

# Dosing systems - nano, micro, medi

Reliable accuracy



Advanced weighing and dosing systems for  
static, dynamic, and continuous weighing.

**jesma**<sup>®</sup>  
weighing solutions



# Gravimetric batch dosing of ingredients and additives

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A condition of a high-quality end-product is a controlled and accurate dosing of the ingredients.

Micro and lab dosing systems from Jesma are specially developed for fine dosing of ingredients, additives and raw materials, where over-dosing can be harmful and/or expensive.

At Jesma each system is adapted to the requirements of the customer. By carefully taking the product characteristics into consideration, Jesma is making it possible accurately to dose even poor flowing products.

## **A Jesma dosing system provides:**

- Accurate dosing and weighing of ingredients and additives, which is a prerequisite of a uniform and high product quality.
- A high-quality system - which meets the requirements to 24 hour operation reliability.
- High flexibility.
- Increased process automation and minimum manual handling, which minimizes the need for manual labour.
- The system is designed according to a very simple principle - this secures easy cleaning and simple maintenance.
- All components are designed and constructed to obtain optimal operational reliability and minimal cross contamination.

A high-quality end product is characterized by the controlled and accurate addition of ingredients. A Jesma micro dosing system enables you to dose ingredients with very different consistency. With only a minimum of modifications it is possible to dose almost any kind of free and poor flowing materials, added from the silos.



# Reliable accuracy

## Construction

The micro dosing system is standard designed with up to 24 silos. The system can be arranged in a circle or in a square depending on the available space and location. Jesma offers different types of micro scales for the dosing system to fit the customer's needs; each with a design that ensures complete emptying of the weighing bin. The silos are available with both conical outlets and live bottoms with scrapers and agitator screw, which ensure complete emptying of poor flowing materials and a uniform filling of the dosing screw.

The silo and dosing system can be individually combined with regards to manual or automatic filling, silo volume, silo bottom and coarse and fine dosing.

The unique design with inspection doors secures easy cleaning and user-friendly maintenance of the system.

The lab dosing system is specially designed for applications where very accurate dosing of vitamins and micronutrients is required. To create a compact unit requiring minimum space, the system is arranged in a circle with space for two rows of silos, from which all screw outlets are joined centrally over the scale placed under a dust tight cover. The dosing screw secures an even dosing flow, as a pneumatic closing cap in the outlet prevents material from dropping at unexpected vibrations.

Jesma also supplies a special system with replaceable dosing screws and bins. This secures a quick and easy change of material, because there is no need for emptying, cleaning and refilling the bins. Cross contamination is eliminated as each individual material has its own hopper which can be clearly labelled.

The modularly design allows the silo- and dosing system to be individually combined in regard to manual or automatic filling, silo volume, silo bottom and coarse and fine dosing. In that way it is possible to design a system perfect for the actual need and it can furthermore be prepared for future expansion with extra silos.



# Batching scales

## Nano dosing

The Jesma nano dosing scale JesBatch is designed to eliminate cross contamination and operate with a very high static accuracy for dosing and batching of ingredients in low quantities.

The scales consist of a teflon coated weighing bin which is emptied when it is pneumatically turned upside down, and the outlet cone is vibrated using a pneumatic hammer to ensure complete emptying between batches. With its weighing bin, pneumating and load cell mounted in a sturdy and rigid frame, the Jesma lab dosing scale will provide superior accuracy and operation reliability.

Based on the ATEX guidelines, the JesBatch range is developed with all electrical and pneumatic components located outside the dust zone, and can be supplied in compliance with the ATEX directive. The weighing bin is easily removed for service, and the weighing bin lid is provided with passive filter.

The dosing chamber is individually designed with inlet holes for the dosing screws which are located to secure optimum dosing accuracy into the weighing bin.

The JesBatch lab scales are supplied in stainless steel AISI304 with frame and legs in mild steel.

