The General Machine Company of New Jersey (a name later shortened to GEMCO) began operations in 1916 as a general machine shop to the growing industry around Newark, NJ. In the 1930s, John L. Muench, Sr. was at a local government arsenal when he was asked about a safer machine to blend gunpowder. The double cone tumble blender was the result with the original patent being issued circa 1937.

The unique concept of the tumble blender created a demand such that it blossomed into a product line that ended Gemco’s days as a job shop. Product development followed customer’s needs and requests. A center band was added in the early ’40s to be able to insert an agitator. A special segmented spherical disc valve solved leaking powder problems in the later 40s. Agitators were modified to provide liquid injection in the ’50s. Simultaneously vessels were jacketed to create dryers. The ’60s added the Porta-hopper for semi-continuous operations. The Vaaler award winning Gemcomatic drum loading/unloading system was perfected in the ’70s as was the Slant-Cone™ design for better, faster blends.

The ’80s brought the Airless I spray which provided the capability to handle viscous, high-surface-tension, heated and/or minute-additive liquids. The ’80s also added fabrication (and later ASME code qualification) to our capabilities, as quality was harder to control with outside vendors. In the ’90s, Gemco continued the tradition with enhanced process monitoring/control, integrated material handling, process step consolidation and dust/fume containment systems to limit worker exposure as well as product contamination. In 2000, Gemco became ISO 9001 certified.

Concurrent with the product line development has been Gemco’s internal operating systems and capabilities. Gemco maintains a modern 55,000 square foot facility in Middlesex, NJ where state-of-the-art systems combine to provide a quality product at a competitive price. Gemco is today highly computerized from computer-aided design (CAD) in engineering to production planning, scheduling, and purchasing. Much of the machining is done with CNC equipment to reduce cost and ensure repeatable quality. Above all, what has evolved is a philosophy of providing innovative custom equipment from proven concepts and component designs; a seasoned and dedicated management committed to customer needs through conservative designs; and a responsive team able to both anticipate and react to customer needs in a timely and professional manner. The proof of that statement is found in our extensive base of repeat customers ranging from fortune 500 companies to small start-ups that rely on our technology, support and craftsmanship.

Gemco’s long history of innovations make it uniquely qualified to offer its years of expertise in powdered blending technology. This expertise will assist you in designing the unique type, size and options to suit your specific application. We take into account your production requirements, volume required per shift/per day, limitations of batch size due to upstream and down stream processes, loading and unloading methods, cleaning and construction costs.

Gemco, the most respected name in Tumble Blenders, Vacuum Tumble Dryers and Valves, is approaching the new millennium with the confidence, focus and commitment necessary to meet the ever-more stringent requirements of our customers.

Blending Basics

As a primer, blending in its simplest form is the combining of two or more materials to produce a homogeneous mixture. These materials may be any combination of particulate (solids blending) or particulate and liquid (liquid – solid blending). Normal tumble blending of free-flowing materials provides a gentle mixing action. For materials that tend to lump up or for high intensity blending, an internal High-Shear Bar is utilized. Critical to any blending operation is the quality of the blend (batch variations). What constitutes a good blend or an acceptable blend is totally application specific.

Whatever your blending requirements, Gemco has the solutions to fit your process.
Considerations In Selection

Before selecting any blending system, it is necessary to understand the characteristics of the materials to be blended, how the material is transported to and from the blend and how the blending system will be integrated into the facility. Key considerations include:

- Material Characteristics
- Loading and Unloading
- Product Changeover
- Resource Availability
- Single or Multi-Floor Operation
- Daily Through-Put
- Cleaning
- Cross Contamination
- Space Limitations
- Process Flow
- Industry Regulations
- Worker Exposure
- Safety
- Quality of the Blend

v-shape

Gemco V-shape blenders are very popular in a wide variety of industries. The blend is achieved by the constant rolling action of the classic tumble blender. Each leg of the V-shape works independently to efficiently achieve a uniform blend. This precise mixing action results in blend variations of 1-2%. Each cylindrical leg has an access cover for easy material loading and cleaning. The V-shape, as all tumble blenders, requires low maintenance and consumes little horsepower.

