

GEA CODEX®

Advanced automation and data solution for all your
manufacturing operations.

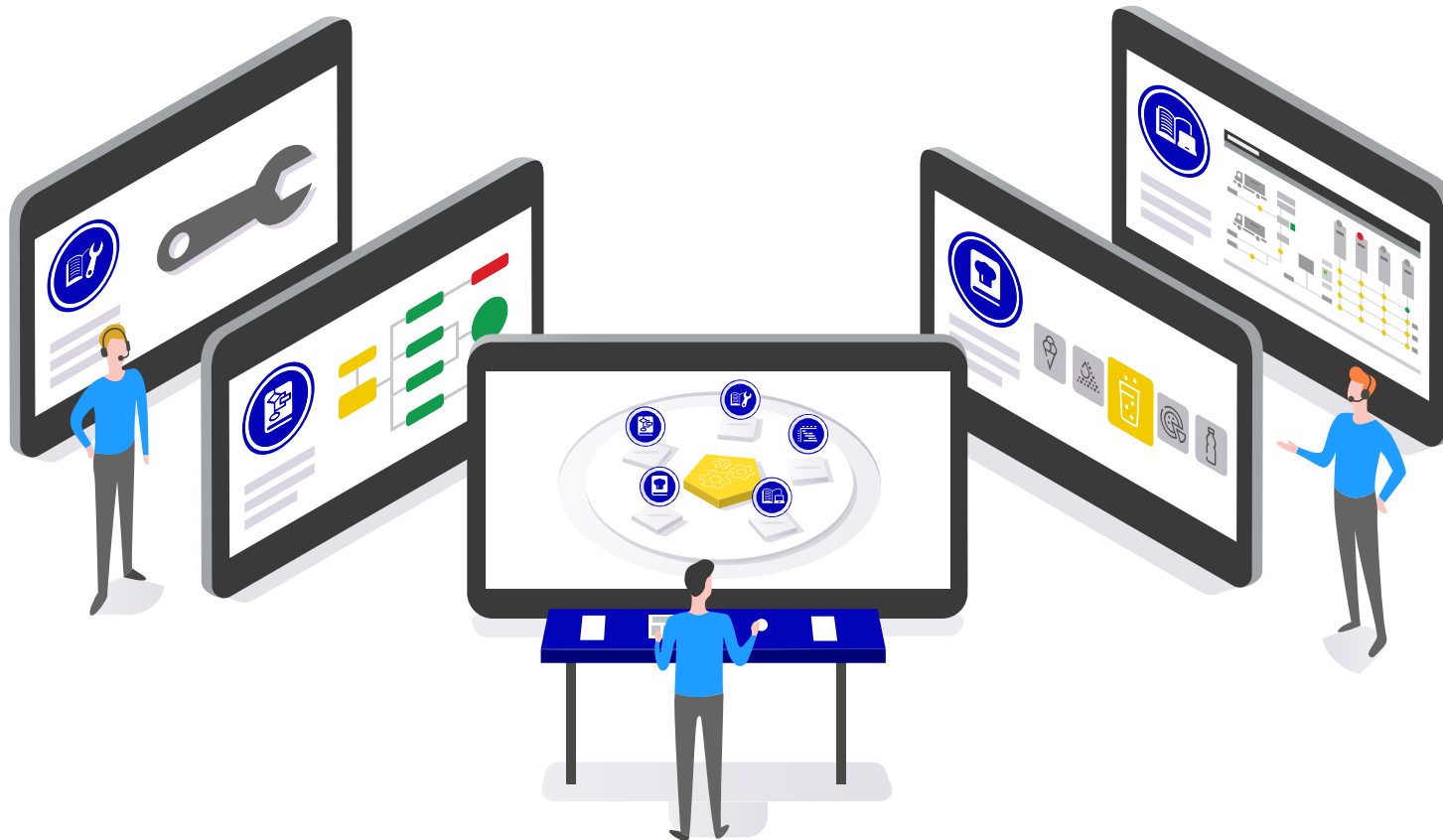
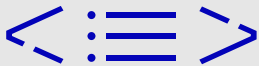


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GEA Codex®

Different environments need different solutions and adaptations.

