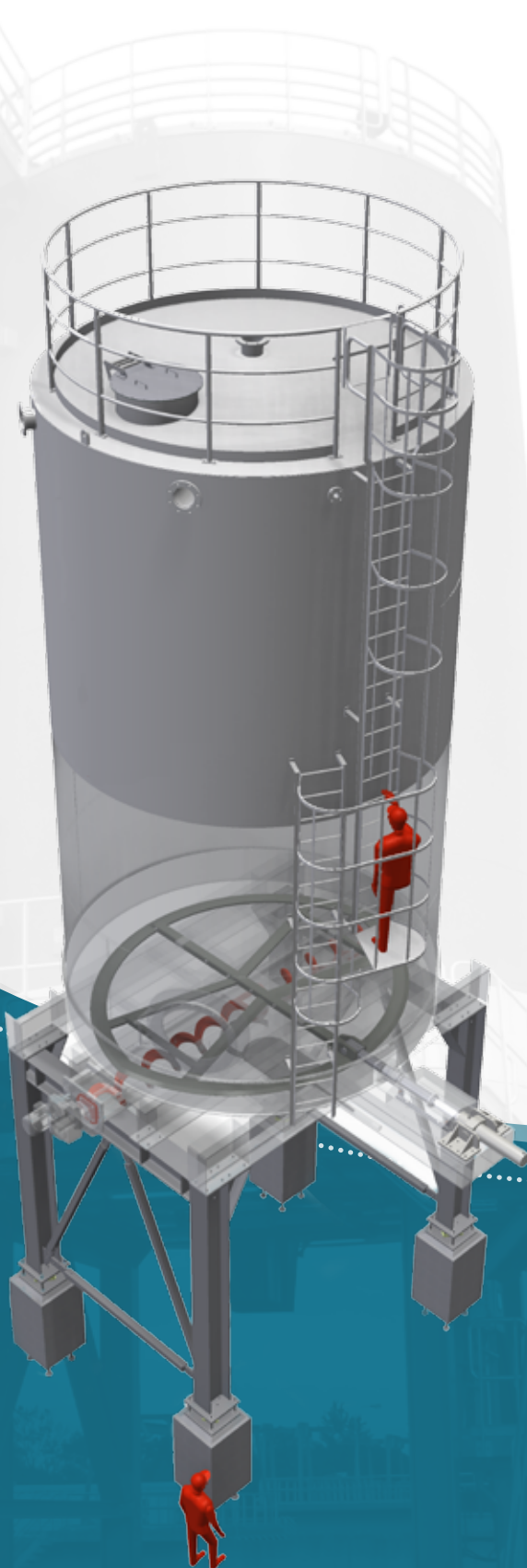




SPIRAC[®]
Solid Handling Solutions

SILOS AND SILO SYSTEMS

LIVE-BOTTOM SILOS,
SLIDING-FRAME SILOS &
TRUCK RECEIVAL BUNKERS



SPIRAC has been the leading supplier of silos since the 1980s. Hundreds of successful installations are in operation around the world, with many having been in service for several decades.

SPIRAC is able to provide an optimized solution to suit most applications. We offer two outloading system solutions, live-bottom and sliding-frame, coupled with rectangular or round silo systems and truck receival bunkers.

Specialized selection will lead to the most cost-effective arrangements to suit your needs.

RECTANGULAR SILOS

There are two types of rectangular silo solutions:

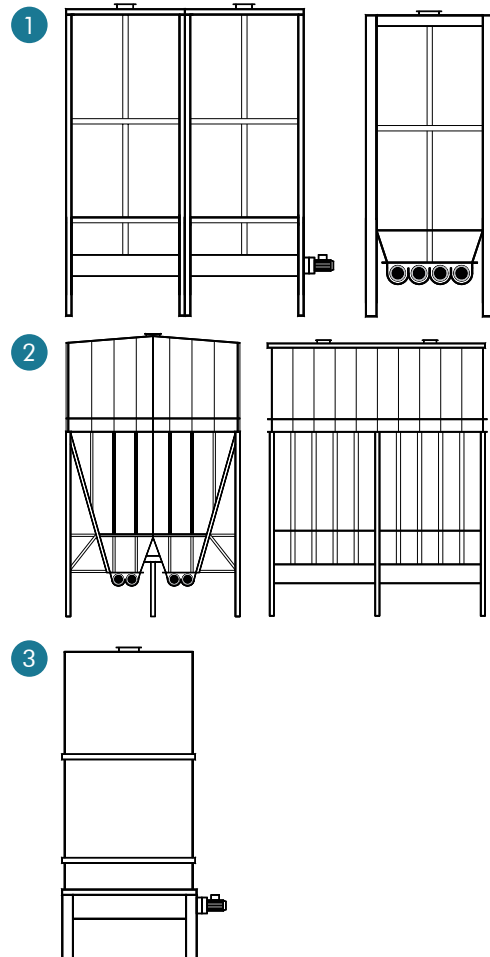
1. Flat panel construction which is suitable for capacities of 20 to 150m³.
2. Block section construction which is used for capacities of 20 to 500m³. This sophisticated design is mainly used for taller profiles and larger volumes.

