MUHR

Development and Production of
Bulk Material Handling
Water- and Processing Water Treatment

MUHR BULK LOADING TECHNOLOGIES

Your basic component for perfect bulk material handling

www.muhr.com

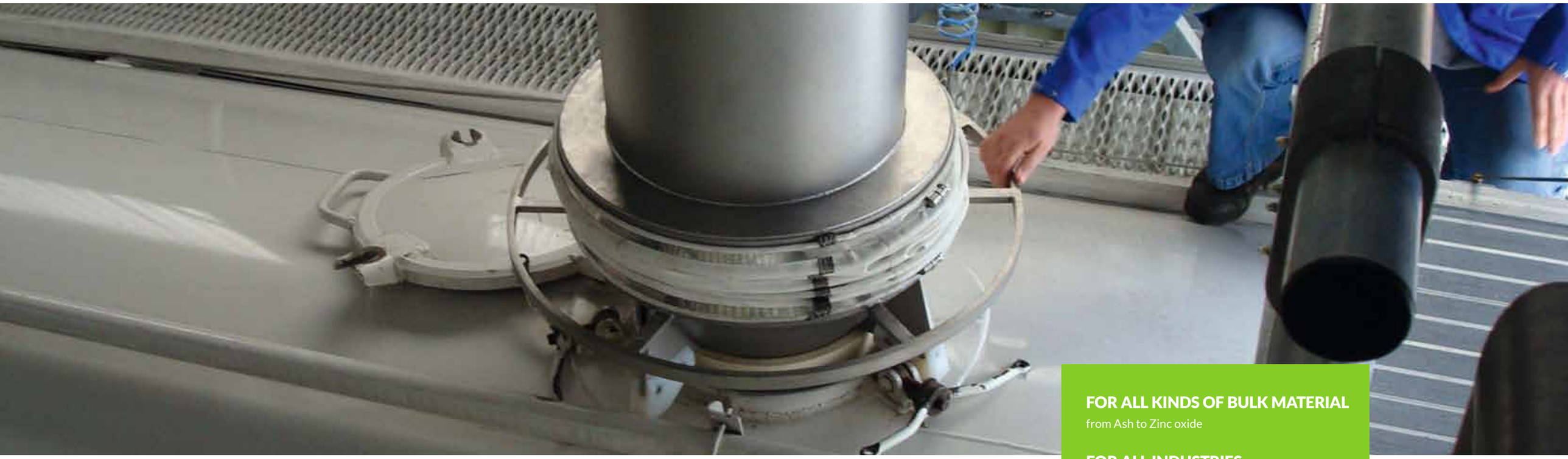
DUST-FREE LOADING
FROM THE FINEST …

… to the coarsest material

Efficient, long-lasting, trouble free and above all dust-free, environmentally friendly loading – this is guaranteed by the worldwide most comprehensive program for bulk loading technology by Muhr.

Bulk goods, loading system, loading conditions, regulations, etc. - every loading situation is different. Accordingly the loading system must be adapted to your individual requirements. With our modular concept we offer you a tailor-made loading system in serial quality.

If additional adaptations for your application are of advantage, these will quite simply be implemented by our team of specialists - tailored to suit your requirements.



FOR ALL KINDS OF BULK MATERIAL
from Ash to Zinc oxide

FOR ALL INDUSTRIES
Chemical, Petrochemical, Food, Grain, Feeding Stuff, Power Plants, Cement, Pit and Quarry, Salt, Fertilizer, Mining

CLOSED LOADING

in silo trucks, tank wagons and containers, etc.

- MVS with pneumatical sealing system
- MBG with loading cone

Closed loading with MVS and MBG
Closed loading should be first and foremost: Closed! And a closed system is dust-free…

Muhr bulk loading systems MVS and MBG for dust-free loading of bulk goods into silo vehicles, tankers, closed containers and silo ships. Economical and environmentally friendly.

MVS - Absolute reliability and completely dust-tight

MVS bulk loading spouts are equipped with a pneumatically inflatable sealing collar on the discharge nozzle.
During loading, this closes the annular gap between tank hatch and the discharge nozzle. Brilliantly simple, effective and reliable.

Advantages

- **Guaranteed dust-free**
  After the inflation of the sealing collar of the MVS loading spout, the silo or charging nozzle, loading spout and tank are a closed system. The force-fitting and form-fitting connection guarantees dust-free loading, even with overpressure in the system due to processes.
  Of course, all of the design elements required for this are safely integrated into the loading system.
- **Reduce filter costs**
  The lower exhaust air speed means that the proportion of dust in the exhaust air is significantly lower. Only the air displaced by the product need be extracted. Compact solution: When connecting the MVS loading system to a central aspiration or an external loading filter, these components can be designed significantly smaller. When also using the integrated filter unit, this can be designed in a very compact form..

For products with minor filter demands, the design with the filter bellows is sufficient. Your advantage: Smaller and lower cost filter systems, lower filter load, longer service life and lower operational and maintenance costs.
- **Universal application**
  The wide sealing range means the sealing collar of the MVS loading spout can be used universally. Thus all standard tank apertures from 390 to 500mm diameter can be covered with just one sealing collar. As an alternative there are also sealing collars with a sealing range of 290 to 400mm available as a special sizes.

