

AR226-1451

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DU PONT CONFIDENTIAL
SPECIAL CONTROL

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P. M. Humanick/
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E. O. Langer
J. T. Chesser
B. F. Galloway
R. E. Read
J. A. Thoroug

22 June 1978

To: T. C. Kuchler, Administration Building

From: R. D. Richardson, 1094 Building

FLUOROSURFACTANTS COMMUNICATION WITH CHAMBERS WORKS EMPLOYEES

The following schedule has been developed for the communication on the presence of organic fluorine substances in human blood plasma (copy attached) to Chambers Works personnel who handle fluorosurfactants and their intermediates:

Day/Date	Time	Action	Responsible
Friday 6/23/78	Before 4 p.m.	Inform Chambers Works Executive Staff that announcement to employees will be made at 10 a.m., 6/27/78.	R. D. Richardson
	Before 4 p.m.	Supervision will be provided with a communication message.	R. D. Richardson
Tuesday 6/27/78	After 8 a.m.	Supervision will inform Union Leaders and local Union Representatives	R. J. Lyng
		Chemicals Area	R. J. Lyng
		Development Manufacturing Area	L. J. Marcot
		Jackson & Technical Laboratories	E. O. Langer
		(Engineering Department)*	F. J. Meadow
		(Environmental & Service Department)*	E. T. Fogg
		(General Analytical Laboratory)*	R. F. Stalzel
	10 a.m.	Supervision will inform all personnel who handle or may contact fluorosurfactants and their intermediates in their assigned work.	
		Chemicals Area	R. J. Lyng
		Development Manufacturing Area	L. J. Marcot
		Jackson & Technical Laboratories	E. O. Langer
		(Engineering Department)*	F. J. Meadow
		(Environmental & Service Department)*	E. T. Fogg
		(General Analytical Laboratory)*	R. F. Stalzel

BEST COPY AVAILABLE

Employees who are not present at 10 a.m. 6/27/78 will be informed when they next report to work.

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*For information only. Employees in this group will not participate in the initial medical program. They should be advised of the program, however.

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VERBAL COMMUNICATION TO CHAMBERS WORKS EMPLOYEES
WHO HANDLE FLUROSURFACTANTS AND THEIR INTERMEDIATES

Through information supplied by the 3M Company, Du Pont has become aware that elevated organic fluorine levels have been detected in the blood of 3M workers exposed to certain organic fluorinated surfactants and the intermediates associated with their manufacture.

These specific fluorochemicals are not used on the Chambers Works, but we do manufacture a line of fluorosurfactants. The Chambers Works fluorosurfactants are manufactured by different technology and have not been implicated. As a precautionary measure, however, we are reviewing handling procedures, medical records and toxicological information related to our fluoro-surfactants.

As a part of this program the organic fluorine level in the blood of Chambers Works employees who are working with these fluorosurfactants will be determined for comparison with the general population. This check will be made at the time of the employee's next regular plant physical examination.

A preliminary report from the 3M Company indicated that they are not aware of any adverse health effects among affected employees. 3M has manufactured fluorinated surfactants for over 20 years.

Your supervision will see that any questions you may have are answered.

RDR
6/22/78

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ADDITIONAL INFORMATION FOR SUPERVISION

A 1976 report⁽¹⁾ indicates that the blood serum of the general population in the U.S. contains trace quantities of fluorine in both organic and inorganic form. The concentration of inorganic fluorine has been shown to be related to fluoride ion in water supplies (natural and added). There is no ready explanation for the presence of organic fluorine.

A recent study by the 3M Company of their workers who manufacture and handle fluorosurfactants and their intermediates has revealed organic fluorine levels in their blood plasma in excess of those not engaged in these operations. 3M reported that a preliminary review of the medical histories and current health status of affected employees has not revealed any unusual health conditions. A more detailed epidemiological study of 3M workers has been initiated.

3M has identified two probable key sources of employee exposure in their operations. These are associated with (1) electrolytic cells in which key intermediates are manufactured, and (2) packaging operations involving powdered products.