ROUND SILOS

3. Round silos can be designed for capacities ranging from 30 to 300m³. These constructions are cost-effective, light and simple and are mainly used for small to medium storage solutions.

TRUCK RECEIVAL BUNKERS

Custom designed to suit the particular site and customer requirements, these bunkers employ either live-bottom or sliding-frame technology. Both systems are designed to handle a wide range of sludge consistencies and flow rates.



SLIDING-FRAME SILOS

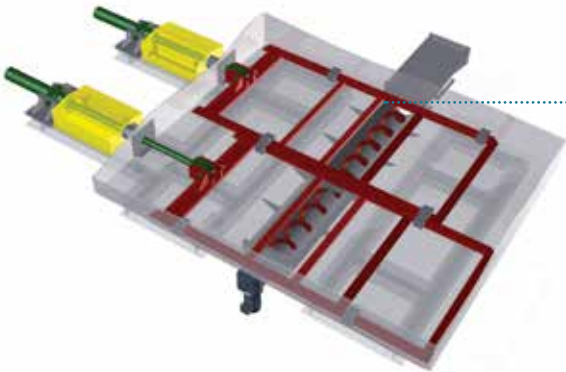
A sliding-frame is used for an extremely efficient extraction system that allows non-free-flowing material to be discharged from a flat-bottom silo. It avoids bulky materials blocking the bottom of the silo by forming a bridge of material.

The sliding-frame's action breaks any bridges that may form over the extraction screw and pushes and pulls the material towards the centre of the silo so that it can be discharged.

The sliding-frame silo is suitable for non-free-flowing materials such as dewatered sewage sludge, wood chips, cellulose, gypsum and waste.



Available in high-capacity truck unloading, low flow-rate pump or conveyor feed options.



FEATURES OF A SLIDING-FRAME SILO

- ▶ A slowly reciprocating, hydraulically driven steel frame pushes or pulls sludge toward a central extraction screw.
- ▶ Speed controlled to provide unloading rates suitable for fast truck filling down to pump feed.
- ▶ Allows for vertical walls and cylindrical silo construction, optimizing volume utilization with capability of reducing height or footprint.
- ▶ Eradicates any opportunity for bridging, arching or flow hang ups – material flow is first in, first out.
- ▶ Reliable, quiet and simple operation.
- ▶ Can also be applied to rectangular silos, concrete bunkers, and truck receival bunkers.

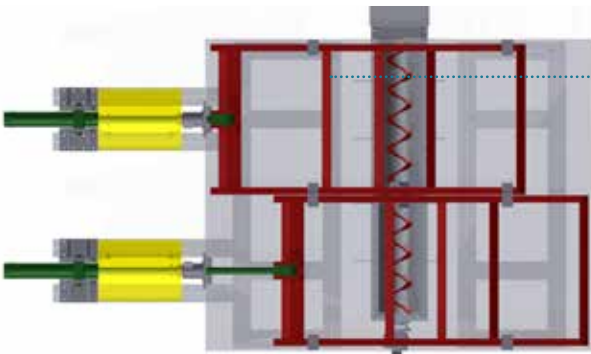
ROUND SLIDING-FRAME SILOS

The sliding-frame is built as an elliptical frame that is made of solid steel bars profiled to a wedge shape. The wedge profile of the elliptical framework pushes in one direction and draws the material towards the discharge opening thereby allowing near total emptying of flat-bottom silos.



	Diameter	Height	Volume	Outloading capacity
Round Sliding-frame Silos	3 - 10 m	3 - 15 m	40 - 1.000 m ³	0 - 250 m ³ /h

Different diameters and heights are available on request.