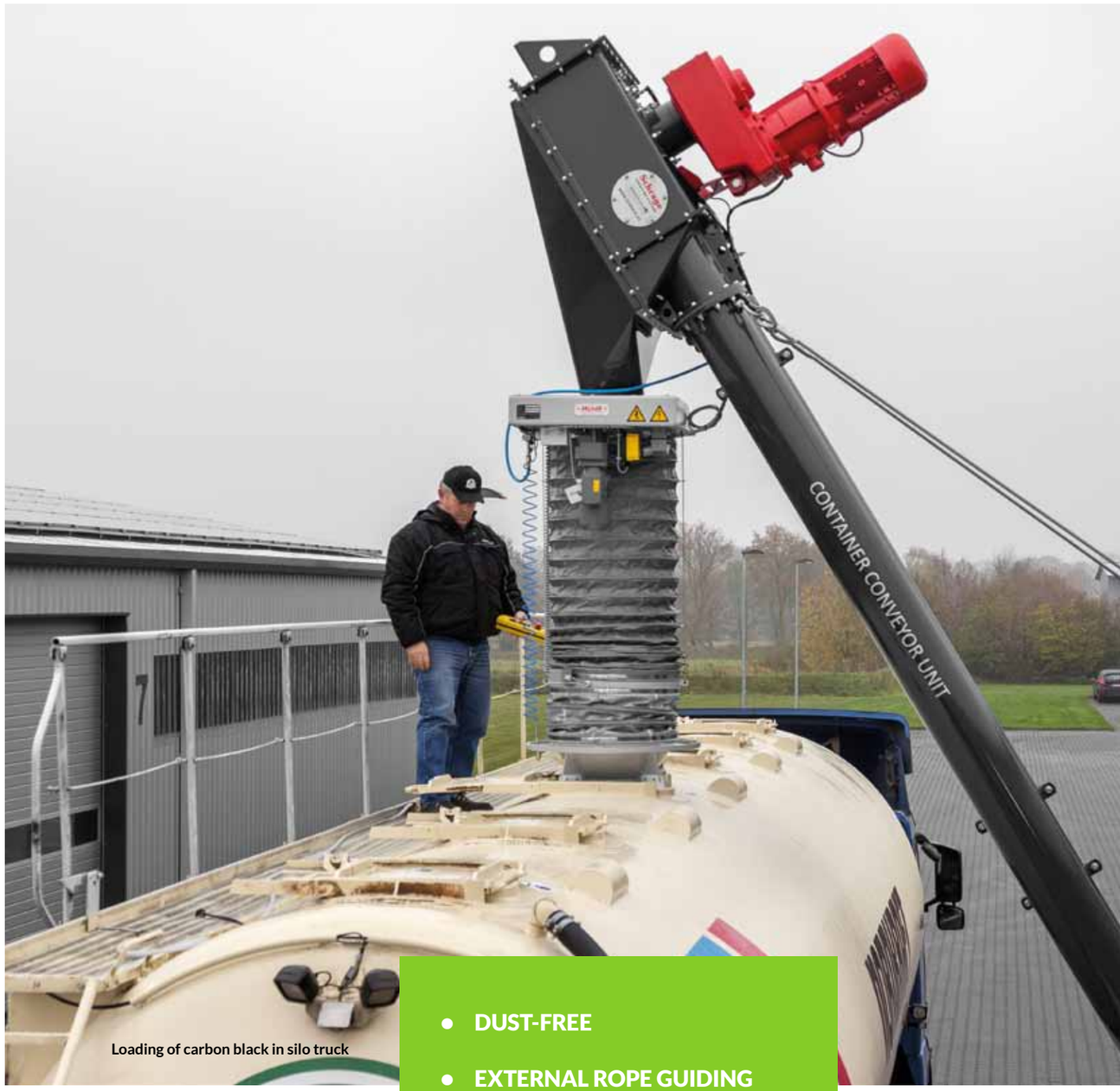
The sealing collars are available in black and also in light-colored finish.

MBG- Well proven design in the highest quality

The Muhr MBG bulk loading systems have a solid loading head whose loading cone is also equipped with an innovative double-layer rubber coating. Together with the product/exhaust air separation this ensures economical, dust-free loading and reliable, safe operation.

Advantages

- **Proven quality**
  The solid design, optimized over many years, ensures optimum operational security and long service life. Secure and economical.
- **Dust-free**
  Rubber-coating of the loading cone with double layer system: 18 mm thick, soft rubber coating for optimum matching to the tank opening, with 3 mm hard rubber layer on top for wear protection. Dust-free and durable.
- **Filter protecting**
  Separation of product flow and exhaust air flow through to beyond the product outlet of the loading nozzle, so that no product is extracted from the product flow in comparison to conventional loading spouts. Economical and efficient.



Loading of carbon black in silo truck

- **DUST-FREE**
- **EXTERNAL ROPE GUIDING**
- **PROVEN QUALITY**
- **ECONOMICALLY**
- **CLEAN LOADING FACILITY AND AREA PROTECTS THE ENVIRONMENT AND OPERATING PERSONNEL**

OPEN LOADING

on trucks, railcars, containers, ships, stockpiles, etc.

- MBO with loading bellow
- MBO-T with telescopic tube system

Open loading with MBO and MBO-T
For the opening loading of bulk goods into trucks, containers, railcars, ships, hoppers or stockpiles.

With open loading in particular, considerable experience is necessary for the conceptualization of the loading system. For the reliable and dust-free loading of coarse-bulk materials such as gravel and clinker, as well as for powdery products. With loading capacities of more than 1,000 m^3/h and loading heights of up to 30 m and more.

MBO

With exterior bellows for the open loading of powdery, granular and very dusty products.

Advantages

- **Perfectly adaptable**
  The equipment of an MBO loading spout is extremely variable:
  Bellows, interior bellows, interior telescopic tube or wear protection cones made from various different materials and coatings, dust hoods, internal and external filter units, etc. Thus, you can form an economical and efficient loading system for any application.
- **Low-wearing and economical**
  Internal components for product guidance as internal bellows or wear protection cones or telescopic tube made from standard steel, stainless steel or wear-resistant special steel reduce the wear. Together with other options such as the optional, simply replaceable and rotatable wear protection tube, this ensures long periods of operation and low operating costs.
- **Dust-free and filter-protecting**
  The dust development is effectively reduced as early as within the course of the loading process through the use of a special dust hood with „Energy Brake“ or the Flow-Speed-Retarder FSR. In addition, a special supply air system on the dust hood ensures optimum efficiency for the exhaustion energy used.

