



PLASTICS PRODUCTION & PROCESSING



FORWARD THINKING | **REAL RESULTS**[®]





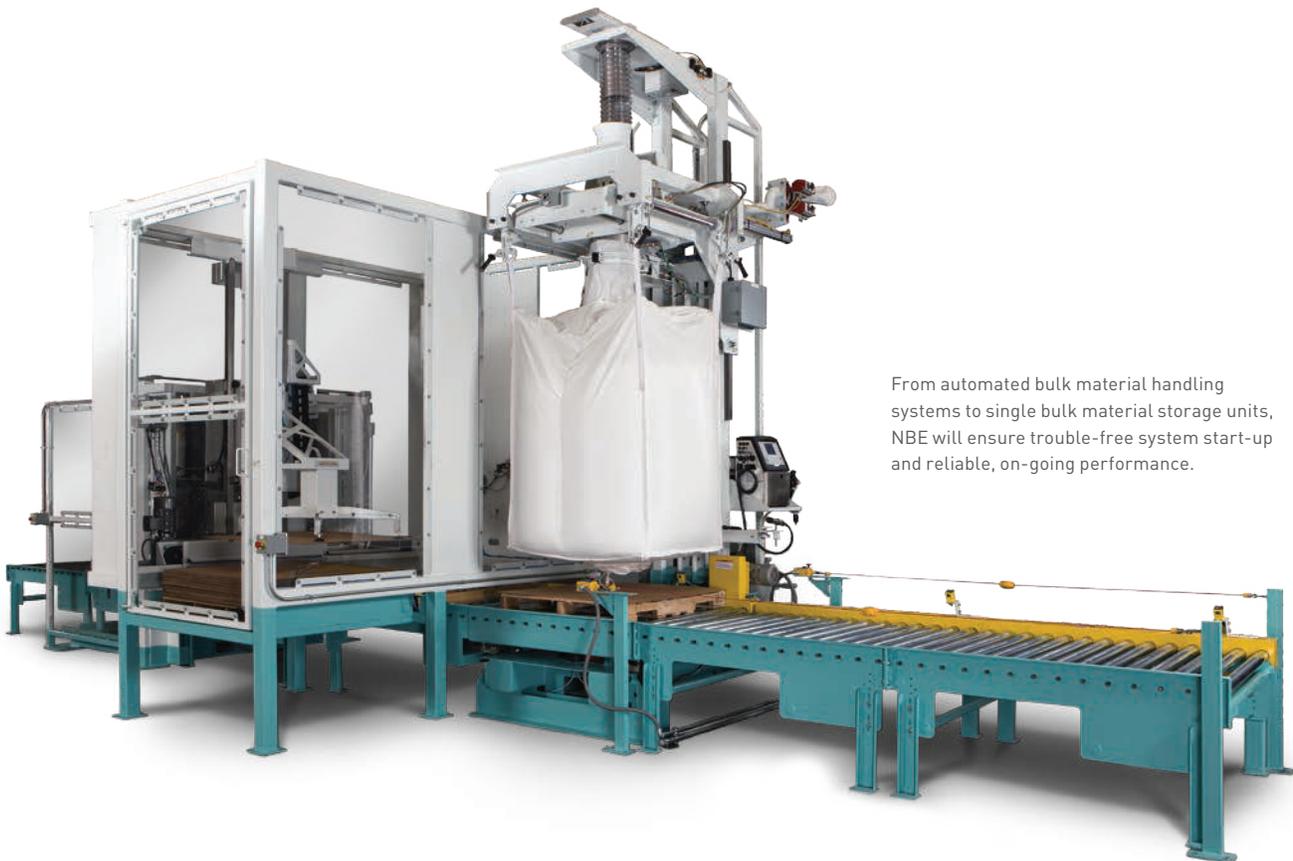
FORWARD THINKING.

EQUIPMENT, AUTOMATION & PERFORMANCE

Ensuring reliable production and throughput, eliminating reactive equipment maintenance, and improving performance of plant operations; these are the daily pressures confronted by plastics producers and plastics processors alike.

