



From Massive to Micro: SCAFCO Grain Systems Hopper-Bottom Silos Meet Customer Needs

When purchasing a storage solution for your farm or commercial enterprise, there are many important factors to consider before you choose the type of silo that will fit your needs and budget.

Hopper bottom silos stand out from other storage and handling systems because they are often easier and less problematic to unload. Opening just one discharge gate on a hopper silo can allow grain to flow out by gravity, with no mechanical equipment required.

The biggest advantage of hopper bottom silos is they allow total cleanout by gravity without the use of sweep augers. There is less material handling equipment, less electricity needed for unloading, and much less maintenance required. Foundations for hopper bottom silos are more economical compared to flat-bottom silos, because they can be erected without subterranean trenches.

Hopper silos with larger storage requirements can also be stiffened for extra security, expanding their capacity.

Hopper bottom silos have long served as working silos for repetitive receiving and discharge of grain. This application is especially useful for holding wet grain or rice before it enters a grain dryer. Also, these silos can be elevated on a structure, allowing the truck driver to drive

up underneath the silo for ease of loading, without the need for expensive turnarounds.

Hopper bottom silos are the best choice if your operation meets the following criteria:

- **You need a short-term storage solution;**
- **You need ease of loading and discharge of stored materials; and**
- **You require a quick transfer of stored materials to a truck or train.**

SCAFCO Grain Systems, a leading US manufacturer of steel storage systems and grain handling equipment since 1961, sees a trend toward customer interest in hopper bottom silos. SCAFCO has supplied hopper silos at numerous facilities where in years past, only flat-bottom silos would have been considered.

SCAFCO hopper bottom silos are available in capacities from 3 MT to 1,500 MT (130 bu. to 55,000 bu.) in a wide variety of sizes. They maintain a high level of performance because of G-115 (min. 350 gr/m² zinc) coated steel on all their roofs, support structures and steel sheets. These corrugated sheets have a 67 mm (2 2/3 in) pitch. With support structures made from hot-dip galvanized

structural steel, they are ready for years of maintenance-free service. Hopper bottom silos can be built with support structures rated for earthquakes, which ensure a proper foundation for structures in areas with frequent seismic activity.

SCAFCO engineers work with customers to meet their needs for storage with a versatile array of hopper silo features and accessories. From companies that require massive storage, to customers with much smaller needs like microbreweries, the following installations illustrate a wide variety of applications.

WHEAT (Photo A): This expansive grain railroad terminal in Eastern Washington State, USA, has three SCAFCO 10,000 MT flat bottom silos, and three SCAFCO 1,500 MT (55,000 bu.) hopper bottom silos for a total of 34,500 MT of storage. The hopper bottom silos stand 25.9 meters (85 ft.) tall and are 11 meters (36 ft.) diameter. For train transport, 110 car shuttle trains can be loaded with 16,000 MT (587,904 bu.) of grain in 10 hours. This facility is a long-term investment in the future of Washington State wheat production and distribution.

FRAC SAND: SCAFCO manufactures hopper bottom silos that are used for storing frac sand. Hydraulic fracturing sand is used in the extraction of oil and natural gas from shale beds. SCAFCO frac sand hopper silos are engineered for products that weigh 1.9 kg/m³ (120 lbs.

pcf.), which is double the weight of wheat.

SCAFCO has also custom engineered taller hopper bottom silos without the need to lay down expensive concrete pilings. Standard hopper bottom silos have a clearance height of 1 meter (39 in.), but SCAFCO has made structures with a 1.2 meter (48 in.) discharge height. Leg support structures can be created significantly stronger than standard supports to fulfill customer requirements, especially where high wind or seismic loads may be a factor.

RICE: Hopper silos are vital in getting rice ready for market. Unmilled rice, known as “paddy rice,” is usually harvested when the grains have a moisture content of 22%. Paddy rice needs to be dried to bring down the moisture level to no more than 12%– 14% for milling. Drying has to be carried out slowly to avoid cracking the rice.

Properly equipped hopper bottom silos are essential to the paddy rice drying and tempering process. After removing approximately 3% of moisture from the wet paddy, the rice is placed into the hopper bottom tempering silo for at least eight hours. This tempering allows moisture inside the rice kernel to move toward the

outer husk where it can be removed in the next drying pass. The process is repeated two or three times before the rice is dried down to its optimal storage moisture.



Photo A - MASSIVE: This grain terminal in Washington State, USA, has three 1,500 MT (55,000 bu.) hopper bottom silos.

Day silos adjacent to the rice mill also utilize hopper bottom structures because of their ability to discharge the grain using gravity. No expensive sweep augers are required and there is minimal damage to the rice kernels.

White milled rice can also be stored in corrugated, galvanized steel hopper bottom silos, although the environmental requirements are a bit stricter due to the high value of the product. Seed let-down ladders on the interior of these silos gently drop the milled rice to the bottom of the silo. These let-downs are designed to reduce damage to the stored product by allowing a smooth flow through a series of chutes.

LENTILS: Hopper bottom bins can provide seed let-downs for grains that are more fragile. This process slows the descent of the grain at 100 MT/hr. as it is discharged from the filling top conveyors, allowing it to fall more softly into the silo.

WOOD PELLETS: A hospital in Oregon State, USA, is saving on their energy costs. They replaced one of their oil-fired boilers with an economical wood pellet fueled boiler. The pellets that feed the boiler are stored in a SCAFCO Grain Systems hopper bottom silo. Since the installation of the economically and environmentally friendly upgrade, the hospital's heating costs have been cut by two thirds.

ORGANIC ANIMAL FEED: A pioneer in the organic animal feed industry in Washington State, USA, turned to SCAFCO for their entire storage system: silos, elevators, conveyors, catwalk, and towers. The complete system called for maximum efficiency and flexibility—and SCAFCO answered the call.

BREWERIES AND MICROBREWERIES: A brewery in Guatemala started out as a small operation, but has grown to become one of the world's largest. They've added a total of 17 SCAFCO hopper bottom silos, each holding 600 MT (27,558 bu.) of malting barley. This operation relied on SCAFCO engineers to fit the silos strategically within their current space, with an eye toward future growth.

On the smaller side (Photo B), microbreweries in the States of Idaho, Oregon, and Colorado, USA, use hopper bottom silos to store their many types of malting barley, turning to SCAFCO to secure the critical ingredients they need to meet growing customer demand for specialty beers and brews.

These bins have a 60 degree cone bottom with a capacity of 36 MT (1,688 bu.) each. These bins are filled pneumatically directly from delivery trucks. The malted barley is then gravity-fed and conveyed directly into production.



Photo B - MICRO: This microbrewery in Idaho State, USA, has two 36 MT (1,688 bu.) hopper silos which are used for malting barley storage and handling.

This eliminates inconvenient bag-handling, which smaller breweries must often use.

For all of these installations, SCAFCO engineers used the latest 3D design and analysis techniques to assure timely, accurate, and efficient products. SCAFCO Grain Systems staff boasts decades of combined experience in a wide variety of storage, handling, and processing applications. From our plant in Spokane, Washington State, USA, we create superior designs that are crafted exclusively from U.S.-sourced prime mill certified steel. Whether your storage requirement is MASSIVE or MICRO, SCAFCO Grain Systems is meeting the demand for hopper bottom silos and other versatile storage systems.

**Contact SCAFCO Grain Systems today:
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