MBO-T

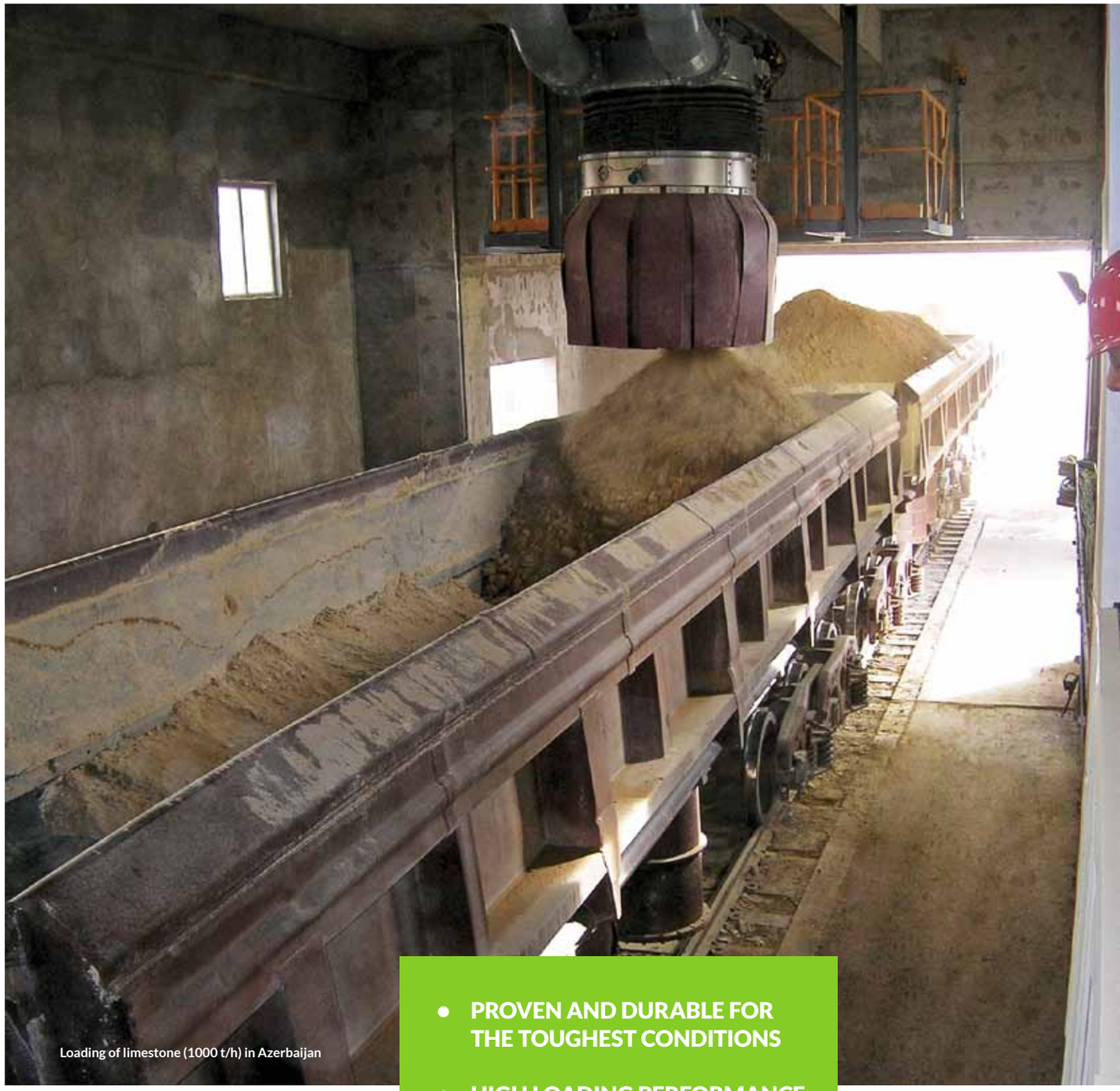
With telescopic tubes for the open loading of coarse-bulk and low-dust products.

Advantages

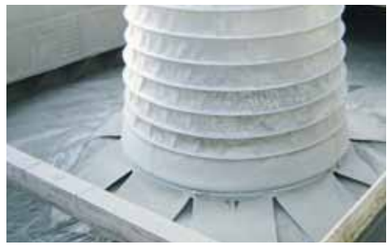
- **Various different designs**
  Individually adapted to the respective application, the telescopic tubes are made from standard steel, stainless steel or wear-resistant special steel.
- **Durable quality**
  As with all Muhr loading systems the MBO-T is also distinguished by its extremely solid and well thought out design. For maximum durability and reliable operation.
- **Individually expandable**
  With the help of numerous equipment options, such as various different dust hoods or control system components, the MBO-T can be ideally adapted to suit your requirements.

Loading of coal on stockpile (1200 t/h, -40°C, ATEX21, l=31m) during installation in Spitsbergen

Loading of FGD plaster (400 t/h, l=30m)



Loading of limestone (1000 t/h) in Azerbaijan



- **PROVEN AND DURABLE FOR THE TOUGHEST CONDITIONS**
- **HIGH LOADING PERFORMANCE**
- **DUST HOOD WITH ENERGY BRAKE**
- **MAXIMUM DUST-REDUCTION**
- **UPGRADEABLE WITH FSR FLOW-SPEED-RETARDER OR CASCADE SYSTEM**

COMBINED LOADING

for both open and closed loading

- MVS/O with pneumatical sealing system and dust hood
- MBG/O with loading cone and dust hood

Combined loading with MVS/O and MBG/O

For the dust-free, combined loading of bulk materials, either to silo vehicles or open vehicles and containers.

With MVS/O and MBG/O you can load both open and closed with the one loading spout, depending on your chosen means of transport. Simple and without compromise Efficient and dust-free.

MVS/O & MBG/O

For the combined loading, MVS and MBG loading nozzles are additionally equipped with dust hoods. The dust hoods can be operated manually or automatically - your choice! For open loading, use your system with the dust hood lowered. And, for closed loading the dust hood is simply pulled up.

