GEA centrifuges are the first choice
Separation Technologies for Tea Applications
Legend has it that almost 3000 years ago while Chinese emperor Shen Nung’s servant was boiling some drinking water, leaves from a nearby tree accidentally blew into the pot. Fascinated by medicinal herbs, Shen Nung decided to try the new infusion. The leaves, of course, were from a Camellia sinensis plant . . . and so the global phenomenon of tea drinking was born.

Whether that’s fact or fiction, tea has been around for thousands of years and, after water, is one of the most widely consumed beverages in the world. In the UK alone, more than 165 million cups of tea are consumed every day. That’s 60.2 billion per year!

Often associated with formal ceremonies in many cultures, tea has not only become established as a daily ritual and part of popular culture, it’s also recognized that some varieties have certain health benefits because of their polyphenol, antioxidant and phytochemical content. In fact, the growing awareness and preference for healthier beverages is driving consumers away from carbonated soft drinks and further boosting the global demand for tea.

Beyond the traditional black variety, tea can be made from many different plants, such as fennel, hibiscus and ginger, to name a few, with a wide range of different flavors, such as Darjeeling, green or herbal teas.

Today, tea is the most widely used ancient beverage in the world, helping us to hydrate, stay warm on a cold day or simply enjoy the taste of its different varieties.

It is one of the few beverages that can be enjoyed hot or cold at any time of the day.

For manufacturers, ensuring that their tea is non-cloudy and has a clear, sparkling appearance is paramount for consumer acceptance.

**GEA centrifuges are perfectly designed for the following products:**

- Tea extract
- Black tea
- Green tea
- Oolong tea
- Herbal tea
- Fruit tea, etc.
- Instant teas

**Convenience is in Demand**

Consumers love brilliantly clear teas.
Serving the Ready-to-drink Industry

Premium beverages start with extremely pure tea extracts.

GEA clarifiers have a considerable role to play in the production of ready-to-drink (RTD) teas. Offering a significant benefit to manufacturers, they do what other technologies are unable to achieve: In the most cost-effective way they ensure that the teas are bright and visually attractive when they reach the market.

**Extraction**
Many extraction processes run in batch mode and simply comprise a hanging basket system (open system design). Such systems can be used for multiple extractions.

**Course filtration**
Aiming to remove any large and hard particle content to protect the downstream equipment, a number of different technologies can be used, such as vibration sieves or rotating drums. The course filtration is normally followed by a bag filter step to remove the smallest tea leaves.

**GEA clarifiers for a perfect clarification**
The key step in RTD production: GEA clarifiers completely remove very fine particles and prevent sedimentation when bottled. They also standardize the turbidity for a reproducible tea quality.

**Further processing**
After clarification, the tea is ready for blending, homogenization, pasteurization and bottling which can also be found in the GEA portfolio.

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**Diagram:**
- Tea leaves
- Cleaning
- Hot water
- Extraction
- Spent tea leaves
- Course filtration
- Insoluble solids (100 percent out)
- Clarification
- Clarifier
- Further processing
Boosting Productivity

GEA separators and decanters ensure highest quality and maximum yield.

The active substances are extracted from tea leaves. The soluble components define the taste, aroma and the product quality. The remaining insoluble compounds are removed completely by a two-stage process using GEA’s decanters and clarifiers. After the initial extraction, coarse particles are separated by GEA decanters. Those coarse particles are submitted to a second extraction – again with GEA decanters. The proven set-up of a two-stage extraction with GEA decanters ensures maximum yield at lowest input of raw product. Subsequently, GEA clarifiers are used to remove the finest insoluble particles – up to 100 % – to ensure the production of brilliantly clear teas.

Consistently High Quality

GEA’s polishing clarifiers provide the brilliant clarity that consumers want.

GEA decanters and separators are specifically designed to meet the stringent demands of tea extract clarification. The decanters optimize product yield by delivering a high level of dry matter from the separated leaves. Clarifiers benefit from higher centrifugal acceleration compared with decanters and, as such, are used to polish the extracts. This high g-force also guarantees that extremely small particles are separated.

Our GSE, GSI and GSC series separators are characterized by their high level of clarification efficiency, which also translates into a longer active lifespan of downstream evaporator – also available from GEA – and greater overall productivity. Furthermore, GEA’s self-cleaning separators are equipped with the latest bowl discharge technology.

