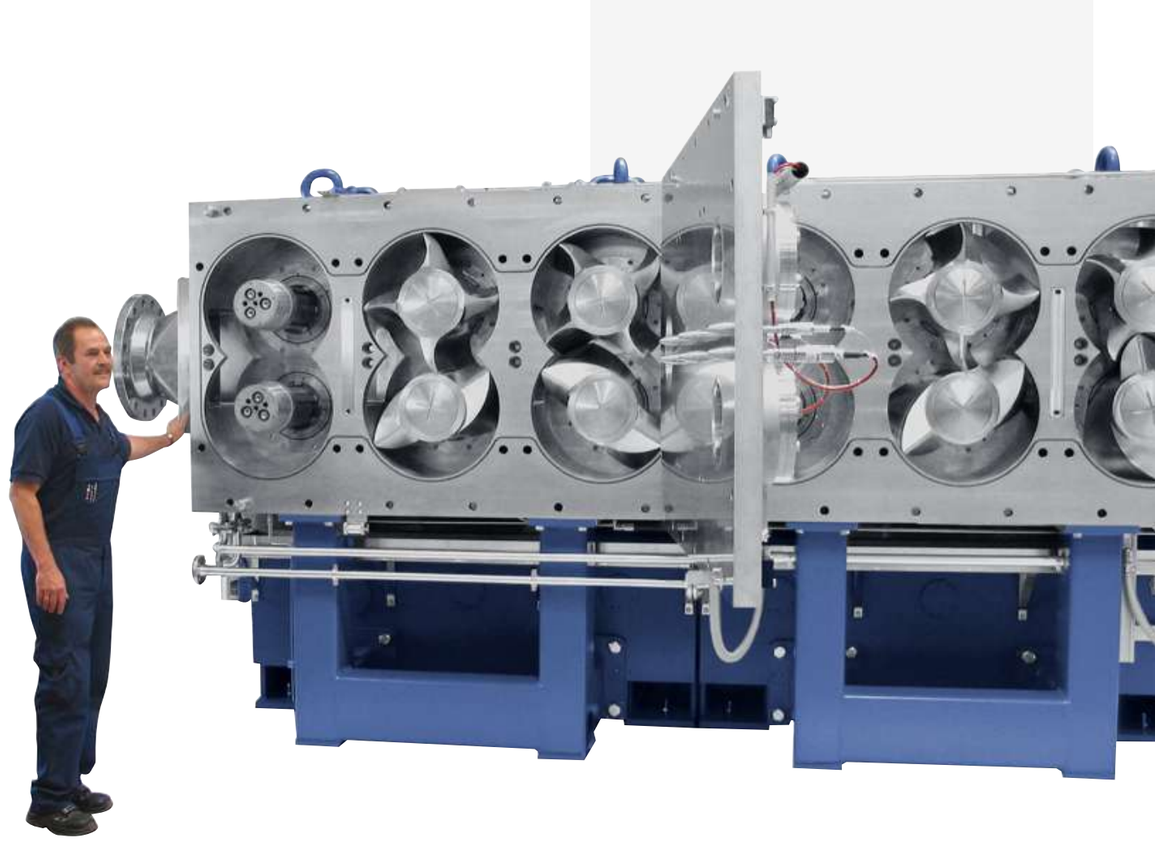
/// Perfect processing of medium and high-viscosity mixtures

The homogeneous mixing of highly viscous products is accomplished on an industrial scale by kneading machines. The kneading machines from IKA are specially designed to prepare and homogenize medium to high viscosity mixtures.

We offer high-performance kneading machines as horizontal, vertical or continuous versions. Our horizontal kneading machines are able to process mixtures of the highest viscosity in a wide range of applications. The somewhat more complex vertical kneading machines of the PLANETRON series are designed so that the seal is located above the product being kneaded. This reliably prevents the mixture from being contaminated. The third type of kneading machine is the fully continuous CONTERNA series. The kneading chambers, arranged in a horizontal row, function as a single unit and serve as a multi-chamber mixing system.

