U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Ave, S.E.
Washington, D.C. 20590

JUL 26 2013

Mr. Gregory Sutherland, Ph.D.
Shane Havoc Consulting, LLC
1905 English Ivy Ct.
Mount Pleasant, SC 29464

Ref. No. 13-0083

Dear Mr. Sutherland:

This responds to your April 14, 2013 letter regarding the packaging standards for plastic drums and jerricans under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). You request clarification of the standards in § 178.509(b)(1) and (2) associated with protection against ultra-violet (UV) radiation for plastic material used in the construction of these packagings. You indicate that you would like to use 1H1 plastic drums or 3H1 plastic jerricans constructed of high-density polyethylene (HDPE) plastic. Furthermore, you indicate these single-use packagings would be used in a "closed supply chain" with no outdoor storage or use. Your questions are paraphrased and answered as follows:

Q1. Does the § 178.509(b)(1) requirement for the packaging (i.e., the material of construction) to be adequately resistant to the aging and degradation effects of UV radiation apply only to those plastic materials that are affected by UV radiation?

A1. Yes. If a plastic material is not adequately resistant to the effects of UV radiation, it must be protected against UV radiation by addition of carbon black, or other suitable pigment or inhibitor, to the composition of the plastic material, in accordance with § 178.509(b)(2).

Q2. Is the § 178.509(b)(1) requirement dependent on exposure of the packaging to UV radiation during the course of its use in hazardous material service? Meaning, if a package is constructed of plastic material affected by UV radiation but it is protected against exposure to UV radiation by being filled, stored, and used indoors and transported in closed containers or vehicles, is it excepted from the requirement of § 178.509(b)(2)?

A2. No. The § 178.509(b)(1) requirement for the packaging to be resistant to UV radiation is specific to the material of construction. The requirement is not dependent on the degree to which a packaging may be exposed to UV radiation during the course of its use in hazardous material service.

Note that as an alternative, you may wish to apply for a special permit in accordance with 49 CFR Part 107, Subpart B. A special permit allows a person to perform a function not otherwise permitted by regulation under the HMR. Section 107.105 explains how to apply for a special permit.

I hope this information is helpful. If you have further questions, please contact this office.

Sincerely,

Robert Benedict
Chief, Standards Development Branch
Standards and Rulemaking Division

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April 14, 2013

Der Kinderen
§178.509(b)(1) & (b)(2)
Packages
13-0083

U.S. DOT
PHMSA Office of Hazardous Materials Standards
Attn: PHH-10
East Building
1200 New Jersey A venue, SE
Washington, DC 20590-0001

To: Delmer Billings, *Sr. Reg. Advisor*

I am writing to you with regards to obtaining an official interpretation of the intent of the regulations detailed in 49 CFR 178.509 (b)(1) & (b)(2). The mandatory requirement for the use of UV protection in plastic packages is unclear as written.

Was the intent that since the regulation refers to plastic packagings in general and there are many types of plastic material that can be used; that only those plastic types affected by UV radiation are mandated to use UV protection? (As an example HDPE plastic is affected by UV after prolonged exposure.)

Or is the requirement for the use of UV protection dependent on the exposure of packagings to UV radiation in the supply chain. (As an example; if a package is filled / stored / transported / used inside either buildings or closed transport equipment, there is negligible UV exposure.) I have attached a NEMA report that indicates an 8 hr day in a lighted interior area is equivalent to 1 min of sun exposure.

I have reviewed the DOT website interpretation section and can find no prior official review of this section.

The packaging application that I would like to use is a 3H1 or 1H1 HDPE package, without UV protection, in a closed supply chain with no outside storage or use. This container would be a marked for single use only. Technically this should not compromise safety in transport or use.

Thank you in advance for your assistance. I look forward to your response.

