



STREAMINDUS ENGINEERING SERVICES PVT LTD

ONE WINDOW SOLUTION PROVIDER FOR ALL YOUR ENGINEERING NEEDS

ISO 9001:2015 ISO 14001:2015

DURABLE • AERATED • WEATHER-PROOF

GRAIN STORAGE SILO SOLUTION

EFFICIENT STORAGE. SEAMLESS FLOW.



Ministry of MSME, Govt. of India



www.streamindus.com

sales@streamindus.com





“Welcome to Streamindus Engineering Services”

Streamindus Engineering Services Pvt. Ltd. is a fast-growing multidisciplinary engineering company specializing in high-performance, customized solutions across industries.

From grain storage silos and pre-engineered buildings to renewable energy and industrial infrastructure, we deliver smart, scalable, and reliable systems backed by deep technical expertise and a customer-first approach.

Our Vision & Mission

To be a trusted leader in delivering innovative, sustainable, and cost-effective engineering solutions across the globe.

To empower agriculture, industry, and infrastructure with tailored engineering systems that enhance productivity, efficiency, and long-term value.





Our process:

REQUIREMENT ANALYSIS

Understanding client needs – type of grain, capacity, location, operational needs.



DESIGN AND ENGINEERING

Custom silo designs with precise technical detailing and structural safety



MANUFACTURING AND QUALITY CONTROL

Fabrication using premium-grade materials (MS, GI, SS, Zincalume).



SUPPLY AND LOGISTICS

Timely delivery of silo components to the project site.



INSTALLATION AND COMMISSIONING

Professional on-site assembly, erection, and testing.



AFTER-SALES SUPPORT AND AMC

Regular maintenance, inspection, and servicing of silo systems.





FLAT BOTTOM SILO

Flat Bottom Silos are ideal for storing large quantities of grain for long durations. Designed with a flat base and conical roof, they provide safe, economical, and efficient bulk storage while ensuring easy maintenance and unloading with integrated accessories.

Key Features:

- **Storage Capacity:** Custom-built from 50 MT to 10,000+ MT
- **Material Options:** Galvanized Iron (GI) & Zincalume
- **Diameter Range:** 3 meters to 30+ meters
- **Height Range:** Up to 25 meters
- **Design Life:** 45+ years with minimal maintenance

Flat-Bottomed Silos – Technical Highlights:

- **Purpose:** Designed for long-term storage of dry granular materials like grain, corn, canola, legumes, etc.
- **Capacity Range:**
Standard: 30 to 2,000 tonnes
Special Projects: Up to 10,000 tonnes
- **Material:** Constructed from high-quality corrugated structural steel with zinc coating of 150-200 g/m² for corrosion resistance.
- **Heat Reduction:** Corrugated metal surface disperses sunlight, preventing excessive heating of stored materials during hot weather.
- **Aeration Floor:** Perforated flooring ensures efficient aeration, preserving grain quality.
- **Sweep Auger:** Installed at the silo base to remove remaining material post gravity discharge, ensuring complete emptying.
- **Aeration System:** Included as standard equipment to maintain internal grain quality and reduce moisture buildup.
- **Structural Strength:** Corrugated steel and rolling process enhance wall stiffness, minimizing risk of dents or deformation.
- **Hermetic Design:** Special sealing of panels and fasteners provides excellent water-tightness, protecting stored material from moisture ingress.



Standard Silo Equipment

- **Inlet** for grain filling
- **Silo roof** with weather-resistant design
- **Roof vents** for air circulation and pressure balance
- **Side hatch** (zinc plated) for inspection and maintenance
- **Perforated floor** – percentage of perforation depends on silo model
- **Side sheathing** – made from construction-grade, zinc-plated, corrugated steel
- **Ventilation fan** connection for effective aeration
- **Set of bolts, nuts, and washers** for secure assembly
- **Set of connectors** for structural integration
- **Set of anchors** to securely fix the silo to the foundation
- **Foundation recommendations** provided based on silo size and load requirements



OPTIONAL SILO EQUIPMENT

- **Roof turbofan** for enhanced air circulation
- **Gallery with transport support** – includes structural support for conveyor systems
- **Ladder and safety cage** for vertical access
- **Maximum fill sensor** to prevent overfilling
- **Temperature monitoring system** for grain quality control
- **Aeration fan** to maintain internal air quality and moisture balance
- **Screw auger** for efficient grain unloading and transfer





GRAIN STORAGE FLAT-BOTTOM SILOS BY STREAMINDUS

Streamindus Engineering Services Pvt. Ltd. offers a wide range of flat-bottom silos for grain and dry bulk material storage, with capacities ranging from 300 MT to 15,000 MT per bin, designed to meet globally recognized engineering standards for safety, performance, and longevity.

DESIGN STANDARDS & STRUCTURAL INTEGRITY

Silos are engineered using load parameters derived from:

- ANSI-ASAE EP 433:88 REV 2006 (American standard)
- DIN 1055:1987 (German standard)
- Wind Load: Designed for standard wind speeds up to 180 km/h and maximum up to 250 km/h as per DIN 1055-4:2005-03.
- Snow & Ice Load: Calculated based on DIN 1055-5:2005-07.
- Seismic Load: Designed as per UBC (Uniform Building Code) and applicable Indian Seismic Zones (IS 1893) depending on site location.

MATERIALS & BUILD QUALITY

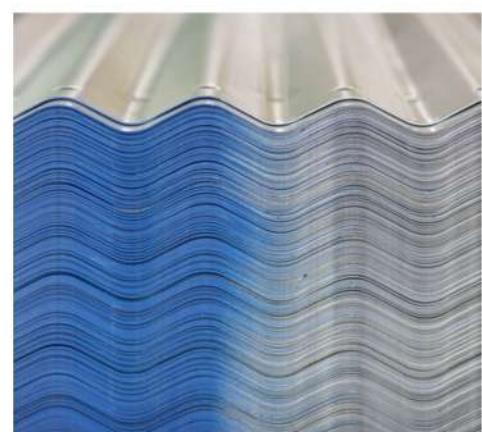
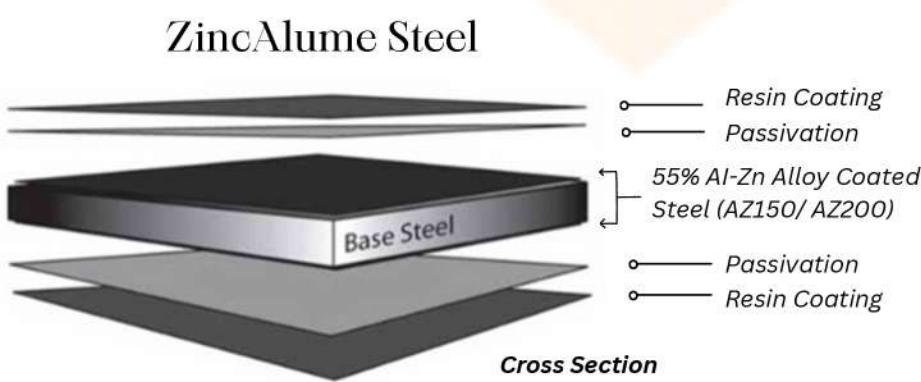
Manufactured using AZ150/200 grade steel – known for:

- High tensile strength and yield
- Superior fatigue resistance, toughness, and abrasion resistance
- Controlled internal purity and fine molecular structure for long service life

CORROSION PROTECTION

Wall sheets and roof panels are made from marine-grade ZINCALUME® steel (AZ150/AZ200) by TATA BlueScope, offering:

- Exceptional resistance to corrosion in harsh conditions (coastal, high rainfall, or snow)
- Yield strength from 300 MPa to 550 MPa, depending on application
- Compliance with international standards: AS1397, ASTM A792M, IS 15961, ISO 9364
- As an alternative, pre-galvanized steel with G300 to G450 coating grade is also available for cost-effective and reliable corrosion protection.





ROOF TURBO FANS

REDUCES WATER CONDENSATION UNDER THE ROOF IN CASE OF DIFFERENT TEMPERATURES INSIDE AND OUTSIDE THE SILO

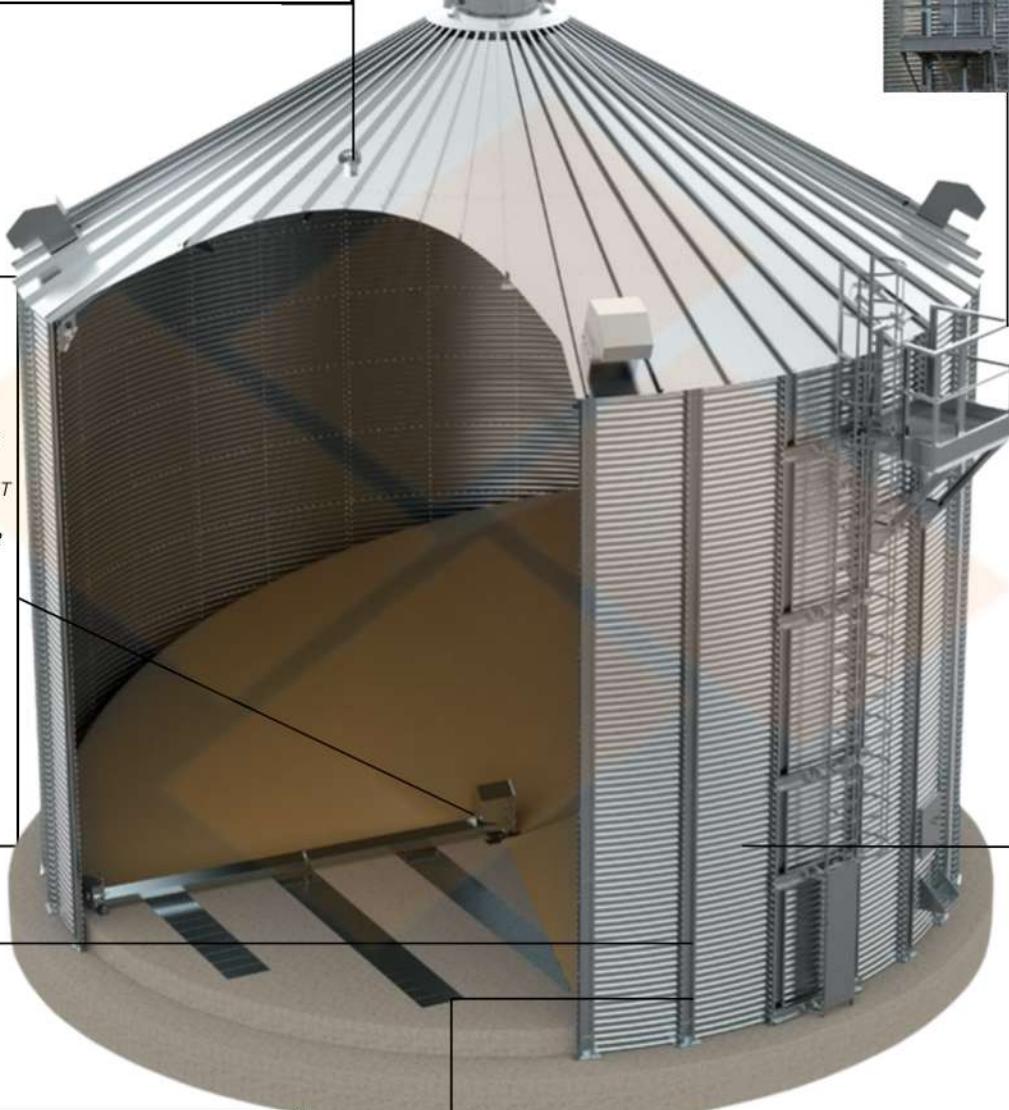
TOP FEEDING INLET:

A CENTRALLY LOCATED OPENING AT THE TOP OF THE SILO USED FOR MATERIAL FILLING THROUGH GRAVITY OR PNEUMATIC CONVEYING.



SWEEP AUGER:

A MECHANICALLY DRIVEN HELICAL SCREW CONVEYOR MOUNTED ON THE SILO FLOOR, USED TO ROTATE AROUND THE SILO CENTER AND CONVEY RESIDUAL BULK MATERIAL TOWARD THE CENTRAL DISCHARGE POINT. IT ENSURES COMPLETE EMPTYING OF THE SILO AFTER GRAVITY DISCHARGE IS NO LONGER EFFECTIVE. COMMONLY USED FOR FREE-FLOWING MATERIALS LIKE GRAINS, PELLETS, OR POWDERS.