It is no longer just a matter of finished product. End-market customers are also looking upstream into the supply chain to identify, and more closely align with those suppliers that can pass through even more sustainability contribution. In response, plastics producers and processors are turning to non-product initiatives, such as rigorous equipment safety, automation, and energy management to deliver greater sustainability advantages.

Whether a fully integrated and automated bulk material infeed and packaging line, or a stand-alone bulk material storage bin. Whether enabling the convergence of system-wide equipment controls with factory management communications, or dispatching one of our company service and support teams. The resources of National Bulk Equipment will ensure you have optimal bulk material handling performance, and the advantages of tangible, sustainable process operations.



From automated bulk material handling systems to single bulk material storage units, NBE will ensure trouble-free system start-up and reliable, on-going performance.

PROCESS ADVANTAGES FOR PLASTICS PRODUCTION

Reduce material cost volatility, improve labor allocation, shorten changeover times, handle varied and challenging material types, prevent material loss; these are the Real Results gained by plastics producers and plastics processors that specify National Bulk Equipment bulk material handling systems. NBE equipment design specifications and materials of construction speed cleaning and inspection times. NBE integrated automation optimizes operator interaction and safety, and improves overall equipment effectiveness. NBE NTEP-certified weigh scales eliminate material waste and costs due to inaccurate filling. NBE dry bulk material conditioning technologies ensure reliable, consistent, and productive handling of challenging materials. Productivity in plastics requires more from bulk material handling equipment than the standard functions of dumping, loading, moving, storing, or mixing. Productivity in plastics requires the process advantages of Real Results from National Bulk Equipment.



NBE applications engineering and equipment designs ensure Real Results; the benefits of tangible, in-use process advantages.

ISO-certified Manufacturing Ensures Precision Production

Every National Bulk Equipment bulk material handling system installation begins with Forward Thinking: looking upstream and downstream, and evaluating every process influence and its possible effect on the application. From the equipment, to the material, to the operator, to the surrounding facility, such Forward Thinking translates into Real Results only by means of the comprehensive capabilities and resources of NBE. NBE application, design, mechanical, controls, and manufacturing engineering; together with technologically advanced MRP systems and certified ISO 9001:2015 production and operations procedures, ensure every NBE dry bulk material handling unit or automated material processing system will simplify factory acceptance testing, streamline start-up, and deliver immediate inline performance.

Accountability and Accuracy: From Spec to Startup and Support

The single-source design, engineering, manufacturing, and installation resources of National Bulk Equipment ensure every project built by NBE; whether a single component or an integrated, fully automated bulk material handling system, is manufactured to exact tolerances and delivered within strict production schedules. NBE operations cover over 180,000 square feet, including R&D facilities for advancing process technologies; and large-scale acceptance testing areas, where, single units, or integrated bulk material handling lines are run through actual operating sequences to ensure performance outcomes. The NBE campus also includes a stand-alone facility for the design and construction of UL listed controls. NBE control panel configurations include: UL 508A, Class I and II, Division 1 and 2, Group A-D, F, and G, and NEMA 12 enclosures with Type X or Z purge.

Integrated engineering and manufacturing systems enable immediate information transfer between NBE 3-D modeling, engineering, and manufacturing departments; ensuring timely production scheduling, and highly accurate fabrication and assembly.





Discharging

National Bulk Equipment bulk material discharging systems provide downstream plastics processing with accurate, repeatable, and consistent material supply. NBE material conditioning components, conveying systems, and process automation work together at the point of material introduction to ensure material delivered to downstream processes is properly conditioned, accurately batched, and reliably supplied.

Filling

National Bulk Equipment bulk material filling systems enable plastics operations to reduce material loss, achieve optimal line speed, and improve labor safety and efficiency. NBE bulk filling systems, with integrated NTEP-certified weighing, eliminate over- or under-filled bulk containers. With NBE equipment, plastics operations run at designed speeds without concern for material waste, rework, or excess labor costs.

Storage

National Bulk Equipment bulk material storage systems provide plastics manufacturing operations the means to profitably manage procurement, supply, and line introduction of bulk feedstock, resins, or related material. From large-capacity exterior silos to inline agitator hoppers, NBE bulk material storage systems protect product from contamination and harmful environments, and keep production facilities organized and clean.

