

Müller Drum and Container Systems



11

Lidded Drums

Drums with bungs / bottles & jars

Hoppers

Silos

Containers

Butterfly Valves

Drum Trucks

Lidded drums

**You wanted a drum.
Now you have a system**

The Müller drum is the basic module in an intelligent system: at the drop of a hat a drum used for storage or transportation becomes a process vessel meeting all the requirements of a present-day production process. To ensure that your manufacturing process proceeds smoothly, the Müller system enables you to add items such as hoppers, dryer inserts, discharge aids, mixing hoods or sieves. It is also compatible with all process-relevant interfaces: drum docking, dust-free filling, handling equipment and emptying at the production unit.

All components are harmonized with each other in a modular system and are interchangeable. And, because the Müller system is so flexible, the drum filling quantities or storage volumes can be adapted to suit your individual manufacturing needs. This means that differing flow, mixing or chemical properties do not necessitate using dozens of different containers, but only the right combination of system modules. Standard sizes are available ex stock.

Müller quality – For your peace of mind

- Quality management to ISO 9001: 2000
- Certified to Pressure Equipment Directive 97/23/EC module A1, approved manufacturer to AD 2000 Code HP 0 and TRR 100 in conjunction with EN 729-3
- ATEX-compliant design possible for all components
- Fabrication of type-tested vessels subject to inspection by Monitoring Association for Metal and Fiber Packaging
- UN certification for hazardous materials in all regular sizes
- All standard articles available ex stock
- Only sheet stock with 3.1B inspection certificates to EN 10204 is used

Drums with bungs / bottles & jars

Hoppers



Silos



Containers



Butterfly valves



Drum trucks



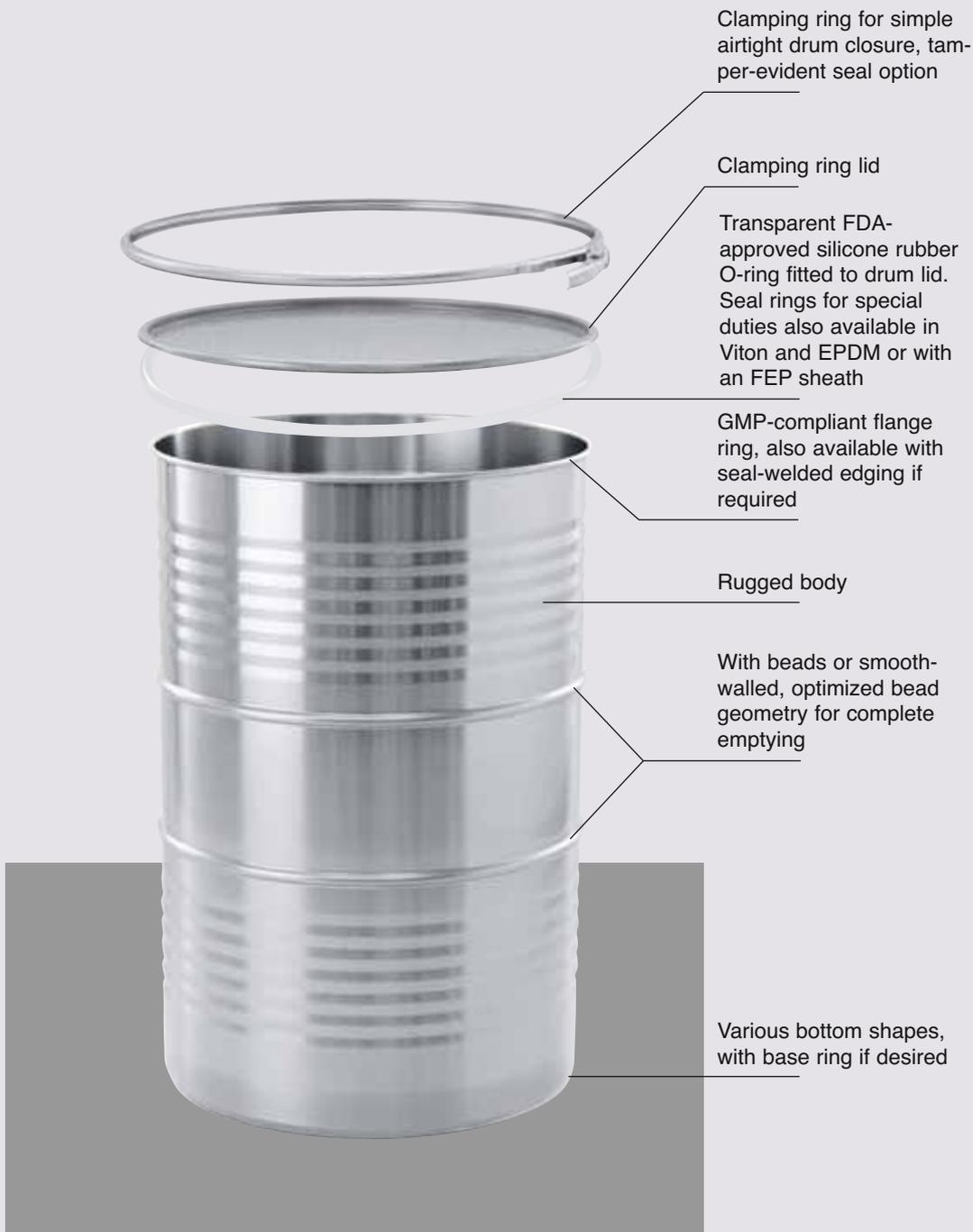
Perfection as a whole, ingenious in detail:

