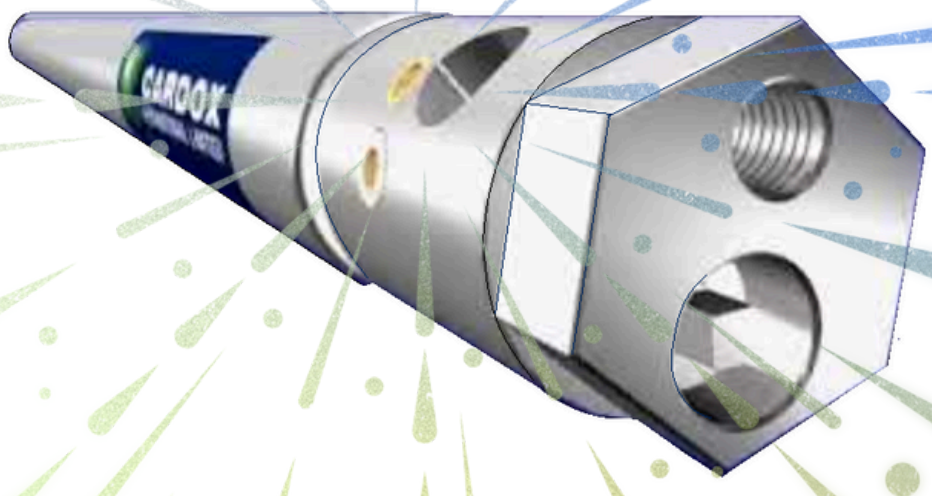
CARDOX
INTERNATIONAL LIMITED

UNION LOCK



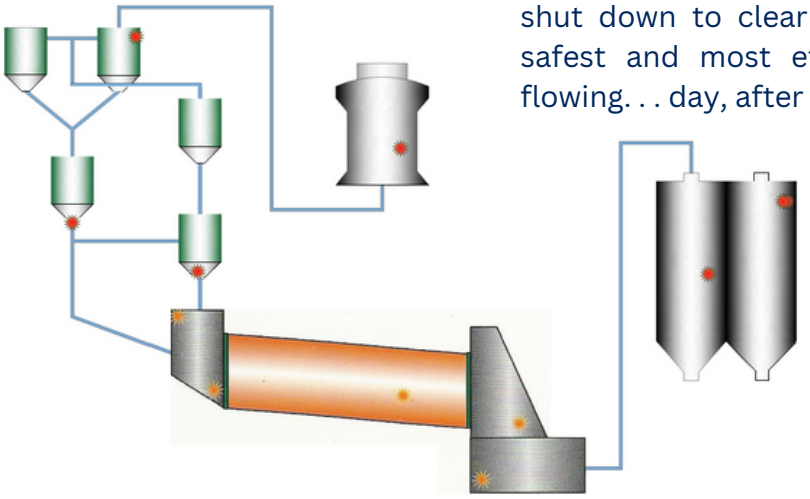
BLOCKAGE CLEARING SYSTEM

High pressure breaking system
for the cement making industry

CARDOX INTERNATIONAL LIMITED

UNION LOCK

MAXIMISE YOUR PRODUCTION



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.

FAST & EFFICIENT

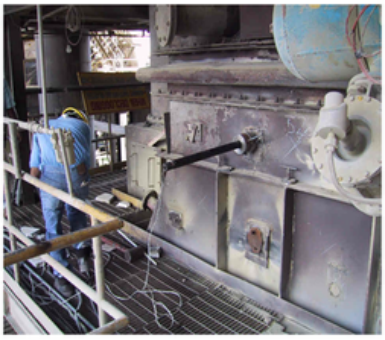
Cardox can quickly remove blockages and build-ups and restore plant production to optimum levels. . . with no need to sit through an extended shut down while the equipment cools. Cardox can be used in all areas of the processing lines at operating temperatures.

Unlike air blasters where cement plants complain of ineffectiveness and report losses of efficiency of up to 75%, 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.

With a safe and powerful carbon dioxide blast, one quick Cardox Tube blast can remove tons of build up. Three or four Tubes blast and you're back up to running at full capacity, with little, or no down time, no added cost and no time to come back up to full temperature.