Our kneading machines are available in different sizes and can be enhanced with various practical features. When you go from vertical to horizontal to continuous kneading machines, the ability to process highly viscous products increases. This means that continuous kneading machines from IKA can handle viscosities up to 900,000 Pas. A diverse range of applications in the electrical, pharmaceutical and chemical industries is made possible with our kneading machines.

As a global company with over 110 years of history, we are **the experts** in process technology for numerous industries. As a multiple award-winning innovation leader, we build our expertise into our products. See for yourself!



Horizontal kneading machines

/// With duplex or Z-shaped kneading blades

The horizontal kneading machines from IKA are suitable for products in a wide viscosity range. They come in two different versions: With duplex kneading blades, as HKD (heavy duty kneading duplex), or with Z-shaped kneading blades as HKS (heavy duty kneading sigma).

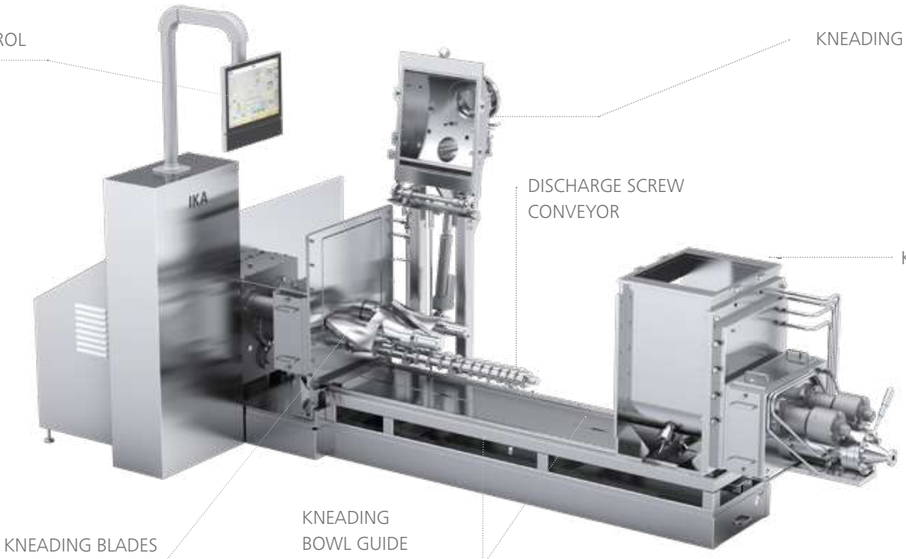
The interlocking DUPLEX kneading blades in the HKD ensure a good kneading and dispersing effect. Running at a ratio of 2:1, the two kneading blades scrape each other off as they overlap. The increasing and decreasing high pressure and shear forces make for intensive mixing and a fine dispersion of the kneaded material in a very short time. The kneading blades are mounted on both sides inside sturdy roller bearings.

The axial spacing of the kneading shafts in the HKS kneading machine is greater than the outside diameter of the kneading blades. The blades do not overlap, therefore, and do not scrape against one another. The counter-rotating movement of the kneading blades causes the kneading material to move continuously. The kneading blades move at a speed ratio of approx. 5:3. Due to the different speeds of rotation of the kneading shafts running in opposite directions, high pressure forces and thus intensive mixing results are achieved.

The HKS and HKD kneading machines can be emptied either by tilting the kneading bowl or by using the integrated discharge screw conveyor. To make cleanup easier, the HKS and the HKD can optionally be equipped with a removable partition or a kneading bowl. Further options include vacuum systems, temperature control systems, granulation systems and metering systems.