Mixing

National Bulk Equipment bulk material mixing and blending systems improve plastics processing and production efficiencies by ensuring accurate and homogeneous blends, protecting material integrity, and reducing cycle times and operator interaction. NBE offers a full line of mixing and blending systems, including high-volume, fully integrated systems, as well as stand-alone, precision batch mixers.

Conveying

National Bulk Equipment bulk material conveying systems are key to effective transfer and protection of materials during plastics processing and production. Whether transporting material from bulk storage to production, conveying materials from process to process, or to bulk packaging; NBE conveying systems ensure contaminant-free material is supplied; regardless of material characteristics, volume, or flow requirements.

The image shows a large industrial facility with several tall, dark grey metal silos or hoppers. Each hopper has a conical bottom section. A control panel with various buttons and switches is mounted on the side of one of the hoppers. In the foreground, a large, empty brown cardboard box sits on a wooden pallet. The background shows a factory interior with a staircase and other equipment. The overall scene is industrial and functional.

**REAL
RESULTS.**

DISCHARGING

Consistent Material Introduction, Optimal Downstream Performance

Bulk Bag Dischargers

National Bulk Equipment bulk bag dischargers are a vital first stage in the assurance of reliable downstream throughput. With market-dominant, welded-frame construction, and systems designed to speed bag loading and spouting, improve material conditioning, reduce dusting, and speed changeovers; NBE bulk bag discharging systems are built to ensure the confidence of performance-proven construction.

Performance-proven Design and Construction

- **4" x 4" x 3/16" Structural Tubing, Heavy Gauge Sheet and Plate**
Built for extended duty cycles and harsh process environments; heavy-duty, welded carbon or stainless steel construction optimizes performance.
- **Dust-free Material Introduction; Protecting Personnel and Product**
The NBE E3™ closed-cycle dust recovery system encloses and secures the bulk bag spout within a sealed containment cylinder; reducing migrant material dust and contamination.
- **Integrated Automation; A Proactive, Customer-driven Advantage**
Equipment controls, placed deeper into process operations, are centralized to a menu-driven HMI; improving data reporting to customers and optimizing process efficiency.



NBE bulk bag dischargers are available with various bag support configurations, including: dedicated-hoist, forklift-load, or customer supplied hoists.

Bulk Container Dischargers

National Bulk Equipment bulk container dischargers provide highly efficient and controlled introduction of dry bulk materials used in plastics processing and production. From high-speed cycle times to heavy-weight containers. From high-lift conveying of containers to custom-designed discharge hoods. NBE bulk container dischargers ensure compatibility with process specifications and material conditions.



Performance-proven Design and Construction

- **Application-specific Lift Capacity; From 750 lbs up to 20,000 lbs**
Exceptional load capacity keeps pace with high-volume processing and production operations; exceeds ASME standard performance.
- **Complete Bulk Material Discharge; Reduce Product Waste**
The NBE Rotolink™ tilt system ensures smooth, continuous-speed, 180-degree container rotation. Rotation is optimally balanced for consistent discharge force and velocity.
- **Process Controls and Automation; Efficient and Accurate**
NBE integrated automation improves equipment resource management, increases operator efficiency and safety, and improves material discharge accuracy.



NBE gaylord, tote, or drum dischargers safely and accurately supply multiple material types to downstream processes.

FILLING

Accurate, Repeatable: No Waste, No Re-work

Bulk Bag Fillers

National Bulk Equipment bulk bag filling systems bring efficiency to bulk plastics packaging lines. NBE automation and control systems ensure accurate filling and weighing. From harsh environments to sanitary applications; from a stand-alone bulk bag filler to a fully automated bulk bag filling facility, NBE bulk bag fillers eliminate doubt and downtime common with commodity equipment.