Advantages

- **Unrestricted advantages**
  All the advantages of the closed and open loading systems are retained and unrestricted in the combined variants. Thus you can load dust-free, economically and securely here too.
- **Unrestricted flexibility**
  You also have all of the equipment options for the closed and open loading systems in the combined variants. Thus you have not only the free choice of the type of loading but also an individual system, tailored to your requirements.

Loading of cement (250 t/h) on barge or tank ships with pneumatically operated sealing cone

- **BOTH OPEN AND CLOSED LOADING WITH ONE SYSTEM**
- **DUST-FREE**
- **WITH MANUALLY OR AUTO-OPERATED DUST-HOOD FOR EFFICIENT OPERATION**
- **FROM FLATBED VEHICLES TO TANK SHIPS**

RESIDUE-FREE LOADING

- MVS-TD dust-free loading telescope
- BSS Bellows-Stretch-System

Residue-free Loading

Perfect, residue-free loading with the Muhr MVS-TD bulk loading system with sealable telescopic tubes or the Muhr BSS Bellows-Stretch-System.

In certain cases, bulk material residues in loading devices are not wanted, e.g. for hygiene reasons, due to the risk of fire or explosion, or in the case of a product change.

Vibrating units on the nozzle head for the cleaning of the loading bellows are frequently insufficient for this purpose, as product residues remain in the folds of the loading bellows.

With the Muhr BSS bellows stretch system or the Muhr MVS-TD telescopic pipe system, residue-free loading is guaranteed. Reliable and safe.

MVS-TD Bulk Loading System

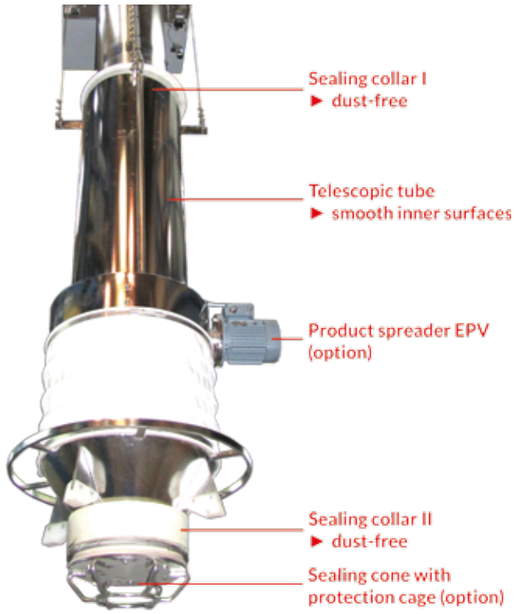
Patented quality with perfect efficiency and safety
In comparison with loading bellows, hardly any product residues are able to deposit on the smooth inner walls of telescopic pipes. The disadvantage of conventional telescopic pipes, however, is that dust is able to escape from between the individual pipes. Not with the Muhr MVS-TD. The ultimate loading telescope: highly flexible and absolutely dust-free!

