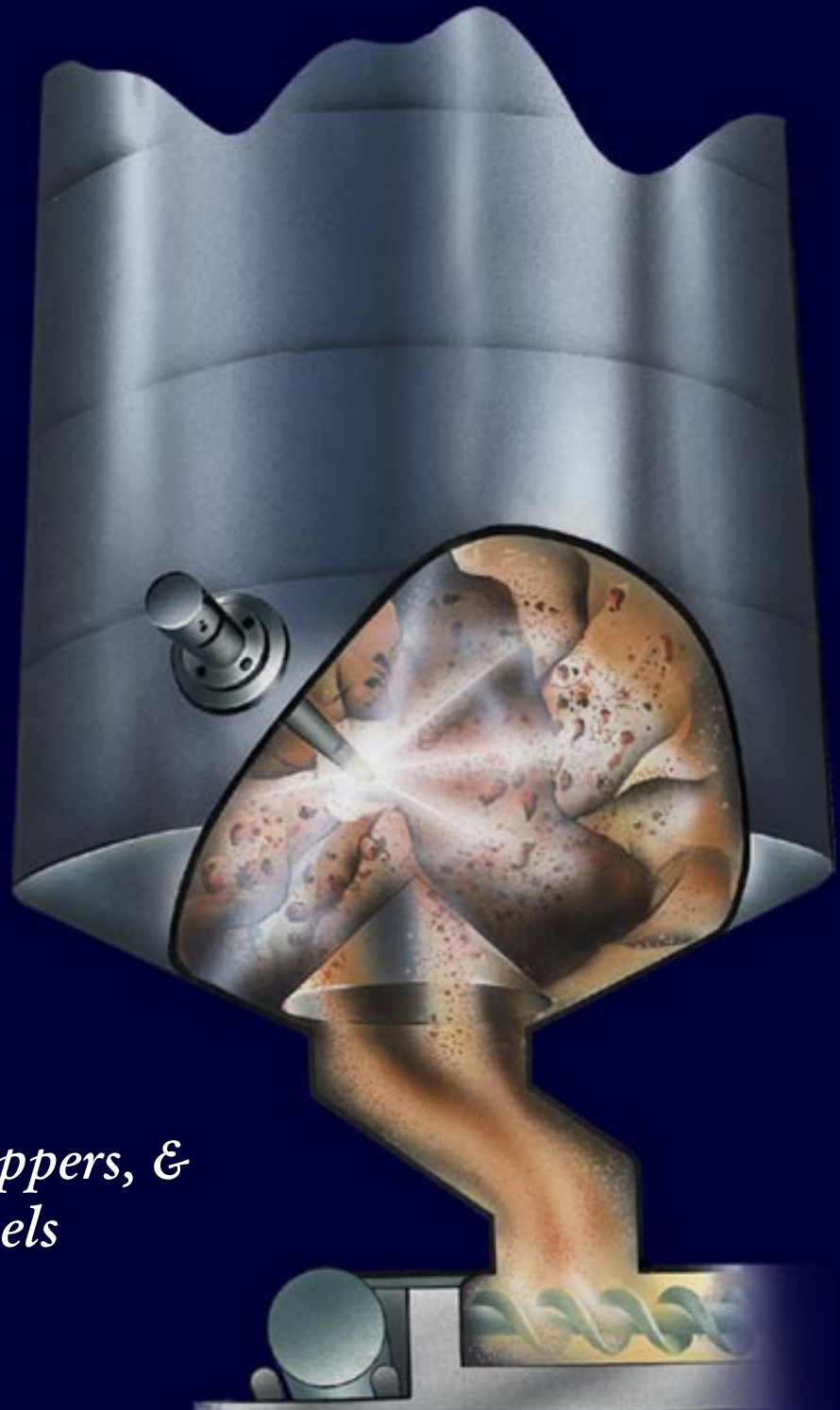




**CARDOX**  
INTERNATIONAL LIMITED

**BUILD-UP &  
BLOCKAGE  
CLEARING  
SYSTEM**



*for silos, bins, hoppers, &  
most storage vessels*

## KEEP YOUR PRODUCT FREE & FLOWING...

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### 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 tube is removed to reveal build-up has been cleared and product is aerated and once again free flowing.

