Handling technology for Pharmaceutical, Chemical, Cosmetics, and Food Industries


Blenders
- Laboratory Blenders
- Small Quantity Blenders
- Drum Blenders
- Container Blenders
- Container Blenders with Lift Functionality
- Specialty Blenders
Today SERVOLIFT is one of the globally leading specialists in the area of container handling and blending technology, even though it only entered the market place in 1977.

Primary Reasons: Innovation and commitment of the team and the fact that comprehensive solutions can be offered for all areas in the pharmaceutical, chemical, cosmetics, and food industries. SERVOLIFT offers the most comprehensive machinery product line in this area.

This brochure provides an overview of the spectrum of blenders.
Laboratory Blenders

SERVOLIFT laboratory blenders are similar to large production blenders in design and blending technique. The geometry of the blending containers and the blending-speed are comparable to the parameters of production runs. Up-scaling of the blending results are assured. The laboratory blender is an indispensable device for trail runs and for quality control. Blender control can be used from the production blender or can be reduced to the required blending for trail runs.
Compact Design and Usable Anywhere

SERVOLIFT laboratory blenders can be used anywhere due to their compact design. Depending on needs they can be used as table top devices or mounted on a stand.

Space saving consoles or stands for specific applications and space requirements are possible, as well as implementation of ergonomic solutions.

The rotation area of the blender is secured with a cover and doors to protect the operator. The status is processed by the control unit. Running with opened protective devices is made impossible. For convenient filling and discharging the blend container the protective cover slides completely over the machine cover, allowing unrestricted access to the flanged container.

“One for all” is the motto for the SERVOLIFT laboratory blender. For blending tests any required container shape can be adapted securely through a flange with a manual clamping. The choices are from small drums to bulk material containers to custom containers.
SERVOLIFT small Mini-Batch Blender are designed especially for small quantities and on-demand blending. The blender is the miniaturized design of the large production blenders, equipped with the same characteristics and operator functions. The mobile chassis is ideally suited for use at various locations.
High Flexibility through Simple Operation

The rotation area of the blender is secured with a cover and doors to protect the operator. The status is processed by the control unit. Running with opened protective devices is made impossible.

The blender can be easily converted depending on the product or quantity. The means to utilize blending containers in various sizes provides for extensive flexibility. SERVOLIFT manufactures mobile mounting trolleys for transport and storage upon customer request. These are custom designed for the containers and can be fitted with height adjustments.

For specialty or existing containers we can also manufacture matching locking or receiver systems. If the existing container does not contain a specific blending geometry, the standard mounting flange will be adapted.
Drum Blenders

The SERVOLIFT drum blender is designed for the needs of the pharmaceutical and chemical industries. Fitted with simple to use features, built in a space saving and compact housing. The blender can be fitted with drums of various sizes.
The drum blender is being loaded with pallet lifters. The drums are being placed in the clamping system, secured and tilted manually.

Hydraulic fixing and tilting are available as individual options or as a combination. All variants offer a safety switch.

The carrier arm can be fitted with a secondary powered blending axis on customer request.

For continued processing of the blended product the blender provides a lift system or a pivot system. After the blending operation containers can be lifted up and poured into another container placed below, or integrated into an automated process.
SERVOLIFT container blenders are designed especially for production needs. Alignment at an angle of 30° to the blending axis has proven to provide the best blending results in the shortest amount of time.

The container is simply placed on the lower frame and locked by hydraulics through the control unit. This provides the necessary ground clearance for the blending operation.
Blending Rotation with Constant Control

All mechanical components are located in the machine housing behind the clamping system and are easily accessible through access doors. The electrical control unit is in a separate switching cabinet inside the housing. This eliminates the need of cable runs to a control room. GMP requirements are met with mostly smooth and even surfaces.

The locked container is continuously monitored for secured mounting and accurate positioning during the blending cycle. The blending rotation will come to a controlled stop in case of irregularities.

SERVOLIFT blenders feature pouring angle compensation to ensure the container is balanced during removal from the clamping system.