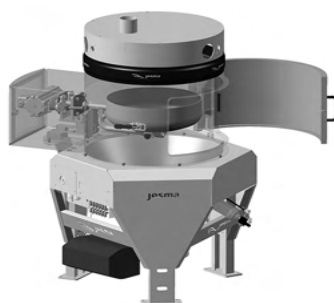
### Types of nano scales

Nano-scale JesBatch-02  
Static capacity: 0 - 2 kg  
Static weighing accuracy: +/- 0.5 g  
Hopper volume: 5 litres  
Diameter: Ø300 mm

Nano-scale JesBatch-20  
Static capacity: 10-20 kg  
Static weighing accuracy: +/- 2-5 g  
Hopper volume: 40 litres  
Diameter: Ø600 mm

Nano-scale JesBatch-10  
Static capacity: 10 kg  
Static weighing accuracy: +/- 2 g  
Hopper volume: 20 litres  
Diameter: Ø450 mm

Nano-scale JesBatch-30  
Static capacity: 30 kg  
Static weighing accuracy: +/- 5-10 g  
Hopper volume: 60 litres  
Diameter: Ø600 mm



The overall system accuracy depends on the scale size, the system capacity, the application of course and fine dosing screws and the efficiency of the control system.



# Reliable accuracy

## Micro dosing

The Jesma micro dosing scale is designed to eliminate cross contamination and operate with a very high static accuracy in the dosing and batching of micro ingredients.

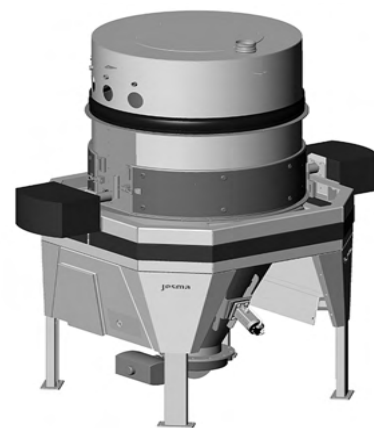
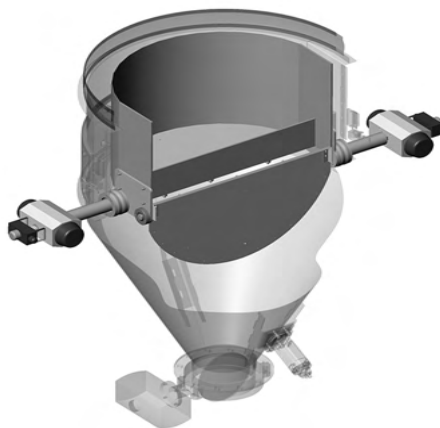
The micro scale consist of a weighing bin with pneumatically activated bottom wings for emptying. The wings are teflon coated and open 90° to ensure complete emptying between batches. The outlet cone is vibrated using a pneumatic hammer to ensure complete emptying between batches.

The micro scale design with 3 load cells, mounted in a sturdy and rigid steel frame, dosing chamber, an outlet cone with butterfly valve provides market leading operational reliability and superior accuracy.

Based on the ATEX guidelines, the micros scale range is developed with all electrical and pneumatic components located outside the dust zone, and can supplied in compliance with the ATEX directive.

The dosing chamber is individually designed with inlet holes for the dosing screws, which are located to secure optimum dosing accuracy into the weigh bin.

The micro scales are supplied in stainless steel AISI304 with frame and legs in mild steel.



### Types of micro scales

Micro scale JesBatch-50

Static capacity: 50 kg

Static weighing accuracy: +/- 10 g

Hopper volume: 190 liters

Diameter: Ø900 mm

Micro scale JesBatch-100

Static capacity: 100 kg

Static weighing accuracy: +/- 20 g

Hopper volume: 320 liters

Diameter: Ø900 mm

Micro scale JesBatch-150

Static capacity: 150 kg

Static weighing accuracy: +/- 30 g

Hopper volume: 320 liters

Diameter: Ø900 mm

Micro scale JesBatch-200

Static capacity: 200 kg

Static weighing accuracy: +/- 40 g

Hopper volume: 500 liters

Diameter: Ø900 mm



## Medi dosing

Together with the lab dosing and micro dosing scales Jesma completes the range of dosing scales with 3 conical scales for dosing and batching of medium quantities of ingredients.

The scales are all supplied completely smooth inside to ensure optimum emptying and minimum cross contamination, combined with a strong and rigid construction to perform the best possible operational reliability.