Müller lidded drums

We have the right container in the right quality to meet all your requirements: Müller lidded drums in GMP-compliant pharma design, butt welded with no folds or crevices and therefore easy to clean without leaving any residues. Their very low tare weight will come as a surprise, yet you can rely on maximum stability. The follow-

ing details reveal some of the other features offered by Müller drums:

- Volumes from 0.1 to 1000 L in 16 different diameters
- Stainless steel in AISI 304, AISI 321, AISI 316L and 316Ti grades as well as Hastelloy and special materials
- UN certified for solid and liquid products
- 320 grit polished finish on surfaces for optimum product discharge, $Ra \leq 0.6 \mu m$
- Electrochemically polished finish and Halar or PTFE coatings also available for special duties



Lid handle



Carrying handles



Hinged handles



Label holders



Trunnion



Lid hinge



Marking

Simple and effective handling – the Müller special drum lid with its filling nozzle forms a closed system for reliable dust-free drum filling.



Components designed for accurate interchangeability convert the drum into a process vessel – for example the Müller dryer insert for granular products and tablets.



Double means less trouble – in a harsh process environment double-walled drums offer that crucial extra ruggedness and safety.



Volume takes up space – and space costs money. Nestable tapered drums save space. They stack together snugly, reducing your space requirements by two-thirds, from the second drum onwards. Highly practical, highly cost-effective, highly recommended.



Double-walled drums for maintaining the contents at a desired temperature – smooth inner wall, outer wall with a spiral channel so that the cooling or heating medium always finds its way.



Müller is good in a tight spot – the user-friendly side outlet guarantees complete drum emptying even under low headroom conditions. The type and size of the side outlet can be selected at will.



Empty space in a drum has obvious disadvantages – bulky shipping and warehousing volumes also cost money. The Müller mixing hood, attached to the drum by clamping ring, provides the required freeboard space only when it is needed, not before.



Müller drums are designed for a range of ambient conditions – and at the same time they adapt to varying process conditions. Liquids can also be discharged reliably and completely under pressure – no problem with the Müller riser-tube lid.



Volume in liters	2.1/01	2.1/06	2.1/03	2.1/04	2.1/05	2.2/01
						
	Stackable base	Ultra clean	Flat bottom, stackable	Dished bottom	Side outlet	Tapered drum
Nominal diameter in mm						
0,1	–	–	80	–	–	–
0,2	–	–	80	–	–	–
0,5	120	–	120	120	–	–
1,0	120/170	–	120/170	120/170	–	–
1,5	170	–	170	170	–	–
3,0	170/250	–	170/250	170/250	250	–
5,0	250	250	250	250	250	–
10	250/315	250/315	250/315	250/315	250/315	–
20	315	315	315	315	315	–
30	315/375	375	315/375	315/375	315/375	375
35	–	315	–	–	–	–
50	375/450	375/450	375/450	375/450	375/450	375
70	375/450	375/450	375/450	375/450	375/450	375
100	450/560	450/560	450/560	450/560	450/560	450
120	–	–	–	–	–	500
150	560	560	560	560	560	–
170	–	–	–	–	–	560
200	560/600	560/600	560/600	560/600	560/600	560
250	600	600	600	600	600	–
300	600/710	600/710	600/710	600/710	600/710	–
350	710	710	710/800	710/800	710	–
400	710	710	710/800	710/800	710	–
500	–	–	800/950	800/950	–	–
600	–	–	950	950	–	–
700	–	–	950/1200	950/1200	–	–
800	–	–	1200	1200	–	–
1000	–	–	1200	1200	–	–
Applications	Universal, with beads, stackable. Smooth walls on request. Optimum cleaning	For cleaning in washing systems or machines. Geometry of beads and bottom optimized for clean discharge and for drum cleaning. Edging welded	Optimum cleaning, smooth walls, stackable	Pressurizable, heavy contents	100% emptying of liquids	Empty drums nestable to save space

	2.2/02	2.6/01	2.6/02	2.6/03	2.6/05	
Volume in liters						
	Tapered drum, folded bottom	Reinforced body	Protected body	Insulated body	Low pressure heating/cooling jacket	
	Nominal diameter in mm					
0,1	–	–	–	–	–	
0,2	–	–	–	–	–	
0,5	–	–	–	–	–	
1,0	–	120	120	120	–	
1,5	–	–	–	–	–	
3,0	–	170	170	170	–	
5,0	–	250	250	250	–	
10	–	250/315	250/315	250/315	–	
20	–	315	315	315	315	
30	375	315/375	315/375	315/375	315/375	
35	–	–	–	–	–	
50	375	375/450	375/450	375/450	375/450	
70	375	375/450	375/450	375/450	375/450	
100	450	450/560	450/560	450/560	450/560	
120	500	–	–	–	–	
150	–	560	560	560	560	
170	560	–	–	–	–	
200	560	560/600	560/600	560/600	560/600	
250	–	600	600	600	–	
300	–	710	710	710	710	
350	–	710/800	710/800	710/800	800	
400	–	710/800	800	800	800	
500	–	800/950	950	950	950	
600	–	950	950	950	–	
700	–	950/1200	1200	–	1200	
800	–	1200	1200	–	1200	
1000	–	1200	1200	–	–	
Applications	Folded bottom, lap seam welded body (minimum lot 100 drums)	Protection against accidental damage, inner wall smooth, very rugged construction, outer wall with beads for automated handling	Protection against damage to inner drum, inner wall smooth	Protection and insulation	Heating/cooling by liquid media at low gauge pressures	