Diversity is one of nature's key concepts to cope with changing and variable environments. This strategy is also a strength in automation: different environments and trades need different solutions and individual adaptations. Whether in the beverage, brewing, chemical, dairy or, new food industries, automation and control systems have different requirements and need specific solutions.

Your benefits:

- Stay independent and not bound to any supplier
- Make sure your production plant operates safely
- Have a fully integrated automation landscape with a common platform
- Ensure reliable service & maintenance capabilities
- Acquire a proven automation solution that protects your investments and enables you to benefit from digital services based on your data
- Find an MES solution that bridges the ERP system and automation layer.

Bring knowledge from process technology & plant engineering together

GEA's strategic solutions:

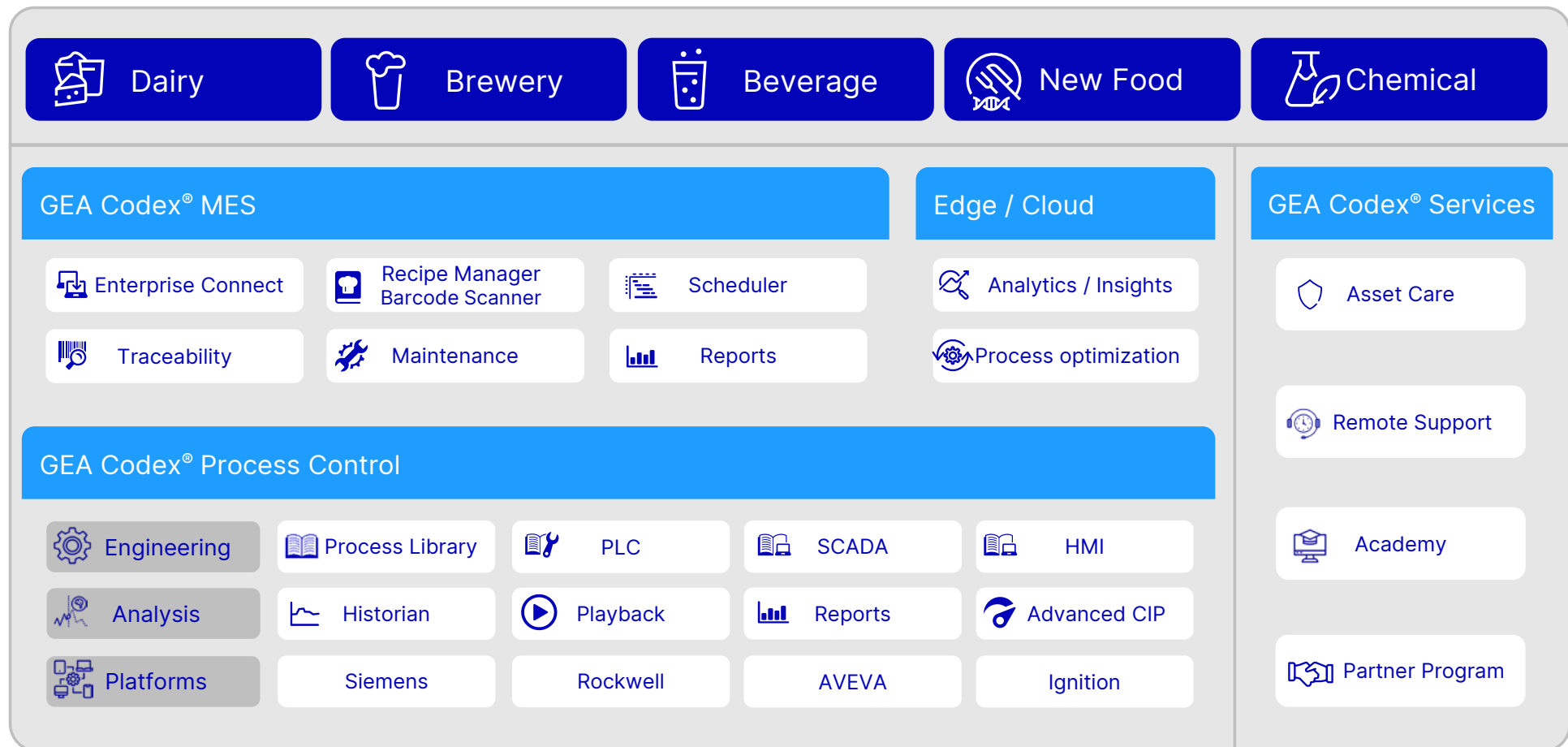
- As system integrators we bring our knowledge from process technology and plant engineering together with software products from market leaders
- Wide spectrum of innovative solutions for process automation and services: from the provision of electronic process control up to integrated, company-wide network systems, complete with the corresponding manufacturing execution systems (MES)
- For the MES level: we supply database-supported applications for quality assurance, increased productivity and verification management
- Automation solutions based on superior industry expertise
- Global network of technology and development centers to provide perfect, practice-oriented solutions –whenever and wherever you need them
- Local and global support network to ensure 24/7 availability and expertise across different time zones.