The specific products implicated in the 3M study are not manufactured nor used on the Chambers Works. Different fluorosurfactants manufactured on Chambers Works in the Chemicals and Development Manufacturing areas and are sold under the "Zonyl" trademark. The Chambers Work processes do not involve electrolytic fluorination and the products are handled throughout in liquid forms and are also sold in liquid forms. Despite the dissimilarity between the Du Pont and 3M technology, all handling procedures for fluorosurfactants and intermediates should be reviewed for adequacy. Assistance may be obtained from R. J. Hubiak (X3415).

A special medical program will be initiated for all employees currently engaged in fluorosurfactants operations. This program will not be extended to personnel who have previously worked with fluorosurfactants, but who are no longer involved, unless the results of the initial program indicate that necessity. Similarly, Engineering Department, Environmental & Service Department and General Analytical Laboratory employees will not be included in the initial program though they should be advised of the program.

The initial special medical program will include (1) a review of the medical records of the employee, and (2) special blood analyses at the time of the employee's regular physical examination.

This program is concerned only with fluorosurfactants and their intermediates. Other fluorinated substances such as "Freon" fluorocarbons and fluoropolymers (e.g., "Teflon", "Viton", etc.) are not implicated.

(1) W. S. Guy, et.al., Proceedings Amer. Chem. Soc., Fluorine and Biological Chemistry Symposium, Chicago, 26 August 1975, Paper 7, page 117.

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WAB
CC: R. E. Putnam

6/27 - 9:00 Division Superintendents
11:00 Line Supv'n.-TEFLON®
2:00 Affected Wage Roll

June 27, 1978

TO: ALL DIVISION SUPERINTENDENTS
CHIEF CHEMIST

FROM: C. H. FOSHEE
PRODUCT SUPERINTENDENT

FLUOROSURFACTANTS ANNOUNCEMENT

Attached is a communications package pertaining to the presence of organic fluorine in the blood of 3M workers. We plan to communicate this information on Tuesday, June 27. Information in the attached letter to TEFLON® Supervision should be communicated to TEFLON®, TEFLON® Research and TEFLON® Laboratory wage roll personnel. The Questions and Answers are to be used as reference material to respond to questions. A communications package is being transmitted to unaffected divisions for information.

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Attachments

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June 27, 1978

TO: TEFLON® SUPERVISION

FROM: C. H. FOSHEE

FLUOROSURFACTANTS IN BLOOD

Through information provided by the 3M Company, Du Pont has become aware that elevated organic fluorine levels have been detected in the blood of 3M workers exposed to certain fluorinated surfactants.

Du Pont does not manufacture these fluorochemicals, but does purchase one of them for use in manufacturing TEFLON® and FEP dispersions in the Fluorocarbons Division. The surfactant we use is perfluoro-octanoic acid ammonium salt and is commonly known as C-8. Du Pont does manufacture different fluorinated surfactants at Deepwater, N. J. and these have not been implicated with higher blood levels.

Fluorinated surfactants are water soluble chemicals used for their marked ability to modify the wettability of materials.

Our toxicological tests indicate that Du Pont's fluorinated surfactants have a low order of toxicity. No known ill effects which could be attributed to these chemicals or C-8 have been detected among employees in more than 20 years of experience with the products.

Du Pont's handling procedures have been designed to minimize exposure of employees to these fluorinated surfactants. As a precautionary measure, however, Du Pont is reviewing its procedures, medical records, and toxicological information relating to these materials.