RECTANGULAR SLIDING-FRAME

Rectangular silos – the sliding-frame is constructed in a rectangular “ladder” shape, and it transfers material from one wedge-shaped “step” of the “ladder” to the next as it oscillates back and forth. This design is suitable for steel or concrete silos or bunkers.

	L x W	Height	Volume	Outloading capacity
Rectangular Sliding-frame Silos	As required	3 -15 m	40 - 1000 m ³	0 - 250 m ³ /h

Different sizes are available on request.

WHAT IS A LIVE-BOTTOM SILO?

These live-bottom systems ensure the elimination of arching, rat-holing or any bottle-neck type losses in flow ability, even for the stickiest or driest of sludges. The basic silo design incorporates aesthetic considerations through symmetry, consistency and fabrication precision.

SPIRAC live-bottom silos and hopper systems are custom designed for application in the wastewater industry, especially for the storage, transfer and outloading of dewatered sludges.

While the silos and hoppers follow standardized design features, the sizes and orientations can be customized to suit most customer requirements.

Three standard configurations are available to provide a wide range of cost-effective designs. These silos are top loaded, typically by shaftless spiral incline or vertical/horizontal conveyors, and outloaded by large diameter/large pitch live-bottom shaftless screws.

FEATURES OF A LIVE-BOTTOM SILO

- ▶ Multiple spiral screws (typically 2-8) form a rectangular bed of moving screws to eradicate bridging or blockage of the stickiest sludges.
- ▶ Large diameter, large pitch spirals are capable of high torque and fast but controllable outloading rates, or very low outloading rates for pump feed.
- ▶ A very low RPM ensures minimum wear of the trough liners.
- ▶ Simple operation, direct drive and few moving parts ensure that maintenance is near zero. Inspection of the interiors of these silos is recommended at 5 -10 year intervals.



Storage capacity

25-1,000 m³ (1,000-35,300 ft³)

Outloading Capacity

0-200 m³/hr (0-7,000 ft³/hr)

– truck bay (high capacity) or pump/conveyor feed (low capacity).

Discharge via multiple knifegate controlled large diameter outlet ports to suit truck dimensions.

Suitable sludge types

Dewatered sludges from centrifuges, plate or belt press, DS range from 15-40% Dried sludges up to 90% DS (special considerations may apply).

Available materials of construction

Silos and hoppers can be manufactured from high spec mild steel or stainless steel, with standard structural elements including I-beams, columns, PFC, angles, hollow sections, flat bar and plate steel. Silos can be shop painted to extreme corrosion protection levels or primed for site painting.

Corrosion Protection

A range of paint specifications is available to suit the requirements of different regions and climatic environments. These kindsof silos are generally located in corrosive, industrial environments and therefore corrosion protection is critical to the long life-expectancy of these silo systems.

TRUCK RECEIVAL BUNKER

SPIRAC has extensive experience and expertise in the design and supply of truck receival bunkers for the receival of imported dewatered sludge at central processing facilities.