GEA Codex®: automation solution for beverage, brewing, chemical, dairy, new food and pharmaceutical industries

GEA offers a portfolio of well-proven systems for the control and collection of process data. We can tailor and supply operating systems for single plants, complete lines, or enterprise-level oversight.

At the heart of the comprehensive GEA automation concept lies a versatile toolbox consisting of three essential parts: GEA Codex® Process Control, GEA Codex® Manufacturing Execution System (MES), and GEA Codex® Services. These modules combine visualization level and control-level functionality into a customizable supervisory control system. Additionally, with the inclusion of Services the system offers extensive support for plant operations.





GEA Codex® Process Control for optimum process performance.

Optimum process performance needs the input of experts in technology and automation. GEA specialists have the know-how to select and adapt control tools to provide optimum process performance. As integration specialists we offer automation solutions that are based on general software platforms.

GEA Codex® Process Control is an open and flexible framework that incorporates GEA process know-how into templates for market-leading platforms such as Siemens, Rockwell, AVEVA and Ignition.

The design of Codex Process Control is based on the GEA style guide, following high-performance HMI Philosophy principles.

Optimized contrast and color to avoid eye strain with visual effects that are limited to abnormal situations, enables the operator to focus on the most important information to ensure efficient plant operation.

This solution contains specific modules and libraries that adapt to different operational processes and industries, thereby allowing

companies in a variety of sectors to use it as an established standard.

GEA Codex® Process Control allows you to monitor and control all your processes — either batch or continuous, from single machines to large complex process lines — in real-time with a high degree of customization based on customer needs and expectations.

Your benefits:

- High-performance HMI provides a harmonized experience that ensures operational efficiency
- Plant control based on ISA-88
- A consistent visualization and functionality across multiple platforms, so you can choose the best solution for you
- Ensure repeatability and consistent product quality
- Electronic signatures for Siemens, Rockwell and Ignition
- Scalable from small skids to very large plants
- Full logging of operating cycles and running time.





GEA Codex® MES for highly customizable functionalities.

GEA Codex® MES is a suite of manufacturing execution system (MES) applications that can be used to build complete MES/MOM (manufacturing operations management) landscapes for projects covering a wide variety of requirements, including interfacing with ERP (enterprise resource planning) systems.