To comply with stringent product requirements, any insoluble solids that contribute to turbidity must be removed from the tea extract. GEA decanters and self-cleaning separators reliably fulfill this task.

Advantages at a glance:
- Optimum product yield
- Consistently high product quality
- Continuous clarification, no stopping for discharge
- Maximum clarification efficiency
- Hygienic design
- Absolute reliability
- Non-stop operation
- Simple integration into existing clean-in-place (CIP) systems
- Integration into automated processes using a programmable logic controller
- Minimal oxygen pick-up
GEA Clarifiers – Specifically Designed for the Tea Industry

Self-cleaning clarifiers represent the state-of-the-art in centrifugal technology. Satisfying the need for continuous operation in the tea industry, they meet and exceed all current requirements for high quality and optimum yields.

Continuous operation with self-cleaning clarifiers
Clarifiers with self-cleaning bowls operate continuously without interruption. The optimum moment for solids discharge is identified by the machine’s photoelectric control system.

These clarifiers are equipped with a disc-type bowl and an internally or externally operating sliding piston. The liquid is quickly and gently clarified in the disc stack, such that the solids flow outwards and accumulate in the sediment holding space.

As soon as the optimum moment for ejection is reached, the movable piston is hydraulically opened; the solids are instantly discharged at full bowl speed and the piston returns to the closed position. Clarified liquid is extracted under pressure by centripetal pumps. The operating noise (sound pressure level) of these clarifiers is less than 78 dB (A). As such, the need for external sound insulation is eliminated.

Minimal oxygen pick-up with hydrohermetic design
Oxygen pick-up is prevented without the use of mechanical seals. Instead, a liquid seal is created by a centripetal pump and an additional stationary disc, which submerges into the rotating liquid. The product therefore retains its aromatic compounds and does not come into contact with atmospheric air.

GEA hydrostop system for precise bowl ejection
GEA hydrostop, a patented hydraulic bowl system, ensures the fast and accurate ejection of the solids. Ejection volumes can be adjusted during operation with no interruption to the product feed. Plus, the solids are highly concentrated to prevent product loss and increase overall yield.

GEA Decanters – High Performance and Low Energy Consumption

Decanters are solids-oriented centrifuges with a solid-wall bowl. They have been developed to deliver high levels of clarification and superior solids drying performance. Key criteria to achieve this include, among others, a high bowl speed, an extremely high scroll torque and a control system to synchronize the differential speed with the solids load.

GEA summationdrive
The GEA summationdrive always provides the full torque requirement across the entire regulation range. It only supplies the power that’s required, because the secondary motor is operationally redundant and there are no braking effects.

Conversion to a higher differential speed is possible without having to replace the gear, and can be provided across a wide range without interruption. The drive is equipped with a multi-stage oil-lubricated planetary gear with two input shafts. Three planetary gears of different sizes for each decanter enable rapid adjustment to accommodate changing process conditions and/or torque requirements.

Quality, performance and economy
- Highest possible dewatering with maximum efficiency
- High operating safety, reliability and low wear
- Rapid adjustment of machine parameters to changing products and processes
- Low labor costs and operating expenses
- Automatic, simple and continuous operation
- Easy to maintain, small footprint
- High-precision manufacturing ensures easy onsite replacement of parts
- Easy access, simple assembly and disassembly
- Fast delivery of spare parts and 24 hour repair service
GEA Service – For your continued success

GEA Service offers dedicated teams of service experts. Our focus is to help our customers build, maintain, and improve their performance, market presence and competitive edge for the entire life cycle of their plants and equipment.

Partnering with GEA gives you the benefit of our world-renowned, customer-tailored service and recommended spares upgrade, modernization and optimization services. With our support you can be certain that every piece of GEA equipment and technology will operate optimally from day one, and for its complete lifespan, to give you maximum return on your investment.

• Getting you started – Seamless support for instant productivity and performance
• Keeping it running – The cost-efficient way of ensuring the safety and reliability
• Constantly improving – Sharing our knowledge to safeguard your investment
• Together with you – Enduring commitment to you and your business
We live our values.
Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is a global technology company with multi-billion euro sales operations in more than 50 countries. Founded in 1881 the company is one of the largest providers of innovative equipment and process technology. GEA is listed in the STOXX® Europe 600 Index. In addition, the company is included in selected MSCI Global Sustainability Indexes.