



NATIONAL BULK
EQUIPMENT

SEALED CONTAINER **DISCHARGERS**

Like every piece of equipment that bears the NBE name, our **Sealed Container Dischargers** are the product of **forward thinking** and designed to deliver **real results**. What ever type or style of container you receive or store your raw materials in, the equipment used to discharge the material needs to be regarded as an **integral first step** in your process and not just another independent piece of material handling equipment. And, in doing so, you will quickly realize that your entire production facility is at the mercy of the **performance and reliability** of your sealed container discharger. NBE is a market leader in the supply of container discharging systems to various industries because we are **acutely aware of the importance** of providing our customers **the best first step** money can buy. NBE dischargers perform their tasks with superior precision and reliability. How? Read on. You'll discover that what you get **out of your process** is the direct result of what we put **into our sealed container discharger**.

WHO MAKES THE BEST SEALED CONTAINER DISCHARGER? NO DOUBT, NBE IS

LEADING THE 'CHARGE.

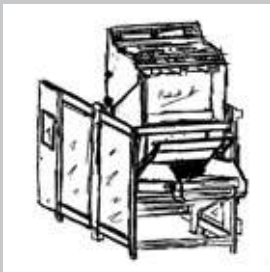




KNOWLEDGE & TEAMWORK | Before we make the first weld on your sealed container discharger, a wealth of materials handling experience and process knowledge is already built in. Ours is a decades-long legacy of innovative thinking, dynamic collaboration, intelligent engineering and rock-solid construction. In addition, all of these disciplines are housed within our state-of-the-art Holland, Michigan facility. This is especially important for highly customized units. Keeping the entire building process under one roof means maintaining control of quality and project timing throughout the entire design and fabrication process. And, as you well know, smooth process flow is critical whether your building a sealed container discharger or producing and packaging a product.

AROUND NBE, FORESIGHT IS 20/20

Optimizing an NBE discharger for your application could be as simple as adding a PLC controller, or could mean extensive customization. Even the roughest napkin sketch can serve to get our engineering team started toward another intelligent, efficient solution.



One of our most valuable resources is our extensive use of 3D modeling. Your equipment selection team can preview your virtual piece of equipment from every angle and make well educated modifications prior to construction.



The foresight provided by the 3D model helps eliminate typical installation problems and hindsight wish lists. However, NBE goes one step further by fully assembling and testing the equipment with your material prior to shipping. This ensures the performance of the discharger within your system.



RELIABLE CRAFTSMANSHIP | Of course, designing in all the smarts in the world is useless if it isn't built right. Once an approved design makes its way to our manufacturing floor, creativity meets craftsmanship. Again, the 3D rendering now guides our manufacturing team. It's here that the fruits of our vast experience are most apparent. Many of our welders, fabricators, and foremen boast decades of experience in building the finest industrial strength custom equipment. Add to this our close partnerships with only the top vendors in the industry, and you can rest assured, your discharger will be constructed with unparalleled attention to detail, and a constant eye toward maximum ruggedness and durability.



Forward
Thinking.
Real
Results.

Four little words that will mean a lot once you purchase a National Bulk Equipment product. We think forward always considering the unit's function within the larger process to ensure that your NBE equipment won't just fit in, it will greatly enhance your production line, right to your bottom line. Once you experience the effects of **Forward Thinking**, you can call it what you will: increased productivity, consistent product flow, maximized efficiency and reduced operating cost. We simply call it **Real Results**.



FEATURES

Safe, efficient, dust free and complete discharge of materials from your containers are always going to be critical **material handling** design factors. However, NBE's **Forward Thinking** philosophy brings sealed container discharger design up to the **process integration level**. NBE's dischargers consistently provide a **reliable and repeatable material supply** as your system demands. By **looking downstream into your system**, we will apply our vast materials and process knowledge to configure all the **required discharger features** that will **optimize** your entire systems' **performance**. From the simplest container discharger to a completely automated system, the **Real Results** obtained everyday by NBE's customers include: **increased** throughput and productivity; **improved** system controls integration; **reduced** operating costs through savings in direct labor and material losses due to spillage, incomplete container discharge, and foreign material contamination.