The scale is delivered with removable platforms for test weights. When the platforms are not in use, they can easily be mounted on the hooks on the side of the scale as shown on the below drawing.

The conical scale type JesHopper range is available in mild coated steel or stainless steel AISI304.

To prevent dust in the surroundings a slight negative pressure must be present in the scale, so aspiration is necessary. Furthermore it must be ensured that air from the below transportation system does not affect the weighing. The air flow can be stopped by mounting a butterfly valve above the transportation system as well as a butterfly valve on the outlet cone as shown below. Alternative slide gate or JesValve can also be offered.

### Types of medi scales

#### JesBatch-400

Static capacity: 200-400 kg  
Static weighing accuracy: +/- 100 g  
Hopper volume: 900 litres  
Diameter: Ø1200 mm

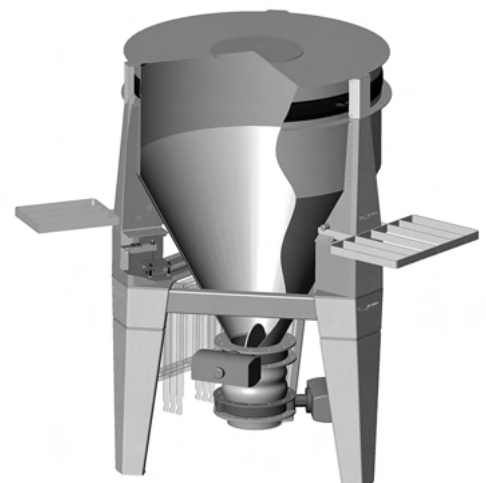
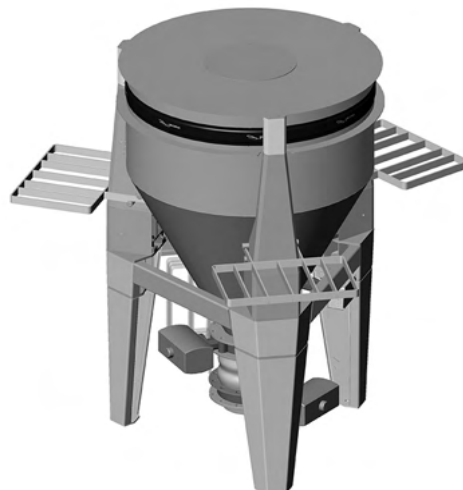
#### JesBatch-1000

Static capacity: 200-1000 kg  
Static weighing accuracy: +/- 250 g  
Hopper volume: 2100 litres  
Diameter: Ø1600 mm

#### JesBatch-600

Static capacity: 200-600 kg  
Static weighing accuracy: +/- 200 g  
Hopper volume: 1400 litres  
Diameter: Ø1400 mm

The overall system accuracy depends on the scale size, the system capacity, the application of coarse and fine dosing screws and the efficiency of the control system.





# Reliable accuracy

## Silos

The Micro and Nano dosing systems are available in a wide range of standard combinations or as custom built depending on project and customer requirement.

Laser cut and rolled from a single sheet of steel plate, the Jesma dosing silos with welded flanged connections provide a reliable and consistent flow of product.

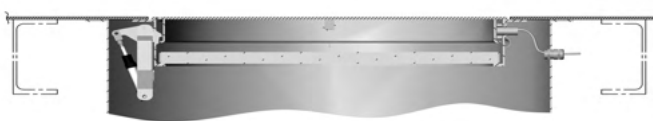
All Jesma silos are supplied incl. removable hatches for easy service and inspection.

Jesma supply the silos in the following standard sizes where the silos height is selected according to the available space and volume requirement.

Silo diameter	Example of height	Example of volume
350	2100	200 litres
550	2100	500 litres
700	2100	800 litres
1000	2100	1650 litres
1200	2100	2375 litres

All silos are available in coated steel St.37.2 or stainless steel AISI304 and AISI316, and with following options:

- Hinged or removable lid with lifting hook.
- Bolted lid with inlet and connection for aspiration.
- Safety grating to prevent objects from falling into the silo.
- Safety package with pneumatic lock and/or inductive switch.
- Sockets for low and high level censors.



- Fixed or removable filling funnel with connection for dust aspiration.

