



AUG 6 2003

U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

Mr. Terrence D. Jones
Keller and Heckman LLP
1001 G Street N.W.
Suite 500 West
Washington, DC 20001

Ref. No. 02-0315

Dear Mr. Jones:

This responds to your letter, submitted on behalf of Cargill Dow LLC, concerning the proper classification of unbuffered lactic acid (88%) under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you requested confirmation that your client's product is not a regulated corrosive material under the HMR when tested on an alternative mammalian species and whether a previous informal interpretation on this matter remains valid.

Under § 173.22 of the HMR, it is the shipper's responsibility to properly class a hazardous material based on available data or other scientific resources. Our 1997 letter of clarification remains valid. The corrosivity test results for the unbuffered lactic acid (88%) using pigs are acceptable as permitted under the 1992 OECD Guideline for Testing of Chemicals, Number 404, "Acute Dermal Irritation/Corrosion" ("OECD Guidelines"). Since October 1, 1995, corrosivity of a material is based on testing according to the OECD Guidelines or alternative methods approved by the Associate Administrator. As specified in the OECD Guidelines, the albino rabbit is the preferred species for testing.

With regard to your client's product, we note that it tested positive for corrosivity on albino rabbits. If another company's product is tested on an alternative mammalian species and the test data is used to determine the corrosivity of your client's product, it is your client's responsibility to substantiate that their product is accurately represented by the product tested.



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

Sincerely,

Edward T. Mazzullo

Edward T. Mazzullo
Director
Office of Hazardous Materials Standards

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December 4, 2002

Mr. Edward T. Mazzullo, Director
Office of Hazardous Materials Standards (DHM-10)
Research and Special Programs Administration
U.S. Department of Transportation
400 Seventh Street, S.W.
Washington, DC 20590-0001Re: Request for Written Clarification Concerning the Use of Pigs in Corrosivity
Testing

Dear Mr. Mazzullo:

This letter is submitted on behalf of Cargill Dow LLC, a shipper of unbuffered lactic acid (88%). Lactic acid is a material that is used for a variety of purposes, including as a preservative in food. By this letter, Cargill Dow seeks confirmation that, in determining whether the lactic acid it ships is a "corrosive material" as defined in 49 CFR § 173.136(a), it may base its hazard determination on data obtained from testing such lactic acid on the skin of pigs.

Section 173.136(a) defines a corrosive material as a "liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time." A liquid that has a severe corrosion rate on steel or aluminum is also classified as a corrosive. The corrosive effect on human skin of a material is to be determined from testing on animals in accordance with the 1992 OECD Guideline for Testing of Chemicals, Number 404 "Acute Dermal Irritation/Corrosion," in accordance with the exposure and observation times set forth in 49 CFR § 173.137. Among other things, the OECD Guideline provides that, while the albino rabbit is the preferred species for testing, "several mammalian species may be used." The Guideline thus leaves the choice of species to the researcher's sound scientific judgment. Because Cargill Dow has received guidance from a leading expert in the field of toxicology that pigs are a more appropriate species for conducting such testing, Cargill Dow seeks DOT's confirmation that it may rely on data derived from testing pigs in making its hazard determination.

On August 8 through 16, 2001, a skin corrosion study of lactic acid (88%) was performed for Cargill Dow by Product Safety Labs, using New Zealand albino rabbits. That study suggested that unbuffered lactic acid (88%) should be assigned to Class 8, Packing Group III, according to 49 CFR § 173.136. In an earlier test conducted by Cargill Dow in September 2000,

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which measured the corrosion rate of lactic acid on carbon steel in accordance with the criteria of Section 173.137(c)(2), it was determined that lactic acid (88%) is not a corrosive material based upon such criteria.

Since the performance of the August 2001 test of its lactic acid on the skin of albino rabbits, Cargill Dow has become aware of studies in the scientific literature that provide strong evidence that the skin of pigs, rather than that of rabbits, is more representative of human skin in determining the corrosivity of lactic acid. It also is aware that in recent years DOT has accepted the results of tests on pig skin in determining whether lactic acid is a regulated corrosive material and that such tests have demonstrated that lactic acid is not a corrosive material as defined by Section 173.136.

As a result of this information which became known to it since the performance of the tests on rabbits, Cargill Dow decided to seek advice as to the current scientific data concerning the use of pigs vs. rabbits in testing a material's corrosivity. Accordingly, Cargill Dow requested that Ian C. Munro, Ph.D., of Cantox Health Sciences International, Mississauga, ON, Canada, a recognized expert in toxicology, provide it with an opinion as to whether pigs or rabbits are the more suitable animal model for assessing the corrosivity of lactic acid. A copy of Dr. Munro's opinion, dated December 3, 2002, along with a copy of Dr. Munro's *curriculum vitae*, are attached hereto.

In his opinion, Dr. Munro concludes, based upon the findings of his review and evaluation of the published scientific data, that the test results in pigs are more predictive of potential risks to humans (Page 1), and that there is "strong evidence that the pig is a more relevant animal model for human skin than the rabbit." (Page 5). Dr. Munro explains that the results of tests using pigs are more representative of human skin since pig skin and human skin have several similar characteristics, including hair density, skin surface structure, epidermal structure, sebum composition, epidermal turnover rate, epidermal lipid composition, and the use of fat for insulation, versus fur in many small mammals. (Page 3). He notes that:

"For many chemicals, the skin of rats and rabbits is far more permeable than human skin, while the skin permeability of guinea pigs, pigs, and monkeys is similar to that of human skin ... Several studies have shown that the permeability characteristics of pig skin resemble those of human skin, and that the pig is a representative animal model for humans in skin permeation studies" (Page 4)

Accordingly, because of the "remarkable similarities" between human and pig skin, the domestic pig has been proposed as a valuable animal model for human dry skin, human wound healing, and human skin permeation studies. (Page 4). Rabbit skin, on the other hand, is far more sensitive to irritation than human skin under similar testing conditions. Dr. Munro states that: "Generally, rabbit skin is more permeable than human skin, which may account, in large part, for the increased irritation observed in rabbits." (Page 4). Dr. Munro thus concludes that:

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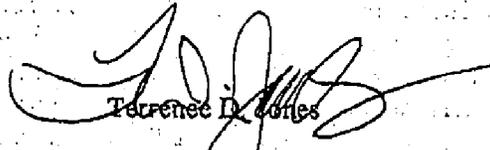
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"[I]t is well established that the rabbit is more sensitive to skin irritants than other test species or humans and the rabbit is currently used as the most conservative animal model in standard irritancy tests. However, the literature provides strong evidence that the pig is a more relevant model for human skin than the rabbit." (Page 5)

On the basis of Dr. Munro's opinion and the scientific studies relied on therein, and the language of the 1992 Guideline which provides that "several mammalian species may be used" in testing the corrosivity of a material, Cargill Dow believes that the results derived from testing its lactic acid on the skin of pigs in accordance with the conditions and methodology described in the Guideline and Section 173.137, may be used in determining whether such material is a corrosive material under Section 173.136.² Cargill Dow requests confirmation from DOT that the results of such tests may be used to determine whether its unbuffered lactic acid (88%) is a corrosive material.

Please do not hesitate to contact me if you have any questions about this request or if you require further information. We greatly appreciate your assistance in this matter.

Yours very truly,



Terrence D. Jones
Attorney for Cargill Dow LLC

Enclosure

² As previously noted, Cargill Dow has determined that its lactic acid is not a corrosive material when tested on carbon steel in accordance with § 173.137(c)(2).