Special mounting points of the locking frames permit the use of similar containers in the same blender.
C-frame Blenders with Lifting Functionality

Container blenders with lifting functionality are ideally suited for integration in the production flow or process automation. The container can be filled from an upper floor by docking on a filler opening. The integrated lifting function enables filling or emptying of drums even with limited top clearances. After the blending process the container can be lifted for discharging into another container or pivoted for placement onto an upper floor.
Easy Loading, Blending, and Emptying

Wall-mounting of the blender is the definite means of separating production and drive technology. The opening necessary for lifting will be sealed (on demand also hermetically) through large and smooth metal panels, that are easily cleaned.

The containers are fitted with clamp beams for the clamp mechanism. Appropriate positioning takes place during inserting into the consoles. The hydraulic clamp cylinders or manual clamping jaws secure the container during the blending process to prevent repositioning or dropping.

The lifting function provides for easy discharging. Customized pouring devices such as funnels and discharge pipes support this procedure. Suction and use of vibration technology is available on customer request.
SERVOLIFT develops customized solutions for any blending task. Standard containers and customer specific developments of any geometry for volumes from 10 liters to 6,000 liters are possible. The examples of this page only show a small fraction of the various possibilities in manufacturing.
Gravity. The optimized shape of the container and the mirror-finish surface ensures careful blending of the product. Integrated guides provide for homogenous distribution in the shortest time. With lift and fill systems these blenders can be integrated in automated processes.

2-Axis Blenders. For blending of difficult products the container rotation is achieved through rotation around two independent axes. This blender is also ideally suited for cleaning of containers with detergents and brush balls.

Double-Cone Blenders. A specialized solution for filling via drum or bulk containers. The discharging and blending processes are fully automated. A sieve is placed below the opening and the blended product will be sieved into a container located beneath.

Ball Grinder. With this special design the product will additionally be ground with ceramic balls inside the container. The filling, locking, and drainage processes are fully automated and ideally suited for shift operations.
<table>
<thead>
<tr>
<th>Type</th>
<th>Laboratory Blender</th>
<th>Small Quantity Blender</th>
<th>Drum Blender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Volume</td>
<td>1-30 l</td>
<td>20-120 l</td>
<td>50-400 l</td>
</tr>
<tr>
<td>Working Volume</td>
<td>30-90 %</td>
<td>31-90 %</td>
<td>32-90 %</td>
</tr>
<tr>
<td>Load Capacity</td>
<td>&lt; 20 kg</td>
<td>&lt; 100 kg</td>
<td>&lt; 300 kg</td>
</tr>
<tr>
<td>Container Volume/Dimensions</td>
<td>Drum/Container/Custom Container</td>
<td>Drum/Container/Custom Container</td>
<td>Drum D= 450 mm/560 mm Custom Dimensions Possible</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>0,25 kW</td>
<td>1,5 kW</td>
<td>1,5 kW</td>
</tr>
<tr>
<td>Blending Revolutions</td>
<td>10-38 U/min</td>
<td>8-30 U/min</td>
<td>5-20 U/min</td>
</tr>
<tr>
<td>Controls</td>
<td>Relay Control/SPS optional</td>
<td>Relay Control/SPS optional</td>
<td>Relay Control/SPS optional</td>
</tr>
<tr>
<td>Operation</td>
<td>Foil Keypad/Terminal / IPC</td>
<td>Foil Keypad/Terminal / IPC</td>
<td>Foil Keypad/Terminal / IPC</td>
</tr>
<tr>
<td>Safety Devices</td>
<td>Plexiglas Protective Cover</td>
<td>Plexiglas Protective Cover</td>
<td>Chain with Safety Switch/ Light Sensor/Laser Scanner Gate with Safety Switch</td>
</tr>
<tr>
<td>Ex-proof Version</td>
<td>Directive 94/EG “ATEX 100 a” (EU) or UL certification (USA)</td>
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</tr>
</tbody>
</table>

**Top View**

[Diagram of Laboratory Blender]

[Diagram of Small Quantity Blender]

[Diagram of Drum Blender]
### Drum Blender with Lifting Functionality

<table>
<thead>
<tr>
<th>Container Blender</th>
<th>Container Blender with Lifting Functionality</th>
<th>Bin Blender</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-400 l</td>
<td>400-4,000 l</td>
<td>120-6,000 l</td>
</tr>
<tr>
<td>33-90 %</td>
<td>34-90 %</td>
<td>36-90 %</td>
</tr>
<tr>
<td>&lt; 300 kg</td>
<td>&lt; 1,800 kg</td>
<td>&lt; 3,000 kg</td>
</tr>
</tbody>
</table>