LIFT & SEAL CONTAINER DISCHARGER
(Direct Discharge)

(See Lift & Discharge model at bottom right and on cover)

FRAMEWORK DESIGNS

All frames are constructed to withstand the harshest of plant environments and demanding duty cycles. Frame capacities range from 750 pounds to 16,000 pounds, with higher capacities available for custom designed dischargers. All pivot points on the equipment feature Fiberglide journal bearings that are constructed of coiled steel backing with a woven PTFE fabric wear surface. These bearings provide a high pressure-velocity factor and are designed to last for the life of the equipment so they should not require replacement.



General Industrial Construction

The support framework is constructed of C-channel, I-beam, angle iron, tubular steel, or other heavy duty structural steel that is stitch and continuously welded to provide superior structural integrity at a value price.



Wash Down Construction

The support framework is tubular construction with all ends capped, no holes protruding to the inside of any tubing, angled or rounded surfaces are utilized to promote drainage where structurally possible, and pockets for material or water accumulation are eliminated. Absolutely no angle iron, C-channel, or I-beam shapes are used in the construction of the equipment.



Lift & Discharge

The containers are hydraulically raised to their discharge point with cam rollers traveling on track bars to guide the lift and provide the smoothest operation possible. This eliminates the potential for side to side racking found in other designs. All moving hydraulic hose, pneumatic tubing and electrical sealrite are contained in flexible cable carriers to protect them during operation. A mast cylinder guide race stabilizes the cylinder rod eliminating potential damage to the rod and seal.

(Available in both general industrial and washdown construction).

LIFT CARRIAGE DESIGNS & OPERATION

Lift carriages are offered in several available configurations to match the customer's process. Floor load styles allow containers to be loaded into the carriage with casters, a pallet jack, or fork lift truck. Fork lift styles allow containers to be loaded with a fork lift truck while eliminating metal to metal contact from the forks to the carriage base. Integral powered or gravity roller conveyor styles allow integration into indexing and accumulation conveyor systems. Additionally, conveyors can include chain transfer devices to transfer full or empty conveyors at right angles from their load position.



The lift carriage is hydraulically raised into the discharge hood with cam rollers traveling on track bars to guide the lift and provide the smoothest operation possible while eliminating the potential for side to side racking found in other designs. A timing circuit along with a pressure reducing

valve is used to ensure the container is sealed without damaging the container before rotating it into the discharge position.



Pneumatic container centering devices position the container in the optimum position for sealing into the hood and achieving maximum discharge from the containers.

Box position switches ensure the container is in the correct position prior to the seal carriage raising the container into the hood.

CUSTOM DISCHARGE HOODS

Discharge hood shapes are custom designed for the customer's specific containers and application parameters. The primary design objectives of all NBE discharger hoods are contamination free, dust free and complete material discharge.



Discharge hoods are constructed of various materials to meet the specific application requirements. Carbon Steel; 304, 316, and 6WL ruggedized stainless steel are common materials of construction. Galvanized steel and other custom alloys or coatings are also available upon request.

Discharge valves are also material and application dependent. Typical configurations utilize round or square pneumatic slide gates, rotary valves, as well as open funnel dischargers.

Discharge hoods can include internal agitators and moveable grates to prevent material from bridging or ratholing in the hood, as well as devices to delump the material prior to discharging.

Discharge hoods can include material sensor switches to indicate when the container is completely empty of its contents.

MARKETS SERVED

NBE serves a wide range of markets including food, chemical, plastics, personal products, pharmaceutical, pet food, dairy, rubber and water treatment.

SAFETY CAGE AND SYSTEMS

Standard safety cage option includes 2-sided safety caging panels constructed of sheet steel with polycarbonate view windows and cut-outs for maintenance purposes.



