



SD ENGINEERING & SERVICES

COMPLETE SILO CLEANING SOLUTIONS

Mechanized Silo Cleaning | CARDOX Technology | CRADLE Technology
Industrial Maintenance

Mr. Naresh Saini

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"Call Any Time, Any Where — We Are Ready."

SAFETY FIRST • SMART ENGINEERING • SUSTAINABLE SOLUTIONS

Mr. Naresh Saini began his career as a Mechanical Design Engineer, working with reputed cement plant engineering companies including BEUMER India Pvt. Ltd., Gebr. Pfeiffer (India) Pvt. Ltd., KHD Humboldt Wedag India Pvt. Ltd., EEL India Ltd., Con-Weigh Pvt. Ltd., and Shree Conveyor System Pvt. Ltd. Leveraging this extensive industry experience, he founded **SD Engineering & Services (SDES)** to provide Mechanized Silo Cleaning Services, CARDOX Technology, and Silo Cleaning Equipment solutions. Today, he continues to apply his practical engineering expertise to deliver safe, efficient, and reliable silo cleaning solutions for the cement industry.



Mr. Naresh Saini
Founder & Managing Director

Key Projects & Industry Experience

During his engineering career, he contributed to the design and execution of projects for leading cement manufacturers, including:

Lafarge Cement (India & Philippines)

Holcim (Sri Lanka & Bangladesh)

UltraTech Cement

Shree Cement

Ambuja Cement

ACC Limited

Grasim Cement

Penna Cement

Raina Industries

Thyssenkrupp Industries India

Maihar Cement

Deccan Cement and several other leading industrial organizations

Our esteemed clients

ACC Limited

Saurashtra Cement

Ambuja Cement

Maratha Cement

Ramco Cements

Penna Cement

Heidelberg Materials

✓ 20+ SUCCESSFUL SILO CLEANING PROJECTS

- ✓ MECHANIZED SILO CLEANING
- ✓ CARDOX TECHNOLOGY
- ✓ BIN WHIP SYSTEM
- ✓ PAN INDIA OPERATIONS
- ✓ HIGHLY SKILLED TEAM
- ✓ SAFETY-FIRST APPROACH



Why choose SD engineering & services?

Parameter	Mechanized Silo Cleaning (SDES)	Conventional / Manual Cleaning
Safety	Controlled confined space entry only for final cleaning, inspection, and maintenance.	Continuous manual work inside the silo throughout the cleaning process..
Cleaning Speed	Fast and efficient with specialized equipment	Slow and labor-intensive
Plant Downtime	Reduced downtime, enabling quicker restart	Longer shutdown periods
Work Quality	Uniform and consistent cleaning results	Quality depends on manual workmanship
Access to Difficult Areas	Easily reaches difficult locations using advanced systems	Limited access to confined or elevated areas
Equipment Used	Bin Whip, CARDOX, Cradle System, Pneumatic & Hydraulic Equipment	Hand tools, ropes, scaffolding, manual equipment
Manpower Requirement	Fewer personnel required	Higher manpower requirement
Operational Efficiency	High productivity with planned execution	Lower productivity and longer execution time
Overall Cost	Better long-term value through faster completion and reduced downtime	Higher overall project cost due to extended duration and manpower



Safety Excellence

Zero-incident safety record. Mechanized systems eliminate confined-space entry risks. Strict safety protocols on every project.



Engineering Expertise

20+ years combined industry experience. Designed equipment for major cement plants worldwide. Technical team of certified professionals.



Proven Reliability

20+ successful projects. Trusted by major industrial clients. PAN India rapid deployment capability.



Complete Solutions

End-to-end service from cleaning to maintenance. CARDOX technology, Cradle System, and manual cleaning expertise. 24/7 emergency support available.

Our Services & Technologies



Bin Whip Technology

Safe, efficient cleaning systems for industrial silos. Removes material build-up and blockages without human entry. Operates from silo top/bottom ensuring 100% worker safety.



Cardox Technology

SD Engineering & Services employs advanced CARDOX Technology to safely eliminate hardened blockages from silos and process equipment. Utilizing the rapid expansion of high-pressure CO₂, the system restores material flow efficiently, minimizes downtime, and supports safe, reliable, and uninterrupted plant operations



Manual Silo Cleaning

Expert confined-space entry and manual cleaning for residual materials below man height. Experienced crew with 14+ years of expertise in safe manual cleaning procedures.



