TF-5208

PLAINTIFF'S EXHIBIT

UC-5148

INDUSTRIAL HYGIENE REPORTS

DE 004942

UC 1-9-2

UNION CARBIDE INTERNAL CORRESPONDENCE

CHEMICALS AND PLASTICS

P O BOX 471 TEXAS CITY TEXAS 77590

TO (NAME)
COMPANY
LOCATION

DATE December 18, 1967

COPY TO See list.

SUBJECT Sandblasting

Gentlemen

Recent industrial hygiene studies of sandblasting operations at two of our Gulf Coast plants caused great concern for the health of the operators. Dust counts were determined within the breathing zone inside the abrasive-blasting hoods. Further study of the respirator equipment was conducted to explain the high dust counts found.

Silicosis is a disease characterized by nodular fibrosis of the tissue of the lungs. It is caused by breathing free-crystalline silica dust (SiO_2)--of which sand is almost 100%. The duration of exposure, size, composition and concentration of particles are factors related to the development of the disease.

A properly installed, properly worn and properly maintained air-supplied abrasive-blasting hood will offer complete protection from silicosis for the operator. The following recommendations are designed to provide clean, respirable and comfortable air with no more than one million particles of silica dust per cubic foot of air in the 0 3 to 5 micron size.

This matter should be given prompt consideration. If I can be of further help, please do not hesitate to contact me.

Very truly yours,

D. E. Deese

D. E. Deese
Industrial Hygienist
Gulf Coast Area

DED:bb
Attachments

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RECOMMENDATIONS FOR SANDBLASTING OPERATIONS

1. Respirators

   a. A supplied-air abrasive-blasting hood (Type CE) is essential respiratory protection for sandblast operators. Each operator should be assigned his own hood.

   b. Only a U. S. Bureau of Mines approved hood should be used for sandblasting work. Any unit not marked "B. M.", followed by the approval number, should not be accepted. (See the attached list of hoods that are approved.)

   c. The neck drawstrings should be kept snug. If the operator becomes aware of sand penetration inside the hood, a Dustfoe respirator should be used additionally for the remainder of the job. Corrective measures should be taken immediately.

   d. A rack or other device from which to suspend hoods should be provided at the sandblasting shed. The purpose is to prevent contamination of hoods with sand from the ground or shelving.

   e. At the end of each day, hoods should be cleaned with a vacuum device so that all accumulated sand may be removed. Defective parts should be replaced then. At least once a week hoods should be cleaned with soap and water.

   f. This type respirator is not to be used in atmospheres that are immediately dangerous to life or from which the wearer cannot escape without the aid of the respirator.

2. Air Hose

   a. Each hood requires a minimum air supply of 6 cu. ft. per minute to prevent dust from entering.

   b. It is a serious mistake to provide valves by which the wearer can adjust his air supply to less than this minimum safe amount. The air supply should be engineered to deliver into the hood the correct amount of air as measured by a suitable air-flow metering device. The flow should then be checked periodically to see that the flow does not fall below this minimum.

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d. The compressor air intake should be located in an area of clean air. This means upwind from the sandblasting area. High dust concentrations have been shown to exist many feet downwind. Compressor air-intake filters are designed to protect only the compressor and have very low efficiency in the microscopic range of respirable dust. Where portable compressors are used, the location of the compressor upwind in clean air should be the responsibility of one individual.

4. Air Conditioning

a. Heat stress is a very real problem on the Gulf Coast because of high temperature and humidity. A sandblasting hood adds to the problem by further limiting the rate of skin evaporation. Two methods are available to cool air for sandblast hoods: (1) the Vortex tube for high pressure systems (60 to 100 psi) and (2) the compressed refrigerant cycle unit such as has been devised for the Texas City plant. (See attached diagrams.)

5. Sandblast Shed Location

Discretion should be exercised in permanently locating sandblasting sheds. Since dust may be airborne some distance downwind, workmen and machinery in nearby areas may be exposed to adverse concentrations.

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TYPE CE ABRASIVE-BLASTING HELMETS, HOODS, OR MASKS

The type CE supplied-air respirator (abrasive-blasting helmet, hood, or mask) is approved for respiratory protection during abrasive blasting in atmospheres that are not immediately harmful or from which the wearer can escape without the aid of the respirator.

1. Pangborn type DD-4 blast helmet. Approval BM-1908, issued to Pangborn Corporation, Hagerstown, Maryland 21740, July 15, 1938, under schedule 19A

2. Sly "Purair" helmet. Approval BM-1911, issued to W. W. Sly Manufacturing Company, 4735 Train Avenue, Cleveland, Ohio 44102, July 16, 1938, under schedule 19A; and July 11, 1957, under schedule 19B.

3. Willson Nos. 31 and 33 abrasive-blasting helmets. Approval BM-1914, issued to Willson Products, Inc., Willson Products Division, P. O. Box 622, Reading, Pennsylvania 19603, March 10, 1939, under schedule 19A.

4. Pangborn type DF-2 blast helmet. Approval BM-1915, issued to Pangborn Corporation, March 23, 1939, under schedule 19A.