double cone

The unique design of the Gemco D/3 Double Cone blender results in a high degree of particle mobility without the use of internal baffles. This type of blender offers a low profile, thus requiring less headroom than that of a V-shape blender. One access cover means easier cleaning and inspection. The Double Cone is a proven performer in a wide variety of industries, offering greater overall volume and high efficiency with blend variations in the range of 1-2%.

slant cone™

The asymmetrical geometry of the Gemco Slant Cone™ design offers very fast blend times. High axial particle mobility plus the intermeshing action of materials results in blend times of up to 33% less than other designs. In addition, The Slant Cone™ achieves more control and a more precise end product with blend variations typically half that of the other shapes regardless of how the material is loaded into the blender.
Gemco’s Laboratory Blenders provide a multi-capability approach to research and development as well as pilot applications. Solids blending, de-lumping, liquid addition, and agglomerations are easily accomplished in minutes. For many applications the units can also function as reaction vessels as well.

Gemco Lab Blenders are actually scaled down versions of full production blenders. Each incorporates Gemco’s traditional dual trunnion design frame with full ball bearing support. Each provides the optional ability to add liquids either with standard gravity feed or with the revolutionary Airless Liquid Injection System. In short, a Gemco Lab Blender is an invaluable addition to any R&D or Pilot Operation.

Size

All Gemco Lab Blenders are available in 4, 8, 16, and 32 quart capacity. For systems with optional agitators, small batches may be run with the use of optional cover insert scoops (available on Double-Cone and Slant-Cone). These scoops lift the material off the bottom and drop it on the agitator for effective small batch blends.

Support Enclosures

Full 304 stainless steel support enclosures are standard on every Gemco Lab Blender. These protect the motor drive and vessel supports and help maintain sanitary conditions around the blending area. The motors are not in the discharge area so potential damage from material spills is eliminated.

**standard features**

- 4, 8, 16, and 32 Quart Nominal Working Capacity
- 316 Stainless Steel Vessels
- 304 Stainless Steel Support Enclosures with 2B Polish
- Standard Designs for Material Densities up to 250 lbs. ft.

**optional features**

- High-Shear Bars
- Full range of finishes including No. 7 Mirror Polish
- Cover Scoops to Process Small Batches with High-Shear Bars
- Individual Timers for Main and High-Shear Motors
- Airless Spray and Liquid Injection Systems

Whatever your blending requirements, Gemco has the solutions to fit your process.
With a working capacity of one to twenty cubic feet, the portable blenders are designed for turn-key installation. Gemco can provide larger units in a configuration suitable to your space, doorways and operational constraints and requirements.

This unique series of blenders can literally have you blending instantly. Simply remove the blender from its shipping crate, wheel it to location, plug it in and you’re in business. No need for costly and time consuming installation construction, floor space or electrical hookup normally associated with machine installation. No permanent floor space or dedicated room required!

Small Batch or Key Mix Operations

Portable Blenders are perfectly suited for pilot and small batch production. They are specially designed for use where small key-mixing operations are required for larger blending operations and where special blends are needed in more than one location. Its portability allows you to move the unit wherever it’s required then stored out of the way when not in use. Plus it can be moved to a separate cleaning area.

Gemco Portable blenders are available in all three vessel designs; Slant-Cone, V-Shape and Double Cone.

**Standard Features**

- 1 to 20 Cubic Foot Working Capacities
- 304 and 316 Stainless Steel Construction
- Up to 30 Inch Clearance for Drum Discharge
- NEMA 12 Panel
- Standard Electric Plug with 10 Foot Cord
- Equipped with Wheels for Portability
- Hinged Safety Gates with Motor Interlocks
- Full Dedicated Electrical Control Panel
- 6 Inch Butterfly Valve Discharge

**Optional Features**

- Push Button Controls
- Panels in NEMA 4, 4X or 7
- Convertible for Future Installation of High-Shear Bars
- Stainless Steel Frames
- Patented Dust-Tight Gemco Discharge Valve
- Airless Spray Systems (Slant-Cone™ and Double Cones Only)
- Internal and External Polishes
- Stainless Steel Trim
- Various High-Shear Bar Designs-Slow Speed, High Speed, Liquid Solids, Ultra high Speed, Two Speed or Variable-Speed
- Pneumatic Valve Operation and Interlocks
Only Gemco offers 3 different geometric shapes and a wide variety of options in our 10-300 cubic foot production blenders. Each machine is tailored to customer specifications and applications. Gemco production blenders handle a variety of material densities and are easily adaptable to material handling systems. With installations in the Pharmaceutical, Nutraceutical, Cosmetic, Ceramic, General Chemical and Powdered Metals industries just to name a few, Gemco’s production tumble blenders are one of the most versatile batch process blenders available today.