# Silo discharge

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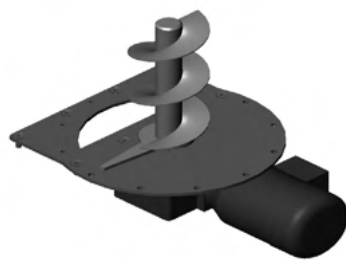
A consistent and reliable product flow from the silo is the primary factor for a high batch efficiency. If the product does not flow evenly from the silo, the capacity of the screw conveyors is reduced, and the overall capacity of the dosing system is unacceptable.

To perform the optimum product flow from the silos, the Jesma system is available with both conical discharges, as well as the mechanical scraper bottoms with agitator screw or a combination.

The conical discharge is selected for free-flowing products which can be discharged by gravity.

The mechanical scrapers are used for poor flowing materials to prevent bridging inside the silos and in the discharge. The scraper bottom is supplied including a 300 mm lifting screw to ensure an optimum flow of e.g., sticky or difficult flowing products.

Both the conical discharge and the mechanical scraper bottom are available in both coated steel St.37.2, and stainless steel AISI304.



Type SK 350

Silo diameter: 350 mm

Delivered with 300 mm lifting screw

Scraper on an 8 mm bottom plate

Gear motor: 0,75 kW

Applicable with the following screws:

TS-30 and TS-45



Type SK 550

Silo diameter: 550 mm

Delivered with 300 mm lifting screw

Scraper on an 8 mm bottom plate

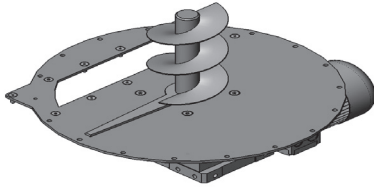
Gear motor: 1,5 kW

Applicable with the following screws:

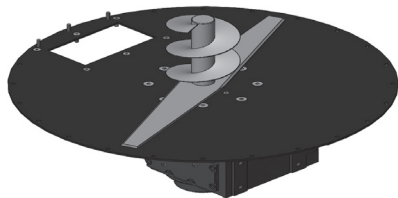
TS-45, TS-60 and TS-75



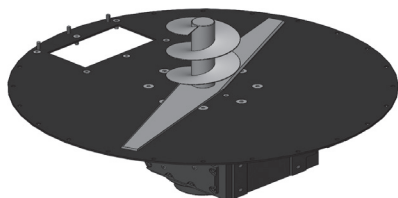
# Reliable accuracy



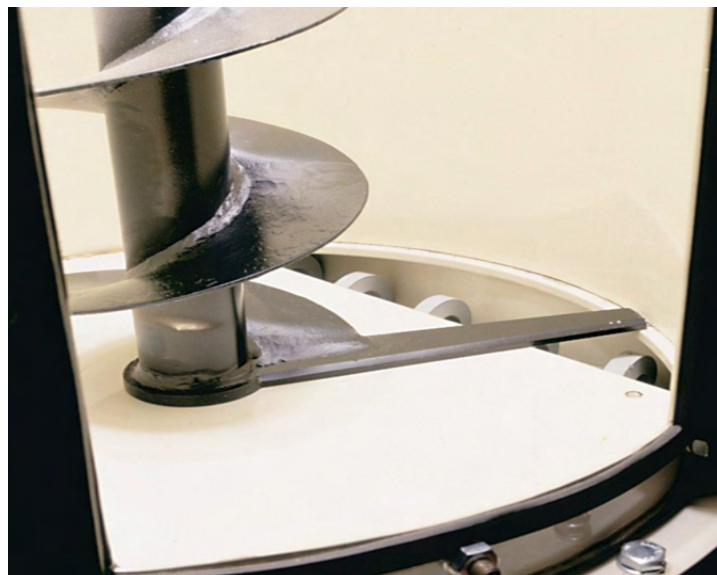
Type SK 700  
Silo diameter: 700 mm  
Delivered with 300 mm lifting screw  
Scraper on an 8 mm bottom plate  
Gear motor: 1,5 kW  
Applicable with the following screws:  
TS-45, TS-60, TS-75, TS-100