5. METCO air-line respirator. Extension of approval BM-1920, issued to Metallizing Engineering Company, Inc., 1101 Prospect Avenue, Westbury, New York 11590, December 8, 1948, under schedule 19A.

6. Willson No. 52 lightweight abrasive-blasting helmet. Approval BM-1923, issued to Willson Products, Inc., July 19, 1949, under schedule 19A.

7. M-S-A® "Blastfoe" abrasive helmets. Approval BM-1926, issued to Mine Safety Appliances Company, 201 North Braddock Avenue, Pittsburgh, Pennsylvania 15208, May 9, 1951, under schedule 19A.

8. Cesco Nos. 603-RH, 603-RS, and 603-RG abrasive blasting hoods. Approval BM-19B-35, issued to Chicago Eye Shield Company, (Cesco Safety Products, Inc.,) 2727 West Roscoe Street, Chicago, Illinois 66018, January 9, 1962, under schedule 19B.

9. M-S-A® "Flexi-Flo" abrasive masks with lightweight or heavyweight hoods. Approval BM-19B-38, issued to Mine Safety Appliances Company, May 7, 1962, under schedule 19B.

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Type CE Abrasive-Blasting Helmets, Hoods, or Masks - continued

10. M-S-A® "Hyperflo" abrasive masks with lightweight or heavyweight hoods Approval BM-19B-38A, issued to Mine Safety Appliances Company, June 14, 1962, under schedule 19B.

11. Bullard No. 37-V abrasive blasting helmet. Approval BM-19B-39, issued to E D. Bullard Company, 2680 Bridgeway, Sausalito, California 94965, April 24, 1962, under schedule 19B.

12. Bullard No. 37-LD lightweight abrasive blasting helmet. Approval BM-19B-40, issued to E. D Bullard Company, April 30, 1962, under schedule 19B.

13. M-S-A® "Flexi-Flo" abrasive mask. Approval BM-19B-41, issued to Mine Safety Appliances Company, March 5, 1964, under schedule 19B.

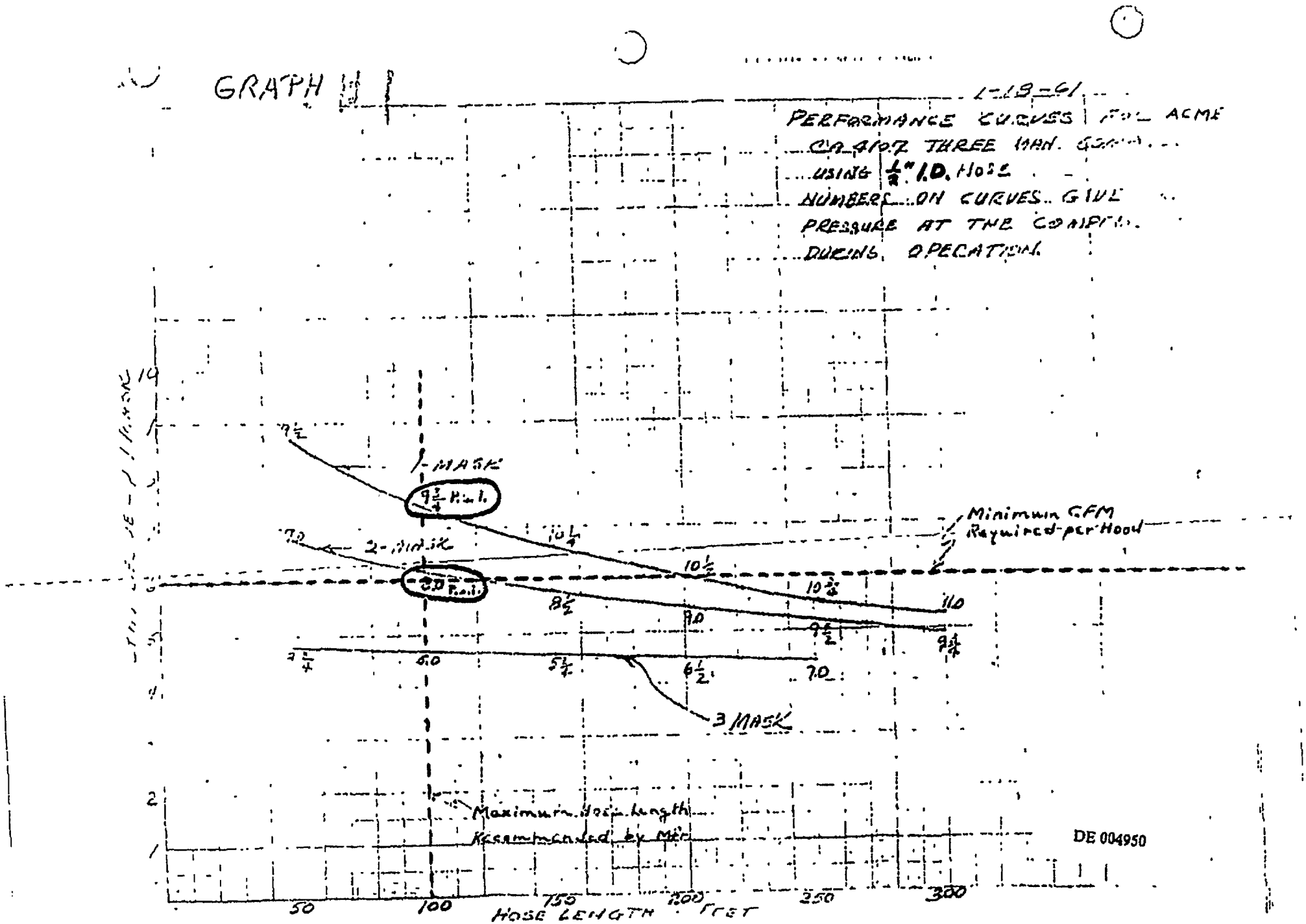
14. M-S-A® "Hyperflo" abrasive mask. Approval BM-19B-41A, issued to Mine Safety Appliances Company, March 5, 1964, under schedule 19B.

