



LIQUIDS PACKAGING



**NATIONAL BULK
EQUIPMENT®**
AN NBE COMPANY

FORWARD THINKING | **REAL RESULTS®**



LIQUIDS PACKAGING SYSTEMS

National Bulk Equipment engineered-to-application liquid packaging projects advance process performance objectives across the fullstream of liquid packaging operations. From container infeed and preparation through filling and end-of-line functions, NBE liquid packaging systems deliver upstream process confidence and downstream results.



National Bulk Equipment liquid packaging systems enable packaging operations processing bulk liquids to run at, or above, designed uptime, rate, and yield targets when filling drums, IBC totes, and pails.

Drum Filling Systems

NBE drum filling systems for bulk liquid packaging are engineered-to-application; ensuring process-specific performance and optimal total cost of ownership are achieved. From high-throughput projects to systems for batch production, NBE drum filling systems enable project owners, AECs, and operations staff to move beyond constraints of build-to-order units into the performance of NBE engineered-to-application systems.



Tote Filling Systems

NBE bulk tote filling systems are engineered to the specific requirements of each application to deliver highly accurate, repeatable fill cycles at designed throughput and yield. From semi-automatic systems to automatic, fullstream projects, NBE engineered-to-application tote filling systems provide total process performance advantages to bulk liquid packaging operations demanding high throughput and high yield.



Pail Filling Systems

NBE pail filling systems are engineered-to-application; whether fullstream integration including upstream liquid supply, container de-nesting, filling, sealing, and downstream package palletizing, or a standalone pail filling and sealing system. NBE pail filling systems are designed to deliver highly accurate, repeatable fill cycles that reduce product loss, improve package cycle times, and increase throughput performance.



INTEGRATED AUTOMATION

The comprehensive reach and influence of automation and controls throughout an NBE project leaves no room for anything but proactive, defined, and thorough automation engineering. The NBE automation architecture ensures optimal performance across the entire, integrated portfolio of NBE liquid packaging process categories, including:

- Container Infeed
- Container Preparation
- Container Filling
- Container Sealing
- Container Identification
- End-of-Line Container Handling

Automatic Systems

The integrated automation of NBE bulk liquids packaging systems enables packaging operations to run fully automated production at designed speeds without concern for recurring material waste, rework, or excess labor allocation common with under-performing liquid packaging systems.



Semi-automatic Systems

It's the up-front work done by the NBE automation engineering team, regarding area classifications, operator interface standards, EH&S influences, rates, data reporting, and security that effectively determines the most efficient balance between operator requirements and automation contribution.



Standalone Systems

NBE bulk liquid packaging systems bring improved operator efficiency and increased process performance to standalone filling operations. Single-operator equipment designs enable one operator to load, fill, and unload the bulk liquid filling system while maintaining safe and ergonomic operator-equipment interactions.





INFEEED

CONTAINER INFEEED

Provide Reliable and Efficient Supply of Containers and Closures to Downstream Packaging Operations

HORIZONTAL PAIL DENESTER



VERTICAL PAIL DENESTER



PAIL CONVEYOR



INTERMEDIATE BULK CONTAINER CONVEYOR





PREPARE

CONTAINER PREPARATION

Ensure Precise Alignment, Orientation, and Positioning of Containers Properly Prepared to Receive Liquid Contents

DRUM ALIGNMENT GUIDES & STOPS



PAIL ALIGNMENT GUIDES & STOPS



AIR RINSER



PAIL ORIENTER





FILL

CONTAINER FILLING

Achieve Accurate, Repeatable Liquid Filling of Containers at Optimal Process Throughput and Yield

PAIL FILLING: NET WEIGHT



BULK CONTAINER FILLING: NET WEIGHT



PAIL FILLING: METERED



BULK CONTAINER FILLING: METERED



PAIL FILLING: LINEAR



BULK CONTAINER FILLING: CONTINUOUS MULTI-LANE





SEAL

CONTAINER SEALING

Reduce Material Loss and Ensure Package Integrity During Closure Alignment and Container Sealing