Type SK 1000  
Silo diameter: 1000 mm  
Delivered with 300 mm lifting screw  
Scraper on an 8 mm bottom plate  
Gear motor: 5,5 kW  
Applicable with the following screws:  
TS-100, TS-130, TS-160 and TS-200



Type SK 1200  
Silo diameter: 1200 mm  
Delivered with 300 mm lifting screw  
Gear motor: 7,5 kW  
Applicable with the following screws:  
TS-160, TS-200, TS-250, TS-315





# Dosing screw

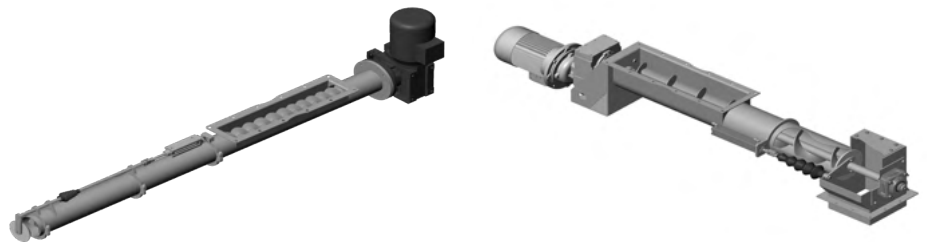
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The Jesma range of dosing screws is applicable for efficient and reliable dosing all types of powders and granulates.

The Jesma dosing screws are designed with a center shaft, and the strong and rigid design together with inclined pitch provides optimum reliability in the dosing of any difficult flowing, sticky or hygroscopic products.

All Jesma dosing screws are supplied including gear motor, flanged inlet, inlet trough and are available in lengths from <math><1\text{m}</math> up to 3.5m.

All screws conveyors are available in coated mild steel or stainless steel AISI304.

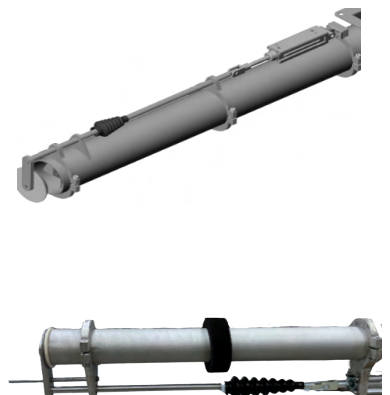


## Pneumatic closing cap for accurate dosing

To achieve the best dosing accuracy Jesma recommends using dosing screws with a center shaft, progressive windings and equipped with pneumatic closing cap on the outlet.

The pneumatic closing cap ensures that the outlet of the screw is closed when the required amount of material is dosed. In this way you avoid after flow of material after dosing and spillage of material due to system vibrations.

A simple solution with a spring-loaded cap can also be offered.



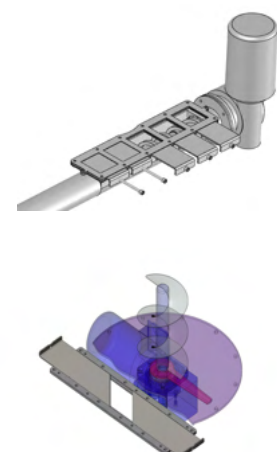
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## Service and regulation gates

To ensure easy service of the dosing screw a service/regulation gate can be placed above the dosing screw. When the service gate is closed, the screw can be removed without emptying the silo.

The service/regulation gate comes in two versions. One version is divided into 5 separate sections, and the other version is manufactured with two slides opposite one another. The service and regulation gates make it possible to close the dosing screw inlet partially or completely.

Closing the inlet partially can be useful with very easy flowing material, making sure that the material does not block up in the screw. (Not suitable for sticky material due to the risk of bridge building).



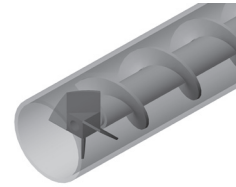


# Reliable accuracy

## Decompressing propeller

Jesma also recommends adding decompressing propeller on the end of the shaft of the dosing screw.

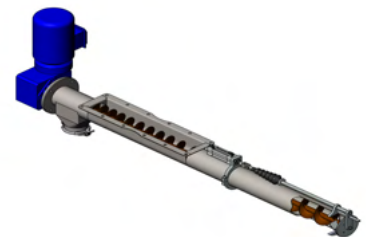
With the decompressing propeller you avoid compressing of the material and ensure an even flow of material. The propeller brakes up the ripples from the screw flights, thereby increasing the accuracy significantly.



