

CHEMETRON

Fire Systems™

CO₂ Low Pressure



A World of Protection

Would your business survive a fire?

While it seems that everything in our world is changing, Chemetron Fire Systems remains constant in our commitment to provide the highest standard of fire protection safety, service and value. As the nation's oldest Low Pressure CO₂ systems manufacturer, Chemetron has led the way in establishing industry standards.

Today we understand the challenge you face in this just-in-time business environment. If a fire occurs, a company simply cannot afford a major interruption to its operations and financial future. Your ability to prevent or recover from a business disruption is critical and will depend on selecting the best fire protection system and agent.

With our worldwide reach, Chemetron Fire Systems is your single source solution for standard or custom designed multiple hazard fire protection . . . that protect our resources for future generations.

Hazard-Engineered Protection

You can measure our experience by the diversity of applications, the technical sophistication, and system performance represented by a range of commercial and industrial special hazard applications. CO₂ is used in the extinguishment of fires involving flammable liquids, electrical hazards, engines utilizing gasoline and other fuels, ordinary combustibles such as paper and wood, and hazardous solids, as well as in the extinguishment and prevention (inerting) of fires in applications that include cement plants, coal pulverizers, coal storage silos and bunkers, and coal handling, grinding and storage systems.

Systems can be specifically engineered to fit the unique fire protection requirements of these applications:

- Coal handling, grinding, and storage systems
- Data processing centers
- Food processing
- Flammable materials storage
- Manufacturing/industrial processes
- Shipboard machinery spaces and cargo holds
- Automotive industry
- Power generation
- Printing plants
- Rolling mills and metal processing
- Telecommunications
- Cement plants
- Offshore platforms

Large Scale and Multiple Hazard Protection

An automatic, fixed-installation low pressure carbon dioxide fire protection system consists of a single insulated refrigerated pressure vessel with performance engineered controls to protect multiple hazards or afford frequent discharges for high risk hazards.

experience





Maximum Protection, Minimal Disruption

When it comes to protecting critical environments, even the smallest fire can result in devastating damage. Early warning and fast response are essential. Chemetron low pressure systems deliver unprecedented levels of safety...stability...sensitivity...and early warning reliability.

No Net Environmental Impact

The carbon dioxide used in fire protection is typically a by-product of other industrial processes, and as such, does not negatively impact global warming.

Low Pressure CO₂ is.....

■ **Effective.** Low pressure CO₂ is effective on a wide range of flammable and combustible materials in both surface and deep-seated fires, which adds up to greater uniformity and predictability.

■ **Fast.** Carbon dioxide is a colorless and odorless three-dimensional clean agent. Within seconds, it penetrates the entire hazard area to smother combustion.

■ **Efficient.** Low pressure CO₂ chokes off combustion quickly. The dry ice "snow" in the discharge allows "local application" protection of non-enclosed hazards.

■ **Non-damaging.** CO₂ is normally harmless to equipment, materials and property. It does not cause spoilage, requires no clean up and leaves no residue, thus minimizing downtime after a fire.

■ **Non-conductive.** CO₂ is electrically non-conductive and three-dimensional.

■ **Economical.** When a hazard requires multiple discharges or when CO₂ requirements exceed 4000 lbs. (1818 kg) of agent [2000 lbs. (909 kg) for main discharge and 2000 lbs. (909 kg) for reserve], the overall system cost is less than a high pressure CO₂ system.

■ **Compact.** Storage units are compact and often installed outdoors to conserve floor space. Capacities range from 1-1/4 tons (1.13 MT) to 60 tons (54.5 MT) or more.

■ **Recognized** by the top independent listing and approval agencies.

A Chemetron Low Pressure CO₂ system is a versatile, cost-effective suppression system designed with an extra measure of reliability.

Multiple Hazard Versatility

Multiple hazards may be protected from a common supply of low pressure CO₂ by using pneumatically operated directional (selector) valves. CO₂ pressure is used to open valves as well as operate switches and accessories. This is essentially an economy measure designed to reduce storage unit size. It is to be used only when there is assurance that only one hazard could require a discharge at any one time.

Similar controls are provided for each hazard area. The directional valves are pilot-controlled and operated by line CO₂ pressure. The directional valves can be actuated by solenoid valve or by manually operating the pilot control valve.

A Low Pressure CO₂ system consists of:

■ Storage, valve & discharge components

Components consist of a storage unit, valve assemblies, piping, and discharge nozzles. All equipment meets exacting specification and quality standards.