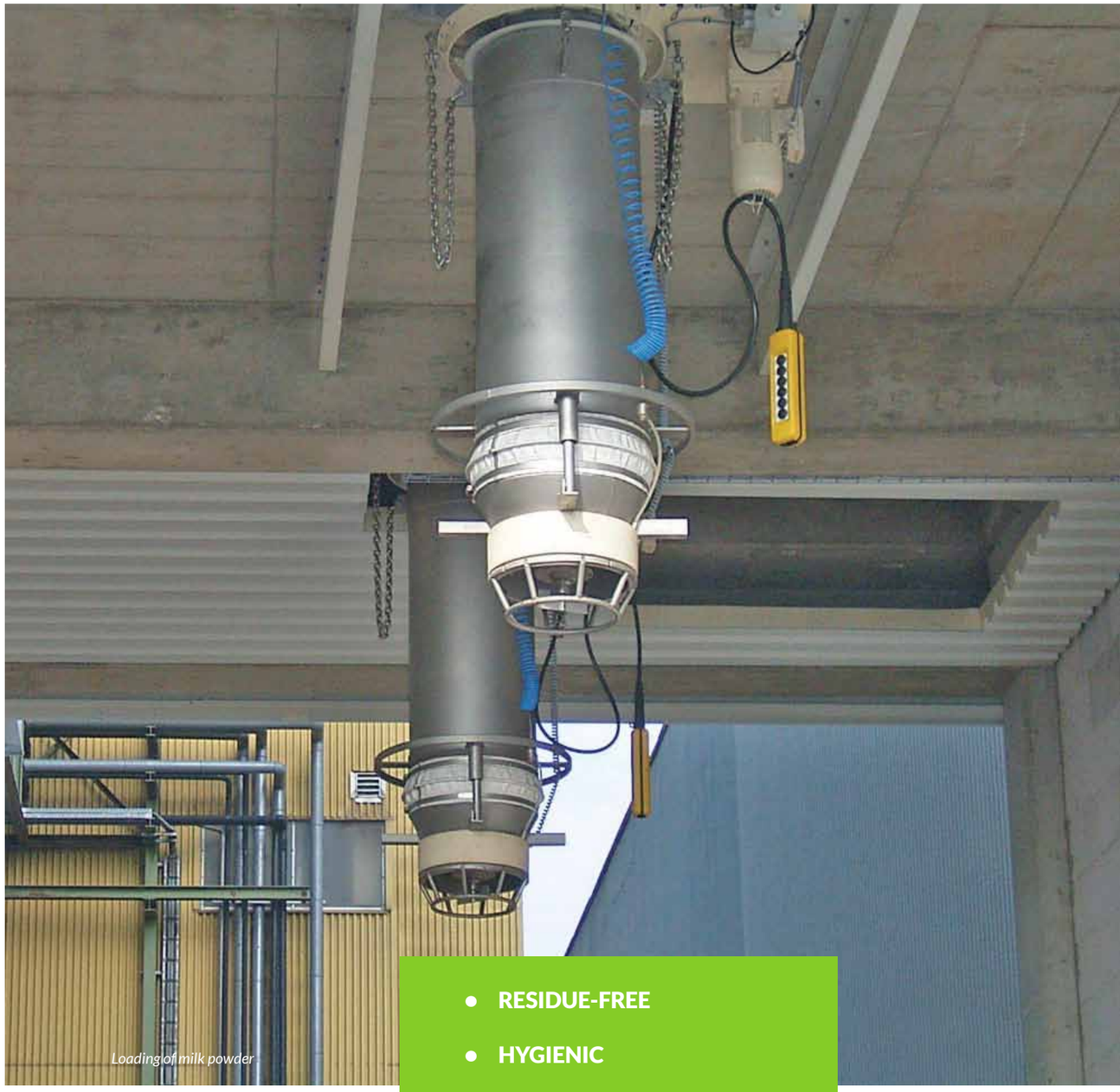
Advantages

- **Guaranteed dust-free**
  With the MVS-TD telescopic pipe system developed by Muhr, after lowering, the individual pipes are connected to each other - dust-tight - with pneumatically inflatable sealing collars, so that in combination with the MVS loading nozzle absolutely dust-free loading is guaranteed. For the retraction of the loading telescope, the sealing collars are released again and the loading system can be moved into the final position above without any problem.
- **Extremely flexible**
  The huge sealing range of the collar means that the MVS-TD loading telescope is very flexible, so that the tank aperture does not necessarily have to be centrally positioned underneath the loader.
- **Variable application**
  The sealable telescopic pipes can also be used in an inclined position, which means they are also ideally suited for the dust-free connection of stationary outlets with mobile loading systems (= loading vehicles).

BSS Bellows-Stretch-System - Tensioning and relaxing at the same time

With the use of the Muhr BSS Bellows-Stretch-System, the walls of the top and bottom bellows are alternatively stretched or folded. This ensures that bulk goods residue is reliably cleared out of the folds of the loading bellows. During the stretching and folding, the loading nozzle is held tightly in place in the tank opening by the pneumatic MVS sealing collar so that it cannot be lifted by the stretching device.




Loading of milk powder

- **RESIDUE-FREE**
- **HYGIENIC**
- **DUST-FREE**
- **FLEXIBLE**
- **EASY & FAST CLEANING**
- **LOW COSTS FOR OPERATING, MAINTENANCE AND SPARE PARTS**

EQUIPMENT MODULES

- Lifting Systems
- Flexible Part / Loading Bellows Chute-
- Sealing Cone
- Vibrating Unit
- Level Indicators
- Integrated Filter Unit IF
- Immersion System DTS

Lifting Systems

Muhr bulk loading systems can be equipped with various different lifting systems for lifting and lowering the loading nozzle to suit the operating conditions:

- Muhr electrical cable winch

  Inlet head and electrical cable winch form a single unit: Slack-cable switch, lift limiters and main components of the winch unit are contained in a closed housing. For practical reasons, all electrical control elements are located together in a terminal box on the inlet head.
- Manual cable winch

  For manual operation of smaller loading spouts with less frequent loading.
- Manual lifting / lowering

  Lifting and lowering the loading spout by hand, optionally with supporting counterweights. Only available for small loading spouts.
- Pneumatic lifting / lowering

  Lifting and lowering the loading spout by means of pneumatic cylinders. Particularly well suited to low lifting heights.

Flexible Part / Loading Bellows Chute

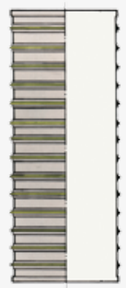
Flexible part in flexible designs for efficient solutions: Muhr loading spouts can be equipped with various different flexible parts for lifting and lowering the loading nozzle to suit the operating conditions.

Wide range of possibilities

From single loading bellows, through double-bellows design, with wear protection cones or internal telescopic tubes, or even as telescopic tube alone, with or without pneumatic intermediate sealing - there is a wide range of options available.

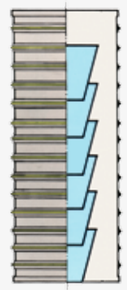
Optimum adaptation

Together with various different materials for the bellows, from PVC or neoprene/hypalon coated polyester fabric, through transparent PUR material, heat-resistant silicone glass fabric, bellows material with foodstuffs approval through to indestructible 2mm thick rubber fabric - it is therefore possible to adapt to the respective loading conditions.

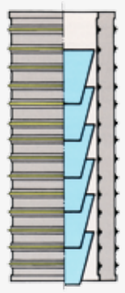


Loading Bellow

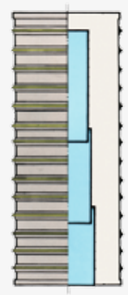
Double-Loading Bellow



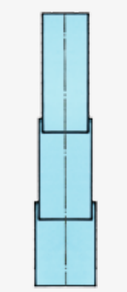
Loading Bellow with Cones for Wear Protection



Double-Loading Bellow with Cones for Wear Protection



Loading Bellow with Telescopic Inside tube



Telescopic tube

- **OPTIMUM ADAPTATION TO SPECIFIC LOADING SITUATION**
- **INCREASE OF PERFORMANCE**
- **ALL-INCLUSIVE PACKAGE: FROM INTEGRATED FILTER TO THE LOADING CONTROL UNIT WITHOUT LOSSES AT INTERFACESTING, MAINTENANCE AND SPARE PARTS**

EQUIPMENT MODULES

- Lifting Systems
- Flexible Part / Loading Bellows Chute-
- Sealing Cone
- Vibrating Unit
- Level Indicators
- Integrated Filter Unit IF
- Immersion System DTS

Sealing Cone

The sealing cone seals the outlet of the loading nozzle after the end of the loading process. This prevents any product that may have adhered to the bellows falling out when the loading nozzle is lifted.

Vibrating Unit

The vibrating unit is fitted to the loading nozzle as an option and frees any bulk goods residue from the inside of the loading bellows after the loading process by means of vibration.

Level Indicators

Muhr loading systems can be equipped with a variety of different level indicators: Rotary blade indicators, vibration probes, capacitive sensors, ultrasonic sensors, pneumatic sensors and bulk material motion detectors, ...

