RUBBER SECTION

DUST CONTROL IN THE RUBBER AND PLASTICS INDUSTRY

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In the rubber and plastics industry many powdered or particulate materials are used which are capable of becoming air borne under the right conditions. These materials include (1) chemicals such as sulfur, antioxidants, accelerators, and metallic oxides, (2) reinforcing materials such as carbon black and hard clays, (3) inert fillers such as cotton shearing, hydrated silicas, and asbestos, (4) pigments such as iron or chromium salts, (5) processing aids such as talc and zinc stearate, and (6) rubber and plastic dust from mechanical action.

When these dusts are dispersed into the workroom atmosphere, they are capable of causing two types of hazards about which we are greatly concerned. One is the explosion and fire hazard, the other is the toxic or occupational health hazard.

For an explosion and fire hazard to exist, the necessary conditions are a sufficiently dense dust cloud, adequate oxygen, air, or other supporters of combustion, and an ignition source intense enough and in contact with the dust long enough to raise the temperature of part of the dust mixture to the ignition point. Reducing any one of these conditions will materially reduce the chance of an explosion to occur.

From a toxicological or health standpoint, a hazard is normally considered to exist when there is exposure by inhalation to atmospheric dust concentrations high enough to have an adverse effect on the health of the worker. Over the years threshold limits have been established for exposure to many of the types of dust encountered in the rubber industry. It should be realized that dust concentrations necessary for explosion are much higher than those generally considered from a health standpoint. It is for the purpose of preventing these hazards from existing that dust control measures are necessary.

Dust control measures are nothing new. The Chinese, centuries ago, used crude ventilation methods in an attempt to reduce exposure to coal dust in coal mining. Today we must apply extra energy and do a better job. When we talk dust control today, we normally think of ventilation first. Actually, this is only one method and we should not be blinded to this method alone. Other methods may provide better control, reduce maintenance problems, and reduce material or product cost.

I would like to illustrate various approaches to dust control in the rubber and plastics industry.

1. A very dusty operation existed some years ago in one of our plants where bales of synthetic rubber were opened. The synthetic rubber bales were coated with talc. The bales were stored in a large room about 200 ft. long. Very high dust concentrations resulted from the opening of the bales and movement of the bales to production. The question was how to solve this problem. Attempts to ventilate were impractical because of the large open area.

Some years later, someone came up with the idea of packaging in polyethylene plastic bags, eliminating the need for talc and resulting in a considerable saving. Now, plastic bags and all are dumped in the mills.

The dust problem has been completely eliminated. The solution was process change, not ventilation. Sometimes, taking a fresh look, as was done here, will result in a better and/or lower cost product.

2. A common problem in most mill rooms was the handling of carbon black, resulting in very messy work areas. A program was undertaken in the company over a four-year period, involving over a million dollars, to improve the mill room appearance by installing ventilation. This, however, did not completely solve the problem. It wasn't until