REST SUPPORTS



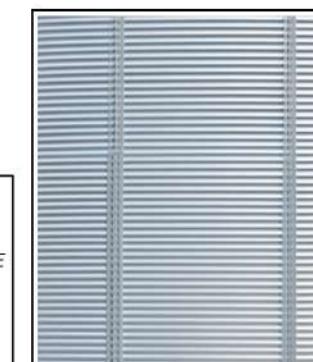
STIFFNESS OF CYLINDER

DUE TO USE OF CORRUGATED STEEL – ROLLING PROCESS REINFORCES THE MATERIAL AND PREVENTS FROM DENTS, ADDITIONALLY VERTICAL REINFORCEMENTS PREVENTS FROM DEFORMATIONS



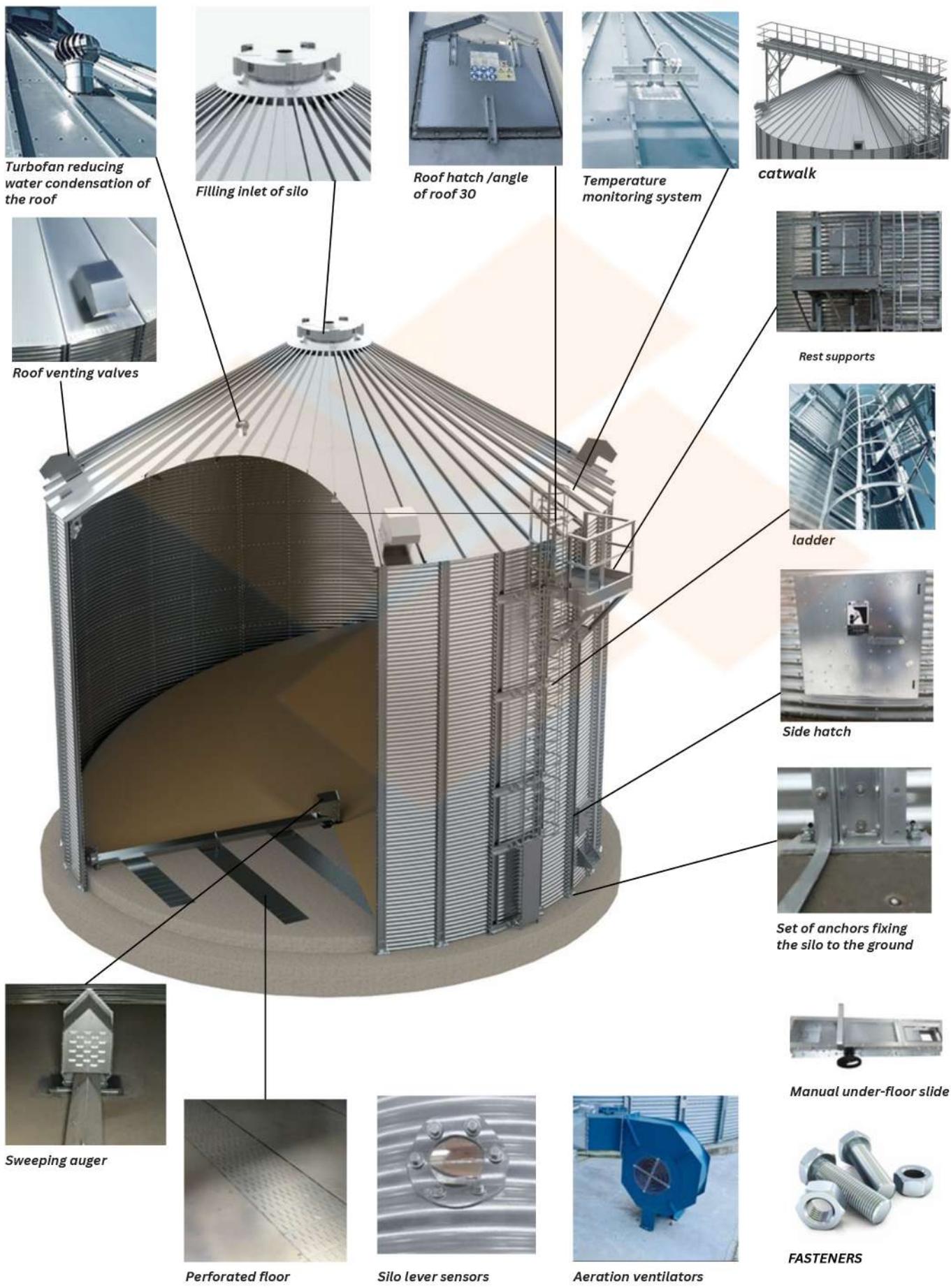
HERMETIC CONSTRUCTION

PROTECTS FROM GETTING THE WATER INTO THE SILO, SPECIALLY SEALED CONNECTIONS OF SIDES AS WELL AS FASTENERS GUARANTEE TIGHTNESS OF SILO'S WALLS



MADE OF CORRUGATED STEEL WITH ZINC COATING
350- 600 G /M2

CORRUGATED STEEL RESULTS IN DEFLECTION OF LIGHT, WHICH IN EFFECT PREVENTS FROM EXCESSIVE HEATING UP OF THE STORED MATERIAL DURING THE SUMMER SEASON, PROPER PROFILE OF THE WAVE PREVENTS FROM STUCKING OF THE GRAIN ON THE WALLS





Advantages of Flat Bottom Silos

- **Ideal for Long-Term Storage**

Designed to store large volumes of grains, pulses, and granular materials for extended durations without spoilage.

- **High Storage Capacity**

Available from 30 to 10,000 tonnes, suitable for both small farms and large industrial operations.

- **Efficient Material Discharge**

Gravity unloading with central outlet, assisted by sweep auger for complete emptying of residual material.

- **Robust Structural Integrity**

Constructed using high-strength, corrugated galvanized steel with zinc coating (up to 350 g/m²), offering corrosion resistance and durability.

- **Enhanced Aeration System**

Equipped with perforated floors and integrated aeration ducts to ensure uniform airflow and maintain grain quality.

- **Temperature Control**

Corrugated wall design reflects sunlight, reducing internal heat buildup during summer.

- **Modular & Scalable**

Flexible design allows for easy expansion and integration with conveyor systems, catwalks, and monitoring units.

- **Hermetically Sealed Construction**

Special sealing and fastening systems prevent water ingress and maintain airtight conditions.

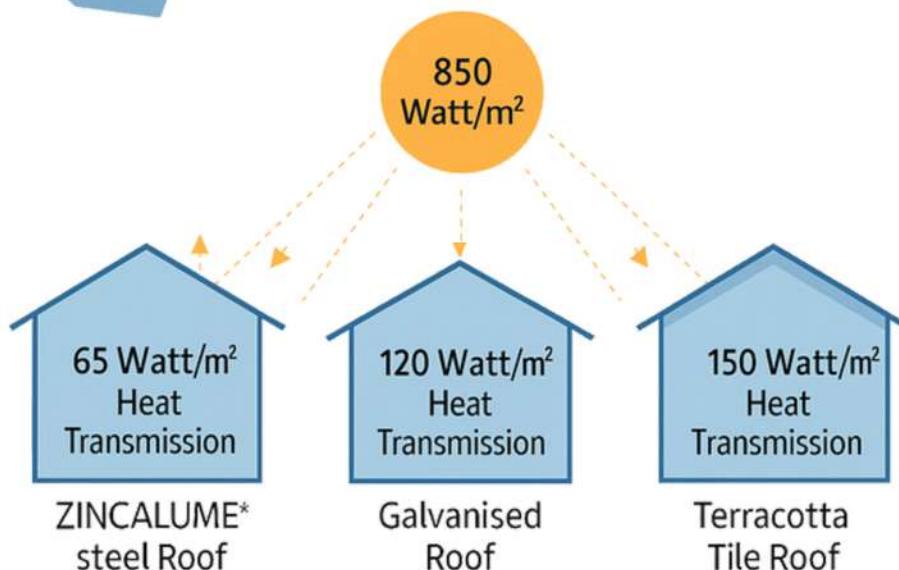
- **Lower Maintenance Requirements**

Galvanized steel and smooth surface design reduce corrosion and material buildup, minimizing maintenance costs.