Muhr loading systems can be equipped with a level indicator through a specially developed system, whose measurement sensors can be arranged above the sealing cone rather than below as would be the case with conventional systems. This enables the trigger point for the max. fill level to be set significantly higher, thus significantly increasing the fill height in the tank and also the usable volume. Secure and efficient.

Integrated Filter Unit IF

Often it is not possible or economical to connect loading equipment to existing extraction systems.
In such cases the Muhr loading systems with integrated filter unit IF are the ideal and economical solution.

Compact & space-saving

With the Muhr loading systems with integrated filter unit IF and pneumatic filter cleaning, the inlet head, filter, compressed air tank, cleaning valve and cleaning control form a compact and space-saving unit.

Quick & simple to install

Muhr loading systems with integrated filter unit are quick and simple to install thanks to the compact design.

Reduce filter costs

A further advantage compared to external filter systems: Product that falls off the filter drops safely back into the loading flow as the filter is located directly inside the loading bellows of the loading system - cost-effective and safe!

High extraction performance

Muhr integrated filter units IF are available with filter areas of 3.5 m2 to 120 m2 and enable an extraction performance of up to 12,000 m3/h. Versions with tube filters are also available for products that are difficult to filter.

DTS immersion system for segregation-free loading.

With conventional loading, especially of product blends whose components exhibit considerable differences in terms of specific weight and grain size, product segregation can occur due to air separation, especially after the product has emerged from the loading nozzle.

With Muhr loading spouts with the DTS immersion system, this effect is avoided.
With the Muhr DTS immersion system, the tube-type product guide unit drops through the loading nozzle down to the base of the tank. During loading, the product guide unit is lifted above the fill level indicator in line with the dumping cone that is developing. In this way, the product guide unit always concentrates the product flow either to the base of the tank or to the top of the dumping cone. The concentration means the wind separation effect and the segregation of the product are both prevented.

- **IMPROVEMENT OF WORKING ENVIRONMENT AND SAFETY AT WORK**
- **HIGH RELIABILITY AND FUNCTIONALITY**
- **MINIMIZATION OF OPERATING AND LIFE CYCLE COSTS**
- **FOR USE IN HAZARDOUS AREAS**

OPTIMIZED TANK FILLING

- EP / EPV electric product spreader
- PPV pneumatic product spreader

Optimized Tank Filling

Up to 30% increase in filling with Muhr EP, EPV and PPV product spreader systems.

All closed Muhr loading spouts can be equipped with product spreading systems. The product spreader ideally fills the empty spaces in the tank, which would normally arise due to the natural material cone, with product. This results in an increase in fill level of up to 30%. This enables enormous cost savings during transportation, whereby a product spreader can amortize its costs after a very short period of use.

EP & EPV Product Spreader

With spreading wings and optionally with patented closure system (=EPV).

The product is spread outwards in a radial direction to the flow of the bulk material with a spreading wing which is positioned just under the outlet of the loading nozzle during the loading.

With system EPV, a special sealing cone closes the loading nozzle at the end of the loading process. This ensures that no product falls from the loading spout whilst it is being lifted.

The product spreader can also be used as a level indicator at the same time thanks to an optional control system.
Many advantages - one system!

PPV Product Spreader

With the Muhr PPV pneumatic product spreader, air nozzles positioned on the sealing cone of the loading nozzle blow the product outwards and in a radial direction to the flow of bulk material. Due to the principle of operation, this system is particularly well suited to powdery bulk materials.

- MINIMUM TRANSPORT COSTS DUE TO MAXIMUM USE OF TANK CAPACITY
- EFFICIENT LOADING BY SAVING VEHICLE CONVERSIONS
- CONTROL UNIT WITH INTEGRATED LEVEL SENSING
- WITH PATENTED SEALING SYSTEM AT LOADING HEAD

LOADING VEHICLES
PNEUMATIC DOCKING DEVICES PAV

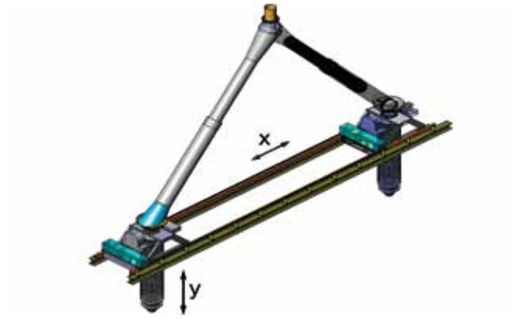
Maximum Flexibility – with Muhr Loading Vehicles-
For flexible positioning of loading spouts above tank openings or underneath silo outlets.

Depending on the task at hand, three different systems are used: The Muhr filling-, positioning- or discharging loading vehicles. The right solution for every situation!

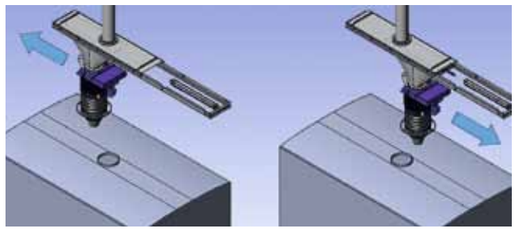
Filling Loading Vehicles
For filling silo trucks, tankers and containers with several apertures or open vehicles, when the transport vehicle is not to be moved during loading.

Ideal if the vehicle is positioned on a weigh-bridge, or when long trains are being filled: In these cases, no displacement from one aperture to the next is required, but only from railcar to railcar.

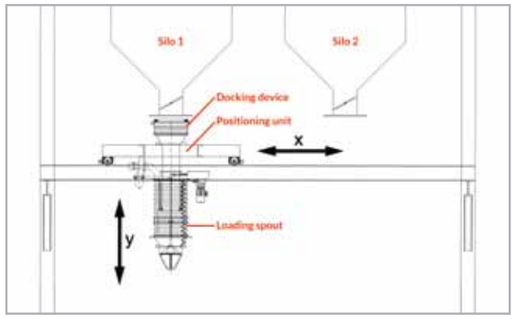
Travel paths of up to 10 m and over are possible. If required, the system can also be designed to move in a lateral direction.