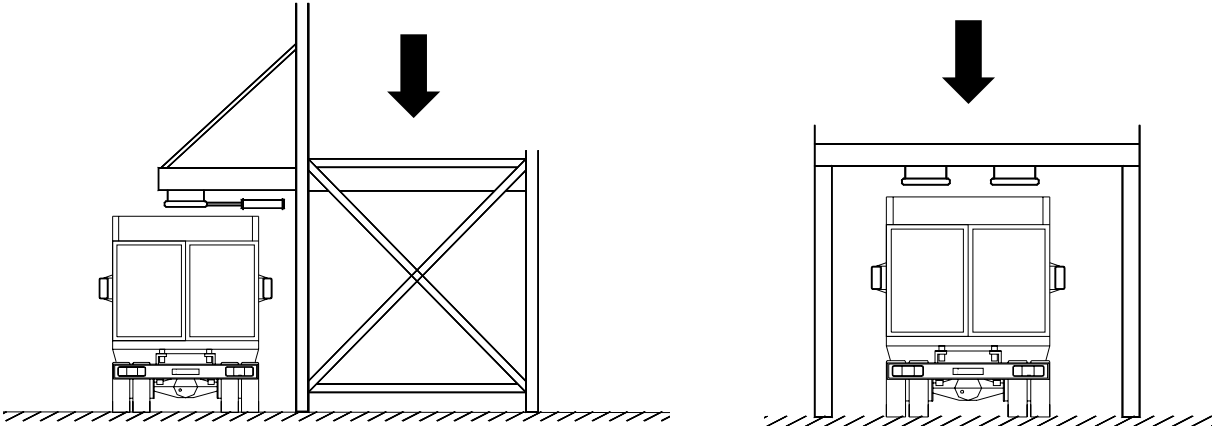
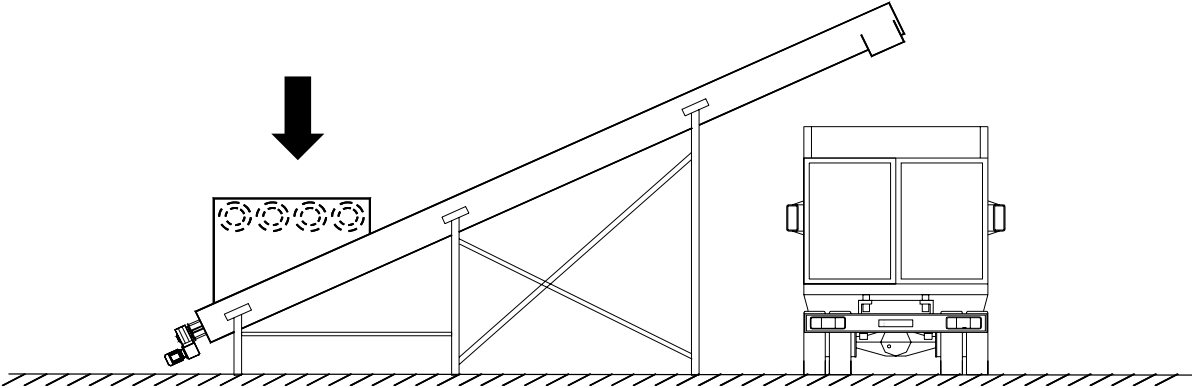
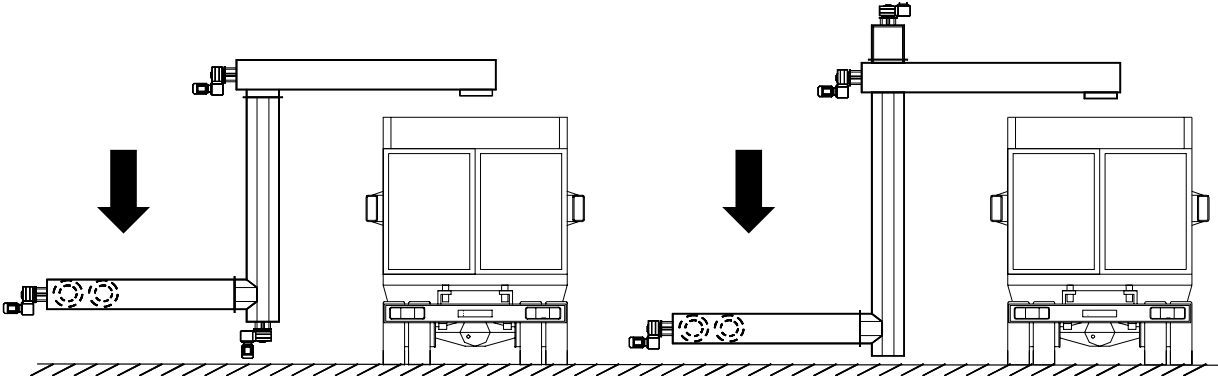
Features include:

- ▶ Precise flowrates.
- ▶ Easy passage of foreign objects.
- ▶ Simple and reliable operation.
- ▶ Low RPM, high torque spirals to prevent blockages.
- ▶ No product bridging.
- ▶ Near zero maintenance.



TYPICAL OUTLOADING ARRANGEMENTS

(For clarity, structural supports and silos are not shown.)





1. SLUDGE CONVEYING AND STORAGE IN A LIVE-BOTTOM SYSTEM.
2. LIVE-BOTTOM SLUDGE SILO UNLOADING (40 M³).
3. SLUDGE SILO FOR FEED TO PC PUMPS (360 M³).
4. SLUDGE DRYING PLANT WITH A TRUCK UNLOADING HOPPER AND CONVEYING TRAIN SILO STORAGE SYSTEM (2 X 200 M³).
5. TRUCK UNLOADING HOPPER WITH 4 X LIVE-BOTTOM SPIRALS.
6. LIVE-BOTTOM SLUDGE RECEIVEAL BUNKER.



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