Cradle System

Safe suspended working platform for confined-space silo cleaning and inspection. Provides controlled access inside the silo for manual cleaning, inspection, and maintenance in areas unreachable by mechanized equipment.



Aeration Pad Replacement & Maintenance

Inspection and maintenance of aeration pads to ensure optimal airflow and silo performance. Regular maintenance prevents costly breakdowns and downtime.



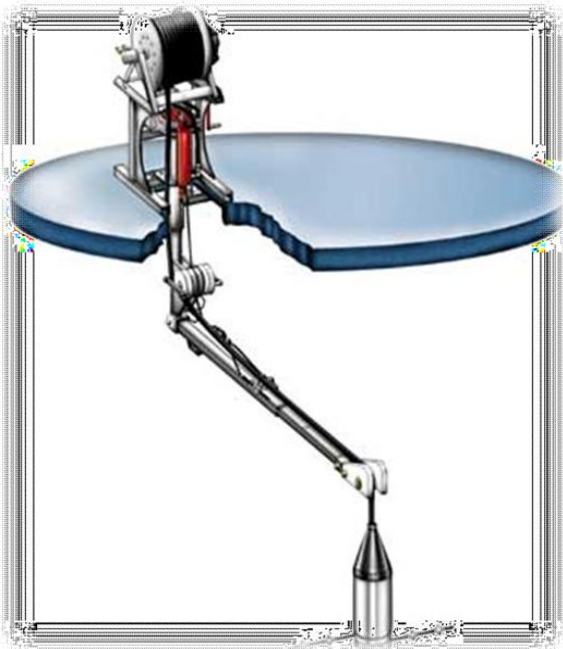
Shutdown Maintenance & Emergency Response

Rapid response services for urgent cleaning needs and emergency blockage clearing. Available 24/7 to minimize downtime and ensure quick operational resumption.



SDES Bin Whip Technology

The SDES Bin Whip System is an advanced mechanized silo cleaning solution designed to safely remove hardened material build-ups, wall coatings, bridging, and blockages from silos and bulk storage vessels. The system operates from the silo roof using a hydraulically or pneumatically powered cutting head mounted on a mechanical boom assembly, ensuring efficient cleaning while significantly reducing confined space exposure

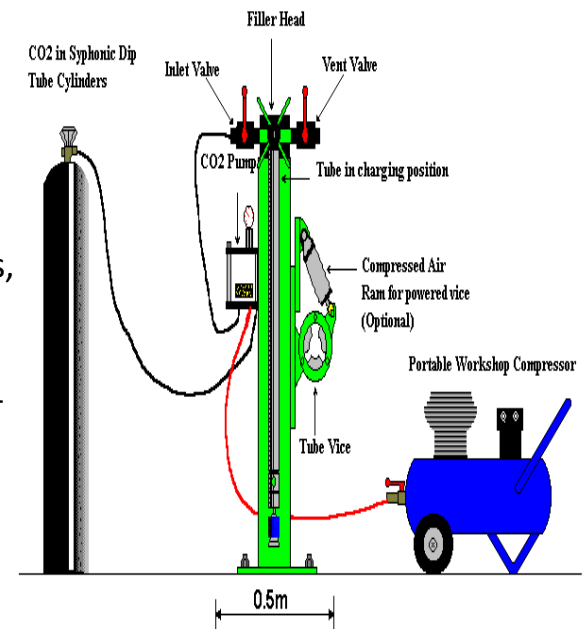


Parameter	Specification
Operating System	Hydraulic
Operating Pressure	500 PSI
Motor Speed	1400 RPM
Operating Control	Controlled by a single operator from the silo roof
Maximum Cleaning Depth	Up to 50 meters
Coverage per Opening	Approximately 10-meter circumference
Access Openings Required	Typically 3–4 openings, depending on silo diameter
Application	Cement, Clinker, Fly Ash, Raw Meal and other bulk materials
Cutting Head	Interchangeable cutting heads selected according to material condition
Power Source	Hydraulic Power Pack



SDES Cardox Technology

CARDOX Technology is an advanced CO₂-based blockage removal system designed to safely eliminate hardened material build-ups from silos, hoppers, cyclones, preheaters, feed pipes, rotary kilns, and other bulk material handling equipment. The system utilizes the rapid expansion of high-pressure liquid carbon dioxide to fracture compacted material, restoring material flow without the use of explosives, chemicals, or water.