More information?

www.mueller-gmbh.com

Lidded drums

Handling with care

Many processes involve liquids such as acids and alkalis and other hazardous substances, or high purity or toxic media. And they must often be warehoused or shipped under extreme conditions such as high pressures or temperatures. In contrast, the pharmaceutical industry specifically calls for hygienic design of product-contacted hardware. Drums with bungs must be appropriately designed and constructed particularly safely to meet these challenging conditions.

It is precisely here that Müller drums with bungs are in their element. The crucial factors in this sector are the correct choice of materials and smooth interior finishes with no unhygienic crevices in the drums. Not forgetting the various types of closures and seals.

Hopper cans combine the advantages of lidded drums and those with bungs: lightweight construction, safe handling, product transfer without the need for a separate hopper, and a large opening for cleaning.

Drums with bungs / bottles & jars

Hoppers

Silos

Containers

Butterfly valves

Drum trucks

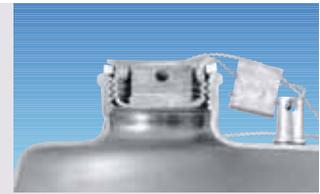


Modular product concept, wide variety of closures, especially suitable for troublesome liquids: Müller drums with bungs

Whenever safe warehousing, transportation and handling of high purity, hazardous or toxic media are called for, Müller stainless steel drums with bungs display their special strengths. The dished bottom, the crevice-free, smooth-finish drum interior and the position of the closures guarantee complete emptying and reliable disposal of the drum contents. On the subject of safety: all standard drums bear the UN certification for

various substance classes and hazard levels, e.g. UN 1A1/X2.0/700. This applies also to numerous other design variants:

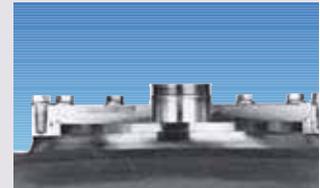
- Capacities from 10 to 250 liters in various diameters
- Stainless steel in AISI 304 and AISI 316L grade as well as Hastelloy and special materials
- 320 grit polished finish on surfaces, $Ra \leq 0.6 \mu m$, electrochemically polished finish and Halar or PTFE coatings also available for special duties (flanged version)
- Folded drums for transportation duties, e.g. for the flavors and fragrances industry
- Ultraclean version for the semiconductor industry



Standard threaded closure



Sterile closure



Flange connection



Protective lid



Rolling hoops



Side bung



Tri-Clamp ferrule



Automatic emptying is more reliable than the manual way – under compressed air pressure the product is discharged completely via the riser tube into the production line.



The safe alternative to glass bottles in laboratories: bottles and jars in stainless steel – unbreakable and with UN-certification.



We are well equipped to meet the stringent hygiene regulations in the pharmaceutical and semiconductor industries – ultraclean drums with sterile closures, internal and external surfaces crevice-free, GMP- and FDA-compliant.



We want to make your processes not only more reliable but also more efficient and profitable – Müller drums can therefore be supplied as stackable units that are easily handled by forklift truck, since horizontal returnable containers take full advantage of high-bay warehousing.



Lidded drums

Challenging requirements, elegant solutions, waste-free handling

The filling of drums and the transfer of their contents are special situations, since each time the product comes into contact with the environment. Symmetric and asymmetric hoppers with shut-off butterfly valves in nominal diameters up to 300 mm make the complete operation dust-free and waste-free, and are not restricted only to Müller drums.

Various cones and discharge aids, from rotary hooks to pneumatic vibrators, contribute to a problem-free emptying process. And the beauty of it is that the hopper is only fitted when and where it is needed. This saves space and is highly cost-effective.

Drums with bungs / bottles & jars

Hoppers

Silos

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Drum trucks



**All for one and one for all:
Müller hoppers**

The Müller hopper system sets new standards for safety, speed and cost-effectiveness. Our hoppers are specially designed for the reliable, dust-free and metered discharge of drum contents. Ingenious simplicity – just fit the hopper manually, close the clamping ring, ready to go. The patented MC butterfly valve makes cleaning simple and quick.

Various discharge aids ensure the efficient emptying of products that do not flow readily:

- The hoppers can be fitted with butterfly valves of various diameters for all Müller lidded drums from Ø 170 mm to Ø 800 mm
- The hoppers are symmetric with 60° or 90° cones or asymmetric. Cones with special angles can also be supplied
- 320 grit polished finish on surfaces, Ra ≤ 0.6 µm, electrochemically polished finish and Halar or PTFE coatings also available for special duties

Secure and simple closure with the drum clamping ring for an airtight joint, if desired specially adapted to your drum (metal, fiber, plastic)

Discharge nozzle with rounded leading edge for gentle insertion through the silicone rubber cap

Type MC butterfly valve DN 100 – 300 or type MRF for other requirements, plus special versions

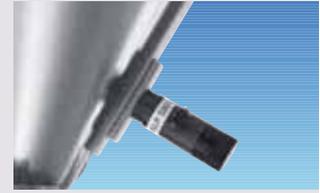
Discharge angle 60°, 90° or asymmetric. Special angles on request

Transparent FDA-approved silicone rubber O-ring fitted to hopper rim. Seal rings for special duties also available in Viton and EPDM or with an FEP sheath

Clamping ring



Sight glass



Vibrator



Rotary hook/agitator



Convenient handles



Bag retaining rod



Support for pickup fork



Marking

Ingenious operating principle – the inverting frame can get to grips even with tapered and smooth-walled drums. It is welded directly to the hopper.