**Convertible Production Blenders**

The Convertible Model Blender has been designed for the customer who does not have an immediate need for internal High-Shear bar, but contemplates the need on future material applications. The Convertible Model Blender is designed having one (1) hollow trunnion machined to accept bearings, seal cartridge and assembly, and agitator shaft. Stainless Steel, Delrin or Teflon end caps are furnished to close off the machined trunnion internals until needed. A motor base plate is provided for future installation of a High-Shear Bar motor.

**Standard features**

- 10 to 300 Cubic Foot Working Capacities
- 304 and 316 Stainless Steel Vessel Construction
- Carbon Steel Frames
- Butterfly Valve
- 18” Access Cover
- Standard Finishes

**Optional features**

- Gemcomatic Material Handling System
- Airless Spray Systems
  (Slant-Cone™ and Double Cones Only)
- Various High-Shear Bar Designs; Slow Speed, High Speed, Liquid Solids, Ultra high Speed, Two Speed or Variable-Speed
- Stainless Steel Frames
- Support Enclosures
- Patented Dust-Tight Gemco Discharge Valve
- Internal and External Polishes
- Various Discharge Angles and Valve Sizes are Available to Enhance the Discharge of Poor Flowing or Easily Segregated Materials

(See Pages 8 – 9 for More Options)
Gemco Porta-hopper blending systems provide the ability to process and transport materials in a common hopper unit. This is accomplished with a system that consists of one blending unit and multiple transportable hoppers.

The blender utilizes Gemco’s exclusive high efficiency D/3 Double Cone design, with a detachable hopper functioning as half of the blender. The hopper is mounted on wheels for easy transportation. When separated from the blender, the hopper becomes a versatile transportation and storage device. Access for cleaning is unmatched, material handling is simplified and unit overfilling is eliminated. The unblending of some products that can occur during discharge is eliminated when the hopper feeds directly into the next process step. During transportation, the hopper can be sealed with dust tight covers. Downtime is reduced to the short period that is required to exchange hoppers.

Semi-Continuous Blending for Solids and Liquids/Solids Applications

The Porta-hopper system is perfect for blend operations where quick change-overs for cleaning are required. Also, the system is particularly suited for applications that are sensitive to cross contamination problems. This problem can be addressed by utilizing different hoppers for each material and by designating those hoppers for use only with specific materials. Using multiple hoppers, the system provides the capacity to process materials in a semi-continuous cycle thus high throughput of the same product.

**Standard Features**

- D/3 Design Provides Greater Particle Mobility for More Efficient Blends
- Easy Cleaning
- Batch Capacities Up to 100 Cubic Feet
- Hoppers are Equipped With Gemco’s Exclusive Dust-Tight Spherical Solids Valves or Economical Butterfly Valves
- Systems are Totally Packaged Including Automated Controls
- Full Range of External and Internal Finishes, Including Pharmaceutical Grades

**Options**

- The System can be Customized With any of Gemco’s Full Range Options Including High-Shear Bar and Liquid Feed
Process and Atmosphere Controls
For process feedback, controls can operate by time or revolutions. Blend temperature, moisture or process completion end point. Real time monitoring and controls are available.

Bulk Bags
In keeping with industry requirements, Gemco provides a Bulk Bag Charging/Discharging interface.

Sampling Ports
This option provides a 316 stainless steel sample valve in the access cover or vessel wall as required which allows a product sample to be taken without opening the unit.

Polishes and Finishes
Gemco offers internal and external finishes ranging from Mill to Mirror. Vessel interiors can be coated with plastics such as Hylar and Kynar when required.

Containment
From simple dust containment using a retractable sleeve or dust arm to a glove box interface to maintain fugitive particles to less then 1ppm on new units and as a retrofit on older units.

Covers for Vacuum Loading
This option provides a cover with matching connections for pneumatic conveying.