Performance-proven Design and Construction

- **Bag Support Framework Hang-weight Capacity Exceeds 4,000 lbs**
For high-volume filling, or high bulk density materials; the hydraulic, cantilevered fill head and bag hanger easily lift weights up to 4,500 lbs; far exceeding that of ball screw designs.
- **NTEP-certified Bag Weigh System Eliminates Material Loss**
Accurate to +/- .05% of the total bag weight, up to 4,500 lbs, NBE weigh systems provide valid, precise, and repeatable weighing of filled bulk bags; eliminating material loss and rework.
- **Integrated Controls Improve Total Process Performance**
Whether optimizing the sequence of a stand-alone unit, or communicating with upstream and downstream processes; NBE integrated automation improves process efficiency and payback.



The bag support frame of every NBE bulk bag filler, whether cantilevered style [above], or four-post style [right], is built to withstand harsh duty cycles and demanding process environments.

Bulk Container Fillers

The accuracy and repeatability of National Bulk Equipment bulk container fillers quickly prove their value on the plant floor and at customer locations where precisely filled, reliably weighed bulk containers are received. NBE bulk container filling systems provide plastics producers the benefits of certified-accurate filling. Production, management, and end-customer personnel all recognize the worth of safe and stable filled containers.

Performance-proven Design and Construction

- **Deck Capacity to 18,000 lbs Enables High-volume Filling**
Process-specific design and structural specifications enable high-volume operations to run at designed speeds without concern for unscheduled maintenance delays.
- **Precision Weigh System Prevents Over-filling and Under-filling**
NBE design-stage engineering and fabrication of NTEP-certified weigh devices eliminates variable weight outcomes common with bolt-on load cells or third-party NTEP scale systems.
- **Process Automation Centralizes System Controls to a Single, Touchscreen HMI**
NBE custom-programmed, process-specific PLCs and HMIs optimize line throughput and increase material supply accuracy by improving system sensing, monitoring, and reporting.

NBE variable container filling systems enable containers of multiple types and sizes to be processed through a single fill station. NBE systems advance beyond conventional rotating fill head designs to ensure optimal fill station performance and reduced waste.



STORAGE

Managing Material Assets, Promoting Process Performance

Corrugated-wall Silos

National Bulk Equipment corrugated-wall silo systems are engineered to application-specific process and site safety requirements; providing material supply to high-volume production operations. Whether supplying one, or multiple points of material need; whether requiring filling equipment or pneumatic conveying, NBE provides silo systems that ensure optimal material and inventory levels.

Performance-proven Design and Construction

- **From 5,000 lb to 1,000,000 lb Capacities; NBE Silos Provide Secure, Durable Storage**
NBE roll-formed, galvanized steel, corrugated-wall silo systems provide dependable, weather-resistant, low-maintenance material storage for free-flowing materials.
- **System Configurations Optimize Safety and Efficiency**
From ladder safety cages to OSHA-compliant, lockable doors and crosswalks; from level indicators to fill kits and discharge systems; NBE silo systems improve process contribution.
- **Single-source Accountability and Expertise**
Leveraging the experience of over 15,000 bulk material handling equipment installations, NBE engineering and installation services will ensure long-term material supply performance.



NBE corrugated-wall storage silos are in use throughout the U.S. and North America in applications where high-volume processing requires continuous material supply.



Surge Bins & Portable Storage Hoppers

A versatile alternative to fixed-location conveying systems or silos; National Bulk Equipment surge bins and portable storage hoppers provide plastics producers space-saving methods for inline supply and mobile storage of low- to mid-level material capacities. NBE surge bins are available with application specific material transitions to speed integration to inline process equipment. NBE portable storage hoppers help protect product; and are easily moved by forklift or by rolling on locking casters.

Performance-proven Design and Construction

- **Built as a Process-critical Component, Not a Commodity**
Plastics processing requirements vary; NBE will design and manufacture surge bins and storage hoppers to custom specifications for capacity, materials of construction, and method of discharge.
- **Managed Material Infeed; Controlled and Reliable**
Optimizing the supply of bulk materials from storage to inline processing, NBE surge bins enable accurate supply of varied material types; in standard capacities up to 1,500 cubic feet.
- **Long-term Reliability for Short-term Storage**
Built of heavy-duty, 14 gauge carbon steel or 304 stainless steel, NBE storage hoppers simplify temporary handling of bulk materials; in standard capacities up to 150 cubic feet.