DRUM LID ALIGNMENT: PICK-AND-PLACE



PAIL LID ALIGNMENT: LID SHUTTLE



PAIL LID ORIENTER: SPOUT ORIENTER



PAIL LID SEALING: AUTOMATIC PRESS



CONTAINER IDENTIFICATION

Deliver Aligned and Readable Labelling and Imprinting of Containers
With No Compromise to Designed Line Speed

LABEL APPLICATION



CONTAINER PRINTING



IDENTIFY



END-OF-LINE

END-OF-LINE CONTAINER HANDLING

Improve Efficiency of Finished-container Accumulation and Handling
and Protect Product During Transit

PALLETIZING: CONTAINER STACKER



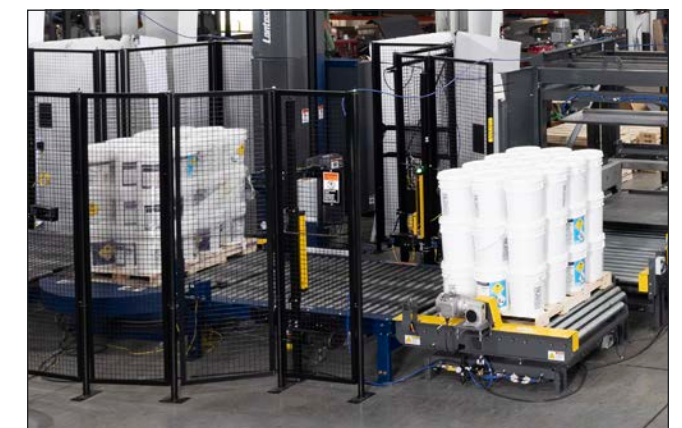
PALLETIZING: CONTAINER LOADER



PALLETIZING: LOAD STABILIZER



STRETCH WRAPPER

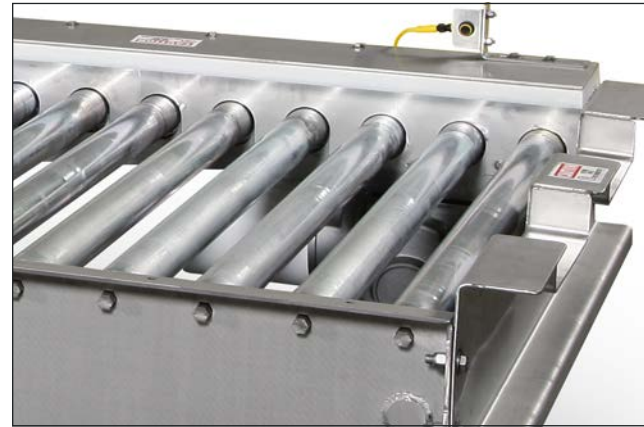


APPLICATION-SPECIFIC SANITARY DESIGN

ANGLED-PLANE FRAMEWORK AND ROUNDED RADII



ENCLOSED AND PROTECTED CONVEYOR DRIVE SYSTEMS



WIP-, CIP-, AND SIP-READY CONSTRUCTION



TOOLLESS, REMOVEABLE DRIP TRAY



CLEAN-DESIGN ENGINEERING AND CONSTRUCTION



CARBON STEEL FRAMEWORK FINISHED TO FDA STANDARDS



PROCESS MATERIAL SUPPLY SYSTEMS

SLURRY AND SOLUTION BLENDING AND SUPPLY SYSTEMS



FLASH BLENDING AND SUPPLY SYSTEMS



BULK LIQUIDS PROCESSING AND SUPPLY SYSTEMS



LIQUID TOTE STAND AND PUMP SUPPLY SYSTEMS



ENGINEERED-TO-APPLICATION PROJECT DELIVERY

Move beyond the constraints of build-to-order and engineer-to-order machine manufacturers. Avoid settling for application input that falls short and project resources too limited to keep pace. NBE engineered-to-application (ETA) project delivery leverages the NBE equipment and systems portfolio and NBE fullstream applications expertise to ensure each project achieves optimal performance from pre-RFQ through turnover.