## Residual emptying

To complete the range of Jesma dosing screws all screws are available with residual emptying.

With the residual emptying system, it is possible to empty the silo, discharge system and screw conveyor just by opening the gate and reverse the screw rotation.



The residual emptying system is made with outlet to Jakob pipe.



Please contact Jesma to hear more about the options and the special conditions in which they are applicable.

Capacity	Type	Power kW	Typical dosing accuracy	Dosing accuracy + weigh error	Min. dosing amount	Capacity *
5-90 l/h	TS-30	0,37 kW	+/- 1 g	+/- 1 g	50 g	70 kg/h
10-180 l/h	TS-45	0,37 kW	+/- 1-2 g	+/- 2 g	100 g	120 kg/h
25-500 l/h	TS-60	0,55 kW	+/- 5 g	+/- 10 g	250 g	320 kg/h
45-900 l/h	TS-75	0,75-1,1 kW	+/- 5-10 g	+/- 20 g	350 g	800 kg/h
150-3500 l/h	TS-100	1,1-1,5 kW	+/- 10 g	+/- 30 g	500 g	1.600 kg/h
250-5000 l/h	TS-130	2,2 kW	+/- 20 g	+/- 50 g	1.000 g	3.000 kg/h
400-7500 l/h	TS-160	2,2 kW	+/- 50 g	+/- 100 g	2.500 g	5.000 kg/h
800-15000 l/h	TS-200	3,0 kW	+/- 175 g	+/- 300 g	5.000 g	10.000 kg/h
1000-22000 l/h	TS-250	4,0 kW	+/- 250 g	+/- 500 g	8.000 g	14.000 kg/h
1800-35000 l/h	TS-315	4,0 kW	+/- 400 g	+/- 800 g	12.000 g	22.000 kg/h

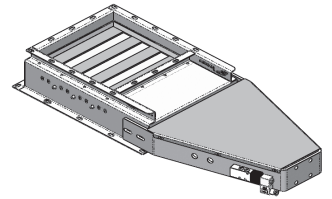
(\*At 50 Hz and a density of 0,65 kg/dm<sup>3</sup>, fine dosing for min. 5 sec. at 10 Hz. All stated accuracies are product-dependent and dependent on the execution of the dosing screw)



# Accessories

## JesValve

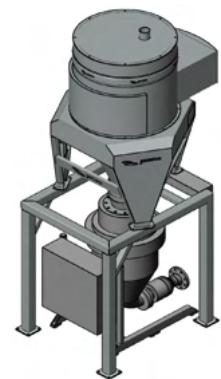
The dosing device JesValve from Jesma is developed to dose powder and other bulk material simply and precisely where there is not much space available like below the scale.



The material will flow freely and uniformly through the JesValve. The JesValve has two purposes; to control the flow from the JesValve and to keep the material above the JesValve in movement and hereby reducing the risk of material blocking up.

## Dense phase/dilute phase

To complete the mixing of component, the weighed material sometimes needs to be transported over a larger distance. This can be done with a pneumatic conveying system.



Jesma has the Knowledge for designing and supplying both dense phase and dilute phase systems for up to 50 kg.

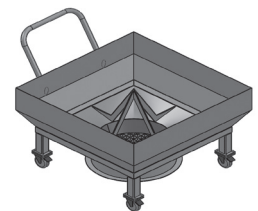
## Moveable emptying devices for sacks and big bags for filling of silos

The Jesma micro and nano dosing systems are supplied in a modular and project designed layout to fit any requirement.

To allow easy and user-friendly filling of the silos the Jesma dosing and batching systems are available with silo filling units for both manual handled sacks and Big Bag's.

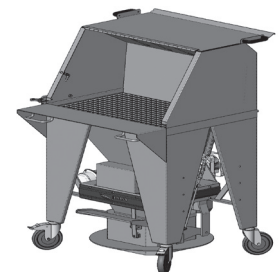
The discharge unit for Big Bag is available in 2 versions:

- For emptying of Big Bags with discharge stub.
- For emptying of flat bottom Big Bags with pyramid knives.