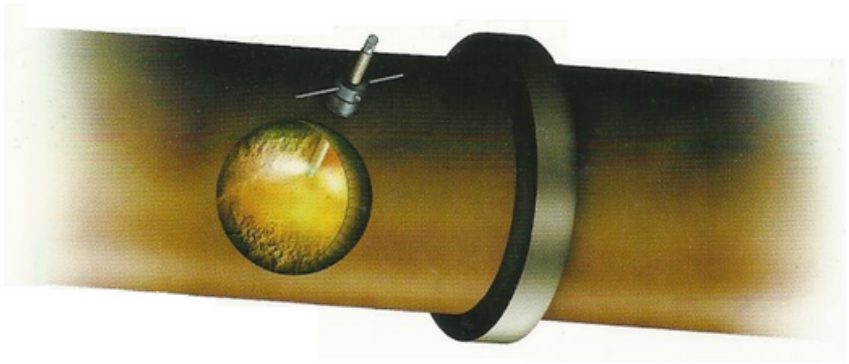
Before: Opening inspection holes reveals build-ups of cement.



During: Cardox Tube is inserted into the build-up through special socket.

After: In seconds the Cardox Tube is activated and removed to reveal the kiln running at full production.

Union-Lock Industrial and Trading Corporation 227 Visayas Avenue, Brgy. Bahay Toro, Quezon City, Philippines 1116
Tel: (+632) 8635-69-02 www.unionlock.com.ph • reception@unionlock.com.ph



SAFE OPERATION

Fully approved by the
UK Health & Safety Executive.

Cardox is safely used from the outside of the 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 your 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.

No other method of clearing build-ups on your production line is faster, easier or more cost effective than the Cardox Blockage Clearing System.

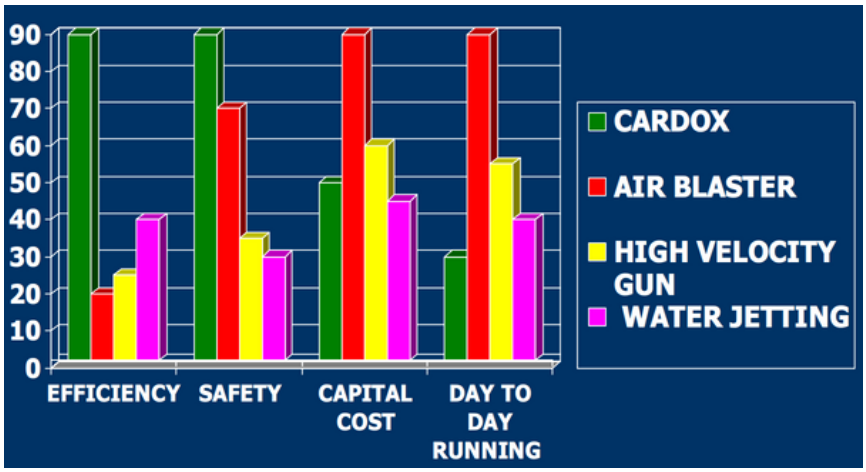
LOW COST

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 off. This wastes time and of course money.

Add on the high installation costs, the high equipment costs and indeed the maintenance costs required with air blasters, and it is no wonder CARDOX is becoming known of removing blockage and build-ups.

The Cardox System can have the problem fixed in a matter of hours, requiring only one to two workers.

Compared to manual cleaning techniques or plant shutdowns the Cardox Blockage Clearing System can typically pay for itself in a single application.