Asymmetrical hoppers urge even bad flowing products to get a move on.



No problem even if your drum has an internal liner. The plastic bag is held in place by a retaining rod and cannot give you the slip.



At home in its nest – the drum is always the focal point. The nest automatically centers and securely supports the drum – together with its hopper – in the right position.



Lidded drums

Fast, mobile and ready for action at all times

With the Müller system silos can be used equally well for warehousing and transportation as for blending, filling, charging and discharging duties. Their main attraction, however, is their range of capacities from 5 to 1200 liters. This makes them highly versatile units for liquids, powders or paste-like media, suitable for tasks from laboratory scale right up to large batch manufacturing. Silos can be cleaned quickly and easily through their large openings.

In the Müller system these silos can be combined with all other modules, such as appropriately sized carriages on castors and mating components. This enables a single silo to be used cost-effectively: as collecting drum, feed tank or mixing vessel.

Drums with bungs / bottles & jars

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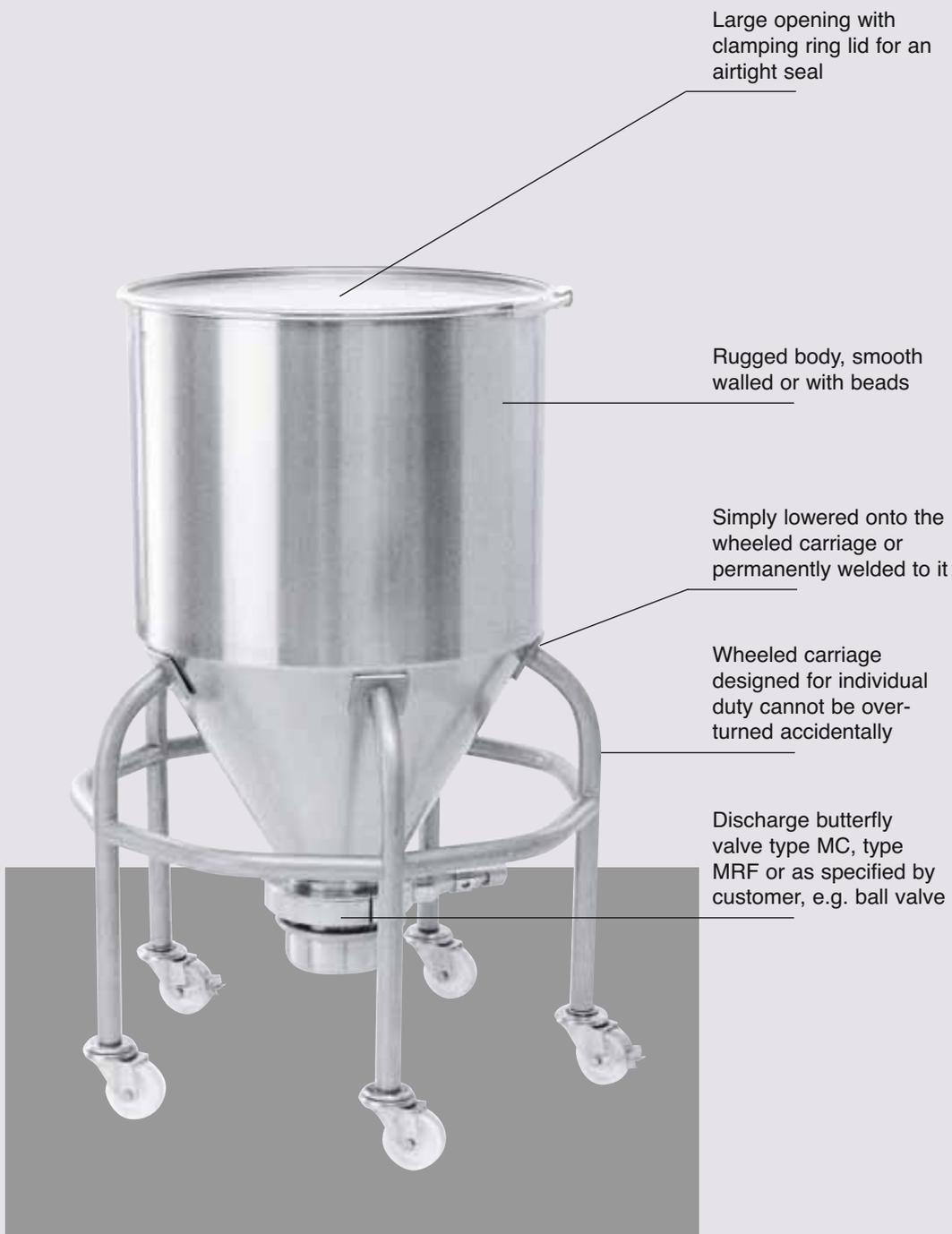


Designed and fabricated for practical needs: Müller silos

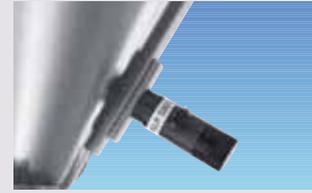
Müller silos play a cost-effective role in those operations where it is not practical or desirable to invert the product container. A typical application is when feeding a production line through an opening in the floor above. The open head of the silo makes cleaning it no problem before returning it for refilling.