NBE surge bins and portable storage hoppers are constructed of heavy-duty, 14 gauge carbon steel or 304 stainless steel; epoxy finishes, accessories, and automation are available to meet application-specific requirements.



MIXING

Thorough Material Preparation; Reducing Cycle Times

Quik Mix™ Vertical Auger Mixers

National Bulk Equipment Quik Mix top-loading vertical auger mixers combine ease of operation with fast, thorough material mixing. The vertical mixing auger, which runs the full height of the mixing tube, draws up and pre-mixes material prior to final, homogeneous blending by the auger-top material dispersing paddle. Blended material is ready for supply to downstream processes. For mixers with capacities up to 1,365 lbs, tool-less removal of mixing tube and auger enables fast cleaning and changeovers. Mixing capacities available from 150 lbs to 100,000 lbs.

Performance-proven Design and Construction

- **Reduce Mix Times and Improve Blend Quality**
Direct-drive, vertical mixing screw with blend-paddle auger flights provide high-speed mixing; ensuring complete, uniform mixing of pellets, regrind, concentrates, and other materials.
- **Simplify Changeovers, Reduce Return-to-Service Times**
Tool-less removal of the mixing tube and vertical mixing screw enable fast changeovers and thorough cleaning for mixers with capacities up to 1,365 lbs; production is quickly back online and cross-contamination is avoided.
- **Automated, Accurate, and Thorough Mixing and Blending**
NBE integrated automation enables mix operations, diagnostics, and calibration to be controlled by a single operator; increasing labor efficiency and reducing material waste.

NBE Quik Mix systems are available in heavy gauge carbon steel or 304 stainless steel construction; custom ribbon or auger designs ensure thorough, homogeneous blends, regardless of material type.



Whirlwind™ High-capacity Vertical Auger Mixers

National Bulk Equipment high-capacity mixing systems are engineered to provide to high-volume plastics production operations a fully automated, integrated production mixer. The in-feeding scoop blades at the base of the vertical, solid core mixing auger feed material into the mixing tube. Material is drawn up and pre-mixed in the tube; then, as pre-mixed material leaves the auger, broad-throw dispersion paddles ensure the final, homogeneous blending action continues in the mixer drum. Available in top-loading or bottom-loading designs, with mixing capacities from 350 lbs to 100,000 lbs.

Performance-proven Design and Construction

- **Process-integrated Mixing; Inline, Thorough, and Accurate**
Whether pellets, granules, or regrind, the Whirlwind mixing system ensures a thorough blend of material is supplied, at high-volume, directly into downstream process operations.
- **Built for Extended Duty Cycles and Harsh Environments**
Thick-wall structural framework, heavy-gauge sheet and plate; carbon steel and stainless steel; and high-performance drive packages ensure performance supports production.
- **Automated, Efficient Material Preparation and Infeed**
NBE automation brings system-wide sensing, monitoring, and reporting to high-volume material mixing and infeed systems; whether communicating with new or legacy systems.



CONVEYING

Reliable Supply of Properly Conditioned Material

Flexible Screw Conveyors

The National Bulk Equipment line of flexible screw conveyors is built to ensure performance and longevity in harsh applications and duty cycles. NBE flexible screw conveyor systems are highly configurable, enabling the conveyor and hopper to be built specific to process requirements. As a stand-alone operation, or part of a complete line, NBE flexible screw conveyors offer single-unit controls, or integration to a central control system.

Performance-proven Design and Construction

- **Gear Drives and Motors Specified for Performance and Longevity**
Optimal output torque and motor horsepower combine to bring maximum power and drive efficiency to the most challenging flexible screw conveying operations.
- **Power and Control: The Science of Flexible Screw Conveying**
Flexible screw conveyor materials of construction, and process-specific flight designs ensure sustained conveying at designed capacities of demanding materials and bulk densities.
- **Process-specific Automation: Designed and Built by NBE**
Whether a stand-alone process, or an element of a comprehensive production line, NBE flexible screw conveyors can be built with single-unit controls, or integrated to a central PLC.



The National Bulk Equipment engineering team will leverage our applications expertise, material science engineering, and R&D resources to design and manufacture flexible screw, or solid core screw conveyor systems for your application.



