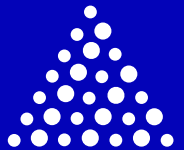




BATCH PROCESSING SOLUTIONS.

For Oral Solid Dosage Forms.



Every GEA plant and system is a unique union of proven technology and individual solutions.

GEA, a trusted supplier of pharmaceutical processing solutions, offers a comprehensive range of tableting technologies, from powder handling and granulation to drying, pelletizing, compression and coating. Whether batch or continuous, for contained production and/or direct compression applications, we have the know-how, equipment and expertise to optimize your oral solid dosage production.

GEA supplies standalone machinery, engineering services and completely integrated end-to-end process lines for even the most challenging products, including potent APIs, MUPS tablets, effervescent and/or multilayer pellets.

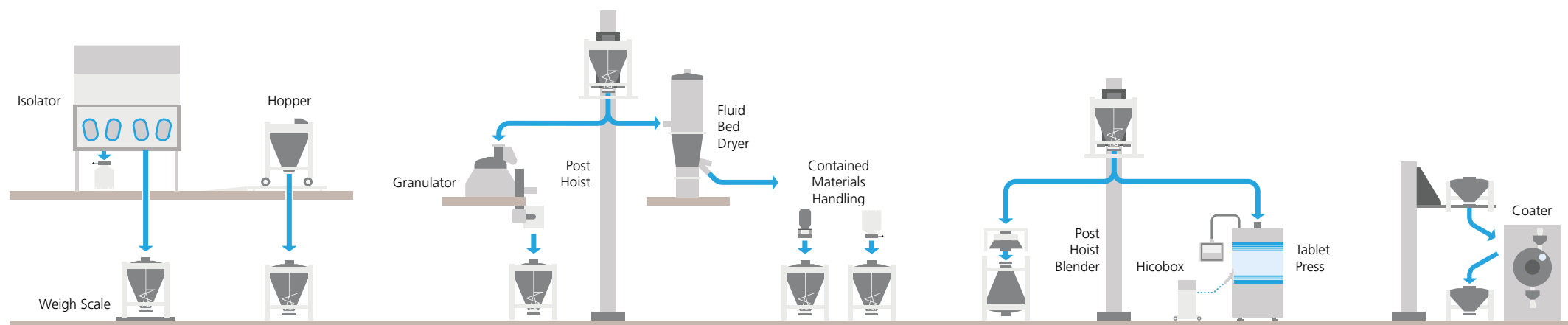
Plus, as containment experts, we offer the largest selection of solutions for contained processing based on a thorough containment risk analysis. Our technology is world renowned for its reliability, flexibility and economy.

We offer truly rapid changeover solutions, increased productivity and safety. But it's much more than that; it's about how we work with you, the customer. We understand your needs; we use our expertise and know-how to develop solutions and optimize processes that bring your products to market quickly and provide the commercial advantage you need.



From Powder to Coated Tablet.

Manufacturing solutions that maximize operational reliability and productivity.



Experts in every aspect of batch processing, GEA offers a complete range of technologies for the production of solid dosage forms: from powder handling to granulating, drying, tablet compression and coating, including the first ever continuous high shear granulation, drying and tableting system.

Irrespective of the scope or complexity of your operation – from R&D through scale-up to commercial production – we have an unrivaled history of identifying the most appropriate solution for your specific application.

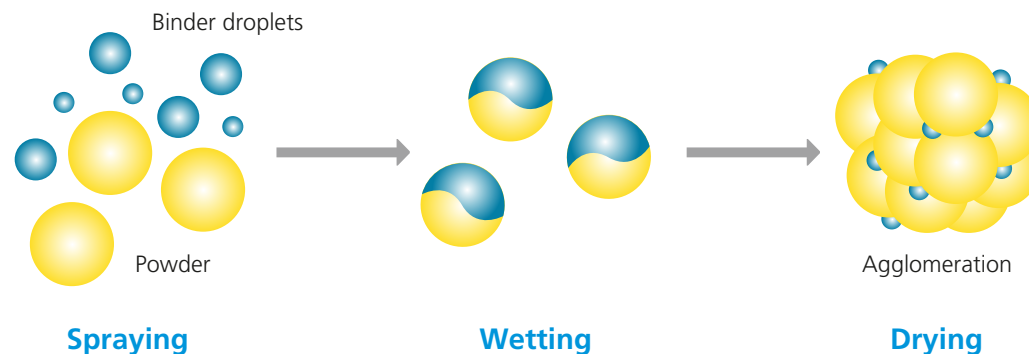
GEA's entire range of process equipment is designed with system integration in mind. A modular approach allows customers to select standard process modules to suit project needs.

Fluid bed dryers and coaters can be combined with top-drive and bottom-drive high shear mixer/granulators, wet and dry milling facilities, product handling systems, binder and coating preparation units, filtration units, tablet presses, all designed for fully integrated systems.

Containment solutions, digitalization and online monitoring systems can be incorporated into both manual and fully automated lines, and third-party equipment can also be accommodated to enhance your process, improve your production efficiency and deliver the ongoing support you need to make your business a success.

Batch Processing Solutions: Granulation.

Granulation, which allows primary powder particles to adhere and form granules, is the single most important unit operation in drug manufacturing.



A number of different granulation and compression technologies are available to pharmaceutical manufacturers, all of which have individual strengths and weaknesses depending on the specific application.

Whereas the use of a high shear granulator with a fluid bed dryer is still the most widely used combination, offering both high levels of productivity and versatility — particularly for large volume products and long campaigns — there are a number of granulation technologies available to pharmaceutical manufacturers.

Why Granulate?

Granulation involves smaller particles adhering to each other to produce larger particles or agglomerates and is often required to improve the flow of powders or the mechanical properties of tablets. It's also used to improve flow, compressibility, bioavailability, homogeneity, electrostatic properties and stability of solid dosage forms.

As granules are usually obtained by adding binders, either as solids or as liquid solutions, a working knowledge of the powder particle size is critical to ensure consistency. Plus, understanding and controlling the many variables in the granulation process is key to ensuring the repeatability and consistency of the finished product.

The GEA Advantage

Using strict scientific or cost-benefit criteria, GEA can help you to select the most appropriate equipment for your application. For example, single-pot technology offers numerous advantages; the machine can be cleaned in less than 2 hours; it's an extremely productive tool for short campaigns or those that require a large number of product changeovers; and, as a unit operation, it is perfectly suited for the PPE-free processing of potent substances.

The advantages of tangential spray systems have long been recognized by GEA and incorporated into the FlexStream multipurpose processor. Similarly, the ConsiGma® platform addresses the pharmaceutical industry's progressive implementation of continuous processing to improve production quality in an efficient and cost-effective way — and comply with increasingly stringent regulations.

Based on standard components, such as GEA high shear mixer granulators and fluid bed dryers, we supply plant for R&D, cGMP and commercial production — including emission control and solvent recovery options, outlet filters and containment solutions — that are configured to meet specific customer requirements.

With projects completed around the world and literally thousands of tests performed, we have established a solid base of expertise related to the needs of the pharmaceutical manufacturing industry.

**For more information**

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