Various discharge cones are available to suit the flow properties of the medium: 60° or 90° symmetric or asymmetric cones.

- Stainless steel in AISI 304, AISI 321 and AISI 316L quality as well as Hastelloy and special materials
- For solid and liquid products
- 320 grit polished finish on surfaces, $Ra \leq 0.6 \mu m$, for optimum product discharge
- Electrochemically polished finish and Halar or PTFE coatings also available for special duties



Sight glass



Vibrator



Rotary hooks / agitator



Convenient handles



Electrically conducting castors



Trunion



Filling nozzle

Pneumatic filling – this silo is filled through a vacuum conveying line. An air filter is mounted on the silo lid by a clamping ring.



Mobile at all times – the silo in its highly practical wheeled carriage, also available with electrically conducting castors. Depending on the process concerned, the hopper bin either rests on the support pads or is permanently welded to the carriage.



Filling between the floors – the silo is simply moved over the opening in the upper floor and docked onto the fall tube. Its contents can then be directly discharged into the machine on the floor below.



Silo with filling nozzle in the lid – for a simple dust-free filling operation. Trunnions are provided on the body of the bin for lifting by crane or in a Müller yoke.



Lidded drums

XXL format – big is beautiful: quantity with Müller quality

Whenever large quantities of product are manufactured and high bulk densities are involved, various sizes and shapes of container are called for. This is where the Müller container system fits the bill, with variants adapted to the duty concerned to offer the best possible solution. With capacities of up to 2000 liters it can be adapted to feed larger quantities of free-flowing material and bulk solids to the production process while still complying with the stringent requirements for chemical, pharmaceutical or food products. Large volumes and heavy loads require not only the right container but also the correct handling to go with it. Many examples and typical applications are given in the brochure **1.2 Müller Handling Systems**.

Drums with bungs / bottles & jars

Hoppers

Silos

Containers

Butterfly valves

Drum trucks



**Duty determines design:
Müller containers**

A container is not just a container. The intended application determines its shape and size. Whether cylindrical pharma containers, IBCs or rectangular containers, you will find the right solution for every duty at Müller:

- Volumes up to 2000 liters
- Stainless steel in AISI 304, AISI 321 and AISI 316L grade as well as Hastelloy and special materials
- For solid and liquid products
- 320 grit polished finish on surfaces, $Ra \leq 0.6 \mu m$, for optimum product discharge
- Electrochemically polished finish and Halar or PTFE coatings also available for special duties

Transparent FDA-approved silicone rubber O-ring fitted to lid. Seal rings for special duties also available in Viton and EPDM or with an FEP sheath

Large removable lid with same diameter as container

Rugged stackable frame for handling by pallet truck and forklift truck

Polished surface finish for optimum product discharge

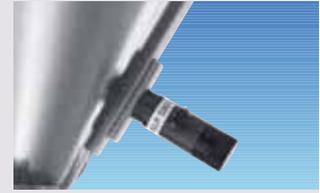
Discharge cone, 60° or 90° symmetric or asymmetric, with various outlet butterfly valves

Manway with clamping ring lid for an airtight seal

Wheeled carriage to suit your duty



Sight glass



Vibrator



Convenient handles



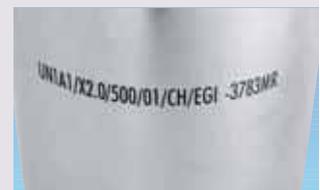
Dust-free docking



Vent nozzle



Label holders



Marking

Round pharma containers – maximum stability, optimized cleaning, best possible flow properties. These containers are designed for lifting by pickup fork to enable automated handling to be carried out at one location.



Your product determines the shape of the container – here the container is held in a blender by a dovetail fixture and clamped pneumatically.



Rectangular container – the space-saving solution. Maximum usable volume for minimum footprint. Surface finish IIB, inner surface $R_a \leq 0.6 \mu\text{m}$.



Only with Müller IBCs – clamping ring lids with full vessel diameter, making the interior of the container freely accessible for easy and thorough cleaning.



Flow shutoff and powder metering made easy:

This butterfly valve was developed specially for the pharmaceutical industry and is nowadays used everywhere where frequent changes of product take place. It can be disassembled quickly by hand without needing any tools, making it extremely easy to clean. Whether actuated by manual lever, pneumatic actuator or electrical positioner – the patented MC butterfly valve gives you control over all handling interfaces. Many examples and typical applications of dust-free product transfer are given in brochure **1.3 Müller Dust-Free Systems**.

Lidded drums

Drums with bungs / bottles & jars

Hoppers

Silos

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Butterfly valves

Drum trucks



**A system for all duties:
the well-known Müller pharma
butterfly valve**

The GMP-compliant MC butterfly valve from Müller was designed for bulk solids. It has also gained favor with users because of its cost-effectiveness, as it offers the benefits of short installation times, disassembly without needing tools and the consequent ease of cleaning. Its operation is simple, reliable and safe.

