

... vinyl ...
(C.R. Thermal Decomposition Products)

Hart-0176

June 16, 1954

Mr. George Laaff (2)
The Bolta Company
Lawrence, Massachusetts

Dear Mr. Laaff:

This letter has reference to the behavior of wall coverings made from vinyl chloride resins in case of a fire in rooms in which they have been used. As you know, polyvinyl chloride resins are stable and inert at room temperature, and no gases or vapors of any kind are given off by these materials until they are heated to temperatures well over those that could be tolerated by man. On subjecting these materials to flame or other sources of high temperature, like other organic materials, they decompose and yield many of the products of combustion found when common organic materials are ignited. In addition to these usual products of combustion, vinyl chloride resins will liberate some hydrochloric acid gas when subjected to sufficiently high temperatures. Vinyl chloride resins do not in themselves support combustion and are self-extinguishing when the source of ignition is removed. For this reason, a fire in a room having a vinyl wall covering must depend on the combustion of other materials of a flammable nature that are present for propagation. The hazard involved from the products of combustion of the flammable materials present would be so much greater than that from the relatively small amount of vinyl resin that the latter would be negligible. The wall covering in question is composed of paper to which a relatively thin film of vinyl resin has been applied, and accordingly, the weight of resin to be considered is small.

Kingman, Coleman and Rasbash have written an article "The Products of Combustion in Burning Buildings" published in JOURNAL OF APPLIED CHEMISTRY (British), page 463, October, 1953, from which we quote:

"It would appear that the danger point in all cases (of a burning building) was reached when the oxygen content had fallen to such a low value that the occupants would have been asphyxiated. Before this stage was reached the carbon monoxide content, though sufficiently high to have unpleasant

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effects, did not reach the lethal limit of exposure (1500 xt, where little x, the concentration, is measured in parts per million, and the time of exposure, little t, in hours)."

It is probable that the same consideration would apply to a fire in a room containing vinyl wall coverings and that lack of oxygen and the toxic products of combustion from flammable materials, which by necessity must be burning in order to decompose the wall covering, would constitute by far the greatest hazard. In areas adjoining a fire, where all combustion products would be diluted still further with additional air, the hazard from the decomposition of vinyl resin in wall coverings would be substantially nonexistent.

Many hundreds of millions of pounds of vinyl chloride resin have been produced and used over the past fifteen years for applications including floor and wall coverings, drapes, window shades, etc., and as far as we know, no unusual hazards have been associated with their use.

Very truly yours,

MEDICAL DIRECTOR
INDUSTRIAL MEDICAL AND TOXICOLOGY DEPARTMENT

Thos. W. Hale, M. D.
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Blind copies to Mr. A. F. Sward
Mr. H. F. Robertson

(Letter sent Special Delivery)

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Mr. George Laaff

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June 15, 1954

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Yours very truly,

H. F. Robertson - Manager

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New Product Engineering Department

HFR:mmm

*including floor & wall
window shades
coverings, drapes etc and as far as we
know no unusual hazards have
been associated with their use*

10 square - wall covering there would
be only approximately one layer of
vinyl chloride resin

The wall covering in question are
conventional wall paper one which a
very thin coat of vinyl resin has been
applied

A wall cover of this nature is composed
of paper to which a resin coat is
applied. It is not a solid material
and according to the ~~test~~ of resin to
be applied to the ~~small~~ wall.
~~The paper is the same weight~~

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