Four sided safety cages completely surrounds the discharger and has hinged doors that are electrically interlocked with the controls to stop or prevent the discharger's operation if the doors are opened.



Light curtains eliminate the need to open and shut safety cage doors while disabling the equipment's operation when the beam is crossed

CONTROL SYSTEMS

Standard controls are deadman style where the operator selects and holds the rotate/return, and/or raise/lower selector switches to operate the equipment. The equipment will stop, and hold, in any position when the switches are released.



Control enclosures can be designed using NEMA 12, 4, 4x, 7, 9, and purged panels.

Custom PLC control programs with touch screen HMI are available to automate the equipment (see automation section).

PNEUMATIC SYSTEM

The equipment includes a complete pneumatic control system for all pneumatic devices including directional control valves, all necessary filter regulators, and a single supply connection complete with a bleedable lock out ball valve.



The system is plumbed using flexible poly-tubing. The poly-tubing is color coded to help troubleshooting and maintenance of the devices

MATERIAL TESTING

NBE highly encourages customers to test their materials for free at our facilities as the ultimate way to ensure the right mix of features are selected that optimize their process.

HYDRAULIC SYSTEMS

Power units and valve stacks are configured based on the customer's required cycles per hour and time per cycle. They can be constructed for general industrial purpose, wash down duty, intrinsically safe, and explosion proof classifications.



The power unit includes a large reservoir with a return line filter, sight gauge, and vented fill cap. The power units are mounted to the framework or can be skid mounted to include a drip-pan that helps prevent fluid from reaching the floor.



The valve stacks provide a range of adjustability to control the discharger's lift and rotation speed, as well as the seal pressure. The seal pressure can be adjusted for different styles of containers to provide a very effective seal without damaging the containers.



Seal cylinders are used to raise and seal the container into the hood on standard 2500 pound units



Rotation cylinders are used to invert the container into its discharge position.

Mast cylinders are used to raise the container to an elevated discharge position on lift and discharge units.



Rotolink™, a 3-bar mechanical linkage is designed to ensure smooth, continuous speed operation for container rotations up to 180 degrees. The linkage geometry is calculated so that it optimally balances and achieves a consistent force and velocity in both the raise and lower directions.

Smoothest operation. Period.



AUTOMATION

At NBE we believe intelligent automation makes all production processes safe, user friendly and just plain more efficient. Current advances in PLC control technology makes automating processes more economical than ever before and directly reduces manual labor costs. That's why, at NBE we offer our products with everything from simple automated tasks to fully automated systems. The real result of intelligent automation from NBE is a drastic reduction in long term operating costs while increasing throughput due to the speed and timeliness of repetitive tasks.