■ Control panels, detection and alarms

The control panel is used to monitor the detection and accessories, as well as control the audible and visual alarms and discharge functions.

■ CO₂ storage units

A quantity of CO₂ sufficient to extinguish the type of fire anticipated is stored. The gas is released into the piping distribution network upon system actuation. Liquid carbon dioxide in the storage unit is maintained by refrigeration at approximately 300 PSI (20.68 Bar) pressure at 0°F (-18°C). The refrigeration system employs the non-ozone depleting refrigerant R-404A.

■ Vaporizers

For hazards where liquid carbon dioxide is inappropriate, vaporizers are utilized to provide a continuous and predictable supply of vaporous CO₂.

■ Hose reels

Low pressure CO₂ hose reels with hand lines can be connected to the storage unit for additional protection. With a capacity for a high discharge rate and up to a 30 foot (9 meter) range from the nozzle,





R E L I A B L E

hose lines can provide greater manual fire protection compared to other types of portable protection.

Hose reels also offer auxiliary fire protection with a high rate discharge and a protection range of up to 150 feet (45.7 meters) from multiple locations.

Methods of Actuation – Fixed Protection

Three independent types of actuation are integrated into each system:

- automatic actuation
- manual electric station
- direct manual release

An optional feature is a pneumatic discharge delay and CO₂ siren for use in systems with no source of electric power or where an uninterrupted source of electric power is not assured. In the event of the loss of power, the pneumatic discharge delay would prevent an immediate CO₂ discharge into a normally occupied space and allow personnel time to evacuate.

Continuous Operation & Monitoring

A reserve supply is easily obtained by increasing the storage unit size. No complicated manifolding and valving are required. Low pressure storage units have a liquid level gauge and pressure gauge, which provide continuous indication of level and pressure conditions without interrupting fire protection.

System Modernization and Retrofit

With thousands of Chemetron systems in service protecting key facilities, modernization of these systems is vital. For details on our programs, contact Chemetron today.

System Safety

Carbon dioxide systems are designed in accordance with NFPA (National Fire Protection Association) standards, which require a minimum carbon dioxide concentration of 34%. These design concentrations will not support human life. Visual and audible warnings must be provided to alert occupants to vacate the area prior to discharge.

As CO₂ will tend to migrate to low lying areas near the protected hazard after a discharge, careful consideration of means to prevent accidental exposure of personnel to hazardous atmospheres in adjoining spaces must be designed into every system. An optional wintergreen odorizer can provide an olfactory warning of the presence of carbon dioxide.

A CO₂ system discharge will also cause turbulence and noise, and the discharge stream may have considerable force.

Warning signs must be provided to advise personnel what to do when the fire extinguishing system is actuated, as well as provide instructions on how to activate the system manually.

Precautions to be taken to protect facility personnel are covered in NFPA Standard No. 12, the Chemetron publication "Carbon Dioxide Safety Manual" and OSHA's Lockout & Tag-out Standard, 29CFR Part 1.910,146.

The Chemetron Difference

Thousands of companies have the confidence to protect their businesses with Chemetron Low Pressure CO₂ integrated systems. With our single source responsibility for suppression, control and support, Chemetron continues to invest in product improvement to meet changing requirements with:

- Fire hazard evaluations
- Systems engineering and design capability
- Continuous quality improvement programs
- Proprietary design engineering, flow calc and computer software
- Education and safety training
- Product and technical assistance
- Installation and testing support service
- ISO 9002 certification and Six Sigma program
- Worldwide sales and distribution network
- A commitment to environmental safety





Our experience has been built on a history of ideas, service and quality of environmentally compatible fire protection technologies. Chemetron Low Pressure CO₂ systems work around the clock . . . and around the globe.

CO₂ Physical and Chemical Properties

CO₂ is an odorless, colorless, inert gas that extinguishes fire primarily by diluting the oxygen that supports combustion. Some cooling is also accomplished. It is used as an extinguishant applied by either the total flood or local application method. In total flooding, the enclosure of the hazard protected is flooded to a proper concentration.

In local applications, CO₂ is directly applied in the proper amount at the needed rate to cover the protected hazard. The small "dry ice" particles, created in the discharge, facilitate its projection into the fire and coverage of the hazard protected.

Because CO₂ is 1.5 times heavier than air, it will tend to settle in low-lying areas in the protected hazard as well as flow into adjacent areas outside of the protected space.