- **Safety & Operational Ease**

Access ladders, roof manholes, and platforms ensure safe inspection and maintenance.

Cool Comfort Greater Thermal Comfort



FLAT BOTTOM SILOS VS. TRADITIONAL WAREHOUSES

Feature	Flat Bottom Silos	Traditional Warehouses
Structural Durability	Corrugated galvanized steel with zinc coating (e.g., 350 g/m ²)	RCC/brick structures prone to wear and moisture damage
Storage Losses	Minimal – due to hermetic sealing and protection	Higher – due to spoilage, rodents, and handling damages
Space Efficiency	Uses vertical space; requires less land area	Requires large footprint for the same storage volume
Scalability	Modular design; easy to expand	Requires major construction to scale
Operational Cost	Lower due to automation and minimal manpower	Higher labor and energy costs
Material Handling	Mechanized discharge (gravity + sweep auger)	Manual or forklift-based, slower unloading
Maintenance Requirements	Low – corrosion-resistant materials	Regular upkeep needed for walls, roof, and floors
Grain Preservation	Airtight, moisture-controlled, with integrated aeration	Higher risk of moisture, pests, and uneven storage conditions
Food Safety & Compliance	Designed to meet international food safety standards	Needs continuous monitoring and pest control to ensure hygiene
Automation Integration	Supports sensors, level monitoring, temperature control	Limited compatibility with automation

Hopper Bottom Silos

Silo Wall

- Constructed from shallow corrugated galvanized steel sheets with vertical stiffeners.
- Effective ring height: 1.12 m.
- Standard sheet length: 3.05 m (customizable for specific diameters).
- Variable sheet thickness tailored to structural load zones.



Silo Roof

- Conical roof with 31° slope, made of trapezoidal steel panels.
- Ensures complete protection from weather and vermin.

Support Steelwork

- Mounted on a rolled ring beam (superior to wall-stiffener extensions used by some competitors).



Fixings

- Assembled with spun galvanized bolts and neoprene-backed washers:
- Protects zinc coating during installation.
- Ensures tight, corrosion-resistant sealing at bolt joints.



Design Standards

- Designed as per DIN 1055 (1987) or ANSI-ASAE EP 433:88 standards.
- Manufactured in-house by **STREAMINDUS ENGINEERING SERVICES PVT LTD.**



Applications

- Temporary wet grain storage in drying plants.
- Buffer bins in grain handling systems.
- Medium-term grain storage for rapid discharge (ports, breweries, mills).
- Suitable for wood pellets, feed pellets, and other free-flowing materials.



Material & Corrosion Protection

- Fabricated using certified pre-galvanized or hot-dip galvanized steel.
- Coating options include Zin-Alume alloy or G450 / G600 zinc galvanization.
- Excellent corrosion resistance, even in coastal or harsh environments.

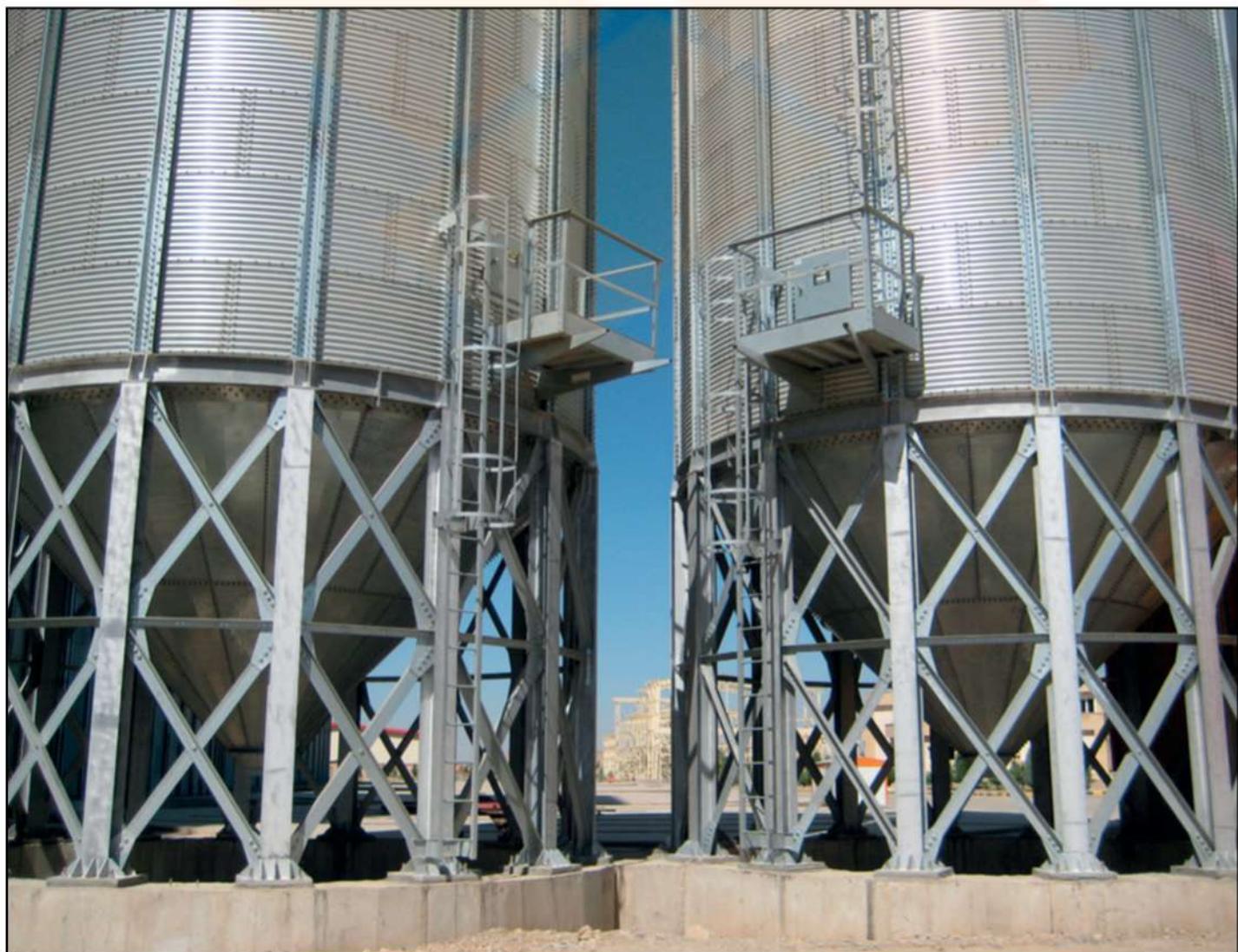
Ventilation System

- Centrifugal or axial fans with inlet adapters
- Roof ventilation vents
- Optional roof-mounted exhaust fans
- Aeration laterals integrated within the hopper base