Precision Positioning Systems
For applications where positioning has to be kept within specific tolerances every time for loading, discharging and monitoring the process, Gemco has the solution.

Full Testing Facility
Gemco has the largest test facility in the industry offering feasibility studies to full production tests with equipment ranging from 16 quarts to 150 cubic feet. This facility has conducted hundreds of customer trials.
Gemco units can easily be placed on load cells.

This cover replaces the standard access cover and allows discharge of product through the opposite end of the blender while still maintaining access to the internals of the vessel. This option is not available on V-Shaped Vessels.

In addition to a Standard Manual provided on a CD, Gemco offers: Material certifications, IQ / OQ template (WORD document) and Gemco F. A. T.

Gemco offers a variety of safety interlocks for both the protection of employees and Gemco equipment.

Stainless steel support enclosures are available. Support Enclosures are designed to be washed down making cleaning easier. These enclosures encase both support frames protecting the motor(s) and help maintain sanitary conditions.

The Gemco Vacuum Dust Arm is a cantilevered device that pneumatically positions itself near the discharge valve. The design allows for the removal of the dust escaping around the valve during charging and discharging.

Gemco equipment is typically manufactured using 304 and 316 stainless steel as the primary metal. Other material such as Carbon Steel, Hastelloy C276, C22 and C2000 and Inconnel are available.

Gemco provides the ability for CIP via specially designed covers. Gemco can assist in selecting a CIP system that is right for your application.
Manyleaders utilize internal High-Shear Bars to enhance the mixing process. Various types are manufactured for specific purposes. Gemco’s High-Shear designs offer the highest degree of blending effectiveness. A High-Shear Bar provides the ability to delump, disperse minute quantities of dry materials and blend large batches very rapidly. Gemco High-Shear Bars are available in three types:

**Slow Speed**
Primarily used for delumping. Long, slow moving High-Shear blades allow load level variation and reduced seal wear. Suitable for breaking down soft lumps and blending minor additives. Typical linear blade tip speed is 1650 feet per minute.

**High Speed**
Suitable for pigment and difficult dispersions as well as breaking down lumps, densifying and intimate blending of minute additives. Typical linear blade tip speed is 3300 feet per minute.

**Ultra High Speed**
Used for high intensity blending and allows high energy input to the product. Gemco’s Ultra High Speed High-Shear Bar can be operated for long periods of time without damage to product or bar. It’s used in all pigment blending, eliminates streaking and a final milling operation in most applications. Typical linear blade tip speed is 5000 feet per minute.

Gemco’s unique cantilever High-Shear Bars are designed to withstand material impact. The assembly features a High-Shear disc and dispersion blade combination that is sized according to vessel capacity and applications.

**Sanitary Options**
The Sanitary High-Shear-Blade and Disc System is a one-piece design which allows for faster and easier cleaning. For those industries where cross contamination and bacterial growth can not be tolerated, this construction is invaluable.

With this one-piece system, the costly and nonproductive time required to disassemble the individual blades, washers, nuts and bolts (32 to 64 individual components in a conventional Intensifier Bar) is eliminated. This eliminates final screening of product due to missing blades, nuts and bolts.

Gemco’s revolutionary seal uses a combination of static O rings and concentric, self energerised lip seals. Pressure build-up in the vessel actually improves the contact between the rotating seal and the non-rotating face, and the new seal design greatly reduces downtime due to packing and bearing changes.

**Only Gemco High-Shear Bars Provide**

- low maintenance design
- no packing
- cleaning problems greatly reduced
- easy retrofit
- minimal powder hang-up
- negligible heat build up
- built in redundant design
- Tip speeds up to 5000 ft/min. or more WITHOUT excessive heat build up.
- Full ball bearing support.
- Multiple liquid injection of separate liquids
Gemco has developed a revolutionary sealing arrangement for High-Shear blenders to address the problem of particle migration and heat build up. Sealing a rotating shaft against powder intrusion is a losing proposition so we eliminated all the dynamic shaft seals and replaced them. We then sealed the gap perpendicular to the shaft.

Shaft run out does not matter. Each seal is individually energized to meet with the face. Any pressure build up inside the vessel actually works to help keep the seal in better contact with the non-rotating face.