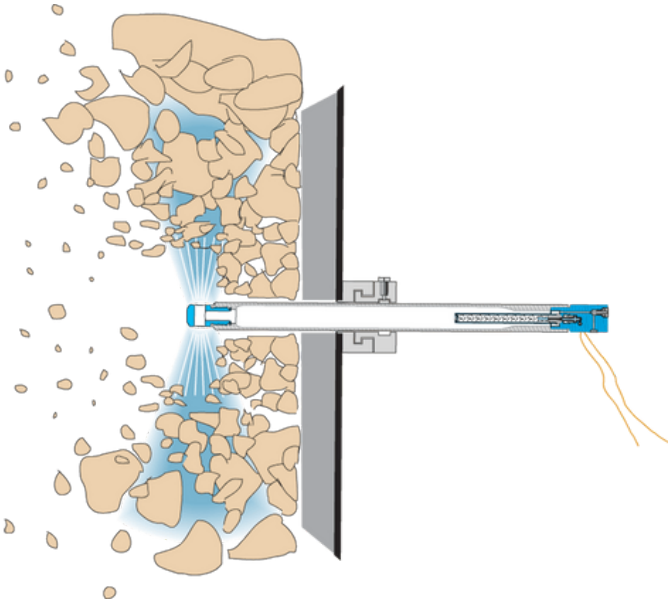


Many cement plants are beginning to realize just how costly the day to day running costs of air blasters can be!

Union-Lock Industrial and Trading Corporation 227 Visayas Avenue, Brgy. Bahay Toro, Quezon City, Philippines 1116
Tel: (+632) 8635-69-02 www.unionlock.com.ph • reception@unionlock.com.ph

HOW IT WORKS

Cardox consists of a high strength reusable steel tube filled with liquid carbon dioxide, a chemical heater and a rupture disc. 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 unit it causes the rupture disc at the end of the tube to burst. This releases the CO2 - now 600 times the original volume - through a special discharge nozzle to create a powerful heaving force, at pressures up to 40,000psi (3,000bar) Cardox can dislodge over 3 tons of blockage in a single blast.
This all takes place in milliseconds.

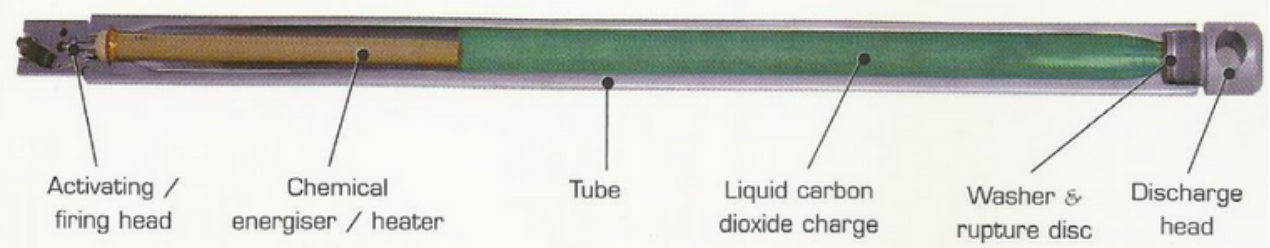


Carbon dioxide gas is an inert gas that is commonly used in fire extinguishers, so it is safe to use without the fear of generating secondary reactions with gases in the processing line. In addition, the quick release of the gas refrigerates the discharge, bringing it to a temperature low enough to avoid ignition of any air-gas mixtures inside the blocked vessels.

Simple, secure coupling systems are mounted on the equipment in areas of known build-up, which allows you to set the Cardox Tube to a predetermined depth and discharge minimizes any risk to refractory in the equipment.