## EFFICIENT, EFFECTIVE & RELIABLE...

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### OVER 50 YEARS OF KEEPING PRODUCTS FREE & FLOWING!

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

#### WHY?

Each and every time you use a Cardox Tube you instantly release a cold heaving mas of CO<sub>2</sub> that expands 600 times its original volume!..... At pressures which can be regulated from 1,200 bar (18,000 psi) to 3,000 bar (40,000 psi).



Soya build up viewed from above



View of soya build up from down inside silo just prior to activation of one Cardox Tube.



Cardox Tube is activated, releasing within a second a powerful heaving mass of cold CO<sub>2</sub> that expands 600 times its original volume.



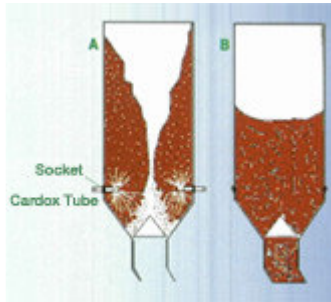
Cardox clears the build-up and creates the product to produce a free flowing product.

# ACCESS

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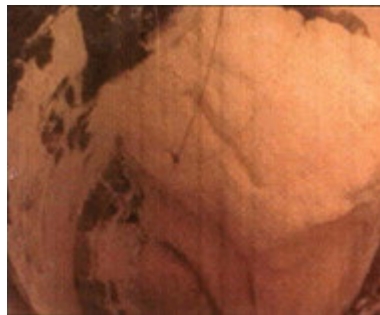
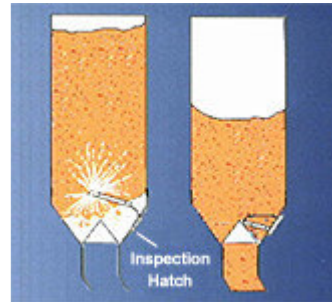
## ACCESS TO BUILD-UP

Through sockets  
Mounted onto silo wall



## ACCESS TO BUILD-UP

Through inspection hatches



Before: 15m high build up on walls of grain silo



After: One Cardox Tube clears the build-up

### 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 time Cardox is needed.

# SAFE OPERATION

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## FULLY APPROVED BY THE UK HEALTH & 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 enter the vessel and Cardox Tubes can discharged away from the vessel area.

## COST EFFECTIVE

Compared to other methods of aerating product and clearing build-up 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 reasonable 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!

## AVAILABILITY

Cardox is available in the following options:

**Purchase** a complete Cardox System

**Hire** a Cardox System

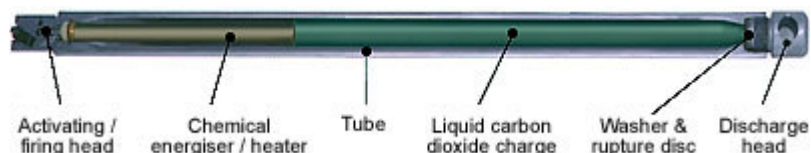
**Hire** a Cardox Service Team to undertake the works

## HOW IT WORKS...

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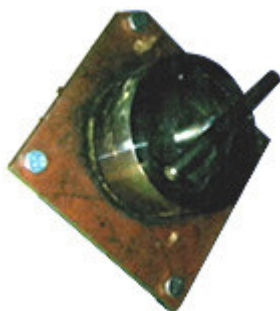
Cardox consists of a high strength reusable steel tube filled with liquid carbon dioxide, a chemical heater and a rupture disc.

### Cardox Tube Cut-away



When energised by the application of a small electrical charge, the chemical heater instantly converts the liquid carbon dioxide to a gas. This conversion expands the CO<sub>2</sub> 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 CO<sub>2</sub> - 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). 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.



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.



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Cardox International are members of:  
MANCHESTER CHAMBER OF COMMERCE AND INDUSTRY

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