

PRESS RELEASE

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amixon[®] mixing technology for professional tea-preparation

Definition and distribution

Reading the cultural and historical backgrounds of tea, the layperson is tempted to draw one or more parallels with wine culture. Both grapevines and (Darjeeling) tea plantations are found on steep slopes and their fruit can often only be harvested by hand. For example, pickers need to gather more than 10,000 leaves to obtain one kilogram of Assam tea. For all their differences, both end products are the result of fermentation processes. The vine, like the tea plant, has been cultivated for thousands of years and both types of plant can reach a considerable age. Vineyards and tea gardens require a lot of manual work and care to guarantee the yields. Weeds need constant suppression as these angiosperms can be extremely vigorous. Weeds may contain natural toxins, for instance pyrrolizidine alkaloids. Like pesticide residues, these must under no circumstances be allowed to contaminate the final product. And like the taste of good quality wine, a good tea can stir our senses and generate feelings of wellbeing and relaxation.

According to ISO-standard 3720, only the leaves of the *Camellia Sinensis* can be described as tea. Members of the flowering plant family Theaceae, they are evergreen highland shrubs or small trees. They are robust and even briefly frost-proof.

In German, the term "tea" is generally understood to cover infusions made from any dried plant derivative. In the Romanic language regions, linguistic differentiation is made between the traditional tea (tea leaf from the *Camellia Sinensis*), herbal tea and fruit tea. For example, Rooibos tea is not tea in the traditional sense.

Tea is a high-quality commodity. Around 6.1 million tons of tea were harvested worldwide in year 2017 with China (40%) and India (22%) being the largest producers followed by Kenya (7%), Sri Lanka (6%) and Turkey and

Vietnam (4% each). Pakistan, Russia and the USA are the three biggest tea importers. In Europe, according to Wikipedia, the per capita consumption in East Friesland is the highest, followed by Great Britain, Ireland and Poland. The pleasure of tea drinking, alongside the reviving effect and colour of the infusion, is derived from the taste and aroma.

Quality management for good tea has to go right back to the beginning, to the tea garden and the determination of the harvesting time, purity of the harvest and transport. The fermentation stage is crucial to determining the quality. The tea leaves are rolled after harvesting to release moisture containing the plant's unique enzymes. The presence of oxygen then triggers the fermentation. The colour of the tea leaves changes, as does the aroma. A feed of hot, dry air or steam halts the fermentation. A short fermentation period results in green tea, a longer fermentation produces black tea. The tea is then dried precisely according to its type and prepared for packaging and safe transport. It must be stored in cool, dry surroundings.

The publications of ISO 3720 2011-04 and directives of the German Tea Association are concerned with the issues of tea production quality from the garden to the consumer.

Tea comes from many countries and is blended and drunk in many more. This places great demands on the industrial mixing and preparation technology.

Tea houses all over the world generally process and sell not only traditional black and green tea but also fruit teas, which are made of dried fruit, plant and herb derivate and prepared in a similar way to traditional tea.

The mixing process is important from many perspectives. First, harvest batches are gathered from a wide range of different gardens, regions and harvest times in order to achieve a desired quality standard. Batching is the process of homogenization and often requires the blending of large volumes. The mixing process itself can be very demanding because the form and structure of the tea leaves / dried fruit derivate may not vary. Fine particles and dust are undesirable.

Blending often takes place in free-fall mixing systems. Here, different tea varieties can be blended and aromatics can be added in powder form. The mixing of liquid aromatics is possible only to a limited extent.

If we analyse the tasks of a mixer in the tea processing factory, there are important criteria as follows:

- High mixing quality
- Minimal energy input (retention of particle structure and size)
- Short mixing times
- Universal applicability for different particle qualities (fibrous or finely dispersed, coarse to very coarse, free flowing to clumping, dry or damp)
- Ideal mixing qualities despite different fill rates

- Fast and even wetting when liquid aromatics are added or when dust binding is all that is required
- Rapid and residue-free emptying
- Can be cleaned when wet or dry
- Optional automatic cleaning
- Optionally sterilisable
- Reliable drying after wet cleaning / short set-up time
- Convenient, ergonomic accessibility

As a manufacturer of precision mixers, amixon GmbH from Paderborn has addressed the above tasks with particular intensity and established a range of different solutions based on the vertical helix mixer. It is the accumulation of some 37 years of experience in the tea, aromatic, herb and spice industry. A well-equipped factory laboratory provides the practical verification for small and large batches; and optionally more than 5m³. The tests also furnish the user with valuable ideas for different preparation details. It is often possible to combine several process steps into one.