General Parameters – Hopper Bottom Silos

Parameter	Minimum	Maximum	Remarks
Diameter	3.62 meters	10.88 meters	Based on modular panel design
Cylinder Height	2.72 meters	14.77 meters	Depends on required storage capacity
Capacity	23 MT	750 MT	Standard range; special designs available
Hopper Angle	45°	60°	Depending on flow characteristics of material





Design Parameters for Hopper Bottom Silos

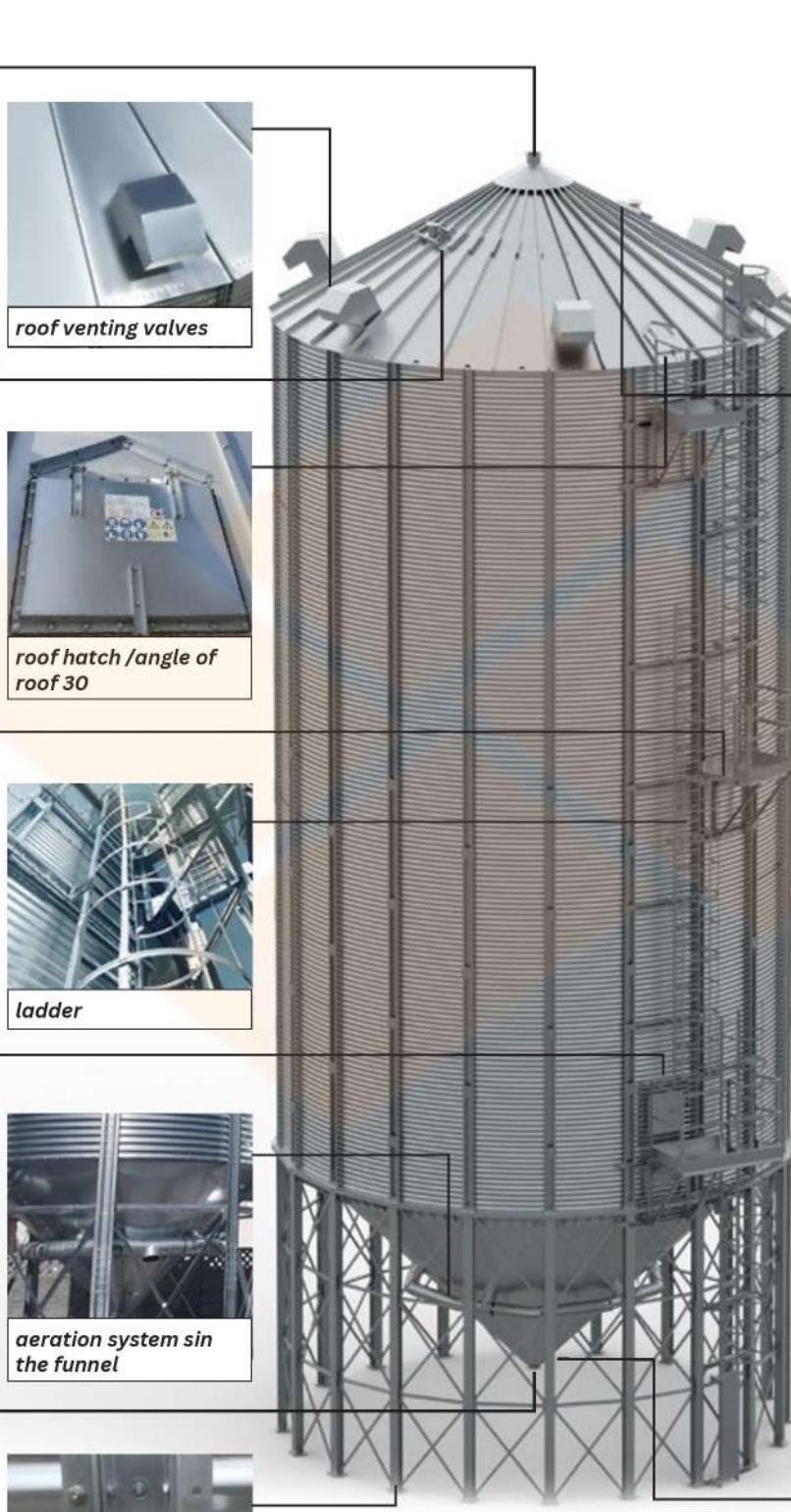
Parameter	Standard/Code Used	Parameter
Design Standards	- DIN 1055-4:2005-03 (Germany) - ANSI-ASAE EP 433:88 (USA) - IS 9178 Part 1 & 2 (India, optional)	International and national silo design codes for structural integrity and load analysis.
Wind Load	- DIN 1055-4:2005-03 - IS 875 (Part 3): 2015	Design wind speed range: 144 to 225 km/h depending on location and code.
Seismic Load	- IS 1893: 2002 (Zone V) - UBC (Uniform Building Code) - ANSI/ASAE EP 433:88	Peak ground acceleration considered up to 0.23g for high seismic zones.
Snow Load	DIN 1055-5:2005-07	Considered for regions with snowfall. Up to 150 kgf/m² (~1.5 kN/m²) .
Silo Wall Pressure	Based on internal friction angle, bulk density & material behavior (active/passive pressure)	Lateral pressures vary by grain type and are calculated zone-wise along the height.
Live Load (Roof & Floors)	IS 875 Part 2	Design for maintenance loads, man access, snow (if applicable).
Design Life	Typically 45+ years	Based on protective coatings, steel grade (Galvalume AZ150/200, G450, G600).
Foundation Design	Based on geotechnical investigation and bearing capacity	Raft or ring beam foundation design, depending on site conditions.
Corrosion Resistance	AZ150 / AZ200 Galvalume, G450 / G600 Galvanized Steel	Ensures long life under harsh environmental conditions.
Ventilation & Thermal	Roof vents, aeration laterals, centrifugal fans	Designed for proper grain aeration and temperature control.



