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**CO<sub>2</sub>**

**Application  
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**CHEMETRON**  
Fire Systems™

*A World of Protection*



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*Carbon Dioxide Fire Suppression —*

# Rotogravure Printing

Rotogravure printing is used extensively in printing magazines, flyers, Sunday supplements, wall coverings, packaging, etc., where high quality color is necessary.

The protection of a gravure printing press by the local application of carbon dioxide is shown on the accompanying drawing.

Almost every gravure printing facility designed for high capacity production has its presses protected by carbon dioxide. The relatively high flammability of the ink used — flash point of 20° to 120°F — and high speed operation, with its potential for static electricity build-up, increases the fire hazard. The CO<sub>2</sub> will extinguish quickly and cleanly, allowing resumption of production in the shortest possible time. The paper is fed into each printing stage where it picks up ink from an etched metal roll. It then passes through a dryer so the ink is dry before entering the next printing stage, where another color is printed. The ink is applied to the cylinder from an ink font on each press unit, with the excess ink removed by a doctor blade. A supply of ink of the particular color being printed at that stage is contained in a cart located adjacent to the unit or in a reservoir built into the base of the unit. A small pump circulates the ink to maintain quality. A fresh ink supply is often piped from the central ink storage room.

The paper can be fed in a web from one end through the press stages, or fed from the center in two directions to the printing units (as shown on the drawing).

The flammable solvent produced by the ink when drying is captured and exhausted to a system that removes it from the air and recovers it for future use. The dryer is usually steam heated.

The arrangement of the protection system shown includes the local application of CO<sub>2</sub> to the ink font and rollers, with the CO<sub>2</sub> calculated as either rate-by-volume or rate-by-area, depending on where the CO<sub>2</sub> discharge nozzles can be mounted.

The dryer is flooded to a 65% concentration, adjusted for the higher temperatures encountered. The exhaust system is also flooded to a 65% concentration. Upon system operation, fans are shut down and the fire dampers closed.

The ink carts on the ends of the unit are covered by local application calculated rate by area. Care should be exercised to ensure that the CO<sub>2</sub> local application covers areas of spillage and leakage that occur on the floor under and around the units.

The local application rate is continued at full equilibrium flow for 30 seconds. The system is designed so that the total flooding portions of the protection receive the amount of CO<sub>2</sub> required in this half minute period.

The system provided should protect the entire press line as one hazard (one zone), unless there is a break in the center as shown. In that case, the units at one end can be one hazard and the units at the other end a second hazard, with provision for simultaneous protection if same should be necessary.

Larger plants with more than one press line are usually arranged with each press line running parallel to the others. The amount of separation between presses is important in determining the need for simultaneous protection. A real advantage of the Chemetron LPCO<sub>2</sub> system is its ability to be designed to easily handle same. Authorities having jurisdiction often dictate the need for arranging for simultaneous protection, and thus should be consulted in the planning stages.

When a solvent recovery system is present, it can be protected as part of the press exhaust or as a separate hazard, depending on the arrangement.

The protection of folders on a small press can be done in a manner similar to that of newspaper presses (see Printing Industry Bulletin #0200, Newspaper Printing Presses). The larger presses have folders of a size that makes coverage from the CO<sub>2</sub>

system not cost effective. Fortunately, they do not constitute the same hazard as that found in newspaper plants. The quality of paper used does not generate the lint of newsprint.

The protection systems are automatic in operation, using rate compensated thermal detectors for fire detection. Pushbutton stations enable operating personnel to initiate a CO<sub>2</sub> discharge. Some of the newer presses have the thermal detection system supplemented by a flame detection system.

Low Pressure CO<sub>2</sub> systems afford the opportunity to supplement the protection with a spurt control. For certain presses, like those used in packaging, small fires develop; in the past these were fought by pressmen using extinguishers. The spurt is available to get an immediate discharge to extinguish small fires without the need for the full engineered discharge.

**Safety Concerns:** When the carbon dioxide system is designed, the provision for personnel safety must be considered as strongly as the fire protection. A safe system includes provision for:

- Alarms that absolutely, positively indicate that the system is about to discharge.
- Analysis of the CO<sub>2</sub> gas flow to identify where the CO<sub>2</sub> will be after a discharge. (Provision for odorizing the CO<sub>2</sub> may be appropriate.)
- Adequate instructions and training, including warning and instructional signs.

NFPA Standard No. 12 provides good information in this regard.

### **Hosereels**

Almost every low pressure CO<sub>2</sub> system installed for press room fire protection includes hand hose lines served from hosereels located on the perimeter of the press room, as shown on the drawing.

These units supplement the fixed protection by extending the capability of the system to fight fires external to the press line itself. They have high CO<sub>2</sub> discharge capacity and a projection of 30 to 35 feet, giving them unique first aid protection capability. The entire contents of the storage unit is available, affording the opportunity to discharge for a long time if this should ever be needed for fire control. The projection of the discharge allows the operator to be remote from the hazard while still directing the discharge where needed, such as at the drive areas. Hosereels are particularly effective in covering spills outside the basic press protection hazard area. For more detailed information on hand hose lines, see Industrial Facilities Bulletin #0760, High Capacity Portable Protection with CO<sub>2</sub> Hand Hose Lines.