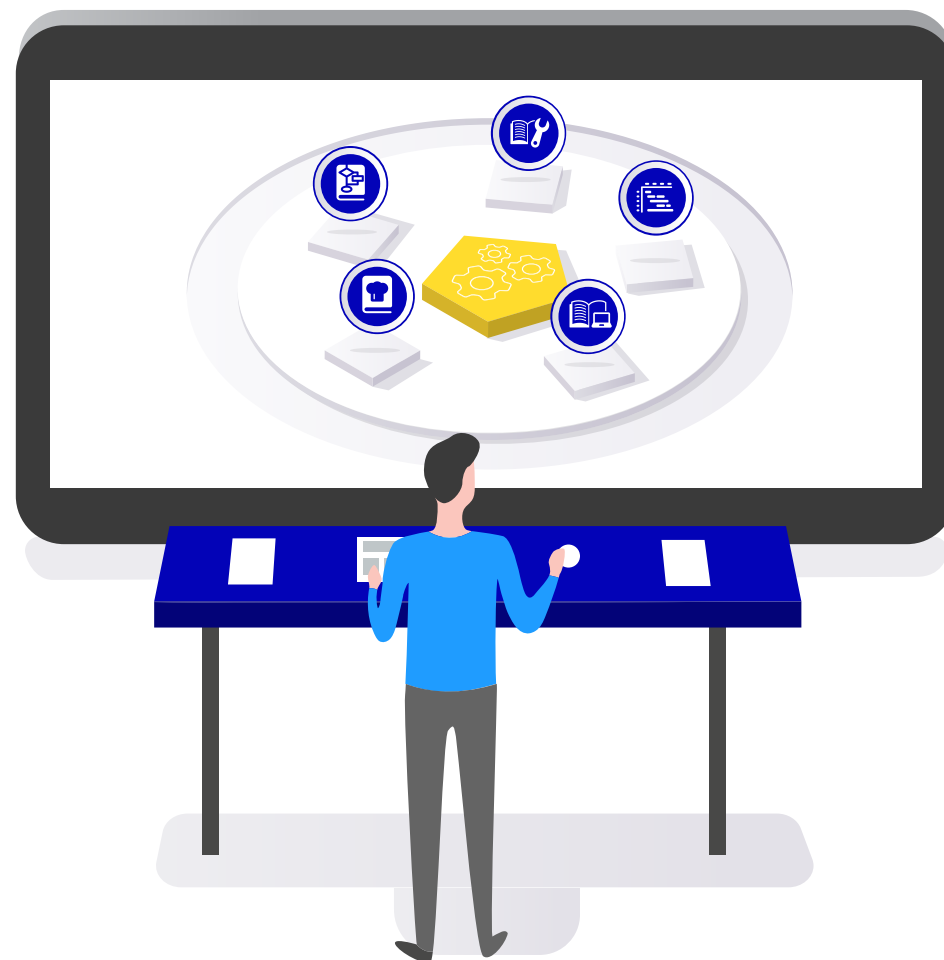
Developed with the latest technologies, it is designed to optimize your manufacturing process from raw material to finished goods.

GEA Codex® MES is built on modules:

- **GEA Codex® Enterprise Connect:** acts as a single point of communication for GEA Codex® modules. It has a small footprint with multiple data transmission interfaces to exchange information with various external systems, including non-ERP ones.
- **GEA Codex® Recipe Manager:** Includes material definition, management of BOMs, advanced scheduling, and the ability to manage production orders from the customer's ERP system using Codex Enterprise Connect.
- **GEA Codex® Barcode Scanner:** Integrated with the Recipe Manager, it captures critical

and useful information to ensure batch consistency, prevent risk of mistakes and update inventory records.

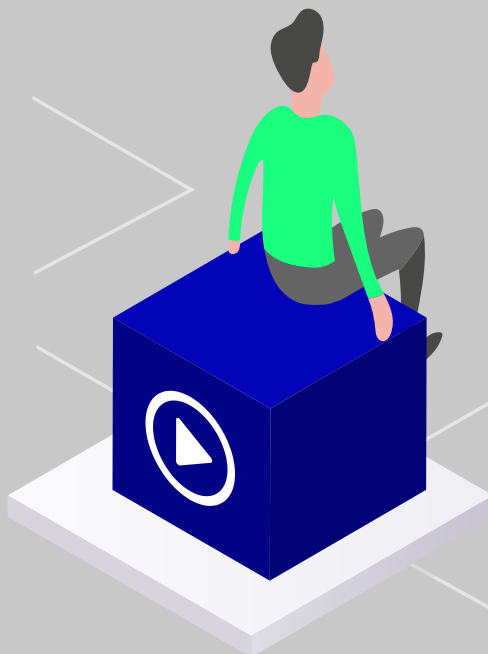
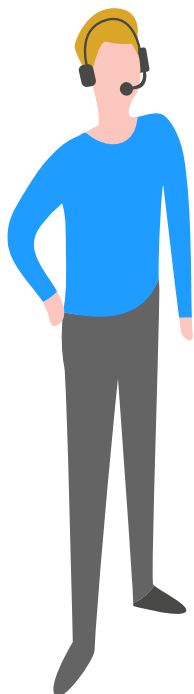
- **GEA Codex® Traceability:** records the transfer of materials, quantities and lot numbers from goods received to finished product.
- **GEA Codex® Historian:** feature-rich data recorder that adds transparency to any process. It supports various presentation formats—from stacked digital to Gantt style—and a variety of data entry techniques.
- **GEA Codex® Report:** fully configurable with the ability to generate weekly, daily or shift-based reports. The information can be used in process documentation to meet regulatory and legal requirements.
- **GEA Codex® Advanced CIP:** collects the needed CIP data and enables you to improve the overall performance of your site.
- **GEA Codex® Plant Playback:** Travel back in time for a recorded history of plant activity. This module animates your SCADA Historian data to improve both production and safety.
- **GEA Codex® Maintenance:** Monitors the assets and provides dashboard-based reports and alarm deviations.



