FINGERPRINT POWDER - SAFETY CONSIDERATIONS

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In July 1983 the National Institute for Occupational Safety and Health (NIOSH) published the results of an investigation of possible health hazards in the Public Safety Building, Upper Darby, Pennsylvania. Their findings indicated "that a potential health hazard exists in using the Sirchie Gray and Silk Black fingerprint powders."[1] The Missouri Division of IAI Newsletter printed a summary and discussion of the NIOSH Upper Darby study in their Fall 1985 issue.[2] This was reprinted in at least one other IAI state division newsletter.

Carbon Black (which usually is a component of dark-colored fingerprint powders) is the "culprit" in these studies. Polynuclear Aromatic Hydrocarbons (known as PNA's or PAH's) are a trace element of Carbon Black, and Carbon Black is also a suspect in the respiratory disease, pneumoconiosis.

We at Lightning Powder Co., Inc., have received many requests for information on the contents of our powders and the safety of fingerprint powder in general since the publication of the above-referenced warnings. We have supplied to your editor photocopies of all the safety studies, letters, and safety reports that will be referenced in this paper, but we would like to discuss Carbon Black and summarize some of the reports here.

Carbon Black is an almost pure form of the element carbon (diamonds and graphite are other forms of nearly pure carbon). It is one of the most finely divided materials known to man. Consequently, it has a very high surface area and very strong adsorption properties.[3] These properties account for its usefulness in fingerprint powders.

Almost 90 percent of the Carbon Black produced is used in the manufacture of tires. It strengthens rubber and improves its resistance to abrasion, thereby improving traction and providing more wear resistance. Additionally, almost every black object, whether made from paper, plastic, leather, wood, or other material contains Carbon Black.

Obviously, there are many thousands of workers whose occupation has exposed them daily to Carbon Black over a period of many years. The NIOSH study which caused concern about fingerprint powders was only a single evaluation of 23 employees in one agency. Exhaustive studies of thousands of workers exposed daily to Carbon Black over decades "do not show any evidence that Carbon Black causes cancer or other disease."[4] Another survey states, "Over the last 50 years, there have been many investigations of the effect of exposing humans and animals to carbon black. . . it appears that exposure to whole or extracted carbon black causes no acute or chronic toxic effects."[5]

A respiratory survey of 500 workers in the U.K. and U.S.A. found no evidence for pneumoconiosis, fibrosis, or respiratory disease due to exposure to Carbon Black.[6]

In a retrospective mortality study of 1,200 men employed by four companies between 1935 and 1974, a total of almost 35,000 person-years at risk, with occupational exposures ranging from one year to over 25 years, the number of deaths from cancer and heart disease did not differ from those expected within the 95 percent confidence interval.[7]

A 1983 respiratory study of 3,027 furnace-black workers in 18 plants in Western Europe and one in the U.S.A., showed only 0.6 percent of the workers (all of whom were smokers) exhibited pneumoconiosis.[8]

In response to an inquiry from Lightning Powder Co., Inc., Mr. Adolph C. Shotts, Manager, Environmental Affairs, Columbian Chemicals Company, informs us that the exposure standard quoted in Paragraph V,A, page 4, of the NIOSH Upper Darby study is a misquote of the original NIOSH criteria document (DHEW Publication No. 78-204). The Upper Darby study states: "NIOSH recommends that exposure to carbon black not exceed 0.1 mg/m^3." Whereas the actual NIOSH recommendation reads, ". . . to PAH's (PNA's). (not Carbon Black) at a concentration greater than 0.1 mg/m^3."

Shotts continues, "Furthermore, the recommendations of this Document were never adopted by OSHA, except for the 3.5 mg/m^3 TLV as a PEL. Since that time OSHA has removed carbon black as a suspect carcinogen from the OSHA Industrial Hygiene Field Operations Manual."[9] Included in the packet of information sent to your editor is a photocopy of a letter from Mr. Thorne G. Auchter, Asst. Secretary for Occupational Safety and Health, U.S. Dept. of Labor, wherein he states that Carbon Black as a suspect carcinogen is removed from the current draft of the manual.

Although all of these reports indicate there are no serious long-term risks associated with exposure to Carbon Black, we are not suggesting that Carbon Black is an inert substance to be treated without regard to possible health hazards. We strongly urge I.D. officers to use protective masks such as the 3M Model 9913 (Lightning Catalog No. 3-5150), as suggested by Garold Warner in his article in the Missouri IAI Newsletter.

We at Lightning Powder Co., Inc., try to keep apprised of all health risks concerning our products, not only for the benefit of our customers, but for selfish reasons--we sift, mill, and mix the powders ourselves and are personally exposed to great concentrations of the components.

We have supplied your editor with copies of all the documents (86 pages) mentioned in this paper. Anyone requiring additional information may contact this writer at Lightning Powder Co., Inc., 1825 Front Street N.E., Salem, Oregon 97303-6648.

REFERENCES:

1. NIOSH, Health Hazard Evaluation Report, HETA 82-390-1345, Public Safety Building, Upper Darby, Pennsylvania.

2. Warner, Garold. Health Hazards From Some Fingerprint Powders. Missouri Division, IAI Newsletter, Sept. 1985, pp. 10-12.

3. Burgess, K.A., and Shotts, A.C. 1983. Carbon Black--History, Manufacture and Use, in Carbon Black - environmental health, The Environmental Health Association of the Carbon Black Industry, pp. 1-6.

4. Ibid. pg. 6.

5. Rivin, D. 1985, Effect of Carbon Black on Worker Health in the Rubber Industry, Dangerous Properties of Industrial Material, Vol. 5, No. 1, pg. 3.

6. Crosbie, W.A., R.A.F. Cox, J.V. LeBlanc, and D. Cooper. 1979. Respiratory survey on carbon black workers in the U.K. and U.S.A. Paper for Akron Rubber Group Spring Meeting.

7. Robertson, J.M., and T.H. Ingalls. 1980. A mortality study of carbon black workers in the United States from 1935 to 1974. Arch. Environ. Health, 35:181-186.

8. Crosbie, W.A. March 1983. The respiratory health of carbon black workers. Report to the European Committee for the Biological Effects of Carbon Black.

9. Shotts, A.C., Letter dated January 7, 1986, to Lightning Powder Co., Inc.

Note: References 6, 7, and 8 are reported by Donald Rivin, Ph.D., in reference 5 above.