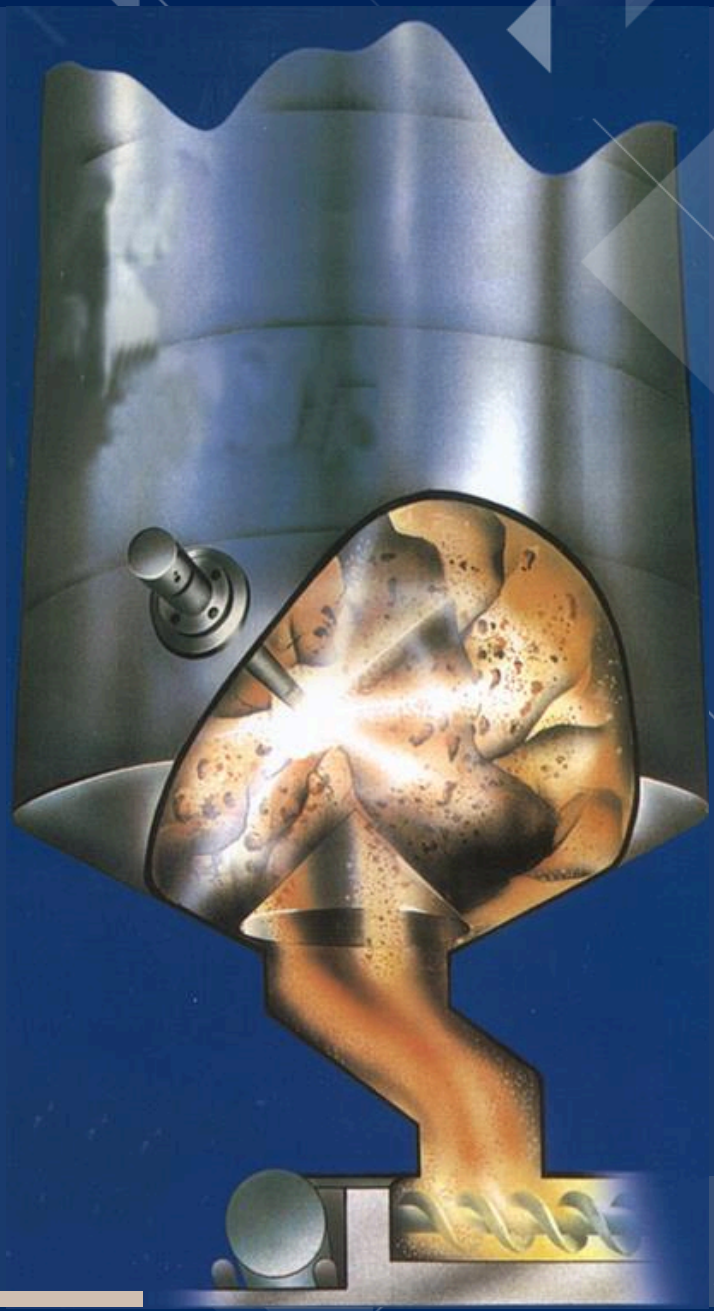
After use the Cardox Tube is removed and replaced with a Sealing Plug that returns the equipment back to normal operation until the next time Cardox is needed.

CARDOX TUBE CUT-AWAY



Union-Lock Industrial and Trading Corporation 227 Visayas Avenue, Brgy. Bahay Toro, Quezon City, Philippines 1116
Tel: (+632) 8635-69-02 www.unionlock.com.ph • reception@unionlock.com.ph

CARDOX
INTERNATIONAL LIMITED

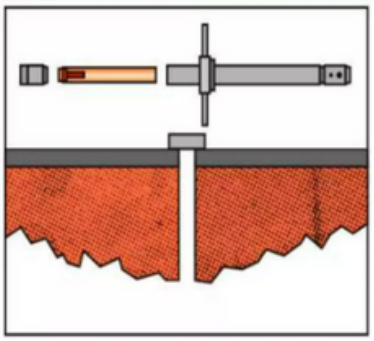


BUILD-UP & BLOCKAGE CLEARING SYSTEM

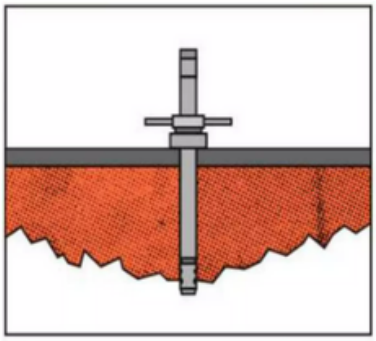
For Silos, Bins, Hopers & most storage Vessels

KEEP YOUR PRODUCT FREE & FLOWING...

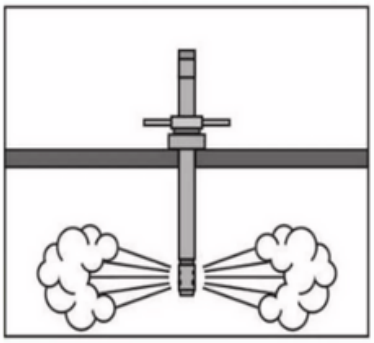
THE CARDOX SYSTEM



Before: Plug is removed to reveal build up of product.