Additional features:

- DN 100, 150, 200, 250 and 300 sizes available ex stock
- Product-contacted components in AISI 316/316L stainless steel
- Also available with valve disk specially coated with a resilient silicone rubber for gentle handling of tablets and capsules
- Narrow construction minimizes headroom required
- If desired also available as ATEX-compliant version for use in Zone 21



Coated disk for tablets



Pneumatic actuator



Actuator with limit switches



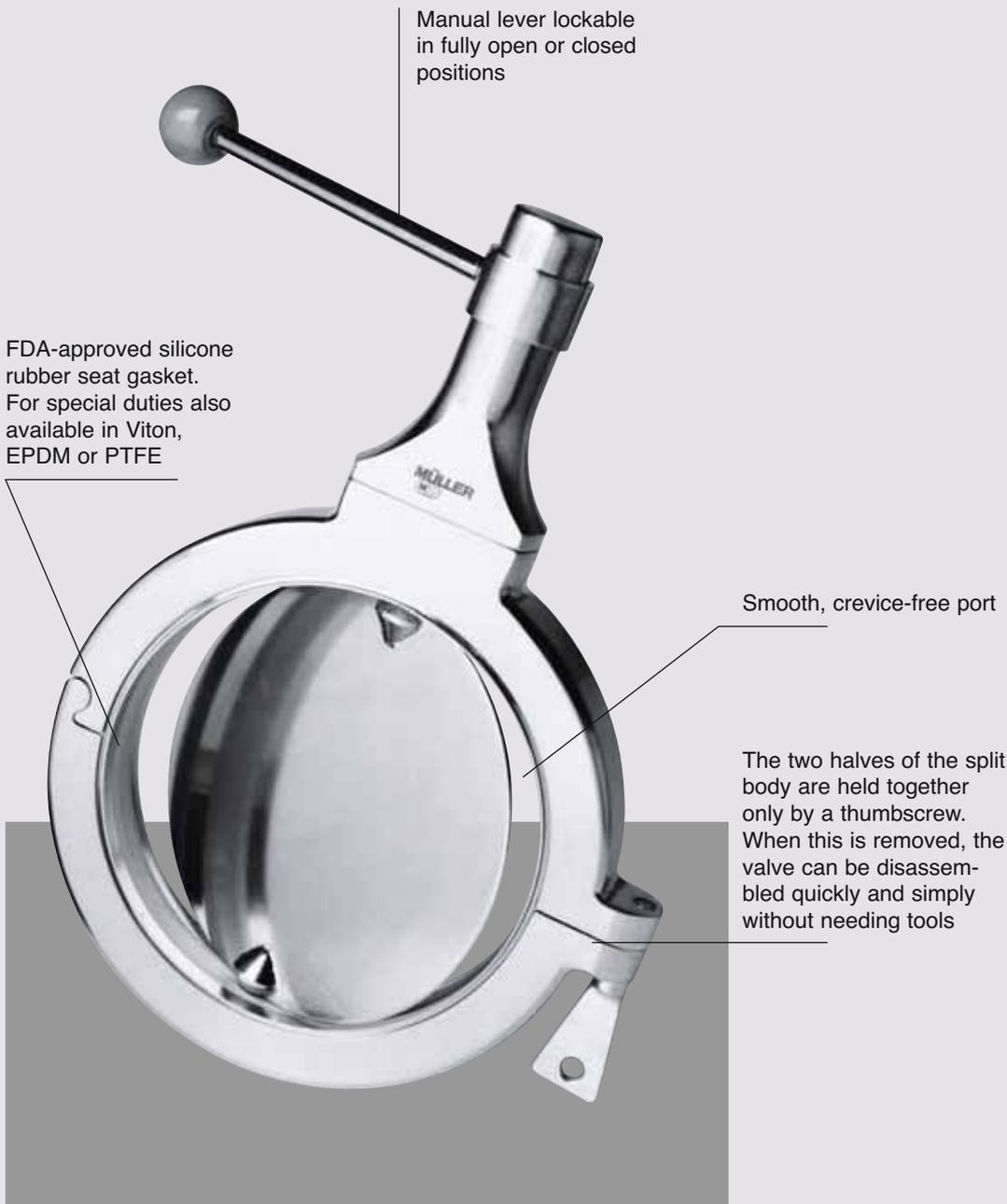
Actuator with positioner



Long manual lever



Type MRF flanged butterfly valve



Patented MC butterfly valve – solid components and compact design: flanges with welding necks, food grade seat gasket, disk with stems, flange retaining segments, split clamp and actuator



Overview of all shutoff valves – MC butterfly valve, MRF butterfly valve, ball valves, actuators and accessories



Everything under control – shutting off the hopper for a controlled and metered discharge



No problem at any interface – here an example of controlled shutoff at a filling opening



Lidded drums

A moving experience

Drum trucks are indispensable in every manufacturing operation where drums continually need to be transported. They make drums mobile and operating procedures flexible. Drum trucks enable operators to move drums safely and easily to every location where they are needed. Müller drum trucks are available in two basic forms: the rectangular type with a waist-level handle for drums of various diameters or for small squat drums, and a round type fitting a particular diameter of drum.