In the design concentrations required to extinguish fire, CO₂ will not support human life.

More Experience. More Applications Worldwide.

versatility



Advantages of LPCO₂ vs. HPCO₂

Low pressure CO₂ and high pressure CO₂ have equal extinguishing capabilities; however low pressure CO₂ storage units have some clear advantages:

- *Multiple shot capability - without any switch-over to a reserve system required.*
- *Reserve supply is easily obtained by increasing the storage unit size. No complicated manifolds or valving is required.*
- *Hazards may be added to an existing system at any time.*
- *LPCO₂ units do not require hydrostatic testing as do HPCO₂ cylinders.*
- *LPCO₂ offers continuous monitoring of the liquid level of CO₂.*
- *LPCO₂ storage requires less floor space and weighs up to 50% less.*
- *LPCO₂ storage units are commonly located outside.*
- *LPCO₂ storage units are easily filled in-place from a CO₂ transport truck, available worldwide, and remain in service during filling. HPCO₂ cylinders must be disconnected and transported to a filling plant.*
- *LPCO₂ is 32% more efficient for local application discharges than HPCO₂.*

1927

Herbert E. Bell forms
Safety Mining Company.

1938

Name changed to Cardox
(acronym for carbon dioxide).

1939

Cardox developed and patented bulk low pressure carbon dioxide storage for use in fire extinguishing systems. The first fire protection CO₂ applications were for the power plant industry.

1940's

World War II accelerated development of CO₂ applications. Massive discharges of carbon dioxide to control large fires was demonstrated with a Cardox crash-fire-rescue truck for the American Armed Forces during World War II. Research expanded to facilitate development of systems that could control large industrial fires with a clean, available, inexpensive fire extinguishant. CO₂ installations in power plants, metal rolling mills, printing plants and industry expanded the practicality of the fire suppression capability.



1950's

Gaseous agent systems took a leap forward when, under Cardox, the first proven method of predicting two phase gas flow in piping systems was developed.

1952

High pressure CO₂ system design introduced that eliminated weights and levers.

1958

Cardox merged with Chemetron Corp. Chemetron is an acronym for Chemical-Metals-Electronics).

1970

High pressure CO₂ system design upgraded.

1975

The Fire Systems operation separated from the CO₂ industrial gas sector and Chemetron Fire Systems was formed.

1994

CO₂ storage tank refrigeration systems were redesigned to utilize the non-ozone depleting refrigerant R-404A.

Today

Since the development of CO₂ as a new concept in fire suppression, Chemetron Fire Systems has been the leader in CO₂ system technology.





A World of Protection

Worldwide Applications

CO₂

- Power Generation
 - Base Load Plants
 - Co-generation & Combined Cycle Plants
 - Power Peaking Units
 - Upgrading Existing Plants: with
 - Coal Conversions
 - Coal Storage/Handling/Pulverizing
- Cement Plant/Blast Furnace Indirect Coal Firing Systems
- Metals Production and Processing
 - Electric Furnaces
 - Continuous Casters
 - Rolling Mills (Steel & Aluminum)
 - Coating Lines
- Printing
 - Newspaper Production
 - Periodical Printing
 - Packaging

- Automotive
 - Assembly: Paint Application, Mixing & Storage
 - Parts: Machining, Heat Treating
- Electronics Operations
 - Computer Areas
 - Automated Information Storage Systems
- Electronics/Computer Production
 - Wet Benches
 - Wave Soldering Machines
- Food Processing
- Research Facilities
 - Test Facilities
 - Anechoic Chambers
- Shipboard (Marine) Systems
- Automated Storage and Retrieval Facilities

FM-200®

- Telecommunication Facilities
- Computer Operations
- Control Rooms
- Shipboard (Marine) Systems
- Rare Book Libraries
- Universities and Museums
- Art Galleries
- Record & Storage Facilities
- Petrochemical Installations
- Pharmaceutical & Medical Facilities
- Electronics & Data Processing Equipment