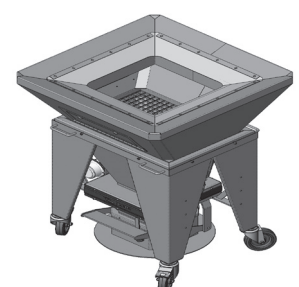
The discharge unit for small sacks is available in 3 versions:

- With connection for central dust extraction.
- With integrated filter for central extraction fan.
- With integrated filter and extraction fan.



The Big Bag and sack discharge unit is optionally available with sifter, lump breaker and in different materials – coated mild steel, stainless steel 304 or 316.

The Jesma micro dosing systems can be equipped with an electrical hoist to lift big bags onto the platform. The hoist has electrical movements in X-Y-Z planes, which, combined with one of the emptying devices, makes the filling of the silos easy for the operator.

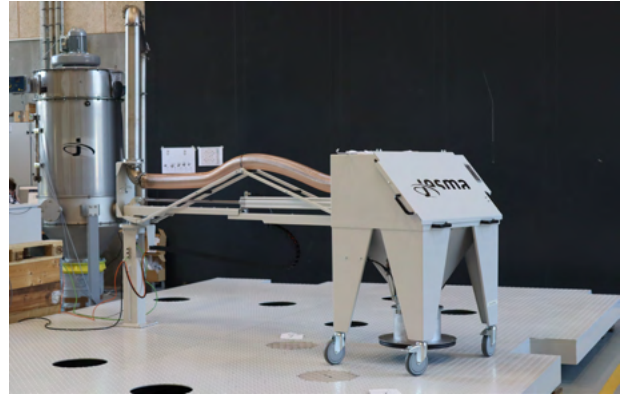




# Reliable accuracy

## JesBag<sup>E</sup> Ergo-Safe

The JesBag<sup>E</sup> Ergo-Safe offers safe and controlled filling of silos, minimizes the risk of product contamination and provides ergonomic and safe working conditions for the operator. It gives the operator a dust free environment due to the aspiration of the JesBag<sup>E</sup> Ergo-Safe filling station. The ergonomic design makes the emptying of the sacks easier and the aspiration system prevents dust flow in the working area.



- Delivered complete with a HMI controller for Siemens as standard.
- The controller has specially developed Jesma Software, including a guiding system to ensure the operator fills the correct silo in correspondence with client overall control system.
- The controller is equipped with a HMI operator panel with intuitive design and easy understandable operator views.

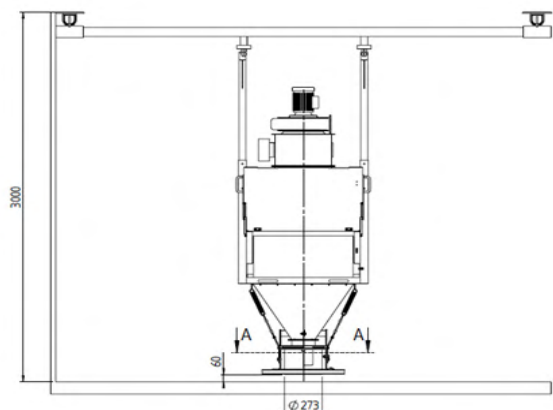
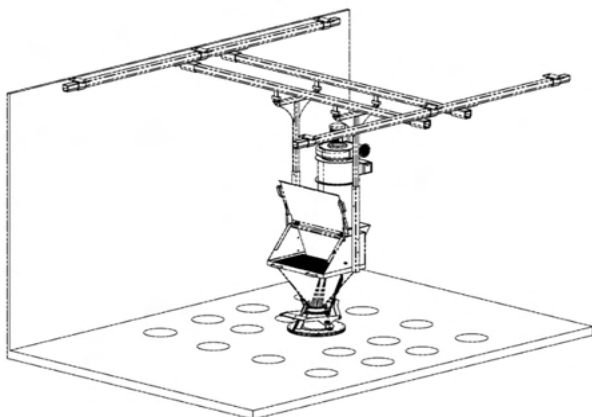
## JesBag - Top rail

With our JesBag emptying device mounted on rails, Jesma offer a safe and controlled filling of silos.

