CHEMETRON™
Fire Systems

CARDOX

CO_2 Application Bulletin

CHEMETRON™
Fire Systems
A World of Protection

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Carbon Dioxide Fire Suppression —

Newspaper Printing Presses

Supplement B — *Protection of Stacked (Tower) Press Configurations*

Referring to our earlier Printing Industry Bulletin #0200, Newspaper Printing Presses, you will note that the protection described relates to offset presses such as the Goss Metroliner, Headliner, or similar presses by TKS, MAN, Mitsubishi, and others. Since that bulletin was written, a new generation of much larger offset presses has been born, typified by the Goss Colorliner. This bulletin describes the innovative CO_2 fire protection developed for this type press.

This press consists of double width units, with the press units stacked one on top of another up to four high. This allows the printing of process color on every newspaper page, greatly enhancing flexibility.

The press units are driven by a horizontal drive shaft under the base unit and power is transferred to all units by a vertical shaft. Vertical channels are designed into the press at the operator's end of the stacked units for piping and wiring runs.

The units are substantially larger in physical size than those covered by the earlier bulletin. The folder used is a 3:2, with 3-high formers. The drawing prepared for this bulletin shows one of the more comprehensive configurations.

When Chemetr on was first approached to design protection for this press, we realized that the conventional protection as covered by our earlier bulletin would not do the job.

First of all, the potential for the fire spreading from one press unit to the next is much greater when the press units are stacked on top of one another because of fire's natural progression vertically. The potential for greater loss in a shorter time with a fire involving multiple units emphasizes the need for quick, complete coverage.

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Secondly, the mere size of the units prohibits protection with CO_2 discharge nozzles mounted on one side of the press. Proper nozzle positioning to use the maximum nozzle coverage of the tested nozzle ratings is not possible.

Thirdly, with the upper units of the tower, there is no adjacent press equipment on which to mount nozzles if you want to discharge in at the printing couples. In the traditional protection configuration, CO_2 discharge nozzles are mounted on one unit and aimed to discharge across at the adjacent units. This gets the nozzles far enough back to allow use of the full discharge pattern.

Lastly, the aesthetics of this very attractive printing equipment would not be supported by a lot of CO_2 nozzles hanging on the outside of the press.

Therefore, Chemetr on fell back to a technology we developed years ago for the protection of very large combustible liquid surfaces that involved the use of linear nozzles.

The linear nozzle consists of multiple nozzle orifices along a pipe, all aimed to discharge back into a channel (see the illustration at the bottom of page 3). The result is a flat, solid CO_2 pattern emerging from the open side of the channel, the entire length of the nozzle.

It was determined that this nozzle — built to the width of the rolls, mounted inside the press, and aimed to discharge down across the rolls behind the mist guards and across the inking system — would give excellent coverage.

To get the CO_2 back around behind the rolls to flood the backside of the roll stack inside the press, small spot nozzles were made a part of each end of the linear nozzle assembly as shown on the nozzle detail. (This detail is omitted from the full press drawing.)

Extensive testing for Rockwell, Factory Mutual, and a large Rockwell customer verified that adequate CO_2 fire extinguishing concentrations were achieved inside the unit. Discharge testing of a number of completed installations has further verified this design.

The press manufacturer drills the frame for piping access to internal mounting of the nozzle at such a location that it provides good coverage, but yet is not in the way of press operation or maintenance. The linear nozzle is made of stainless steel.

The CO_2 feed to the press nozzles from the main CO_2 pipe header in the reel room is located in the vertical pipe chase that is part of the press, as mentioned earlier.

Between the second and third units of the 4- high unit, there is a large arch where the back sides of the rolls are exposed. This area is covered by 4 small spot nozzles mounted such that 2 discharge across at the rolls from each side using local application of CO_2 for the protection needed. Similarly, the lower arch of the tower units is covered by 2 nozzles — one on each side.

The inking equipment at the very top of the tower is also covered by local application from spot nozzles.

The single units are protected in a variation of the traditional method utilizing 4 spot nozzles covering the unit completely from the corners. Due to size and equipment configuration, nozzles are not very visible and they can be painted the color of the press, if desired, to make them even less noticeable.

An interesting aspect of this fire protection scheme is that when calculating CO_2 quantities, less CO_2 is required than would have been necessary if the traditional method of protection could have been used.

Looking at the folder used and Supplement A of our earlier newspaper protection bulletin, Bulletin #0205, ...P rotection of Folders & Newspaper Flexographic Presses, you will note this press has a third level of formers. This results in another set of surfaces on which dust and lint can accumulate, necessitating CO_2 coverage. Two added spot nozzles provide this coverage.

The lower part of the folder (below the lower level of the former) is boxed in by four spot nozzles. However, it has been found that the addition of 2 small nozzles in the very bottom of the folder helps get CO_2 quickly to this area where the hazard is greatest. These are included.

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Fire Detection

The fire detection on these units has been either spot detection using rate compensated heat detectors, or it has been linear detection utilizing a system with thermistor cable. This detector cable system, while more expensive, has the significant advantages of having the detector (the cable) closer to potential fire locations and having the ability to identify and pinpoint the point of fire detection, and thus, the source of the fire.

This detection system is particularly valuable as presses get larger and more extensive.

Conclusion

As long as paper is used for printing, a fire hazard will exist. This hazard may be increased or decreased depending on the inks and printing methods used.

Chemetron is continuously monitoring all new press developments and new press designs as they enter the market so we can modify protection methods to meet the needs of any new press design.

NOTES

1. In this supplement we have not specifically discussed fixed protection of press drives or dust collectors, or fringe area protection with CO_2 hose lines. These are basically the same as with other press designs.

2. For simplicity sake, we have shown each press line protected as a single entity (hazard). In reality, a line would probably be broken down into several hazards to reduce CO_2 discharge quantities.

3. At the 1991 ANPA/Tec Conference, Rockwell/Goss introduced a MetroColor Press that will be used in a somewhat less comprehensive printing configuration than the Colorliner, but will still use stacked (tower) type units. The protection requirements are similar to those of the Colorliner. Its primary market is expected to be adding process color to existing Metroliner or Headliner offset press lines.

Linear Nozzle Detail