#### Specifications
- **Drum Diameter:**
  - 450 mm/560 mm
  - Custom Dimensions possible

#### Power Requirements
- **1,5 kW**
  - 600 l < 500 kg => 4 kW
  - 1,000 l < 800 kg => 5.5 kW
  - 1,600 l < 1,200 kg => 7.5 kW
  - 2,000 l < 1,800 kg => 2 x 7.5 kW

#### Control Options
- **Relay Control**
- **SPS-optional**

#### Keypad and Interface
- **Foil Keypad**
- **Terminal / IPC**

#### Safety Features
- **Chain with Safety Switch/ Light Sensor/Laser Scanner**
- **Gate with Safety Switch**

#### Compliance
- Directive 94/EG “ATEX 100 a” (EU) or UL certification (USA)
Controls and Operation

All SERVOLIFT blending systems are equipped with modern SPS or IPC control systems from established manufacturers such as Siemens, Allen Bradley, etc. Choose the desired degree of automation, which can begin with single process control all the way to fully automated process chains through networked environments.
SERVOLIFT defines the scope of the documentation, plans the qualification, generates the process documentation, and conducts the installation and operational qualifications according to the specific requirements of the pharmaceutical company.

Scope of Documentation
- Technical Documentation Research
- Documentation of Functions and Processes
- Generates Description of System
- Generates Documents for Installation Qualification (IQ)
- Generates Documents for Operational Qualification (OQ)

Recipe Management with IPC

Recipe Management with IPC
Blending System according to FDA 21 CFR Part 11 (Option to Operator Variant 3)

System Features
- Establishment in accordance with FDA guideline 21 CFR Part 11 
  “Electronic Records/Electronic Signatures”
- Windows 2000 based security with definite assignment of 
  user and password, password renewal, password history, 
  and defined password length
- Extensive Audit Trail System with encrypted 
  recording of all operator actions, alarms, and process data, 
  verified with checksum
- Recipe Management
- Generation of Batch records
- Visualization of all Operation Modes and Error 
  Messages of the Control Device
- System can be calibrated
- Rule-Based remote maintenance
- Generation of Qualification Documentation and 
  Performance of Tests for Installation Qualification (IQ) and 
  Operational Qualification (OQ)

System Architecture

Software:
- iFIX 3.0 from Intellution
- Windows 2000
- Microsoft Visual Basic 6.0

Hardware:
- TFT-Touchscreen
- Industry-PC
Control and Operation – Simpler, Safer, Faster

Control

- Blender drives regulated via frequency converter
- Siemens S7-300 SPS control, other types optional
- Relay control for easy applications
- Stainless steel cabinet on the blender housing
- Safety chain with safety switch or safety light barrier or scanner
- Electrical system completely assembled and tested in accordance with EN 60204
- Electrical schematics, SPS program and operator manuals in German or English
- Pouring angle compensation at end of cycle
- Defined and automated fill and drain cycles
- EX safety according to 94/9/EG (ATEX 100 a)
- Qualification documentation (IQ, OQ)

Operation

For operation of the blending systems 3 variants are available:

**Operator Variant 1: Foil Keyboard**
- Operation with membrane Keyboard
- Blending Time: electronic timer
- Blending Speed: adjustment with potentiometer with digital read-out

**Operator Variant 2: Terminal**
- Terminal with LED display, 4 lines at 40 characters, alpha-numeric block with 16 function keys
- Menu-based operation
- Password protection
- Display of errors and system status
- Logging of blending process (serial interface)
- Recipe management
- Bus interface for all systems
- Printer in protective housing

**Operator Variant 3: Industrial PC**
For applications with expanded recipe management
For applications with extensive password protection
For applications with extensive logging
For applications according to FDA 21 CFR Part 11, optional
- 12” touch screen
- Graphical and text user interface
- Display of errors and system condition
- Data backup possible through network
- Printer interface on PC
- Qualification according to FDA 21 CFR Part 11, optional