**A Few Reasons Why Gemco’s New High-Shear Bar Seal Is Right for You**

**no packing**
- No High Heat Build Up and Wear from the Large Surface Area of Packing Riding Against the Bar to Degrade the Product and Compromise the Shaft
- No Maintenance Required for Routine Adjustments to Maintain Correct Packing Tightness
- No Maintenance for Routine Removal and Replacement of Packing
- No Packing to Trap Product from One Batch and Release it into a Subsequent Batch Causing Cross Contamination
- No Degraded Packing to Shred and Re-Enter the Product as Contamination
- No Degraded Product Having Been Subjected to the Heat and Wear in the Packing Area Becoming Discolored and then Migrating Back Into the Batch as Contamination

**low maintenance design**
- Seals Last a Significant Number of Batches with Longer Hours of Operation Over Traditional Designs
- Seals are Easily Cleaned to Prevent Cross Contamination when Re-Used with Different Products
- Bolt-In Exchangeability with Existing Gemco Packing Gland Designs

**clean simple effective design**
- Clean with Minimal Powder Hang-Up Points
- Minimal Seal Contact Area for Negligible Friction and Heat Build-Up
- Set Screws are Covered with Cap Screws to Prevent Pockets Where Powder can Gather and Cake
The Gemcomatic is an automatic system for transferring materials from drums into Gemco blenders, dryers or formulators and back to drums. This is achieved through the use of a pneumatically controlled drum lift tray, a Gemco Dust-Tight Valve and a vessel positioning system (including all safety interlocks) built directly into any size or shape Gemco unit. The result is a system that provides a safe, dust-free transfer of materials with substantial savings in time and labor. The complete operation is safety interlocked protecting both the operator and the product.

Fast, Clean Operation

As a one-floor, one-person operation, the Gemcomatic eliminates second floor mezzanine or platform expenditures, additional material handling costs and saves processing time. A typical Gemcomatic system will discharge a drum in just 90 seconds and fill one in less than 60 seconds. This means fast throughput and greater processing efficiency. The blender spends more time blending and less time loading and unloading.

Gemcomatic is a clean, totally “closed” system during powder transfer. Drums are pneumatically lifted until they contact an oversized face gasket, forming a dust-tight seal. This seal prevents dust problems and contamination caused by particle migration.

**Standard Features**

- Fully Automatic “One-Button” Load and Discharge
- Field Proven-Hundreds of Installations
- Fast Loading (under 90 seconds) and Discharging (under 60 seconds per drum)
- Accommodates any Drum Weight to 1600 Pounds
- Accommodates any Standard or Odd Size Shipping Drums (Metal, Plastic or Fiberpak) from 26 to 35” High and 18 to 24” Diameter
- Pneumatically Operated Drum Roller Tray Lift Assembly
- Pre-Wired with Safety Interlocks

**Options**

- Tray Vibrators for Poor Flowing Materials
- Bag Dumping Package
- Full Sanitary Package Available
- Bag Guard Design
- Drum Weigh Off
- Two-hand Safety Controls

**Gemcomatic Couldn’t Work Without It!**

Clean, efficient totally automatic drum loading and discharging is virtually IMPOSSIBLE without the exclusive GEMCO Dust-tight Valve. Unlike butterfly valves which require a flange or “spool piece”, GEMCO’s unique design allows the drum to make FLUSH contact with the bottom of the valve. This forms a total seal between the drum and the valve. When the valve closes, it simultaneously “shears” through the material and “scoops” the material out of the top of the drum and back into the vessel. This action eliminates overfilling and spilling.

**No Other System Provides This Unique Feature!**

1) Drum is rolled onto roller lift tray. Drum automatically positions – operator initiates load cycle.

2) Lifter raises drum to form dust-tight seal against gasket around valve.

3) Valve automatically opens at approximately 110° as unit rotates at 1.5 rpm.

4) Drum empties completely, valve automatically closes at approximately 240° and unit continues to 0° position.

5) Empty drum is lowered and...

6) Rolled off – entire cycle takes approximately 90 seconds per drum.
What is a Liquid-Feed Blender? In a tumble blender, liquids can be efficiently blended with solids, up to 25%, depending on solids absorption. This method of blending is suitable for intimate dispersions of liquids to solids, extension of pigments, flavorings and scents, and breakdown of lumps or agglomeration of particles, whether friable or plastic stage.