**Your benefits:**

- Modular and scalable system that allows you to choose what you need
- Reliable solutions optimized for plant operation
- Reporting targeted to different plant operation staff such as operators, maintenance staff and managers, to ensure well-informed decision making
- Compliant with standard ISA-95
- Helps with regulatory compliance (if required, agencies can access information)
- Secure by design
- Seamlessly integrated with GEA Codex® Process Control, providing consistent operation with a common look and feel.

For customers who need a highly customized solution, and integration with other existing or proprietary systems, GEA has the expertise to design and implement projects according to customer demands.





GEA Codex® Services to maximize plant operations.

GEA Codex® Services allows to optimize plant operations by maximizing the availability of the equipment, ensuring more secure operations and educating your employees by providing the right amount of knowledge and skills.

GEA Codex® Services is built on:

- **GEA Codex® Asset Care:** designed to increase the protection of your control system against cyber-attacks and other security threats. Ensure that your system remains up-to-date and operates at its highest potential.
- **GEA Codex® Remote Support:** uses remote monitoring and diagnostic tools to address unforeseen situations before they become major problems. Our team of experts can quickly diagnose issues and find solutions, ensuring that your plant remains operational and productive.

- **GEA Codex® Academy:** training system offering customized training programs to meet your specific needs. Provide your team with the knowledge and tools necessary to get the most out of your control system.

Your benefits:

- Benefit from a local and global Service Support organization
- Flexibility to choose the services that best suit the needs of the plant
- Access to systems specialists familiar with your control system. Minimize the cost of on-site technical support
- Ensure maximum efficiency and productivity while minimizing downtime and reducing costs
- Keep your system and personnel up to date
- Improve the security and control of your assets.



Customer cases with GEA Codex®.

US customer in Hard Seltzer market.



Challenge

The customer had to build and commission four production plants at four different locations in the US, very quickly, to take advantage of the fast-growing market for Hard Seltzer. The plants would also have to be commissioned during the COVID pandemic with all the relevant travel and quarantine restrictions.

GEA Solution

- Automation of the process units and process lines based on GEA Codex® Process Control
- GEA Codex® allows for decentralized engineering -many automation engineers, short time
- Commissioning by GEA staff located in the US with remote support by colleagues from Spain, Germany, India.

Customers Gain:

- Production capacity increased
- Flexible allocation of plant operators as same operation philosophy on all plants
- Reliable service and maintenance as automation engineers from the GEA office in the US are involved in all the projects. This ensures local after-sales support.

Customer cases with GEA Codex®.

Large powder plant in Poland.



Challenge

The customer wished to harmonize different technologies within the plant to create a homogeneous automation solution.

GEA Solution

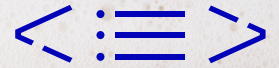
GEA Codex®, with GEA Codex® Process Control and GEA Codex® MES, was chosen for the complete automation of the plant, so automation experts from different locations used the same standards.

Customers Gain:

- High performance user interface with a user-friendly appearance designed with operator situational awareness in mind
- Homogenous automation landscape: complete plant is covered by one PLC and HMI type
- Safe operation: all technology parts in the plant follow the same software standards and have a consistent operation philosophy.