Sincerely

Gregory Sutherland Ph.D. (DGSA

Setting Standards for Excellence

A NEMA Lighting Systems Division Document

Ultraviolet Radiation From Fluorescent Lamps

Prepared by

Lamp Section
National Electrical Manufacturers Association
1300 North 17th Street, Suite 1847
Rosslyn, VA 22209
May 4, 1999

ULTRAVIOLET RADIATION FROM FLUORESCENT LAMPS

In recent years the popular press has reported various scientific studies on possible effects of skin exposure to light sources. This interest has been stimulated by the facts that (1) most light sources emit some small amount of ultraviolet (UV) energy, and (2) extended exposure to the high UV levels in sunlight can causes adverse effects in the skin. Unfortunately, such brief summaries of technical subjects without either details or follow-up can cause undue concern among the public about indoor lighting.

Melanoma, the malignant form of skin cancer, has had increasing incidence over the past half century. Considerable research on causes of melanoma has looked at possible links with factors of modern life-style that have changed over the same period of time. In the early 1980's a suggestion was made that fluorescent lighting might be a cause of melanoma, but this suggestion could not be substantiated. In 1988, an international scientific review[1] concluded that "the available evidence does not support the existence of any substantial association between melanoma risk and exposure to fluorescent lighting." This conclusion stands today.

The two most common kinds of skin cancer are the non melanoma skin cancers[2], basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). These are slow growing cancers that seldom spread to other parts of the body. Nevertheless, treatment is essential because, as reference (2) points out, "[i]t is encouraging to know that skin cancer is now almost 100 percent curable if found early and treated promptly." BCC accounts for more than 90 percent of all skin cancers in the United States. In a recent publication, Lytle et al.[3] of the Center for Devices and Radiological Health (FDA) report that studies "indicate that SCC results from long-term chronic solar UV exposure, whereas solar UV exposure after age 10 may not contribute to BCC."

On this basis, one could expect that the small contribution of UV due to indoor lighting will not be a major health concern. Lytle et al.[3] addressed this by surveying 58 fluorescent lamp types for UV emission. Using these data, the UV exposure at typical office light levels was calculated for luminaires using large grid parabolic louvers that did not block UV. This estimated indoor UV exposure during one eight hour workday is equivalent to just over a minute of midday solar exposure on a clear July day in Washington, D.C. While there are different ways to interpret the UV due to fluorescent lighting, they all rely on a variety of assumptions. This comparison of the full day indoor exposure to roughly one-minute of outdoor exposure clearly conveys the relative insignificance of the UV from fluorescent lamps. In addition, many luminaire types and lighting techniques (enclosed luminaires, indirect lighting, etc.) will further reduce or eliminate the small amount of UV emitted from the fluorescent lamps.

In 1998 Driscoll and Pearson[4] of the National Radiological Protection Board (U.K.) reviewed the relation of UV from fluorescent lighting to skin cancers and presented results from new studies. Quoting from the summary, "[t]herefore, it is concluded that at commonly used illumination levels the measured UVR [ultraviolet radiation] emissions from fluorescent lighting do not present an acute or a significant chronic hazard."

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[1] "Malignant Melanoma and Fluorescent Lighting," CIE-Journal, 7:29 (1988)

[2] "What You Need To Know About Skin Cancer," National Cancer Institute, NIH Publication No. 90-1564 (1989)

[3] C. Lytle, W. Cyr, J. Beer, S. Miller, R. James, R. Landry, M. Jacobs, R. Kaczmarek, C. Sharkness, D. Gaylor, F. Gruijl, and J. van der Leun, "An Estimation of Squamous Cell Carcinoma Risk from Ultraviolet Radiation Emitted by Fluorescent Lamps," Photodermatol Photoimmunol Photomed 1992/1993, 9:268 (1993)

[4] C. Driscoll and A. Pearson, "Ultraviolet Radiation from Fluorescent Lamps for General Lighting," Croner's Occupational Hygiene Magazine, June/July, p.5 (1998)