Positioning Loading Vehicles
For precision positioning of loading spouts above a tank opening. Depending on the design, the loading spout can be positioned either in a longitudinal or a longitudinal and lateral position relative to the container axis.
The travel paths generally total up to 1,000 mm in the longitudinal axis and up to 200 mm in the lateral axis.



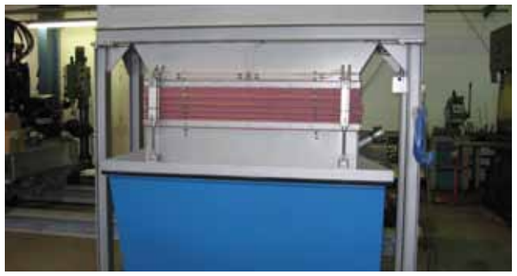
Discharging Loading Vehicles
With an integrated docking device for discharging several silos with one loading system.
To do so, the loading vehicle initially approaches one of the silo apertures. After the dust-proof docking on the silo aperture by means of the integrated docking device and the docking of the loading spout on the tank of the transport vehicle, the loading procedure can be started.
The travel path and number of silos to be emptied can be freely selected.



PAV Pneumatic Docking Device
Pneumatic docking devices are employed for dust-free filling of containers, barrels, mixing and weighing containers.

This also ensures a dust-free connection of moving units with stationary units, such as mobile discharge or conveyor systems with silo outlets, silo vehicle outlets with stationary extraction systems, mixer outlets with stationary extraction systems or transportation containers and much more.

PAV Docking Devices are available in all shapes and sizes and are individually manufactured in accordance with customer requirements. They can also be expanded with numerous equipment modules.



Telescopic Loading Vehicle TVM (exhibition model)

- **MAXIMUM FLEXIBILITY IN X, Y AND Z-DIRECTION**
- **PERFECT CONNECTION OF DISCHARGE UNIT AND TRANSPORT VEHICLE**
- **DUST-FREE FILLING, EMPTYING AND BULK HANDLING**

EFFICIENT RAILCAR- AND TRUCK-LOADING

Intelligent loading facilities from a single source. Optimal configuration of all components. Perfect integration. Maximum use of resources.

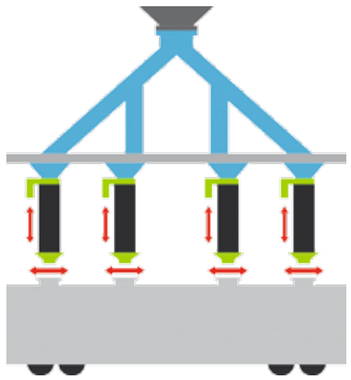
The smart way of Bulk-Handling

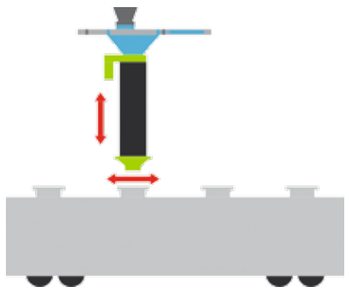
Planning or revision of a bulk loading facility for the railcar and truck loading is initially an investment. An investment with the objective to gain maximum benefit of the available conditions.

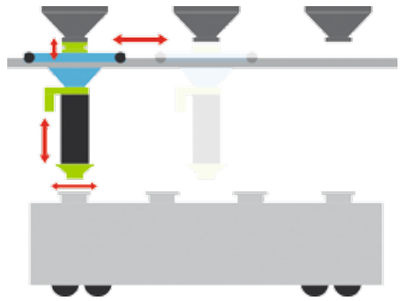
Muhr develops an optimized overall concept for your individual demand. From a single loading spout positioner to a fully automatic loading facility.

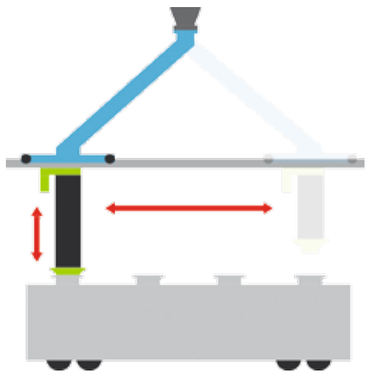
Whether granules, pellets, powder or gravel products - Muhr loading facilities optimize your railcar and truck loading with regard to

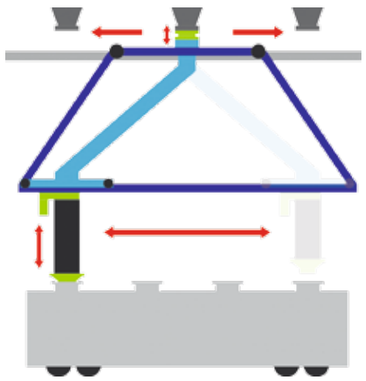
- minimal loading time
- maximum filling-level (with product spreader system)
- minimal manpower requirement
- maximum flexibility (combinable with many additional options, such as weighing devices)

