

**PLAINTIFF'S
EXHIBIT**

DUP-143

February 17, 1971

M. W. Kordas, Jr.
Supervisor, Applied Research
Harrington Arms Company, Inc.
Bridgeport, Connecticut 06602

TOXICITY OF THE PRIMER AND THE PROJECTILE
IN RIFLE AMMUNITION

Your letter of January 19, 1971 to Dr. John A. Kapp, Jr.,
was given to me for comment.

Lead.

Based upon the analysis given in your letter, the amount of lead in one rifle primer will be 5.2 milligrams. When multiplied by the number of rounds estimated to be consumed in one activity period, which is 250, we find that a total of 1300 milligrams will be consumed. Most of this will enter the air of the space within which the firing is done. I assume from the prior discussion that the firing is expected to be done within confined quarters, such as a basement range. The amount of air theoretically necessary to dilute the 1300 milligrams of lead to the Threshold Limit Value of 0.2 milligrams per cubic meter of air will be 240,000 cubic feet. A safe atmospheric concentration can be maintained if the space in which the firing is done is supplied with air at a rate of approximately 25,000 cubic feet per minute, if the firing is done in 10 minutes or a correspondingly lesser rate when the firing is prolonged over an extended period of time. For example, if the firing is all done within one hour, the rate drops to about 4,000 cubic feet per minute.

Asbestos in the Projectile.

The weight of the projectile is not given in your letter. On the basis of 36 per cent by weight of asbestos in the projectile we estimate (assuming projectile weight of one gram) that 250 rounds would probably contain 50 to 100 grams of asbestos as a minimum. The projectile is described as "friable". We judge from this description that the asbestos could be reduced by friability to discrete fibers and disperse at least to a partial extent in the air of the enclosure in which the firing is done.

DUP 0972732

M. W. Kordas, Jr.
February 17, 1971
Page 2

Asbestos in the Projectile (Cont'd).

The danger of inhaling asbestos fibers has received a lot of attention in recent years. The American Conference of Governmental Industrial Hygienists now recommends a Threshold Limit Value of 5 fibers per milliliter of air (fibers greater than 5 microns in length counted by a phase contrast method following collection by a membrane filter technique). This low level of concentration reflects the concern that is felt for the health effects of inhaling asbestos fibers. In addition to the fibrotic disease called asbestosis, which has long been recognized, it is now known that persons who acquire the disease asbestosis are more likely to develop lung cancer than rates for the general population would predict.

It would be well to seek a suitable substitute for asbestos in the friable projectile.

In the building construction industry, where asbestos-containing insulation has been sprayed on steel structural members, it has been necessary to seek substitutes for asbestos. Various compositions containing fibers from steel mill slag have been used in the insulating of steel members of buildings. This might be a starting point in a search for an adequate substitute for asbestos in the friable projectiles.

ORIGINAL SIGNED BY
JAMES E. MORGAN

James E. Morgan

JTM/bjd

DUP 0972733