The Gemco Liquid-Feed High-Shear Bar is similar to the High Speed High-Shear Bar. The High-Shear Bar shaft is hollow to form a passage way for liquids and the High-Shear disc is split to form a radial crack for a fine atomization of liquid droplets to exit under high speed rotation. Liquids can be injected into Gemco Tumble Blenders utilizing one of the following methods:

**Standard Gravity Feed**

This system is best suited for injection of water-like liquids at 5% to 20% injection ratios. Liquids are introduced into the vessel via centrifugal action between apertures in the High-Shear disc assembly.

**Airless Spray I**

This system provides precise droplet size control down to 6 microns independent of High-Shear Bar speed while accurately controlling quantities when minute amounts are required. There is no need to over wet or waste additives to ensure all materials have received enough liquid. Flow rates can be varied up to eight gallons per minute. Multiple liquids can be sequentially added in one process.

Airless Spray can inject any liquid regardless of viscosity and is capable of distributing small amounts of liquid evenly throughout the powder mass. The Gemco Airless Liquid Injection System is available on all D/3 Double-Cone and Slant-Cone™ Blenders.
Gemco's Customer Support Group provides a wide range of services oriented to today's customer requirements! Whether you purchase a Gemco Tumble Blender, Vacuum Dryer or Valve, our Customer Support Group is there to assist you.

Gemco's parts department maintains a customer profile database for quick equipment identification, parts, pricing and delivery information. Gemco stocks most common maintenance and repair parts. Visit our “Stock Room” page on our website located at www.okgemco.com for a complete list of your recommended spare parts and easy on-line ordering.

24-Hour Hotline

We’re only a phone call away. Gemco guarantees a response within 24 hours. Our hotline number is in service 24 hours a day, 365 days a year. For emergencies and troubleshooting dial 1.800. OK Gemco (654.3626) ext. 331.

Field Service

An independent department with experienced service technicians, our technicians are capable of handling all manufacture's tumble blending and drying equipment.

Retro-Fits

Change in Process? No problem! Gemco understands that requirements change over the long working life of a Gemco Blender. Gemco can modify your existing Blender to meet your new requirements. Gemco Blenders can be modified to accept most of our options or new designs. Whether you are changing how you load, blend, discharge, clean or integrate the blender with upstream or down stream processes or functions, Gemco's can handle these special requests to customized your equipment.

Refurbishing

Gemco can update and refurbish your used units. Everything from replacing all of the elastomers and bearings, repolishing and painting the unit to complete overhauls, installing all of the latest product updates, safety features, automation and monitoring equipment. Gemco's goal is to get your used unit back to nearly factory new condition.

Training

Gemco offers intensive “Hands-on” operator and maintenance training courses on your equipment at your facility. Typically multi-day programs, your operators and maintenance personnel will be factory trained to perform all of the functions and maintenance procedures required to keep the Gemco Blender trouble free and provide years of safe and productive service.

we offer:

- 24 Hour Hotline
- On-Site Repair and Maintenance
- Installation and Relocating Services
- Contracted Maintenance Services
- Maintenance and Operator Training
- Custom Retrofits and Refurbishing
Taking advantage of robust interactive technology and the Internet, the Gemco Stock Room allows instant access to our parts inventory. Once you have received your password, you can view a complete list of all the inventory items available for each of your Gemco products. This innovative feature allows you to take control over ordering replacement parts by using our secure e-commerce server. You’ll also be able to track order status and review past transactions. At Gemco we believe in using the Internet to its fullest capacity to bring value added services to our clients.

**Step 1:**
**Open an account**

Fill out our online form and send it to us.

**Step 2:**
**Log-in to the system**

Log-in using your email address and password. You will enter the secure area of our site.

**Step 3:**
**Find the part you need**

Searching our online inventory is a snap! Enter serial number or part number, and navigate to the appropriate part. Select the part you require and proceed to checkout.

**Step 4:**
**Order**

Order the part and pick a payment method. For your convenience, Gemco now offers online payment via credit card or purchase order.

You can review the status of your order at any time by logging back into the system.

*Visit the Stockroom at www.okgemco.com*

Gemco’s new Stock Room Online Ordering System allows real-time ordering of parts for your Gemco equipment.