The JesBag is delivered including aspiration system. This gives the operator a dust free environment.

The JesBag emptying device is supplied with our standard funnel with foot lever, which can be lowered down to your silo opening, ensuring dust free filling of your silo.

The JesBag emptying device can be moved manually in X and Y direction and the rail system can be designed according to your silo filling area. The rails can be mounted directly in your sealing or on a support frame depending on your demand.



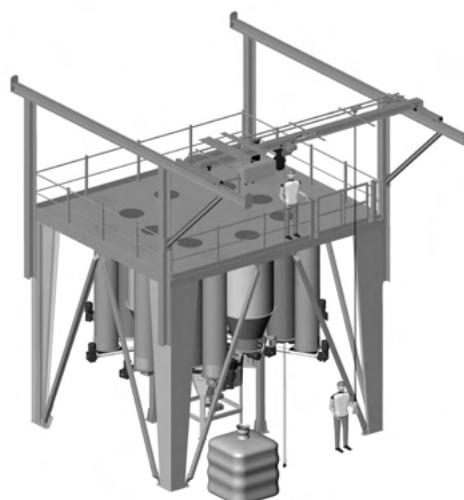
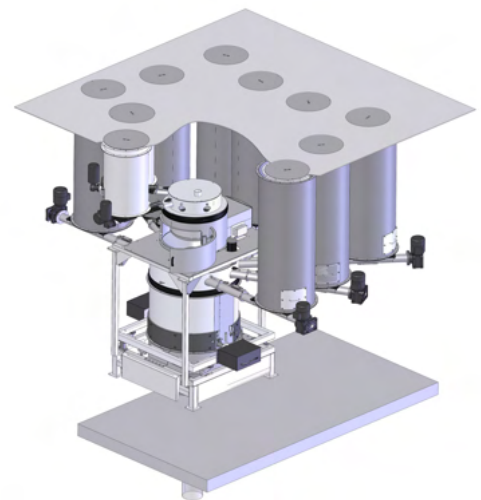
# The complete system

Jesma delivers both single components and complete solutions for micro and lab dosing systems.

As development, construction and production are carried out in-house we guarantee a high level of quality. Through professional guidance from our qualified and experienced staff we offer the most optimum solution. Our products and weighing systems are undergoing continuous development to ensure that our products are state of the art and are optimized according to international standards, ensuring Jesma a technological and competitive advantage.

The individual system can easily be designed according to our customer's individual requirements and preferences with regard to type of product and physical surroundings for the placing of the system. The systems can be developed and designed in many different combinations, taking into consideration the number of silos, dosing screws, capacity, special characteristics for the micro scale, accuracy, and available space for the system.

Furthermore, Jesma can supply the dosing system fully equipped with platform, supporting legs, stairways and banister.





## Project planning

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The core in good project planning is the ability to develop, design and control a project from idea to operation. The ability to supply the best solution, within the customer defined parameters and resources, is the key to optimum project handling. In close dialogue with the customer we prepare a specified quotation taking the customers individual requirements into consideration.

With our highly qualified and experienced staff of engineers and project planners, we offer you professional guidance and consultancy in the planning of your individual weighing solution.

In addition to the medi, micro and nano dosing systems Jesma offers a number of products which complement the system giving you a total turnkey project.

Jesma offers among other things:

- Complete steel structures.
- Filling system for manual, mechanical or vacuum-/pressure transport.
- Conveyor systems from weigher to mixer.
- Weighing electronics and complete dosing computer control.

Contact us – we should be pleased to prepare you an offer for your individual project, both for single components and for complete solutions.





**Jesma Poland**  
Ul. Firmowa 18  
PL-62-023 Robakowo  
(+48) 722 011 022  
mtr@jesma.com

**Jesma HQ**  
Helsingørvej 18  
DK-7100 Vejle  
+45 75 72 11 00  
Jesma@jesma.dk

**Jesma/SEG**  
Forettgatan 33  
SE-254 67 Helsingborg  
+46 87 64 74 00  
info-seg@jesmagroup.com

 Part of Jesma Group

[www.jesma.com](http://www.jesma.com)