Customer cases with GEA Codex®.

Multi-national beverage supplier.



Challenge

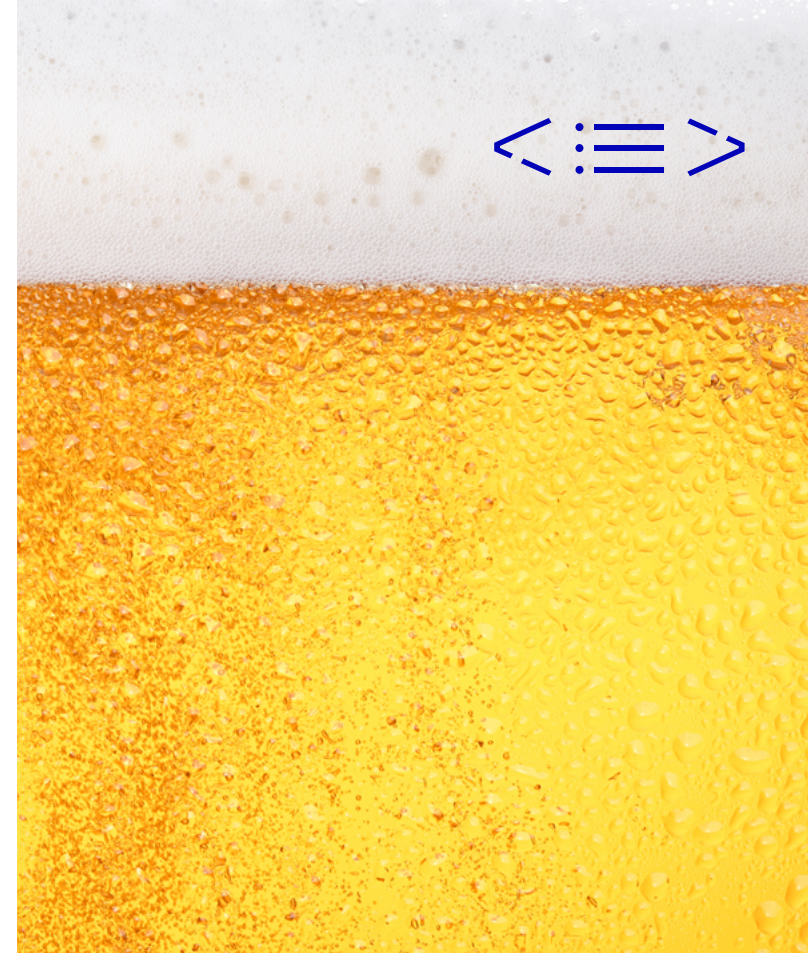
This customer wanted to create uniform corporate automation standards for all its production facilities worldwide.

GEA Solution

- GEA Codex® Process Control in conjunction with GEA partner program and the GEA Codex® Academy
- Allows system integrators and even competitors of GEA to be trained and use GEA Codex® for the client's projects
- GEA Codex® is widely used in many installations
- GEA is making major investments in the development of digital services, with analytics, to improve efficiency.

Customers Gain:

- Plant operation is performed in a consistent efficient manner in every plant
- Supplier independence
- Reliable service and maintenance with 24/7 remote service offered
- Protection of investment –long-term strategy
- Training available for 3rd party suppliers and client's maintenance staff
- Reduced project risk by having local support from GEA offices on a global scale.



References of GEA Codex®.

GEA Codex® and Baladna.