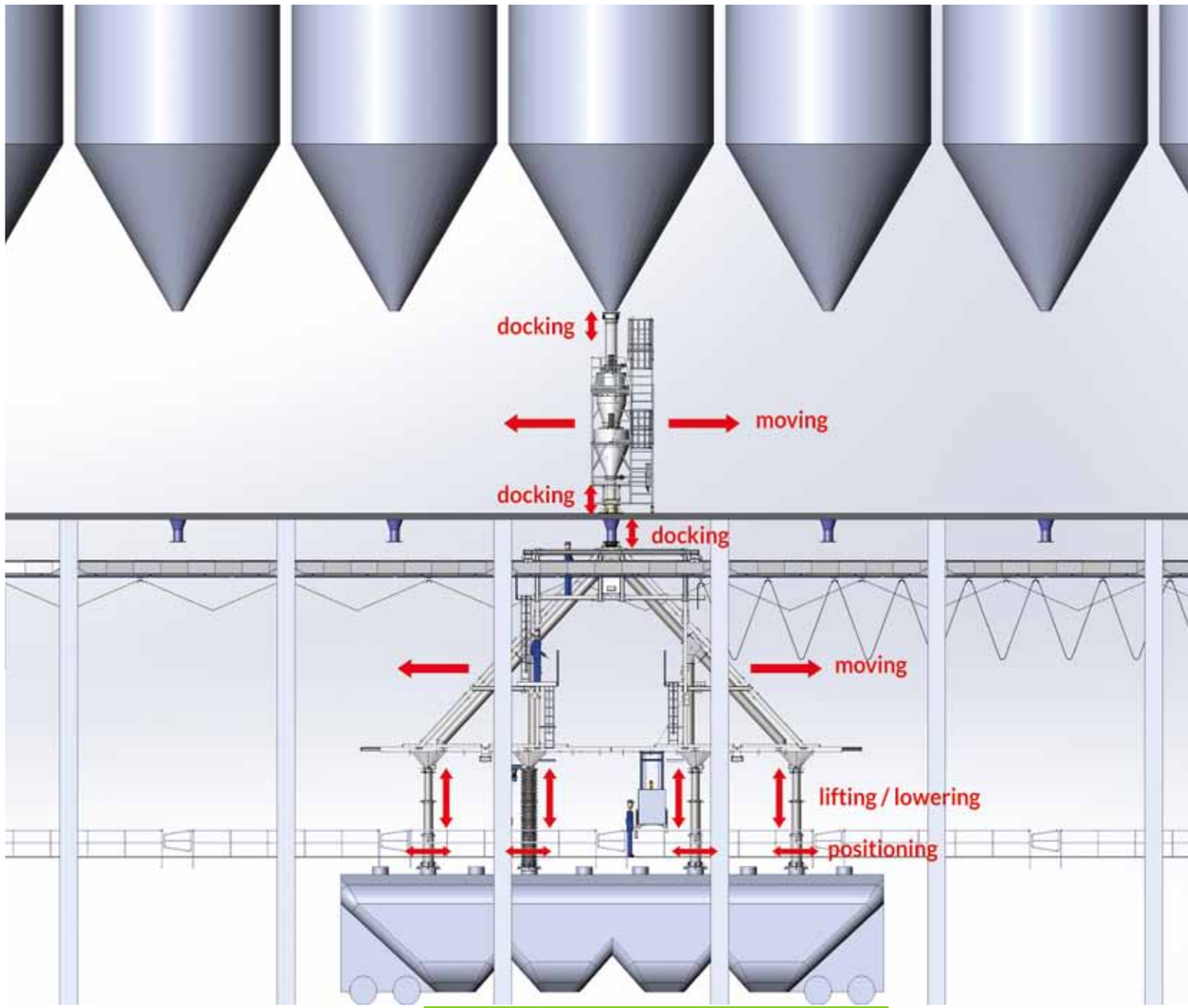












BENEFIT FROM 50 YEARS OF EXPERIENCE IN PLANNING AND IMPLEMENTATION OF PROJECTS AROUND THE WORLD!

MOBILE
LOADING-WEIGHING SYSTEMS

Mobile Loading-Weighing Systems

Docking - weighing - metering - loading in one system. Mobile from outlet to outlet.

For gravimetric metering of bulk goods in transport vehicles and containers from multiple silo cells or product feeds.

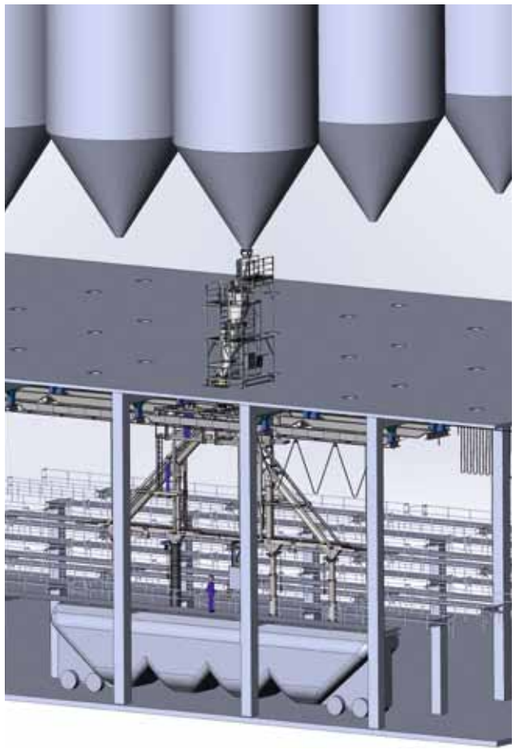
MWV Mobile Weighing-Loading System

The mobile Muhr MWV weighing-loading system comprises a pneumatic docking device, a weighing and metering system, a loading system and a mobile chassis.

The MWV mobile weighing-loading system is positioned underneath an outlet opening. Then a dust-free connection is established both via the docking unit to the outlet opening and also via the loading system to the transportation vehicle. Now the desired weight can be metered, dust-free into the transport vehicle.

Advantages

- Loading performance up to 300 m3/h
- Overloading the transport vehicle impossible
- Partial quantity loading in multi-cell
- transport containers or per customer stipulations



Filter unit

Loading station below MWV-level

MWV (with docking device, cap lifter, sampler and filter unit for dedusting) for loading of plastic pellets from 44 silos

EQUIPMENT OPTIONS

- manually manoeuvrable
- positionable by fork lift, pull- or pushing device
- self-driving by its own drive including fully automatic positioning when operating on rails
- cover lifting device
- integrated filter unit
- sampler

Also available as mobile loading system MV without weighing unit.

MUHR PRODUCT RANGE


Bulk Loading Systems


Railcar Dumping Systems


Container Mixer


Trash Rack Cleaning Systems


Cooling- and Processing Water Extraction


Fish Protection Technology

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