

TEXT
OR FULL REPORT OF
Investigation of Health Hazards
From Tetra-ethyl Lead Gasoline

RG 443, Records of the NIH
N114, 1930-48
General Records, 0425T,
Box 23
S.L. TEL

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REGULATIONS PROPOSED

FOLLOWING THE

TETRA-ETHYL LEAD INVESTIGATION

These regulations have been formulated in accordance with the recommendations of the Surgeon General's Committee, under whose direction the investigation into the hazards from tetra-ethyl lead gasoline was conducted. They are proposed for adoption by the several states in order to secure uniformity of control and will be the subject of consideration at the meeting of the State and Territorial Health Authorities with the Surgeon General in May, 1926. These regulations are based upon present conditions and knowledge, and it is appreciated that changes may be advisable from time to time. Further research is being carried on to determine the possible necessity for such changes.

By the term Tetra-Ethyl Lead is meant the chemical substance $Pb(C_2H_5)_4$ of a commercial grade of purity or higher. Ethyl Fluid is the concentrated commercial fluid containing tetra-ethyl lead and other ingredients, which is to be added to gasoline to make ethyl gasoline. The manufacture of ethyl fluid consists in mixing these other ingredients with tetra-ethyl lead and is called Blending. Ethylizing is the process of mixing the ethyl fluid with gasoline or other motor fluid to form ethyl gasoline or other ethylized motor fluid. In the term Ethyl Gasoline as herein used are included all other ethylized motor fluids containing tetra-ethyl lead.

I. Proposed Regulations for the manufacture of tetra-ethyl lead and the blending of the latter to make ethyl fluid.

II. Proposed Regulations for ethylizing.

III. Proposed Regulations for distribution of ethyl gasoline.

IV. Proposed Regulations for automobile garages, repair shops, service stations, and filling stations.

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Proposed Regulations for the Manufacture of
Tetra-ethyl Lead and the Blending of
the latter to make Ethyl Fluid

1. No person shall be employed without adequate instructions as to the nature of the hazard and the precautions to be taken.
2. Each worker shall have a periodical physical examination which shall consist of such physical and other tests as are indicative of the absorption of tetra-ethyl lead and shall include, as a minimum, the following items:
 - (a) Examination of blood for stippling by carefully trained workers, using positive and negative controls, without knowledge of the source of the slides; this examination shall be once a week for the first four weeks, and bi-monthly thereafter.
 - (b) Semi-monthly contact with plant physician for informal statement as to general health.
 - (c) Bi-monthly weight, stripped.
 - (d) Bi-monthly systolic and diastolic blood pressure estimation, while sitting.
 - (e) Bi-monthly hemoglobin estimation by Dare's hemoglobinometer.

Exact records of these examinations shall be kept, and persons showing gradually increasing amounts of stippling, sudden development of stippling, or other marked deviation from normal, shall be promptly excluded from tetra-ethyl lead work, irrespective of whether or not such finding may be indicative of lead poisoning.

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3. All parts of the plants where lead in any form is used shall be subject to sanitary measures to prevent collection and dissemination of lead dust.
4. Separate ventilation systems shall be provided for the manufacturing apparatus, and for the air of the rooms, the outlets of the latter being located near the floor of each room.
5. Daily inspection shall cover efficiency of ventilating systems, all joints, valves, and gaskets of manufacturing apparatus, and adequacy of pressure-hose respirators.
6. All containers of ethyl fluid or tetra-ethyl lead shall be labeled as to exact content and danger and shall conform to the regulations of the Interstate Commerce Commission. These containers shall be carefully tested for leaks and shall bear a plainly legible label stating that they are to be closed tight immediately when emptied, without cleansing, and sent back to the plant.
7. Kerosene or other material used for cleansing the used containers of ethyl fluid or tetra-ethyl lead shall be placed in the containers by means of a closed system with air vents to outside air and with adequate ventilation.
8. The filling shall be performed by means of a closed system with air vent from the container to the outside air, and with adequate ventilation.
9. A dye shall be added to ethyl fluid in sufficient amount to give staining qualities to the ethyl gasoline, to deter individuals from using it for cleansing or other similar purposes.

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10. Reports shall be made monthly to the appropriate officer of the state concerned covering the following points:

Number of workers employed at beginning of month.

Number of workers employed at close of month.

Number of new workers.

Number of workers separated from tetra-ethyl lead work on account of results of examinations.

Number of definite cases of poisoning.

Condition of cases of poisoning previously reported so far as known.

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SECTION 6.REPORTED INJURIES FROM ETHYL GASOLINE

Perhaps the most important evidence as regards the possible harmful effects of ethyl gasoline was obtained by inquiry in the regions where it had been longest used. This, however, is largely subjective, and therefore difficult or impossible to evaluate. City and State health authorities and labor leaders, who are in a position to know if the use of tetraethyl lead, which is now universally known to be very dangerous in its undiluted form, had caused any known serious results when diluted in gasoline in their respective jurisdictions, gave absolutely negative evidence as to any such harmfulness. It might easily happen that on account of labor turn-over and the disinclination of susceptible persons to remain at work where they were subject to a possible hazard of this sort, those who had been injured would not be found by an examination such as that detailed in the preceding sections of this report. Each employee examined was therefore questioned confidentially as to any rumors which he may have heard, or any knowledge or suspicion which he might have, regarding injuries or accidents from the use of ethyl gasoline.

It was fortunate that the workers examined appreciated the impartial nature of this inquiry and the confidential terms of the examination. Many stories were elicited of the very serious poisonings which occurred at the blending plant where lead tetraethyl was mixed with halogens to form concentrated ethyl fluid. This plant was located near Dayton, Ohio. This, of course, was not the information being sought, and the subject's attention was directed to the use of ethyl gasoline itself. From the

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