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

1200 New Jersey Ave., S.E.
Washington, DC 20590

January 9, 2008

Mr. David Harmon
PerkinElmer Optoelectronics
44370 Christy Street
Fremont, CA 94538

Ref. No. 07-0143

Dear Mr. Harmon:

This responds to your email concerning the applicability of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) to certain arc lamps containing small amounts of a Division 2.2 gas under pressure. Specifically, you ask if the lamps are subject to regulation under the HMR.

The lamps are manufactured by Cermax and PerkinElmer to a specification you provide and are offered for transportation in the packaging configurations described in your letter. We agree that Cermax and PerkinElmer brand lamps containing less than 30 mL of gas are transported in a quantity and form that will not pose an unreasonable risk to health, public safety or property during transportation. Therefore, it is our determination that they are not subject to the requirements of the HMR.

However, it is our determination that the Cermax brand lamps containing between 68 mL and 270 mL of xenon and charged to a pressure between 275 psig and 500 psig are most appropriately described using the shipping description "UN 3363, Dangerous Goods in Apparatus, Class 9." You may wish to consider using the limited quantity exceptions provided in § 173.306 for shipments of compressed gas. For international transportation, the lamps must be prepared for transportation in accordance with applicable international regulations.

I trust this satisfies your inquiry. Please contact us if we can be of further assistance.

Sincerely,

Edward T. Mazzullo
Director
Office of Hazardous Materials Standards

Stevens
§173.115
§173.22
Shipper's Responsibility & Definitions
07-0143

Drakeford, Carolyn <PHMSA>

From: Gale, John <PHMSA>
Sent: Friday, July 13, 2007 8:30 AM
To: Kelley, Shane <PHMSA>; INFOCNTR <PHMSA>; Drakeford, Carolyn <PHMSA>
Subject: RE: Perkinelmer Arc lamps

From: Harmon, David [mailto:David.Harmon@perkinelmer.com]
Sent: Mon 6/25/2007 7:08 PM
To: Kelley, Shane <PHMSA>
Cc: dgicc@aol.com
Subject: Perkinelmer Arc lamps

Shane,

As we discussed on the telephone on June 20th, 2007, I am writing to request your department to please issue an opinion and interpretation on the shipping of our products relative to "Dangerous Goods" classification. I have included as much information as possible to help you make your determination. Thanks in advance for your consideration and attention in this manner.

Company Information:
We are an Optoelectronics company headquartered in Fremont California and we produce various types of arc lamps which contain Xenon, Krypton or a mix of these two gases. We ship these lamps from 2 principle factories; Fremont, CA and Singapore and we ship them both domestically and internationally from those 2 locations. They also are shipped to both end customers and distributors including our site in Wiesbaden Germany who is a distributor for the EU.

General product use description:
These lamps are used in several ways in several applications. The majority of these lamps are branded as "Cermax" lamps. The entertainment industry uses these lamps for high end movie projectors (such as IMAX Theater) or high end projection televisions as well as normal theater projection equipment and lighting. The medical lighting industry uses these lamps for endoscope machines, for general operating room lighting conditions and other related types of equipment. They are used in some military applications for guidance or countermeasures applications given by light. Others lamps which are carried under the PerkinElmer brand are used as "flash lamps" for laser and industrial applications; these are small quartz tubes that are utilized to create a bright flash of lights which is used to create laser lighting or beacons.

General product contents:
The majority of our lamps are filled with Xenon gas; some lamps are filled with Krypton or a mix of Krypton/Xenon. These gases by themselves are neither flammable nor explosive meaning that they are inert gases. The vessel where the gas is contained is produced with a combination of safire, ceramic and steel. These materials are then joined by a combination of brazing and/or TIG welding.

Shipping details:
The lamps are packed in open cell packing foam, which fits each lamp model to its unique form and is approximately 2" to 4" thick per side, depending on the lamp. This foam is then surrounded by an initial single wall card board box which is rated at a 200 lbs per square inch bursting strength, then multiple boxes of this nature are packed together into a larger double wall box which is rated at 275 lbs per spare inch bursting strength as well as containing Styrofoam packing peanuts. Though there are a few variants depending on the lamp and/or customer but this is the typical shipping method. We regularly ship these lamps via air and/ground both domestically and internationally through various carriers.