Suitable applications for the HKS / HKD kneading machines include

- Dental materials (plastic or ceramic)
- Industrial ceramics
- Hot melt adhesives
- Manufacturing of abrasives
- Graphite materials
- Sealants
- Lubricants
- Building materials
- Carbide materials



TYPE	VOLUME (l)	DRIVE POWER (kW)	DIMENSIONS INCLUDING DISCHARGE SCREW CONVEYOR, approx. (L x W x H) mm
HKD 2.5	1.75	0.75	1175 x 360 x 460
HKS / HKD 10	7	1.5 / 2.2	1365 x 500 x 1350
HKS / HKD 25	17	2.2 / 4	1450 x 880 x 1280
HKS / HKD 50	35	4 / 5.5	1920 x 700 x 1400
HKS / HKD 125	85	7.5 / 11	2070 x 1000 x 1770
HKS 200	140	15	3190 x 2390 x 2365
HKS / HKD 250	170	11 / 15	2975 x 1255 x 1890
HKS / HKD 500	350	15 / 22	3400 x 1640 x 2750
HKS / HKD 1000	700	37 / 37	3830 x 2030 x 3600
HKD 1400	980	45	3970 x 2000 x 3550

Further sizes upon request.

HKD 1400

PLANETRON HKV vertical kneading machine

/// Planetary movement of the blades for intensive kneading

The HKV (heavy duty kneading - vertical) vertical kneader is a kneading machine with vertically-arranged, DUPLEX-like kneading blades. The two kneading blades move in relation to each other like planets: One kneading blade revolves around another rotating, central kneading blade. In doing so, both kneading blades brush against one another. The increasing and decreasing pressure and shear forces make for intensive mixing and the finest dispersion of the kneaded material in a very short time.

The HKV vertical kneading machine comes in different ranges. Either with a constant speed ratio (around 1.2) in the 2000 series, or, as the 3000 series, with an additional central drive that enables a variable speed ratio (around 1.2 to 10).

The mixture to be kneaded does not come into contact with seals or bearings, since these are located higher up, above the mixture. Product purity guaranteed. The use of several kneading bowls makes the process semi-automatic. The kneading blades are cantilevered in sturdy roller bearings, which are located above the level of the kneading material. The 2000 series is driven by one motor, and the 3000 series by two separate motors. The speeds can be smoothly adjusted via the frequency converters.

The vertical kneading machine can be supplemented or enhanced with attractive features. An ATEX version is available, for instance, as well as a vacuum emptying system. The tungsten carbide or hard chrome coating protects against wear and tear. In order to make discharging the kneaded mixture easier, optional lifting and pressing devices are also available.

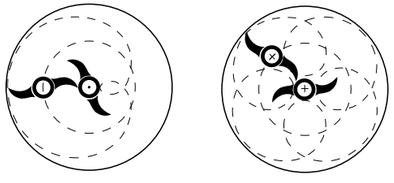
Suitable applications for the HKV vertical kneading machine

- Dental materials (plastic or ceramic)
- Industrial ceramics
- MIM / CIM (metal injection molding and ceramic powder injection molding)
- Manufacturing of abrasives
- Graphite products
- Sealants
- Lubricants
- Pharmaceutical products

HKV 800

TYPE	VOLUME (l)	DRIVE POWER (kW)	DIMENSIONS approx. (L x W x H) mm
HKV 1	0.5	0.12	400 x 600 x 880
HKV 5	2.5	0.37	600 x 660 x 860
HKV 25	12.5	1.5	960 x 800 x 1800
HKV 50	25	2.2	1140 x 935 x 2150
HKV 100	50	4	1370 x 1045 x 2295
HKV 200	100	5.5	1660 x 1280 x 2635
HKV 400	200	11	2040 x 1570 x 3300
HKV 800	400	18.5	2600 x 2320 x 4300
HKV 1600	800	45	3400 x 2700 x 4550
HKV 3200	1600	75	4200 x 3600 x 6000

Further sizes upon request



Movement diagram of the planet-like rotation with different speed ratios of the two kneading blades