Twin-shaft mixer in “Off-Line-process”

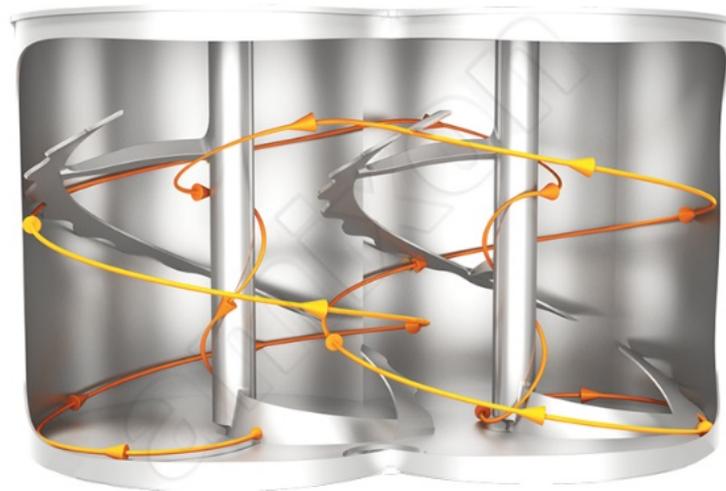
In general, producers of food and gourmet products bear a great responsibility. Infusion beverages must taste good and be one hundred percent pure. These high-quality demands are only met if the raw material components are prepared in quality-controlled systems. Short mixing times ensure that the particle structure of the raw materials is retained. We offer established solutions, particularly when the challenge is to mix in superfine components such as liquid aromatics, vitamin supplements or powdered aromatics.

The amixon® twin-shaft mixer is particularly suitable for larger batches of around 2m³ to 25 m³. The mixing tools only start to rotate once the last powdered recipe ingredient has been added. Liquids can be added during mixing. Ideal mixing qualities are obtained after 20 to 40 revolutions. Then the closures open and the finished mixture flows into containers or big bags. The mixer empties up to 99.98%. The filled big bags or containers are taken to the packaging plant and their contents transferred.

The twin-shaft mixer described here mixes precisely and very gently. **The mixing time often lasts only 20 to 30 seconds.** Delicate components such as herbs, tea leaves or agglomerated aromatics from fluidized bed granulation or from the spray tower remain practically intact. If required, the vertical twin-shaft mixer can also be produced as a vacuum version. This allows the removal of atmospheric oxygen by the application of a vacuum. Saturation to atmospheric pressure is achieved by the addition of inert gases.



Twin-shaft mixer for large tea batches of 10 m³ and more



In off-line mixing, the blending process is decoupled from the transferring process. This saves time because while the filling machine is transferring product into cans, bags, sachets and tea bags, the mixer can be cleaned and prepared for the next mixing operation.

The benefits of the amixon® twin-shaft mixer for the user are as follows:

- Ideal mixing qualities with very short mixing times. Mixing process is particularly gentle to the product.
- Space-saving design, particularly suitable for large batches. Only one quality analysis per large batch.
- Extremely rapid emptying, optionally simultaneously into up to four containers. Particularly effective emptying of residues by up to 99.98% and better.
- The filling degrees can vary from about 15% to 100% with this mixer.
- Maximum possible hygiene standards. Large inspection doors close with zero-clearance, permanently gastight.
- Dust ex zone 20-compliant mixing chambers available on request. The mixer can also optionally be manufactured in a pressure shock resistant, pressure resistant or vacuum-tight version.

KoneSlid® mixers for “end-of-the-line mixing”

The KoneSlid® mixer from amixon® has been specially developed for “end-of-the-line” production concepts for the luxury food industry. In this method, all processing apparatuses are located one below the other. The



finished mixture flows from the mixer through the mixer outlet bin directly into the packaging machine. Cleaning work is greatly reduced because this mixer empties residue-free.

Batch sizes are generally 300 or 2000 litres. At low rotation speeds the KoneSlid® mixes very precisely and extremely gently. The mixing process is also particularly short. The design of the mixer ensures, for example, that sensitive agglomerates from the spray tower, fluidised bed granulation or from vacuum freeze drying are preserved. This mixer can also be supplied as a vacuum-tight version if required. This allows the atmospheric oxygen to be removed from the porous powder mixture during

mixing by applying a vacuum. Saturation is achieved by the addition of appropriate inert gas. Emptying takes place without segregation in just a few seconds. Free-flowing goods usually flow out completely, so that cross-contamination is excluded.

Source: Wikipedia, <https://www.teeverband.de>