EQUIPMENT



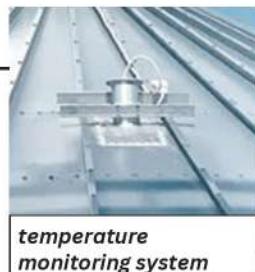
filling inlet of silo



ACCESSORIES



catwalk



temperature monitoring system



silo lever sensors



aeration ventilators



manual or electric valve under the silo



Bucket Elevator

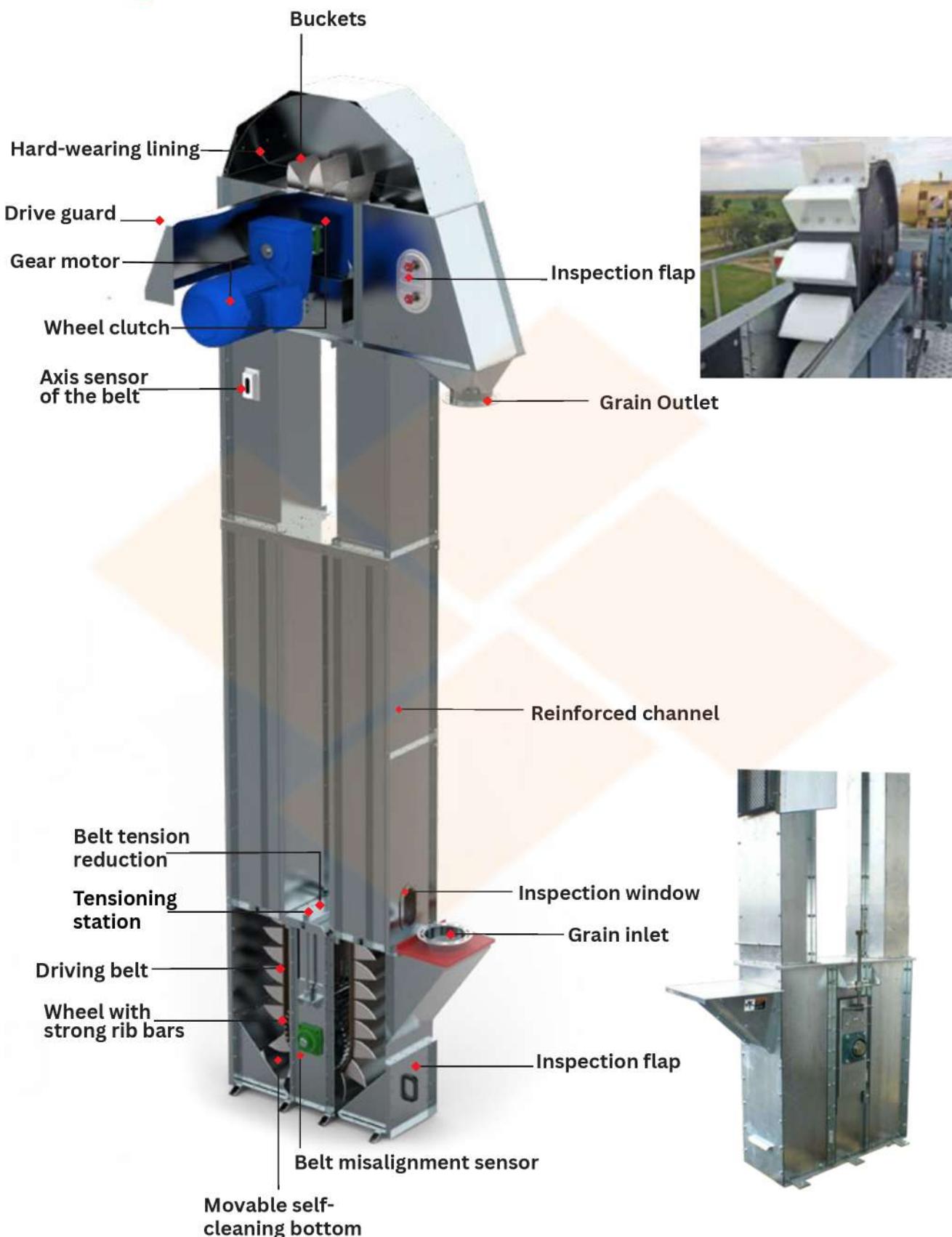
Designed for the vertical transport of-Grains, seeds, pulses, and granulated products

- Free-flowing loose materials up to 16 mm in diameter
- Materials with moisture content up to 25%
- Capacity & Dimensions:
- Available in 3 standard sizes
- Conveying capacity: Up to 200 m³/h
- Maximum height: Up to 30 meters

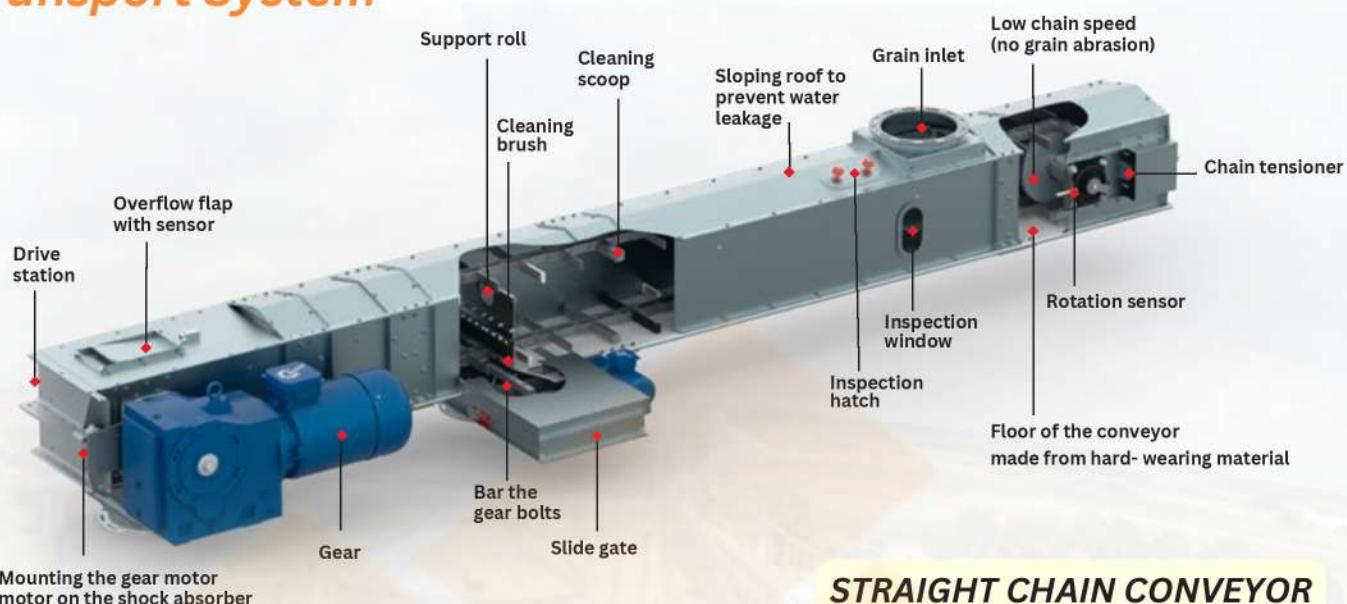
Category	Feature / Description
Durable Construction	Fully made of constructional galvanized steel for superior corrosion resistance and long life
Efficient & Reliable Operation	Self-cleaning foot with movable bottom to avoid material buildup - Wheel with rib bar for improved grip and belt alignment - Laser-cut drive and tension wheel components for precise assembly and extended service life
Advanced Belt & Pulley Design	- Properly profiled pulley prevents belt contact with channel walls, enabling self-alignment - Wide belt adjustment range for accurate tensioning - Optimal belt speed for gentle grain handling and sufficient discharge force
Top-Quality Components	- High-quality bearings for low maintenance and long-term durability - Abrasion-prone areas lined with wear-resistant material - Galvanized 8.8-grade screws for enhanced structural integrity
Enclosed Gear Motor	Fitted with a weather-protected ABB/SIEMENS gear motor housed under a protective head cover
Robust Bucket Design	Secure fastening eliminates the risk of buckets detaching from the belt
Optional Add-ons	- Motion detector - Belt linearity sensor - Foot overloading sensor - Service platform - Support tower