Agitator Hoppers

The application-specific engineering and construction of National Bulk Equipment agitator hoppers enables delivery of a consistent, metered supply of material to the horizontal outfeed conveyor, ensuring reliable downstream availability of even the most sluggish, non free-flowing materials. From hopper shape to drive size and configuration, from materials of construction to auger flight selection, every NBE agitator hopper prevents the bridging and ratholing problems associated with commodity hopper systems.



Low-RPM, high-torque agitator paddle rotation, together with the horizontal transfer conveyor located in the hopper bottom trough, ensure reliable, downstream material supply.

Performance-proven Design and Construction

- **Improve Infeed Efficiency of Sluggish or Non-flowing Materials**
Eliminate material supply interruption; ensure material characteristics meet downstream requirements; NBE agitator hoppers condition source material and promote efficient supply.
- **Power and Precision Combined in Design and Construction**
Heavy-gauge carbon steel or stainless steel framework and hopper; high torque gear reducers and drives; sandblasted and hand-burnished weld seams ensure reliable material supply.
- **Process-integrated Automation: Greater Efficiency, Accuracy, and Safety**
Complete controls engineering, including interlocked user and machine operations, improve process efficiency and protect operators during production and maintenance events.

NBE V-shaped or U-shaped agitator hoppers ensure consistent material supply; standard hopper capacities up to 1,500 cubic feet; with higher capacity designs available.



FLOOR-LEVEL TILTERS

Consistent Material Supply; Minimal Operator Involvement

National Bulk Equipment floor-level container tilters reduce labor and operating costs associated with removing material from gaylords, drums, and other bulk containers. NBE floor-level tilters are designed to accommodate pallet jack, hand truck, and forklift loading of bulk containers. Containers loaded into the unit are automatically tilted up to direct material to the vacuum wand, ensuring complete material removal with minimal operator involvement.

Floor-level Container Tilters

- **Effective, Automated Material Discharge; Minimal Operator Interaction**

As a vacuum system removes material from the container, the NBE container tilter initiates an automatic tilting action; gradually angling the container to a 45-degree tilt position and directing remaining material in the container to the vacuum system wand.

- **Performance-proven Design and Construction**

Built for the demanding duty cycles and harsh environments of plastics processing and production operations; NBE container tilters are formed of heavy gauge carbon steel or stainless steel, and can easily handle filled containers weighing up to 2,500 lbs.

- **Application-specific Features Improve Total Process Efficiency**

NBE container tilters are designed to the unique requirements of each application; whether vibratory kits for non-free flowing material, container covers for dust control and contaminant protection, or custom cradle configurations for varied container types.



Floor-level Loading Position



45-degree Tilt Position

PARTS & COMPONENTS

Simple and Fast Selection; Quick and Accurate Delivery

The full line of National Bulk Equipment OEM parts and components is made available specifically for plastics processing and production professionals involved in the operation and maintenance of dry bulk material conveying systems and material handling equipment. NBE sales, warehousing, and logistics staff are ready to provide assistance in selecting from over 1,750 SKUs across 60 different product categories. For 24-hour support, this same selection is available online at the NBE parts and components web store. Select from simple lists of configurations and materials of construction, look through a range of dimensions and specifications; and, when logged in compare product pricing, and place an order. Whether on the phone or online, placing an order will be simple, fast, and accurate.

Connecting Parts and Accessories to Optimal Process Performance

The reliable and accurate supply of quality parts and system components is as vital to ensuring optimal process performance as is the reliable, accurate supply to production of feedstocks, resins, and additives. As a manufacturer of bulk material handling equipment, and a supplier of OEM parts and components, NBE is uniquely positioned to offer a team of engineers and service staff ready to work on-site to provide installation, maintenance, and monitoring.

From couplers to flex hose; from airboxes to tilt tables, or diverters to elbows; choose from over 1,750 SKUs across 60 product categories. The NBE parts and components website is ready, 24-hours a day. Or, for application assistance, our sales specialists are ready to ensure your order is placed quickly and accurately.





FORWARD THINKING | **REAL RESULTS**®

DISCHARGE	STORE	CONVEY	FILL	MIX	WEIGH	RECLAIM	INFED
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