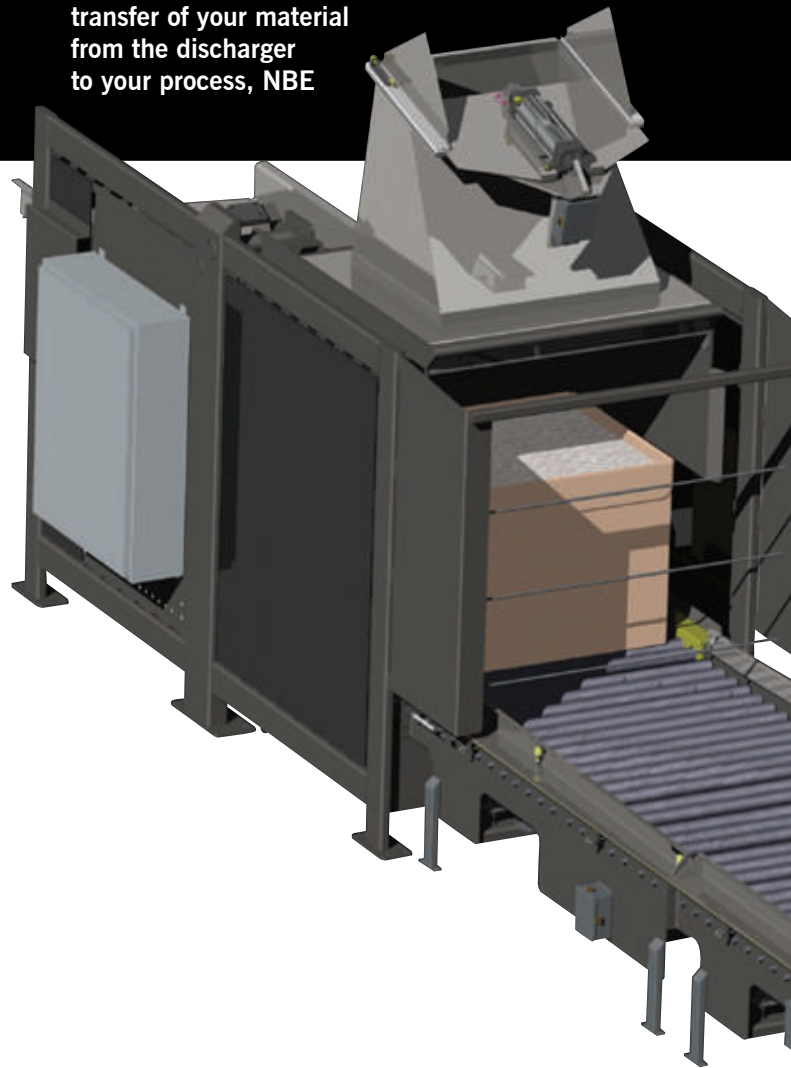
Our lift and seal container dischargers allow for a wealth of automated functions throughout their



operational cycles. With the push of a single button, optional PLC controls can automate everything from simple operations (such as taking a container from placement in the equipment to its final discharge position) to automating the entire sequence of operations. Indeed, when integrated with our indexing and staging conveyors, our most complete automated systems can reduce human involvement to literally placing full containers at one end of the discharging system and removing empty ones at the other. All at a rate that optimizes the capacity of the entire process. Now that's Forward Thinking!