Drums with bungs / bottles & jars

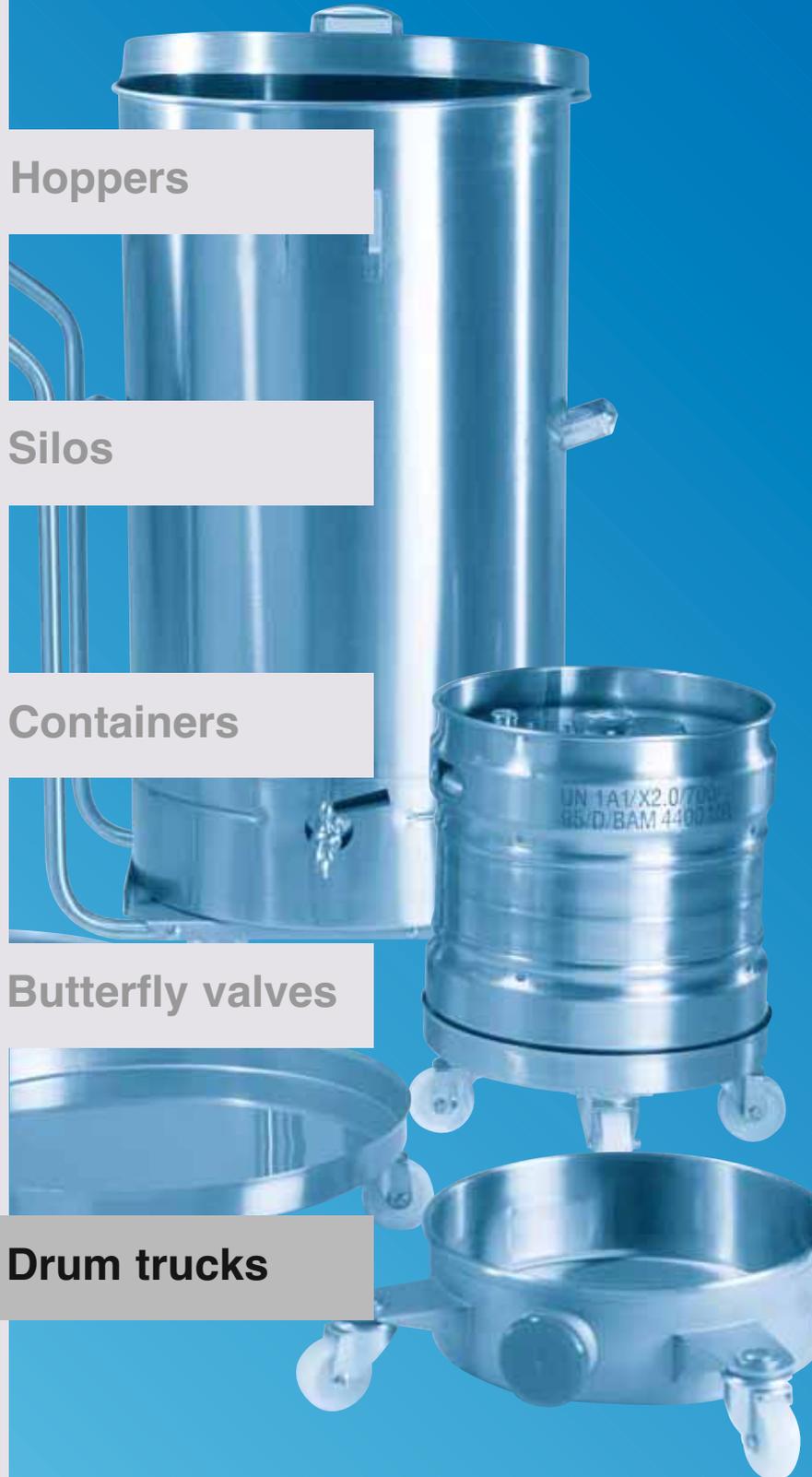
Hoppers

Silos

Containers

Butterfly valves

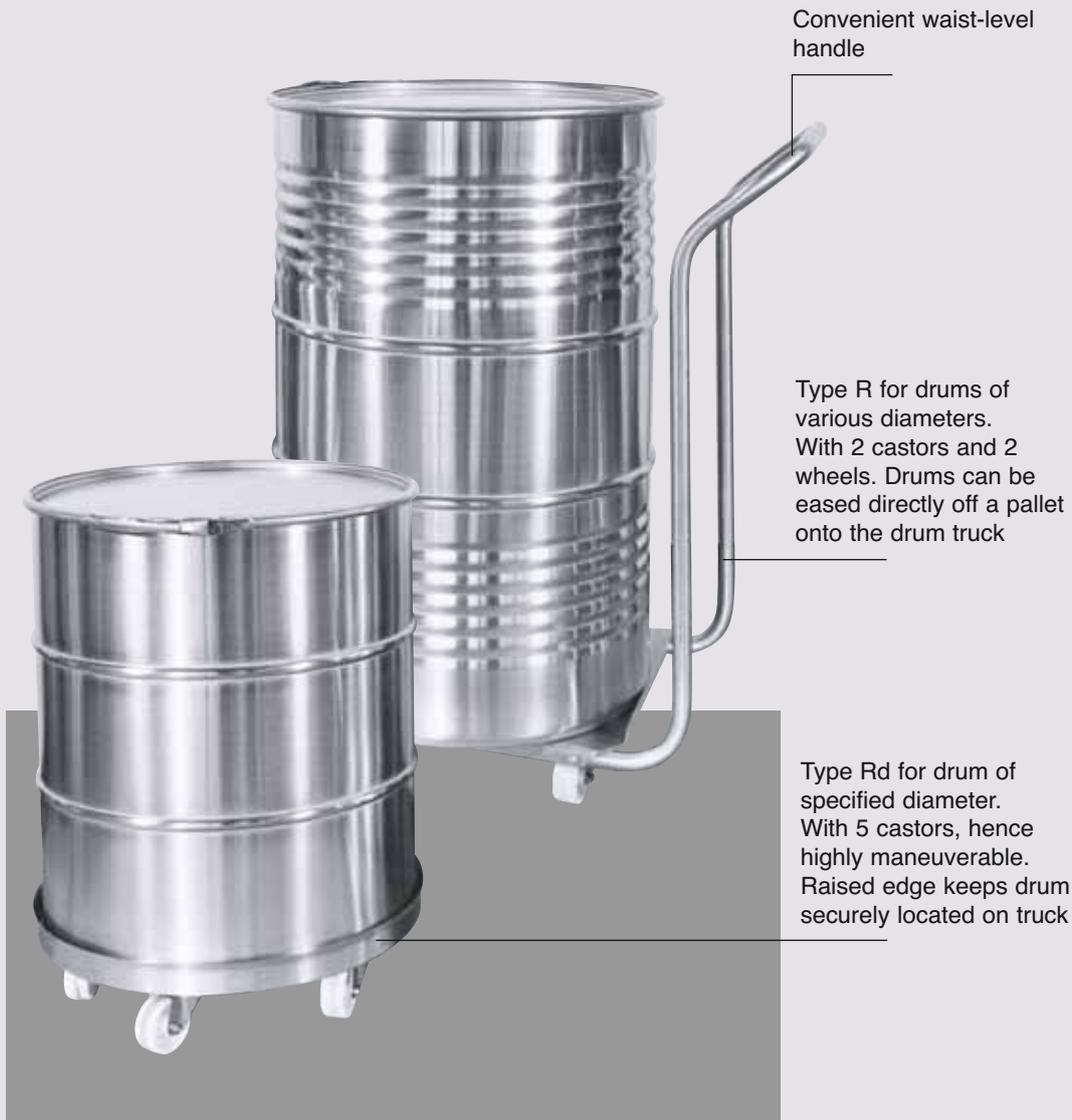
Drum trucks



**Safely and flexibly from A to B:
Müller drum trucks**

Müller drum trucks are fabricated throughout in AISI 304 stainless steel. Not only does this rugged construction give them a long service life, but it also makes cleaning easy. The nylon wheels and castors have stainless steel housings. For some duties

electrically conducting wheels can also be supplied for compliance with ATEX Zones 0 and 20. Drum trucks can carry loads up to 300 kg, and a carefully planned range of accessories caters for all conceivable duties.



With cleaning opening



Electrically conducting wheels



Locating pin



Gap for ball valve



Wheels mounted directly on drum



Clamped drum truck



Wheel parking brake

A handy help – the round drum truck is highly maneuverable and easy to position.



Individual mobility – for special applications the castors can also be attached to the drum directly.



Extremely flexible – the drum truck version with clamping ring is securely fixed to the drum, but can be detached whenever necessary.



Like pushing a shopping cart – the waist-level handle makes it easy to position the drum under the filling tube.



	6.1/01	6.1/02	6.1	6.1	6.1	6.1
						
	Type Rd	Type R	Drum barrow	Low loader	Special design	Electrically conducting castor
	For drum diameter (mm)					
	315	bis 560	on request	on request	on request	optional for all drum trucks
	375	bis 600				
	450	bis 710				
	500					
	560					
	600					
	710					