Cardox tube is placed in the tube holder, inserted and then secured in the socket. The tube is then activated.



After: The build up has been cleared & product is aerated and once again free flowing.

EFFICIENT, EFFECTIVE & RELIABLE

OVER 50 YEARS OF KEEPING PRODUCTS FREE & FLOWING!

Cardox is widely recognized as the most efficient and reliable means of clearing build ups and blockages... whether **grain, flour, maize, soya, salt, sugar, cement, gypsum, coal, fertilizer, catalyst, ores, powder etc.**
The powerful Cardox System provides the ultimate solution to clear even the most difficult of build ups.

Build up viewed from above

Cardox Tube is activated, releasing within a second, a powerful heaving mass of cold CO2 that expands 600 times its original volume.

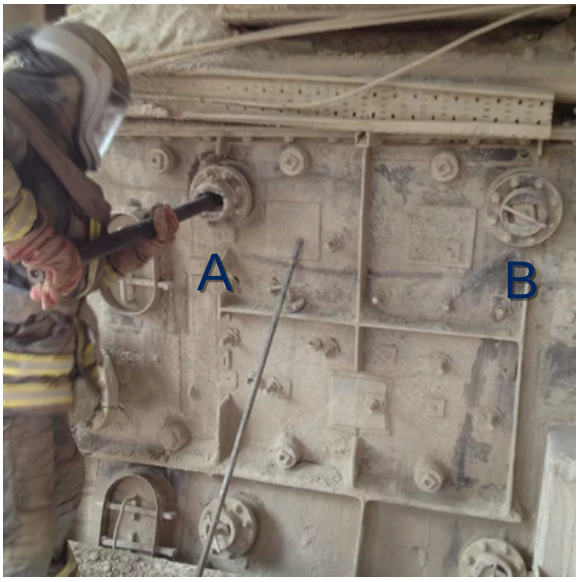
HOW?

Each and every time you use Cardox Tube you instantly release a cold heaving mass of CO2 that expands 600 times its original volume!..... At pressures which can be regulated from 1,200 bar (16,000 psi) to 3,000 bar (40,000 psi)

Union-Lock Industrial and Trading Corporation 227 Visayas Avenue, Brgy. Bahay Toro, Quezon City, Philippines 1116
Tel: (+632) 8635-69-02 www.unionlock.com.ph • reception@unionlock.com.ph

ACCESS TO BUILD-UP

THROUGH SOCKETS MOUNTED ONTO SILO WALL



A

The 'Sealing Plug' is removed from the 'Socket' and a hole made in the product. The Cardox Tube is inserted through the Socket into the product and activated.

B

Cardox Tube is removed, and Sealing Plug replaced in Socket, returning the vessel to normal operation until the next Cardox is needed.

SAFE OPERATION

FULLY APPROVED BY THE UK HEALTH & SAFETY EXECUTIVE

Cardox can be applied either through small Sockets mounted onto the vessel wall or through inspection hatches around the silo. Either way nobody need to enter the vessel and Cardox Tubes can discharged away from the vessel area.

ACCESS TO BUILD-UP

THROUGH INSPECTION HATCHES

COST EFFECTIVE

Compared to other methods of aerating products and clearing build-ups Cardox usually proves more cost effective in terms of:

CAPITAL COSTS

Many of our customers report that Cardox has paid for itself after just a single application.

HIRE COSTS

Extremely reasonably rates available!

RUNNING OR OPERATIONAL COSTS

There are NO continuous running costs with Cardox, the System need only be used when build-up accumulates.