Bucket Elevator – Streamindus High-Capacity Grain Handling Solution



Straight Chain Conveyor – Streamindus Horizontal Grain Transport System



STRAIGHT CHAIN CONVEYOR

Application:

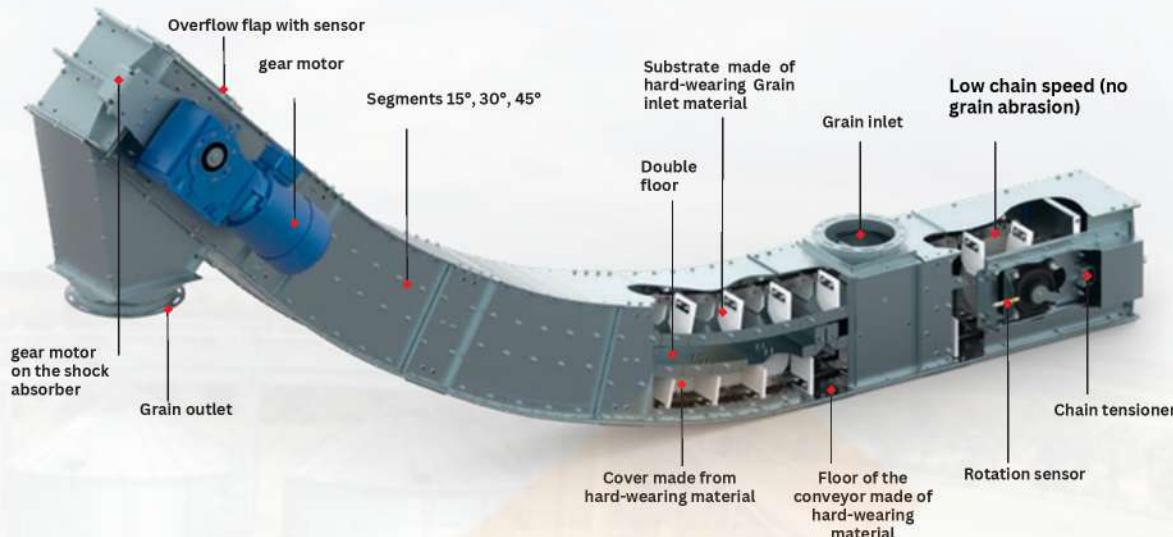
- Designed for the horizontal transport of:
- Grains, seeds, and other granulated materials
- Ideal for integration into bulk grain handling systems and silo installations

Capacity & Dimensions:

- High conveying capacity: Up to 200 m³/h
- Maximum length: Up to 90 meters

Category	Feature / Description
Durable Construction	<ul style="list-style-type: none"> Entire structure made of galvanized constructional steel for corrosion resistance and long service life Sloped roof design prevents water leakage and material ingress
Efficient Chain System	<ul style="list-style-type: none"> Equipped with roller chain offering high tensile strength Chain with scoops and self-cleaning scrapers for efficiency Toothless chain tensioning wheels ensure gentle grain handling without kernel damage
Stable & Smooth Operation	<ul style="list-style-type: none"> Roller positioning every 1 meter for chain stability Low chain speed reduces wear and ensures gentle grain handling Operates quietly with low energy consumption
Smart Cleaning Features	<ul style="list-style-type: none"> Cleaning brushes over the outlet maintain conveyor cleanliness Hard-wearing floor material in scraper and roller zones for long-term durability
Maintenance-Friendly Design	<ul style="list-style-type: none"> Inspection windows and service hatches for easy access Powered by industrial-grade drive for robust performance
Industrial-Grade Engineering	<ul style="list-style-type: none"> Engineered with robust construction and modular design Ideal for continuous operation in grain handling plants

Angle Chain Conveyor – Streamindus Inclined Grain Transport Solution



ANGLE CHAIN CONVEYOR

Application:

- Designed for changing levels of material transport, this inclined chain conveyor handles:
- Grains, seeds, and granulated materials
- Ideal for connecting silos or processing equipment at different elevations

Capacity & Dimensions:

- High conveying capacity: Up to 200 m³/h
- Available incline angles: 15°, 30°, and 45°
- Maximum length: Up to 100 meters

Category	Feature / Description
Durable Construction	<ul style="list-style-type: none"> The entire unit is made from galvanized structural steel for superior corrosion resistance Double floor construction for added durability Sloped roof design ensures no water leakage
Inclined Design Options	<ul style="list-style-type: none"> Available in 15°, 30°, and 45° angles for customized system layouts Ideal for space optimization in multi-level grain handling systems
Efficient Chain System	<ul style="list-style-type: none"> Roller chain with high tensile strength Chain with scoops and self-cleaning scrapers to reduce grain buildup Toothless chain tensioning wheels ensure grain integrity Rollers placed every 1 meter for chain stability at steeper inclines
Built for Performance	<ul style="list-style-type: none"> Industrial drive system for robust and efficient operation Hard-wearing contact zones at scraper blade and roller locations for longevity Cleaning brushes at outlets help maintain hygiene and reduce downtime
Maintenance & Safety	<ul style="list-style-type: none"> Inspection windows and access hatches for easy maintenance Engineered for quiet operation and low energy consumption Low chain speed ensures gentle grain handling and minimal abrasion

AERATION FAN SYSTEMS- Essential for Safe & Long-Term Grain Storage

At Streamindus, our aeration fan systems are specially designed to ensure the stored grain remains cool, dry, and pest-free, safeguarding your investment and maintaining grain quality.