Parameter

Specification

Technology

High-Pressure Liquid CO₂ Discharge System

Working Principle

Rapid expansion of liquid CO₂ into high-pressure gas

Activation Method

Electrically Activated Safety Heater

Discharge Mechanism

Rupture Disc Release

Tube Type

Reusable High-Pressure CARDOX Tube

Consumables

Safety Heater, Rupture Disc & Sealing Washer

Charging System

CO₂ Pump & Charging Stand

Operating Medium

Liquid Carbon Dioxide (CO₂)

Cleaning Process

Dry Process (No Water / No Chemicals)

Application Areas

Silos, Cyclones, Preheaters, Rotary Kilns, Feed Pipes, Hoppers & Bins

How Cardox works

Holes are made in the build-up through the sockets by either an air lance or rotary auger rods, (extendable auger rods enable substantially longer holes to be made).

The charged Cardox Tube(s), made from a special alloy steel, are then inserted through the sockets and secured by turning the tube holder through 90° in the socket.

A simple connection is made from the Tube to a hand-held activating machine and on passing an impulse to the Tube, a low-tension electric fuse initiates a rapid reaction in the safety heater, causing the liquid carbon dioxide to pressurise (the safety heater can only react in a pressurised environment).

This instantaneous build-up in pressure reaches a yield pressure of the shear disc, which bursts, releasing a cold

heaving mass of CO₂ expanding to 600 times its original volume, which aerates and clears the surrounding material. The whole process takes less than a second.

The pressure generated can be regulated between 2800 bar (40 000 psi) and 1200 bar (18 000 psi) by selecting the thickness of the shear disc.

The high pressure discharge is far in excess of what air-blasters can produce and the Tubes are used over and over again, the safety heater and rupture disc being replaced after each use.

It is conceived that the new Cardox Silo Tube will have a service life of approximately 15 years.



Cardox Silo Tube (In section).

SDES Cradle System

The SDES Cradle System is a hydraulically operated suspended access platform used for critical silo cleaning operations. It is deployed when hard or thick material build-ups cannot be completely removed using the Bin Whip System. A trained technician is safely lowered into the silo using the cradle platform to remove the remaining hard coatings with a hydraulic breaker machine. This method significantly reduces project time while eliminating the need for full internal scaffolding in most critical silo conditions



Parameter

System Type

Lifting Mechanism

Platform

Wire Rope Capacity

Safety System

Power Source

Control

Application

Working Method

Suitable For

Specification

Hydraulic Suspended Cradle System

Hydraulic Wire Rope Winch

Guard-Rail Suspended Working Platform

22 Ton Primary Wire Rope

Dual Independent Safety Ropes & Full Body Harness

Hydraulic Power Pack

Hydraulic Manifold Control from Silo Top

Critical Silo Cleaning, Hard Coating Removal & Inspection

Technician lowered safely using cradle platform

Cement, Clinker, Fly Ash, Limestone & Other Bulk Storage Silos



SDES Manual Cleaning

Manual Cleaning is the final stage of the silo cleaning process. After mechanized cleaning using the Bin Whip System and when the remaining material level is reduced to approximately **1.5 meters or below**, and the silo wall coatings have been completely removed, permission is obtained from the client before trained personnel enter the silo. The remaining material is then manually cleared to ensure complete cleaning and maximum material recovery under strict confined space safety procedures



Parameter

Cleaning Method

Access

Tools Used

Safety Requirement

PPE

Communication

Application

Specification

Manual Confined Space Cleaning

Silo side door

Hand Tools, Hydraulic Breaker, Shovel, etc.

PTW, LOTOTO, Gas Testing & Rescue Plan

Helmet, Full Body Harness, Respirator, Goggles & Safety Shoes

Two-Way Radio / Attendant Monitoring

Critical & Localized Hard Material Removal



Aeration Pad Replacement & Maintenance

SD Engineering & Services provides complete Aeration Pad and Open Airslide Cloth Replacement services to restore efficient material conveying and fluidization systems. Damaged, worn, or clogged aeration pads and airslide cloths are carefully removed and replaced with new components to ensure smooth material flow, improved conveying efficiency, and reliable plant operation. After installation, the complete system is tested in the presence of the client's representative to ensure a leak-free and satisfactory performance before handing over the silo



GET IN TOUCH

Ready to Optimize Your Silo Operations?



COMPANY NAME

SD ENGINEERING & SERVICES



FOUNDER & MANAGING DIRECTOR

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**"Call Any Time, Any Where -
We Are Ready!"**



Ready to restore your silos to **100% capacity**? Contact SDES today for a site assessment, emergency response, or machinery supply inquiry. Our team is on standby — any time, any where.