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QUESTIONS AND ANSWERS

1. Q. What is the effect of elevated organic fluorine levels in blood?
A. Although 3M has found elevated organic fluorine levels in the blood of workers exposed to certain fluorinated intermediates, they have identified no related health effects in any of these workers or in those exposed to the surfactants but are continuing a broad investigation.
2. Q. Does Du Pont have information about organic fluorine levels in the blood of its employees exposed to these materials?
A. Not at this time.
- 2a. Q. Why not?
A. We had no reason to believe any problem of this type existed and normal blood tests would not show this kind of information unless you were looking precisely for fluorine levels. While we have not specifically looked at fluorine content in the blood, we have been satisfied that no known health effects which could be attributed to these chemicals have been detected among employees.
3. Q. Will Du Pont be conducting blood tests on employees at Washington Works who may have been exposed to the fluorinated surfactant purchased from 3M?
A. We will check some employee blood levels to establish a background level for fluorinated compounds.
4. Q. Are employees being notified of findings reported by 3M?
A. Yes.
5. Q. What products are manufactured by Du Pont using the fluorinated surfactants purchased from 3M?
A. The material purchased from 3M is used in the polymerization process for making TEFLON® fluorocarbon dispersions. These dispersions contain only about one tenth of one percent (.001) or 1000 parts per million of fluorinated surfactant.

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QUESTIONS AND ANSWERS

6. Q. What are uses for the dispersions?
- A. TEFLON® fluorocarbon dispersions are used to coat glass fibers and metals. In the coating operation the surfactants are destroyed by the sintering process which is used. The only application where the fluoro-surfactants are not destroyed is packings and gaskets.
7. Q. Where are gaskets and packings used?
- A. We don't know all the places, however we can assume that any operations where liquids are being transported might use pump packings and gaskets.
8. Q. If packings and gaskets are used in systems to transport liquids, could they be coming into contact with liquids ingested by humans?
- A. It is possible. However, we believe most of the applications involving our dispersions in packings and gaskets are industrial operations. Du Pont does not sanction the use of unsintered TEFLON®, such as that involved in packings and gaskets, and applications where the material would come in contact with food, beverages or potable water.
9. Q. Are any consumer products made and sold by Du Pont involved?
- A. No. All materials using fluorinated surfactants which could reach the consumer or general public are processed in such a way that the surfactant is burned off before it goes to the consumer.
10. Q. Is there any problem involved with cookware which has been coated with TEFLON®?
- A. No.
11. Q. What is meant when you say that Du Pont's fluorinated surfactants have a low order of toxicity?
- A. By a "low order of toxicity" we mean that a lethal dose would be about a cupful or eight fluid ounces of this material.

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QUESTIONS AND ANSWERS

12. Q. In 3M's findings, what were the elevated levels of organic fluorine which they found in their workers?
- A. The highest level 3M detected was 45 parts per million of this material in a person's blood. This is equal to about one-tenth of a drop of the material in the total blood content of the average human being.
13. Q. Why aren't the fluorinated surfactants manufactured by Du Pont implicated by 3M's findings?
- A. The surfactants which Du Pont manufactures are made by a completely different process and are chemically different than those made by 3M. However, because of their similar functional activity, it is possible they may behave in a similar way but at this point we have no data to confirm or deny this.
14. Q. If Du Pont's fluorinated surfactants are not implicated, why not use these materials instead of purchasing them from 3M to make TEFLON®?
- A. Chemically Du Pont's fluorinated surfactants behave differently and are not suited to the existing process for making TEFLON® fluorocarbon resins.
15. Q. Are other companies involved and have they been alerted about 3M's findings?
- A. The 3M Company has notified its customers. To the best of our knowledge these are the only companies in the United States involved. Du Pont intends to share all of the information developed on this situation with any companies in the U.S. and worldwide who might be involved.
16. Q. Will Du Pont be notifying customers of the findings reported by 3M?
- A. We will share this information on a need-to-know basis.
17. Q. Will Du Pont be informing the appropriate regulatory agencies of this situation?
- A. At this point in time we see no significant risk associated with the fluorine content in the blood. The existence of fluorine in blood has been known for 10 years and is published in open literature.

QUESTIONS AND ANSWERS

18. Q. Are these fluorinated surfactants found in the blood persistent?
- A. Published literature indicates that fluorinated compounds containing oxygen and nitrogen are persistent. However, 3M has indicated that organic fluorinated compounds are secreted by the body as a waste product. Data are conflicting about the existence of organic fluorinated compounds in animals.

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