Challenge:

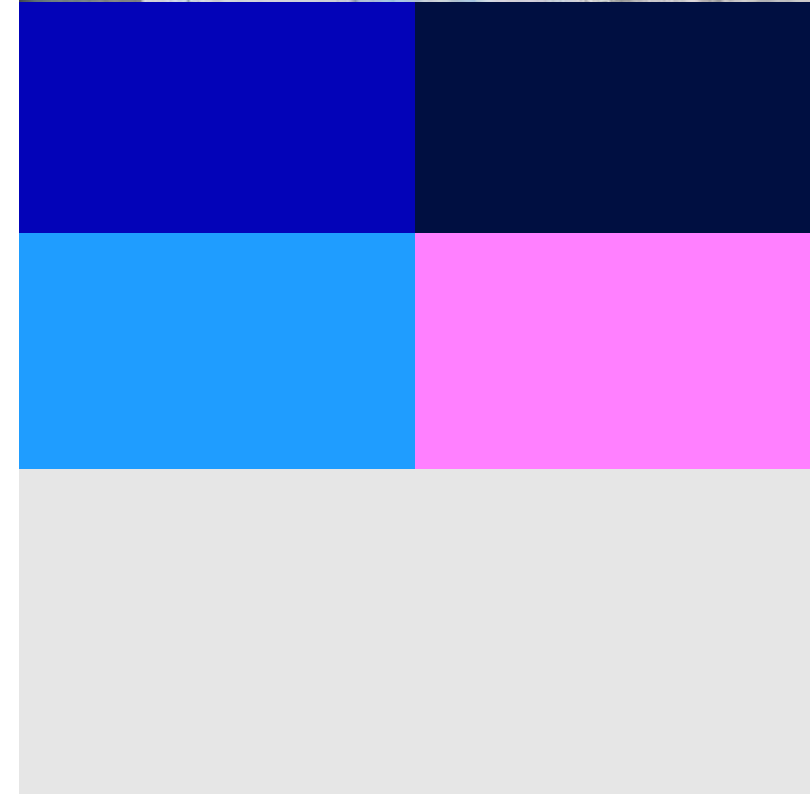
- A Qatari leading food producer leans on GEA to help the dairy industry
- Transforming over two million square meters of desert into a massive dairy farm complete with barns, automatic parlors and production lines
- A software solution that needs to juggle over 225 different dairy and juice products daily.

Solution:

- GEA Codex® Process Control allows a high degree of customization and scalability
- GEA Codex® Recipe system enables sequencing of phases that can also be configured to run in parallel
- GEA Codex® Historian for recording and visualizing all available analog and digital information.

Result:

- Tailored solution for Baladna with GEA Codex® meeting all requirements and ready for future expansions
- “All in one” automation solution providing consistent functionality and visualization



References of GEA Codex®.

GEA Codex® and Milchwerk
Crailsheim-Dinkelsbühl.



Challenge

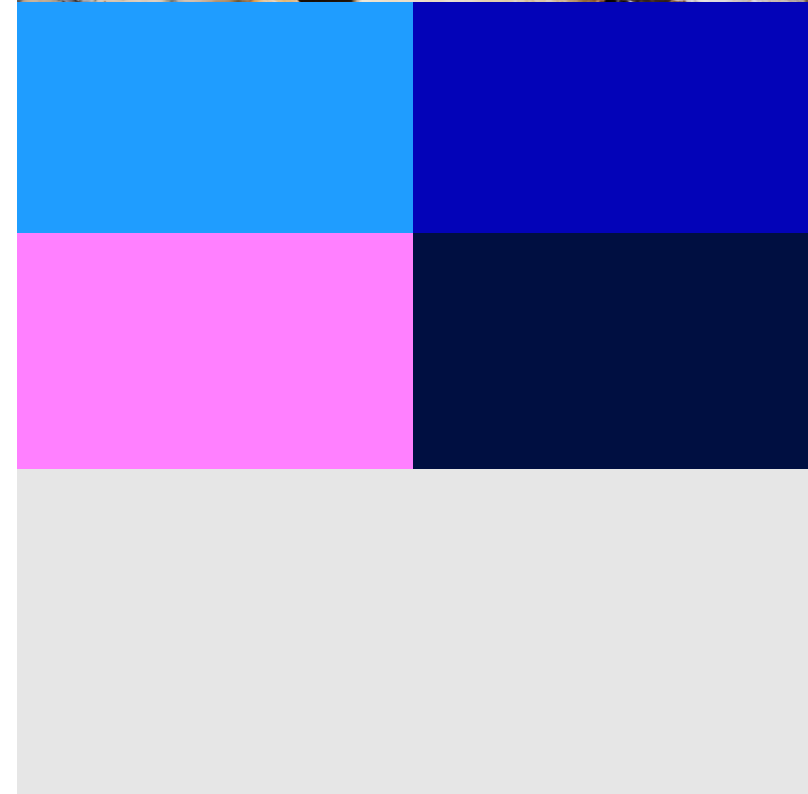
- The German dairy plant Milchwerk Crailsheim-Dinkelsbühl has entrusted GEA with the modernization of its milk treatment area
- GEA to develop an energy and heat quantity concept for the entire plant to unlock CO2 savings potential
- Upgrading of the dairy plant without stopping production.