WATER MIST

- Gas Turbines
- Machinery Spaces

CHEMETRON

Fire Systems™

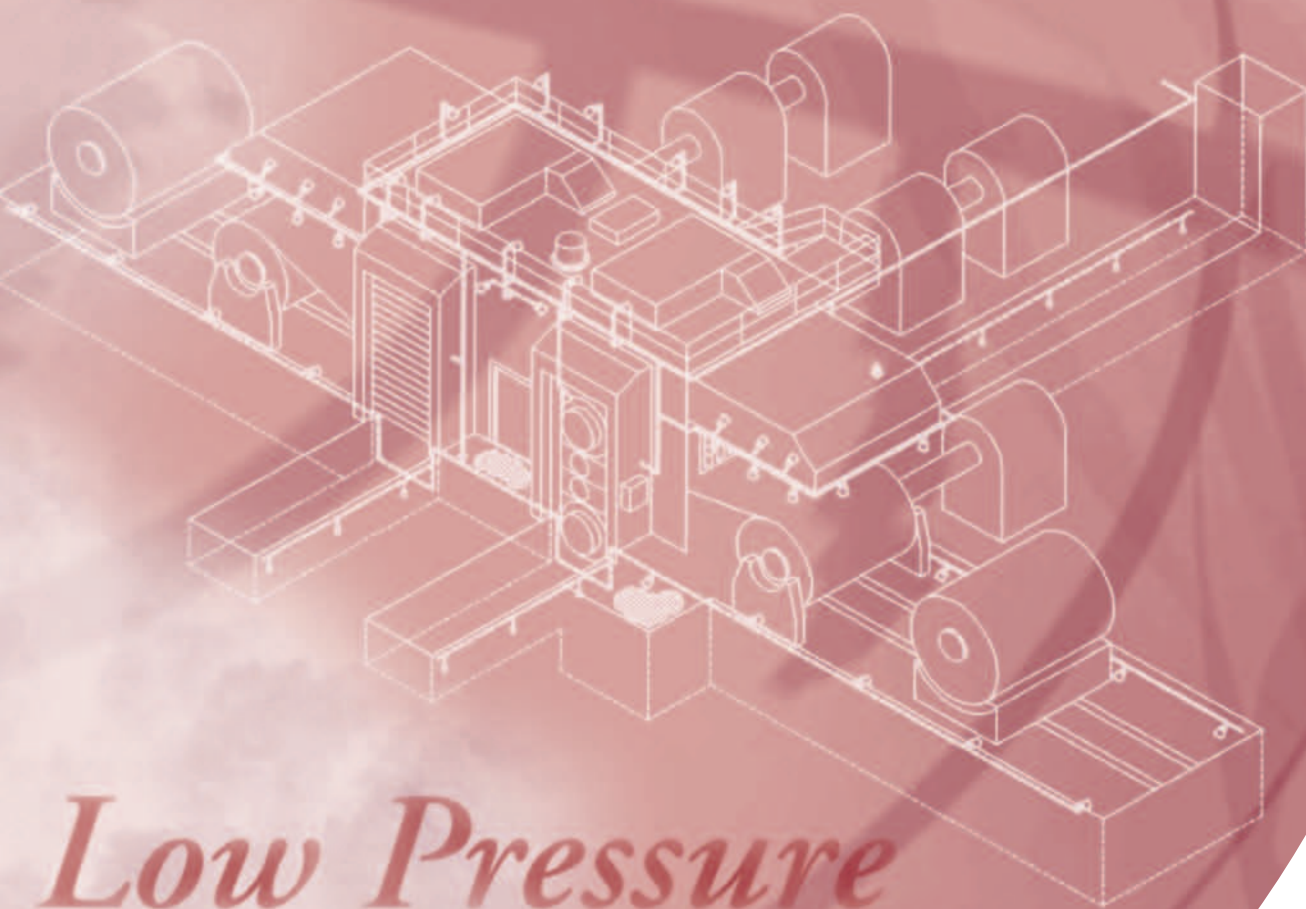
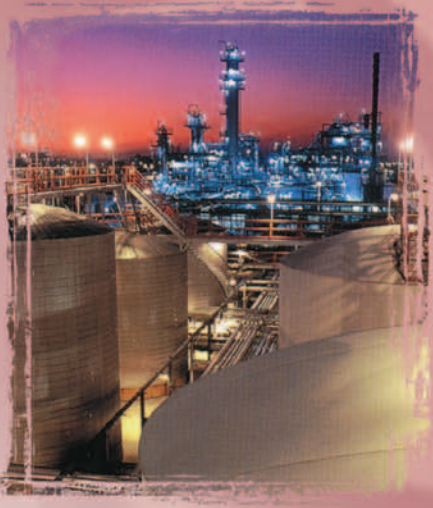
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Chemetron. Your Single Source Solution.

WORLDWIDE PROTECTION



Low Pressure

CO₂