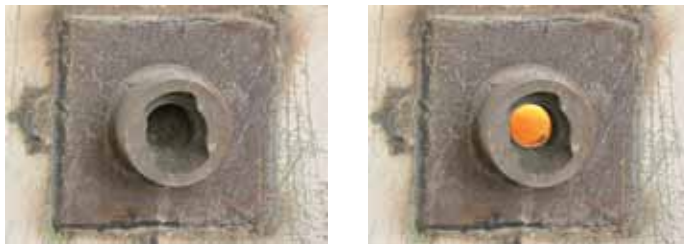


CARDOX.

CARDOX Systems™

BUILD-UP & BLOCKAGE CLEARING SYSTEM FOR THE CEMENT INDUSTRY

In cement production, there are plenty of places in your processing lines that are prone to rings, chokes and build-ups. Why jeopardize your bottom line every time you have to shut down to clear the blockage? CARDOX is the fastest, safest and most efficient way to keep your production flowing... day, after day, after day.



CARDOX can quickly remove blockages and build-ups and restore plant production to optimum levels... with no need to sit through an extended shut down while the equipment cools. CARDOX can be used in ALL areas of the processing lines at operating temperatures.

By using CARDOX there is NO loss in efficiency! Each time you use a CARDOX tube you are guaranteed maximum pressure to remove the build-up and with tubes having a working life of over 15 years, maximum efficiency is achieved over that period.

CARDOX is safely used from the outside of all areas of the processing line. Since workers do not have to enter the kiln or any part of the production line, there is no danger of exposure to heat or contaminated air, and there is no danger of loosened material falling on your employees, which may harm or even bury them.

The CARDOX tube is secured in a sealed coupler assembly. This means that you operators are not exposed to flying debris - unlike water injection... or in danger of being too close to the blast area - as with shot gun methods. Plant personnel operate from a safe distance whilst the CARDOX tube does the work.



Where is CARDOX used?

Every cement plant that has installed CARDOX agree that without any doubt it is the **MOST EFFICIENT & COST EFFECTIVE** method of clearing build up and blockages in:

- PREHEATERS
- CYCLONES
- INLET CHAMBERS
- RISER DUCTS
- FEED PIPES
- ROTARY KILNS
- RAW FEED MILLS
- PRECALCINERS
- COOLERS
- SILOS
- ... AND ANYWHERE IN THE CEMENT PROCESSING LINE

CARDOX Tubes are manufactured to ISO9002 and also carry Rolls Royce Quality Assurance Approval.

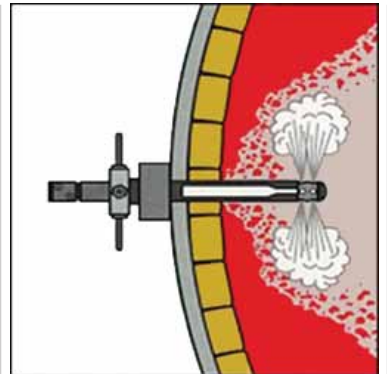
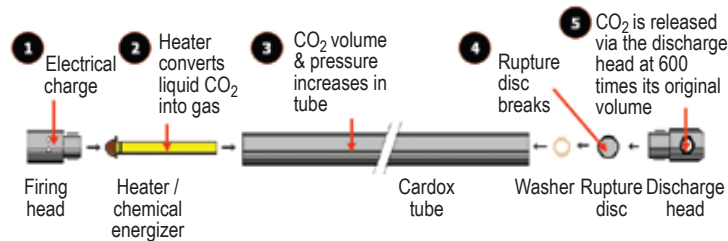


CARDOX

CARDOX Systems™



How CARDOX works



CARDOX has a variety of different tubes for specific applications. Tubes are filled with liquid carbon dioxide (exactly the same as a fire extinguisher). When energized by the application of a small electrical charge, the chemical heater instantly converts the liquid carbon dioxide to a gas. This conversion expands the CO₂ volume and builds up pressure inside the tube until it causes the rupture disc at the end of the tube to burst. This releases the CO₂ - now 660 times the original volume - through a special discharge nozzle to create a powerful heaving force, at pressures up to 40,000 psi (3,000 bar). This all takes place in milliseconds.

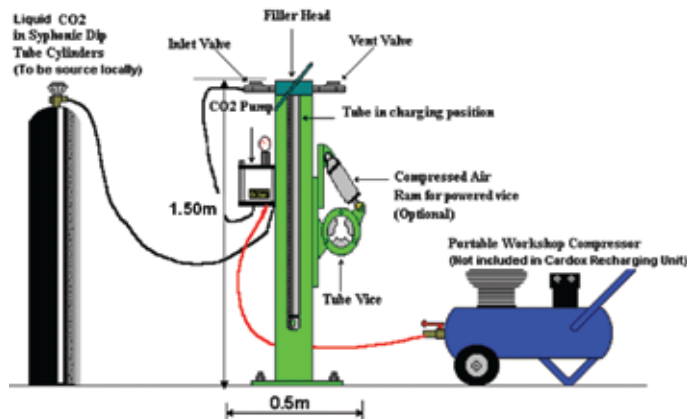
This instantaneous build-up in pressure reaches the yielding pressure of the rupture (shear) disc which bursts releasing a heaving mass of carbon dioxide which breaks the surrounding material.