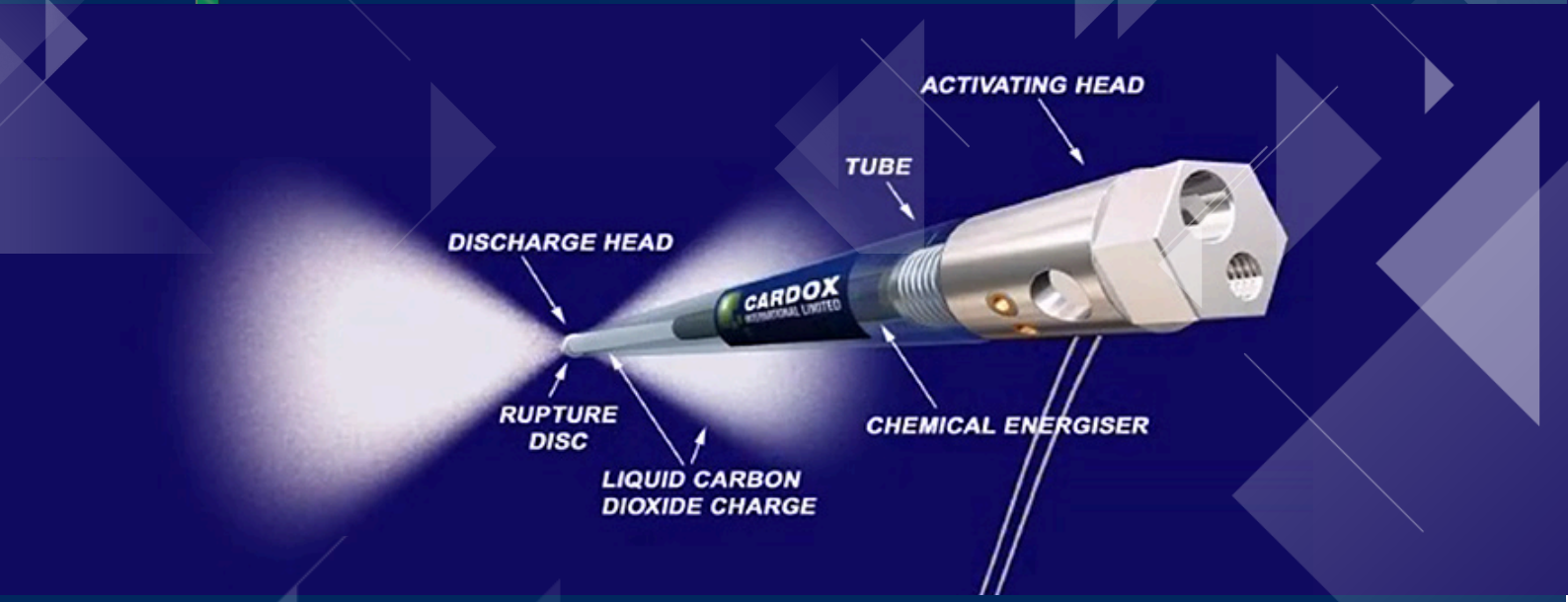
MAINTENANCE COSTS

Virtually no maintenance costs!

Union-Lock Industrial and Trading Corporation 227 Visayas Avenue, Brgy. Bahay Toro, Quezon City, Philippines 1116
Tel: (+632) 8635-69-02 www.unionlock.com.ph • reception@unionlock.com.ph

CARDOX INTERNATIONAL LIMITED

UNION LOCK



HOW IT WORKS. . .

Cardox consists of a high strength reusable steel tube filled with liquid carbon dioxide, a chemical heater and a rupture disc.

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 600 times the original volume - through a special discharge nozzle to create a powerful heaving force, at pressure uo to 40,000 psi (3,000 bar). This all takes place in milliseconds.

Carbon dioxide gas is an inert gas that is commonly used in fire extinguishers, so it is safe to use without fear of generating secondary reaction with gases in the vessel/silo. In addition the quick release of the gas refrigerates the discharge, bringing it to a temperature low enough to avoid ignition of any air gas mixtures inside the blocked vessel.

Small sockets and plugs are installed in the area where build-ups usually occur.

Simple, secure coupling devices are mounted on the equipment in areas of known build-up, which allows you to set the Cardox Tube to a predetermined depth and discharge direction.

Union-Lock Industrial and Trading Corporation 227 Visayas Avenue, Brgy. Bahay Toro, Quezon City, Philippines 1116
Tel: (+632) 8635-69-02 www.unionlock.com.ph • reception@unionlock.com.ph