Parameter	Specification
Fan Type	Centrifugal / Axial Flow
Capacity Range	3 HP to 25 HP
Airflow Capacity	3,000 CFM to 20,000 CFM (Cubic Feet per Minute)
Pressure Range	Up to 4–6 inches of water column (in WC)
Power Supply	3 Phase, 415V, 50 Hz
Material	Hot-dip galvanized or powder-coated steel
Motor Type	TEFC (Totally Enclosed Fan Cooled), IP55 protection
Drive System	Direct Drive / Belt Drive (Optional)
Inlet Guard	Galvanized mesh safety guard
Mounting	Silo base mounted / Plenum chamber compatible
Noise Level	< 80 dB
Controls	Thermostat or PLC-based automated fan controller
Optional	Insect control grid, weather protection hood, silencers

Purpose of Aeration Fans in Grain Silos

1. Temperature Control

Grain generates heat due to respiration.

Aeration fans circulate ambient air to remove excess heat and prevent hot spots that can lead to spoilage.

2. Moisture Management

Moisture migration occurs when there's a temperature difference inside the silo (e.g., cold outside and warm inside).

Aeration balances internal moisture, helping to prevent condensation, mold, and grain caking.

3. Prevention of Spoilage and Insects

Warm and humid conditions are ideal for fungal growth and insect infestation.

Aeration keeps the grain cool and dry, reducing biological activity and pest risks.

4. Maintaining Grain Quality

By reducing temperature and moisture, aeration fans help preserve grain quality for longer periods—essential for commercial storage and trade.

5. Safe Long-Term Storage

In regions with seasonal changes, aeration ensures the grain stays safe and stable through different climate conditions.





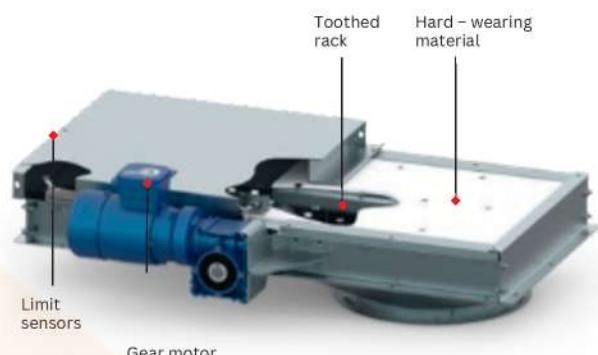
SILO UNLOADING SYSTEM

Electric Slide Gate

Application:

Designed to control the grain flow in automated storage and drying process lines. It is used in systems such as:

- Grain conveying systems (bucket elevators, chain, belt, or screw conveyors)
- Silo filling and emptying processes
- Technological lines in grain handling facilities



Technical Highlights:

- Mounting Widths: Available in 855 mm and 1055 mm variants
- Material: Made from high-strength constructional steel
- Drive System: Powered by motor, 0.55 kW
- Operation Mechanism: Operates on a toothed rack drive with ball bearings on the guide
- Limit Switches: Equipped with IP55 mechanical limit switches indicating open/closed positions
- Mounting: Features an external flange for robust and stable installation

Manual Slide Gate

Application:

- Provides manual control of grain discharge or flow within conveyor systems or silo bottoms where automation is not required or in case of power failure backup.



Key Features:

- Simple, mechanically operated gate system
- Compatible with flat-bottom silo discharge or conveyor outlet points
- Ensures reliable grain flow control during manual operations

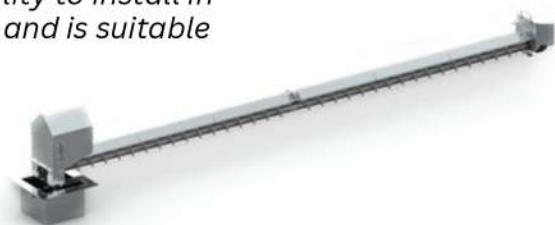
Circulating Screw Conveyor Discharger

Application:

Ideal for discharging grain from flat-bottom silos, with ability to install in new or existing silos. Provides uniform material discharge and is suitable for different silo diameters.

Key Features:

- Adjustable construction to match silo diameter
- Galvanized casing with anti-corrosion protection
- Can be retrofitted into existing silos
- Rubber drive wheel for motion with height-adjustable drive
- Capacity control for discharge regulation
- Driven by NORD® gearmotor and chain gearbox
- Fitted with branded UCF bearings for high durability



Contact Us



sales@streamindus.com



+91 9266766938/39



www.streamindus.com



C-25, Sector-8, Noida
Uttar Pradesh- 201301



Grain Silos

Flat-bottomed, conical, or internal funnel designs
Constructed from high-strength corrugated steel
Storage capacity from 30 to 15,000 tonnes
Engineered for durability, aeration, and easy discharge



Feed Silos

Robust corrugated steel feed silos, available in capacities ranging from 2 to 50 tonnes, designed for efficient on-farm storage of feed materials.



Square & Circular Silos

Modular square or circular steel silos
Capacities from 15 to 120 tonnes
Designed with funnel angles between 45° and 60° for smooth material discharge



Grain Dryers

High-efficiency grain drying systems:
Powered by gravity, chain, or screw conveyors
Output capacities from 20 to 300 t/h
Available with standard or overrun cranes for enhanced performance



Grain Transport Systems

Versatile and scalable material transport solutions:
Vertical transport: Bucket elevators
Horizontal transport: Belt, screw, and chain conveyors
Handling capacities from 10 to 300 t/h, designed for gentle and efficient grain movement



Feed Mills

Customized farm-scale and industrial feed milling systems, designed and delivered to meet the specific production needs of each client. Tailored technology ensures optimal feed processing efficiency.



Automation Systems

Complete automation and control solutions:
Based on PLC controllers, PCs, and Siemens® components
Fully customized to align with client-approved facility technologies. Designed for seamless integration and precision control



Receiving Hoppers

Heavy-duty stationary, batch, or continuous feed hoppers:
Output from 20 to 3,000 tonnes per day
Optional add-ons: grain coolers, dedusting systems, and noise silencers



Grain Cleaning & Sorting

High-capacity systems for:
Pre-cleaning and intensive cleaning
Throughput capacity: 20 to 240 t/h
Ensures grain purity, quality, and storage-readiness



Turn-Key Projects

Comprehensive design-to-execution services:
Conceptual and execution designs
Detailed investment cost estimates
Foundation and civil works
Equipment manufacturing & supply
Installation and commissioning
After-sales service & maintenance



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