Proper execution of engineered-to-application project delivery is demanding. ETA demands that our project expertise span the fullstream of equipment application and integration. NBE ETA execution removes parity and advances process performance.

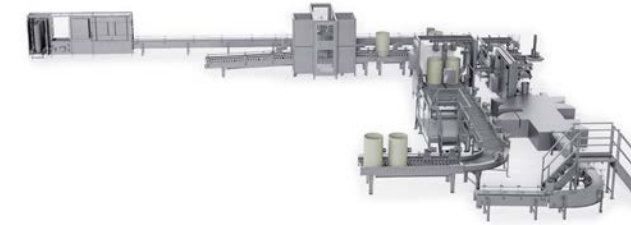
Advancing Bulk Liquids Packaging Performance & Project Delivery

The broader factors inherent in NBE engineered-to-application projects, such as facility design considerations, regulatory guidelines, and supply chain integration are what demand insights from every NBE practice area. This collective knowledgebase contributes so effectively to the customers' process operations because each NBE project is managed from a bigger view, a wider perspective.

- **Applications Engineering:** NBE projects are engineered-to-application to address enterprise-wide influences, not just those specific to one line. NBE applications engineering evaluates and integrates the broader context of the application.
- **Project Management:** NBE projects effectively contribute to customer operations because NBE project managers bring clarity to the project delivery experience. The NBE project management group ensures proactive process improvement rather than reactive alarm.
- **Mechanical Engineering:** The advantages of NBE mechanical engineering are as tangible as the build specs and materials of construction. The objective is to ensure NBE projects bring optimal efficiency; from lead times to rate targets and after-sale support.
- **Automation Engineering:** Specific requirements for automation differ, but the function of NBE automation engineering remains the same; to improve efficiency at every level, from operators and supervisory staff to senior management and maintenance.
- **Fabrication & Assembly:** NBE build specifications and materials of construction are so dominant within the market because NBE recognizes its responsibility to its customers. NBE liquid packaging systems are built to ensure process uptime, and reliable, long-term operation.
- **Customer Service & Quality Assurance:** NBE testing protocols, and separate final inspection protocols, complete the fabrication and assembly process; but this is not the end. These are proactive steps to confirm the project is ready for start-up at the customer location.

FULLSTREAM ADVANTAGE

Advance the performance objectives of integrated upstream, midstream, and downstream bulk liquids handling systems by leveraging the NBE engineered-to-application (ETA) project delivery method across the fullstream of bulk liquids packaging projects.



Engineered to project-specific application parameters, NBE fullstream liquids processing and packaging projects work to reduce upstream labor requirements while improving downstream cycle times and ensuring optimal end-of-line finished-product integrity.

Upstream

Storing and supplying bulk liquids from tanks, IBC totes, and drums to downstream packaging processes. When application specifications demand complex liquid supply and concentration requirements, and when process run times and production yield cannot be compromised, NBE engineered-to-application bulk liquid handling systems bring performance effectiveness and total cost-of-ownership advantages to upstream liquids handling operations.



Midstream

Formulation, transfer, and infeed of bulk liquids across processing operations in preparation for downstream packaging. NBE engineered-to-application bulk liquid handling systems ensure the accurate, repeatable processing, metering, and delivery of contaminant-free, properly formulated bulk liquid to downstream packaging operations, regardless of challenging material characteristics, supply volume, or flow properties.



Downstream

Packaging of bulk liquids into IBC totes, drums, and pails. The performance-proven construction of NBE engineered-to-application bulk liquid packaging systems ensures fullstream process efficiency. NBE liquid filling systems are built to handle extended duty cycles and endure harsh environments. NBE liquid filling systems provide downstream advantages by outputting accurately filled containers while reducing product loss and improving labor safety and efficiency.





FORWARD THINKING | **REAL RESULTS**®

DISCHARGE	STORE	CONVEY	FILL	MIX	RECLAIM	INFEEED	PROCESS	PACKAGE
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