Solution

- Developing the process and technology design based on the specific site conditions, a job for GEA Codex®
- GEA Codex® Plant Playback analyzes industrial processes batch by batch as a software-based video recorder, enabling to rewind and monitor previous plant activity, view past mimic screens and improve analyses.

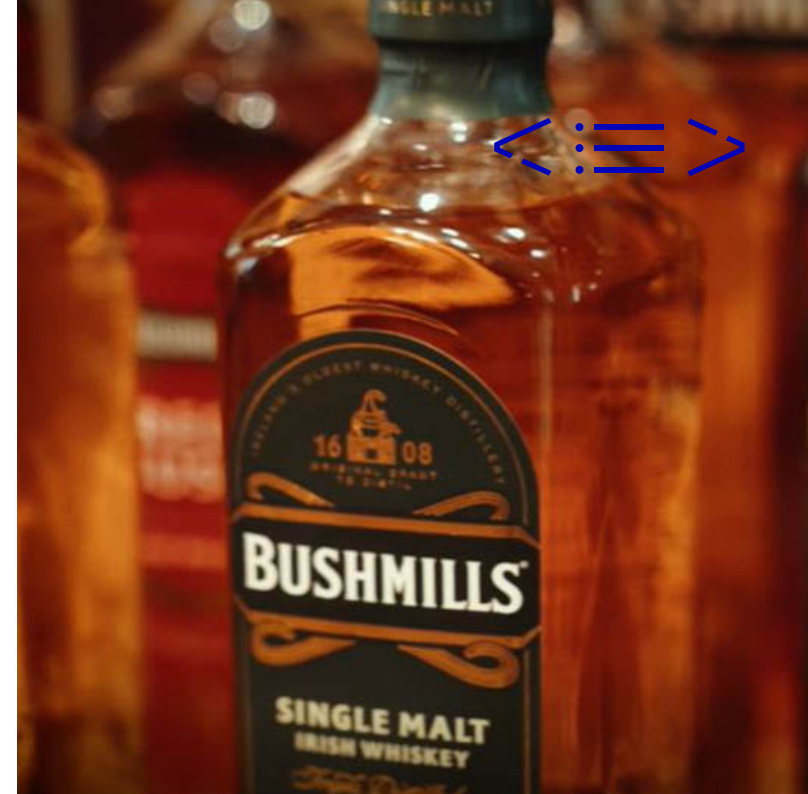
Result

- Modernization of the milk area in the plant without stopping production
- Recording of historical plant activity data in a digital format for process optimization
- This reveals dependencies and operational root causes, which can be easily fixed
- Improving production as well as product and process safety.



References of GEA Codex®.

GEA Codex® and Bushmills.



Challenge

- GEA partners with the oldest licensed whiskey distillery in the world to build an extension to their distillery
- Precise process conditions are essential to achieve the consistent quality that is vital to any spirit brand
- The client needed to track the whole process and KPI for energy, production, yield.

Solution

- GEA Codex® Process Control enables the operator to focus on the most important information to ensure efficient plant operation
- GEA's brewery portfolio and its Codex modules, prove its position amongst experienced brewers
- GEA Codex® Reports creates dynamic reports. Any plant process-derived information can be recorded, represented graphically or analyzed.

Result

- Able to track easier the overall production thanks to Codex and additional instrumentation (reports, trends, KPI's)
- High performance UI design delivers a control system that is powerful and easy to use
- In connection with tradition behind the success of iconic products, GEA demonstrates how stainless steel and copper combined make the golden liquid.