Applications	5 castors, a simple but safe handling aid for loads up to 300 kg	Drums can be eased directly off a pallet onto the drum truck. Handles loads up to 300 kg, for small drums	For moving drums short distances	Keeps the headroom requirement down	Customized for specific duty	Electrically conducting castor, ATEX Zones 0 and 20, stainless steel housing

More information?

www.mueller-gmbh.com

Presenting the other companies of the Müller Group

Today it is of ever increasing importance to cooperate with trustworthy and competent business partners who know what they are doing. As our customer you can rely on a wholehearted partnership. And you gain the innovation and skills of a world class group of companies in the field of packaging, handling, transportation and modular systems.

If you now feel the need to talk to us and ask a few questions, then please do not hesitate.

www.muellerdrums.com

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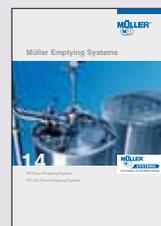
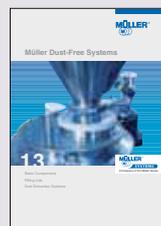
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Just one click opens new horizons

As a customer you always experience Müller as a whole. Your contacts are not determined by our organization but by the duties you specify. Proximity to customers and an individual consulting service provide that crucial impetus. Our 40 committed representatives in all key centers of the industrialized nations around the globe make us active worldwide, yet never far away.

Experience the potential we offer in your next project. Our world of modular systems is only a click away. Make use of our expertise – packed full of ideas in stainless steel. Each one a Müller original.



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