INTE

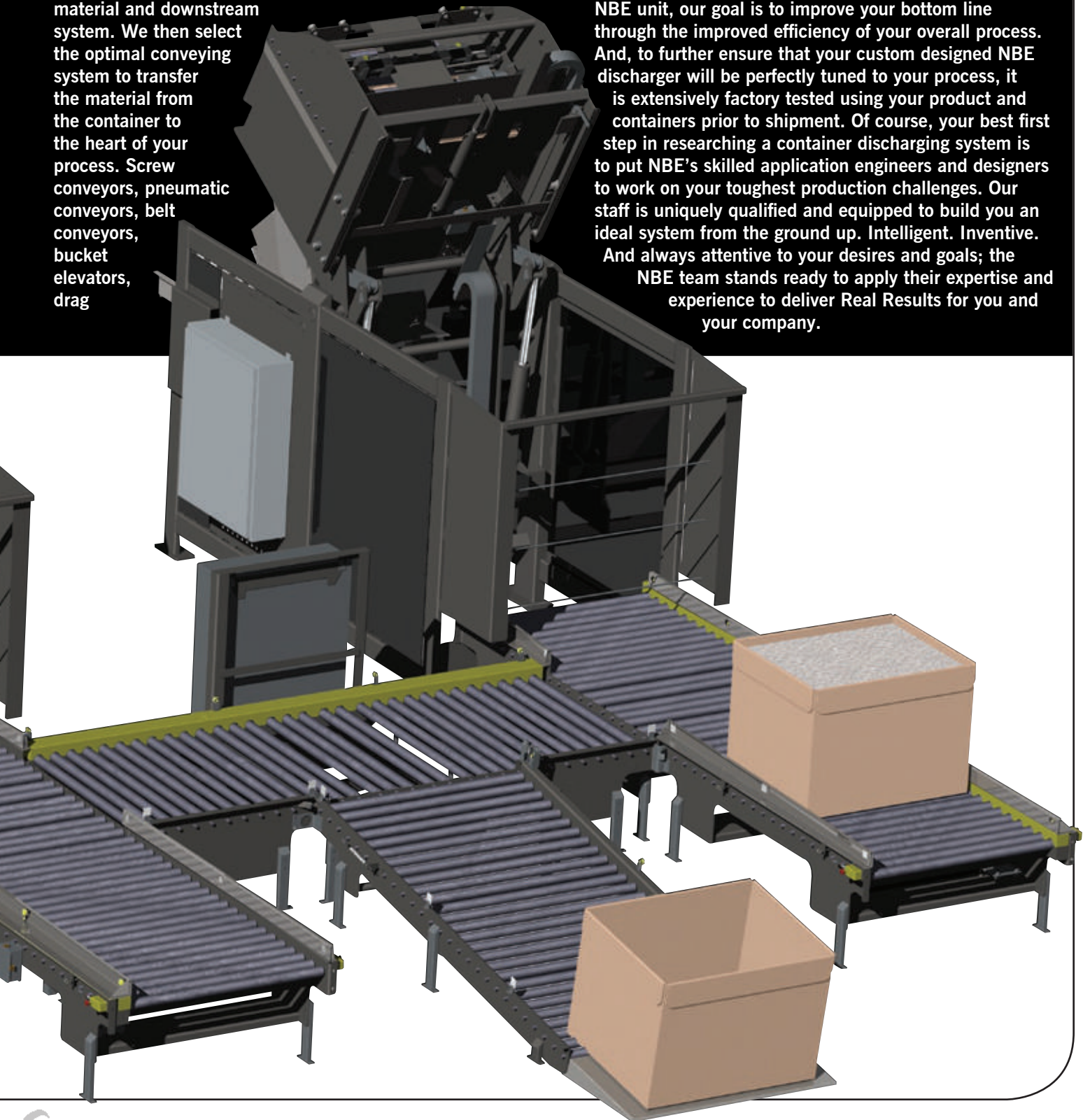
NBE doesn't just sell integration. We live it. Consideration of the unit's function within the larger process is built into everything we make. And we think beyond the simple stuff like ensuring container fit within the discharger or considering discharge height, available floor space and ceiling height. We ask the deeper questions. How will material be introduced to the unit? What material characteristics might alter the method of discharge? What is the best method of transferring the material from the discharger to the process? What is the optimal processing rate, plant sanitary requirements, opportunities for automation and other considerations necessary for successful integration of the sealed container discharging equipment into the process? Regarding the transfer of your material from the discharger to your process, NBE



GRATIFICATION

will select the best method to fit your process needs. For applications where it's impossible to discharge material directly into your process, NBE first analyzes your material and downstream system. We then select the optimal conveying system to transfer the material from the container to the heart of your process. Screw conveyors, pneumatic conveyors, belt conveyors, bucket elevators, drag

conveyors, etc. can all be seamlessly integrated into your process with an NBE Sealed Container Discharger. Regardless of the type of machine linked to your new NBE unit, our goal is to improve your bottom line through the improved efficiency of your overall process. And, to further ensure that your custom designed NBE discharger will be perfectly tuned to your process, it is extensively factory tested using your product and containers prior to shipment. Of course, your best first step in researching a container discharging system is to put NBE's skilled application engineers and designers to work on your toughest production challenges. Our staff is uniquely qualified and equipped to build you an ideal system from the ground up. Intelligent. Inventive. And always attentive to your desires and goals; the NBE team stands ready to apply their expertise and experience to deliver Real Results for you and your company.



FORWARD THINKING

throughout our product line means

REAL RESULTS

on your production line. (And, ultimately on your bottom line.)



Let's get started today!



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EQUIPMENT

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Represented By:

Forward Thinking. Real Results.