By selecting the thickness of the rupture disc, the power of the tube can be regulated to suit all conditions.



After recovery the tube, the heater, washer and rupture disc are replaced, the liquid carbon dioxide recharged and the tube is ready to be used again.

- The versatile CARDOX tube recharging unit:**
- Can be located anywhere on the plant
 - Takes less than one minute to fill CARDOX tubes
 - Only needs to be used when build-up / blockage occurs
 - Needs minimum amount of maintenance



Advantages

- Fully approved by Health & Safety Executive (U.K.)
- Classified as Non-Explosives
- No permit required for usage, or transportation
- No license required for import
- No magazine required for storage
- Immediate return to work site
- Instantaneous results
- Indefinite shelf life
- No shock waves or damaging vibration
- Can be activated in series
- Vertical & horizontal loading

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CARDOX

CARDOX Systems™



SUMMARY	CARDOX	OTHER METHODS
Efficiency in clearing Build-up / Blockages	> 95% of Build-up, usually all Build-up is fully removed	Partial, ineffective in some cases
Frequency	Used only when Build-up occurs	Minimum once per shift or continuous operation
Time to remove Build-up / Blockages	Less than 1 second	Several hours or days
Maintenance	Low cost, only used when Build-up occurs	High maintenance on both manpower & operating costs, sometimes damage to refractory lining
Operation	Can operate while plant is running at full capacity, shutdown is not required	In some instances the plant has to be shutdown for several days
Safety & Risks	Classified as non-explosive, approved by Health & Safety Authorities in U.K. & Singapore	Dangerous, capable of several near-miss incidents to workers



Who uses CARDOX?

All the major cement manufacturers...

- LAFARGE (& BLUE CIRCLE)
- HOLCIM
- CEMEX
- HEIDELBERG
- ITALCEMENTI
- RMC
- CIMPOR
- DICKERHOFF
- PORTLAND CEMENT
- AND MANY MORE.... HAVE FOUND NO BETTER SOLUTION FOR KEEPING THE CEMENT PRODUCTION RUNNING AT FULL CAPACITY

Some CARDOX Applications...



Preheater: CARDOX tube inserted and secured into Socket.



Cooler area: CARDOX sockets welded onto cooler area for clearing of 'SNOWMAN' build-up.



Feed pipe: No other method clears ring build-up as efficiently and with virtually NO down time!

CARDOX has been used in cement plants in more than 150 installations all over the world for over 30 years!

They have found **NO** better solution for keeping the cement production running at full capacity.

No other method of clearing build-ups and blockages in silos, bins, hoppers and most storage vessels is safer, easier or more cost effective than the CARDOX System.

Other ring or blockage removal operations, such as sending workers inside may take as long as eight days and up to thirty workers and involves shutting down the kiln and allowing it to cool. The CARDOX System can have the problem fixed in a matter of hours, requiring only one or two workers.

Compared other cleaning techniques, the CARDOX System can typically pay for itself in a single application because it is such a fast and efficient method of removing blockages and build-ups.

CARDOX Tubes are manufactured to ISO9002 and also carry Rolls Royce Quality Assurance Approval.

..CONTACT US:

Talk to Us



A vital part of the service we provide is the ability to understand the customer and its services, ensuring our ability to meet and exceed every client's expectations and customer service levels, every single time.

We work closely with our customers to ensure the safe completion of the projects in which we participate. Since each project is unique, our highly-trained personnel carefully consider and design the safety procedures, equipment, technology and numerous other details required for the successful completion of the project.

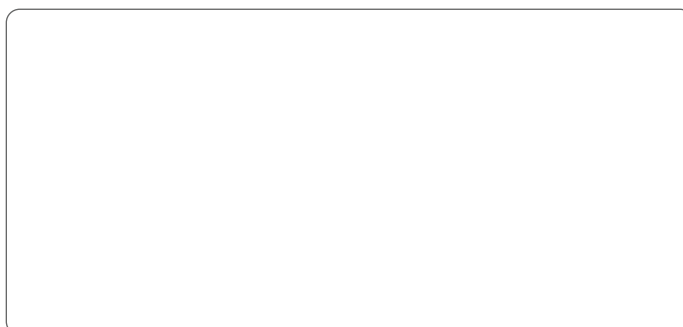
Our reputation for detail rests on the shoulders of our high quality personnel. These individuals are highly qualified; moreover, they have undergone rigorous academic and field training. When this is coupled with their years of field experience, the end result is quality you can count on. Whatever size or nature, you are assured that all projects can be carried out with the same professionalism and confidence.

Peace of heart, peace of mind.

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Singapore 658079
Singapore

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SILO CLEANING
▪
**BUILD-UP &
BLOCKAGE CLEARING**
▪
ROCK EXCAVATION

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