



**CARDOX**  
INTERNATIONAL LIMITED



**PROMOTIONAL DATA**

# **CARDOX IN THE CEMENT INDUSTRY**

## **WHO USES CARDOX?**

Cardox is used by **ALL** the major cement manufacturers including **HOLDERBANK, LEFARGE, HEIDELBERGER. BLUE CIRCLE, ITALCEMENTI, CEMENT FRANCAIS, DYCKERHOFF GROUP, PORTLAND CEMENT, RUGBY CEMENT, VALENCIANA DE CEMENTOS, ALAMO CEMENT, CALAVERAS CEMENT** and more...

Cardox has been used at some cement plants for over 30 years i.e. in France, Switzerland & UK - they have found **NO** better solution for keeping the cement production running at **full capacity**

## **WHY USE CARDOX?**

Every cement plant that has installed The Cardox System agree that without any doubt it is the **MOST EFFICIENT and COST EFFECTIVE** method of clearing build up and blockages on the market by far! - **Using Cardox, a cement plant can maximise its production capabilities!**

## **WHERE USE CARDOX?**

Cardox is used in cement plants all over the world including **Austria, Australia, Belgium, Canada, Czech Republic, China, France, Holland, India, Ireland, Israel, Italy, Indonesia, Korea, Morocco, Malaysia, Philippines, South Africa, Slovakia, Spain, Switzerland, Thailand, U.K., U.S.** and more!

Cardox is used to clear build-ups in all areas of the cement processing line **Preheaters, Cyclones, Rotary Kilns, Lepol Grate, Precalciners, Coolers, Silos.**

## Why more and more cement manufacturers are installing Cardox instead of airblasters to clear build-ups and blockages

**Efficiency:** Cardox guarantees maximum efficiency and power each and every time it is used – Upto 6 times more powerful than airblasters

**Low cost:** INSTALLATION COSTS, MAINTENANCE COSTS AND RUNNING COSTS are all lower than airblaster systems

The proof:-  
**9 AIRBLASTERS = 1 CARDOX**

Cardox Socket  
Dia 13 cm





WHY CLUTTER UP YOUR PREHEATER TOWER ?..





when just <sup>1</sup>Cardox will do the job more effectively



Another Cement Plant changes to Cardox!

**CARDOX –  
THE ULTIMATE  
BLOCKAGE CLEARING  
SYSTEM**

1) Plug is removed  
from Cardox Socket  
to reveal build-up in  
Preheater.

Hole is drilled into  
build-up.

2) Cardox Tube is  
inserted into hole,  
secured and  
activated.





## CARDOX TUBE SOCKETS WELDED ON EQUIPMENT



Close view of Cardox Tube Socket with Sealing Plug. When a build-up/blockage occurs, the Sealing Plug is removed and a Cardox Tube inserted for clearing the build-up/blockage. When the Cardox Tube has been activated and pulled out, the Sealing Plug is put back into place until another Cardox Tube is required.

Photo depicts three Cardox Tube Sockets with Sealing Plug ready to accommodate Cardox Tubes.

## CARDOX FOR BLOCKAGE PROBLEMS

- EC** The much improved CARDOX system is reportedly making a name for itself in the cement industry as the 'most efficient blockage and build-up clearing method on the market'.
- EC** Das erheblich verbesserte Cardox-System hat sich Berichten zufolge in der Zementindustrie einen guten Ruf als die 'effizienteste Freilegungsmethode bei blockierten Zementleitungen auf dem Markt' erarbeitet.
- EC** Le système Cardox a subi de nombreuses améliorations et se fait une réputation d'excellence au sein de l'industrie du ciment comme étant 'la méthode de suppression des blocages et des accumulations la plus efficace sur le marché'.

**W**ith many cement plants allegedly complaining that their 'air cannon' systems are simply not 'man enough' to fully clear build-ups because of high losses in efficiency, Cardox guarantees maximum power each and every time it is used. Thus, maximum efficiency is always achieved. Cardox produces an instantaneous, safe, but powerful blast of carbon dioxide, with each tube being able to remove up to 3t of material, right where the build-up is.

Other techniques for clearing blockages and build-ups in hot processing lines require the kiln to be shut down and cool, which obviously wastes valuable production time and of course money. With Cardox, there is no need to shut down the kiln, and the versatile Cardox Tubes can be used in all areas of the production line.

### Safe operation

Cardox is safely operated from a safe distance outside of all areas of the processing line – so there is no need to expose workers to high heat or contaminated air. And there is no need to subject workers to the dangers of loosened material falling on them.

Other techniques, which might require the workers to operate equipment close to the material build-up, can expose the worker to a danger of flying debris or 'blow back' of debris. In this day and age, must employers not consider the safety of their workers as paramount?



Before: Opening inspection holes reveals build-up of cement



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



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



### Low costs

Cement plants are allegedly becoming increasingly aware of just how costly the day to day running costs of 'air cannon' can be. Add on their high installation costs, the cost of the actual equipment and associated maintenance costs and it explains why Cardox is proving to be the most cost effective method of clearing blockages and build-ups in cement processing lines. When compared to manual clearing techniques or plant shut downs, the Cardox blockage clearing system can typically pay for itself in a single application.

### How it works

Cardox consists of a high strength reusable steel tube filled with liquid

carbon dioxide ( $\text{CO}_2$ ), a chemical heater and a rupture disc. When energised by the application of a small electrical charge, the chemical heater instantly converts the liquid  $\text{CO}_2$  to a gas. This conversion expands the  $\text{CO}_2$  volume and build up pressure inside the tube until it causes the rupture disc at the end of the tube to burst. This releases the  $\text{CO}_2$  - now to 600 times the original volume - through a special discharge nozzle to create a powerful heaving force, at pressures up to 3000 bar. This all takes place in milliseconds.

Carbon dioxide is the inert gas commonly used in fire extinguishers, so it is safe to use without the fear of generating secondary reactions with gases in the processing line. The

quick release of the gas also refrigerates the discharge, bringing it to a temperature low enough to avoid ignition of any air-gas mixtures inside the blocked vessel.

The Cardox tubes are refilled and reused continually and can last for over 15 years. With the new tube recharging unit, tubes are refilled with liquid  $\text{CO}_2$  in less than a minute.

Simple, secure coupling fixtures are mounted on the equipment in areas of known build up, which allows the Cardox to be set to a pre-determined depth and discharge direction. After use the Cardox tube is easily removed and replaced with a sealing plug that returns the equipment back to normal operation until the next time Cardox is needed. **EC**



Inside the Cardox system

**CARDOX**  
INTERNATIONAL LIMITED



**BLOCKAGE CLEARING SYSTEM**

The most efficient cost effective Blockage & Build-up clearing system available to the cement making industry.

- Fully approved by UK Health & Safety Executives.
- Used by all the major cement companies world-wide.
- Equipment has life span of over 15 years.
- Complete safety for workers.
- No need to shutdown the kiln operation.
- One tube can clear up to 3 tons of build-up.
- No loss in efficiency.
- Low running costs.