### ***Other Areas of Concern***

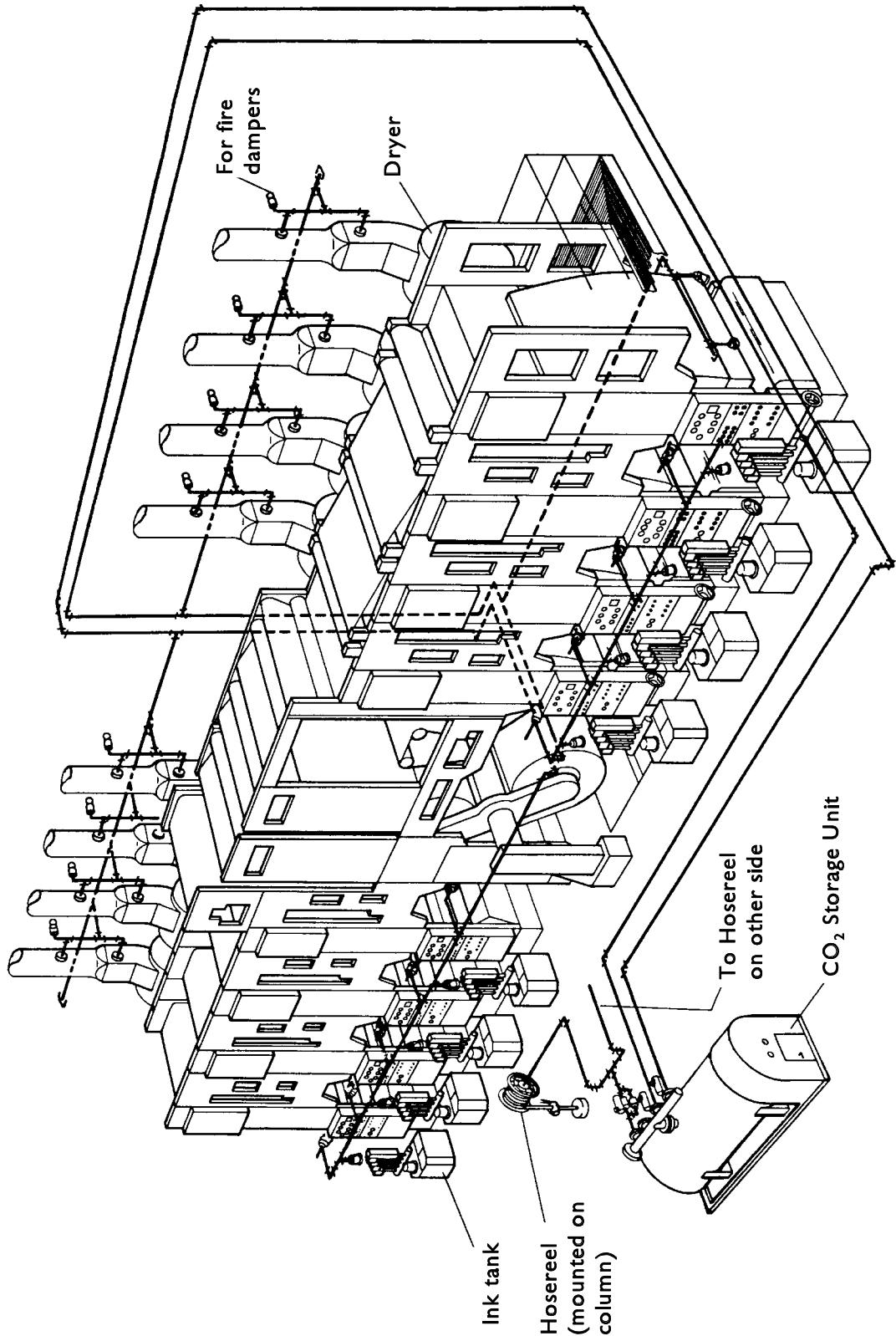
The basic system provided for protection of the production presses can, of course, also be used to protect the Proof Press, as well as the Hand Correction/Cylinder Wash equipment. Many plants that print with gravure also have laminators, extruders, wax mounters, etc., that are best protected by CO<sub>2</sub>. If reasonably close to the press room system, they can be protected as extensions of same. More details on the protection of these units can be obtained from Chemetron.

Other areas within the printing complex for which CO<sub>2</sub> protection is a logical choice include the switch-gear areas, ink rooms, and diesel generator facilities.

It should be noted that protection can still be provided for many of these areas that do not justify fixed protection when the basic system has hose line coverage. This is done by providing an access to the room through which the hose line playpipe nozzle can be inserted to flood the room manually. The high flow rate permits flooding within minutes.

Chemetron can provide detailed design information on rotogravure printing plant protection, as well as a list of typical installations including a variety of press sizes and configurations.

CO<sub>2</sub> Fire Protection for Rotogravure Printing Press



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