HKV 1 S2000

Conterna continuous kneading machine

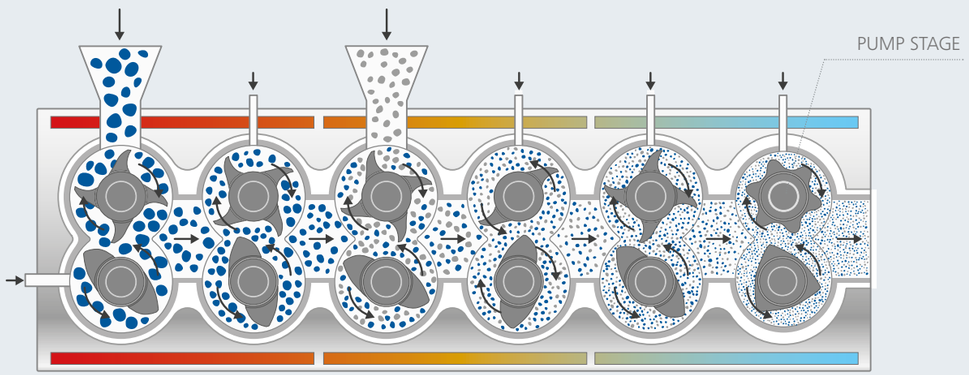
/// For an intensive, gentle and homogeneous mixture of substances

The Conterna HKC (heavy duty kneading - continuously) is designed for high volumes and represents the actual heart of production in many systems. High-viscosity mixtures can be processed in an optimum manner using this multi-chamber mixing system, consisting of kneading chambers connected in series. Depending on the specification and product / process requirements, the Conterna can be equipped with anywhere from 1 to 15 kneading chambers (more chambers available on request). Reliable shaft sealing can be ensured by implementing different sealing systems, such as gap seals and shaft seals.

In each kneading chamber there are 2 DUPLEX-like kneading blades, mounted one above the other, the speed of which can be smoothly adjusted with the help of a frequency-controlled drive. The metered solid or liquid material is continuously moved along from kneading chamber to kneading chamber by the kneading blades to be then discharged from the final processing chamber. Additional solids or liquids can be added in all of the chambers.

The upper, slower, kneading blade on the Conterna HKC can be equipped with either two-wing or four-wing kneading elements. The lower, faster kneading blades, on the other hand, are always equipped with 2 wings. The rotation of the kneading elements is always at a ratio of 2:1. In order to achieve a higher discharge pressure, the last chamber can be equipped with a pumping stage.

With the Conterna, you can design your production very efficiently, practically and always according to your wishes: Thanks to the strong shear forces, production time can be saved and the compact design requires minimal space. The continuous kneading also means that less staff are needed. For easier cleaning and better accessibility, the option to open the kneading chamber block hydraulically is also available. The kneading blades, which can be optionally heated and cooled, guarantee reliable temperature control of the mixture. The shear force can be increased by a factor of 2.5 using the optionally available high viscosity kneading blades.



Processing principle of the HKC

Technical data*

/// Conterna HKC continuous kneading machine

MACHINE TYPE	HKC 6/2,0
DIMENSIONS AND WEIGHTS	
Overall dimensions (L x W x H) mm	1860 x 1520 x 1300 mm
Weight	approx. 2 t

KNEADING CHAMBER		**PUMPING CHAMBER**	
Number of processing chambers	5	Number of processing chambers	1
Number of kneading drives	5	Number of drives	1
Total volume per chamber	2 l	Total volume per chamber	2 l
Drive power per chamber	4 kW	Drive power per chamber	1.5 kW
Speed of the lower, faster kneading blades (min^{-1})	3 – 33 min^{-1}	Speed of the lower, faster pump wing (min^{-1})	1 – 10 min^{-1}
Speed ratio of lower to upper tool	2 : 1	Speed ratio of lower to upper tool	2 : 1

MACHINE TYPE	CONTERNA HKC 2	CONTERNA HKC 25	CONTERNA HKC 50	CONTERNA HKC 100
GENERAL CHARACTERISTICS				
Volume up to (kg/h)	80	1 000	2 000	4 000
Drive power of kneading chamber (kW)	4	15	37	75 - 90

* Parameters such as the speed of the kneading blades depend on the mixture and its viscosity and can even be varied from kneading chamber to kneading chamber with the Conterna. This data should therefore be viewed as an example.

Suitable applications for the Conterna HKC continuous kneading machine

> Silicone mixtures
> Masterbatch for the automotive industry
> Ceramic mixtures
> Carbide mixtures
> Graphite mixtures
> Organic and biological plastics

HKC 14/100

HKC 12/50