Product Abuse Testing:
In 2005, we carried out some testing on our lamps used in the entertainment industry for one of our customers regarding the strength of the product itself. I have attached a copy of this report in case it may be helpful for you. This is the PDF file called Quanta failure reporting. It details the force required to burst the lamp itself both from

the perspective of force applied, dropping, shock and vibration testing. The result is that it takes a pretty significant load to break the lamp housing and when doing so the internal elements are contained (except of course the gas).

Shipping configurations:
In the attached powerpoint file, you can see pictures of the lamps which are described above. In the first slide (fig #1) the top left corner pictures, are of a "bare" cermax lamp. This is the base configuration for most of the Xenon arc lamps. We ship the lamps in this configuration most often but also ship them inside of a module and inside of a system. The bare lamp is also placed into a module (which can be seen in fig. #2) and into an endoscopy system (slide #2, fig. #3). The next slide then shows picture examples of the PerkinElmer brand flash lamps. These lamps are filled either with Xenon, Krypton or a mix of those two gases. These can be seen in slide #2, fig. #4.

Current classifications:
Currently we are shipping lamps under two different dangerous goods classifications; **1)** Dangerous Goods in Apparatus, **UN3363**, Haz Class 9 and **2)** Dangerous Goods in Excepted Quantities, **UN2036**, xenon, Haz Class 2.2. The reason for the difference in classification is that some of our lamps carry less than 30ml of gas and others carry larger quantities of gas at different pressures. As you probably already know, we arrived at these classifications types by working with Candy Cook from DGI.

Quantities and pressures:
Though we ship a number of different models of these lamps in which the fill amount and pressure may vary, I have attempted to group them below as minimums and maximums for simplicity. These groupings are listed below and are given by a population of models which fit into the max/min listed. .

Cermax brand lamps – Xenon filled – currently UN2036
Minimum pressure 30 lbs per square inch — Minimum gas amount inside the lamp 8ml
Maximum pressure 415 lbs per square inch — Maximum gas amount inside the lamp 26ml

Cermax brand lamps – Xenon filled – currently UN3363
Minimum pressure 275 lbs per square inch — Minimum gas amount inside the lamp 68ml
Maximum pressure 500 lbs per square inch — Maximum gas amount inside the lamp 270ml

PerkinElmer brand lamps – Krypton filled – currently UN3363
Minimum pressure 42 lbs per square inch — Minimum gas amount inside the lamp 1ml
Maximum pressure 70 lbs per square inch — Maximum gas amount inside the lamp 8ml

PerkinElmer brand lamps - Xenon filled – currently UN3363
Minimum pressure 44 lbs per square inch — Minimum gas amount inside the lamp .4 ml
Maximum pressure 58 lbs per square inch — Maximum gas amount inside the lamp 2 ml

PerkinElmer brand lamps – Krypton and Xenon filled – currently UN3363
Minimum pressure 41 lbs per square inch — Minimum gas amount inside the lamp .4 ml
Maximum pressure 141 lbs per square inch — Maximum gas amount inside the lamp 8 ml

I have tried to provide you with sufficient information to make a conclusive determination. It is our belief that these lamps should not pose a hazard to transportation and therefore should not be classified as dangerous goods. If the lamps were to somehow be broken during transportation, the gas would escape from the housing and all parts would be contained within the lamp housing and or the box. As the gas is an inert gas, the risk or danger to anyone within close proximity would be none or almost none. While we wait for your determination we will continue to ship these lamps under the two DG classifications currently designated.

We very much appreciate any opinion you can render for us and look forward to your reply,

Regards,

Dave
Dave Harmon

Director of Quality, EH&S and Continuous Improvement

PerkinElmer Optoelectronics
44370 Christy Street
Fremont, California - 94538
Phone: 510-979-6862
Mobile: 510-364-7360
Fax: 510-687-1152
david.harmon@perkinelmer.com