15. Pulmosan HA-99 hood. Approval BM-19B-44, issued to Pulmosan Safety Equipment Corporation, 644 Pacific Street, Brooklyn, New York 12217, January 20, 1965, under schedule 19B.

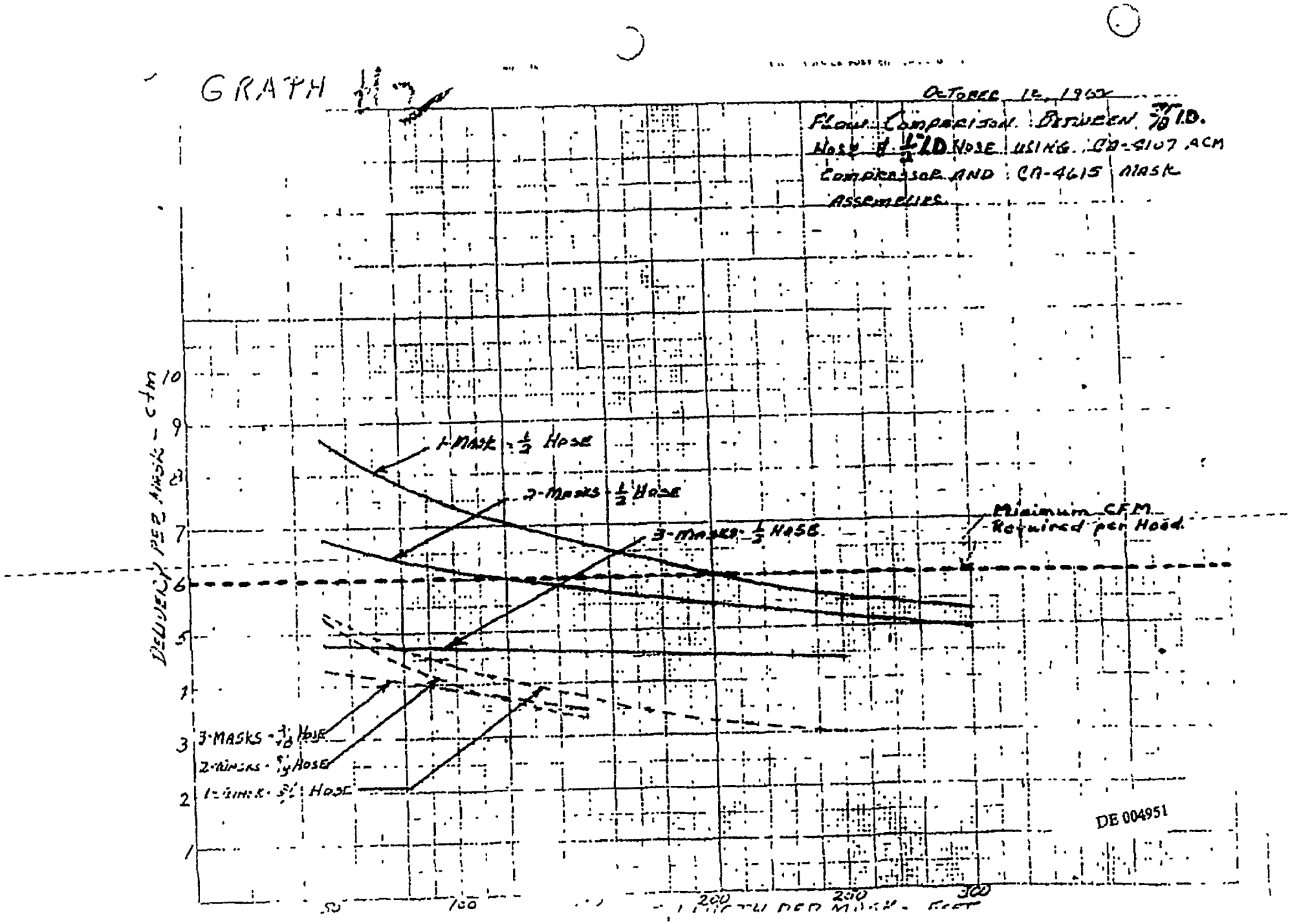
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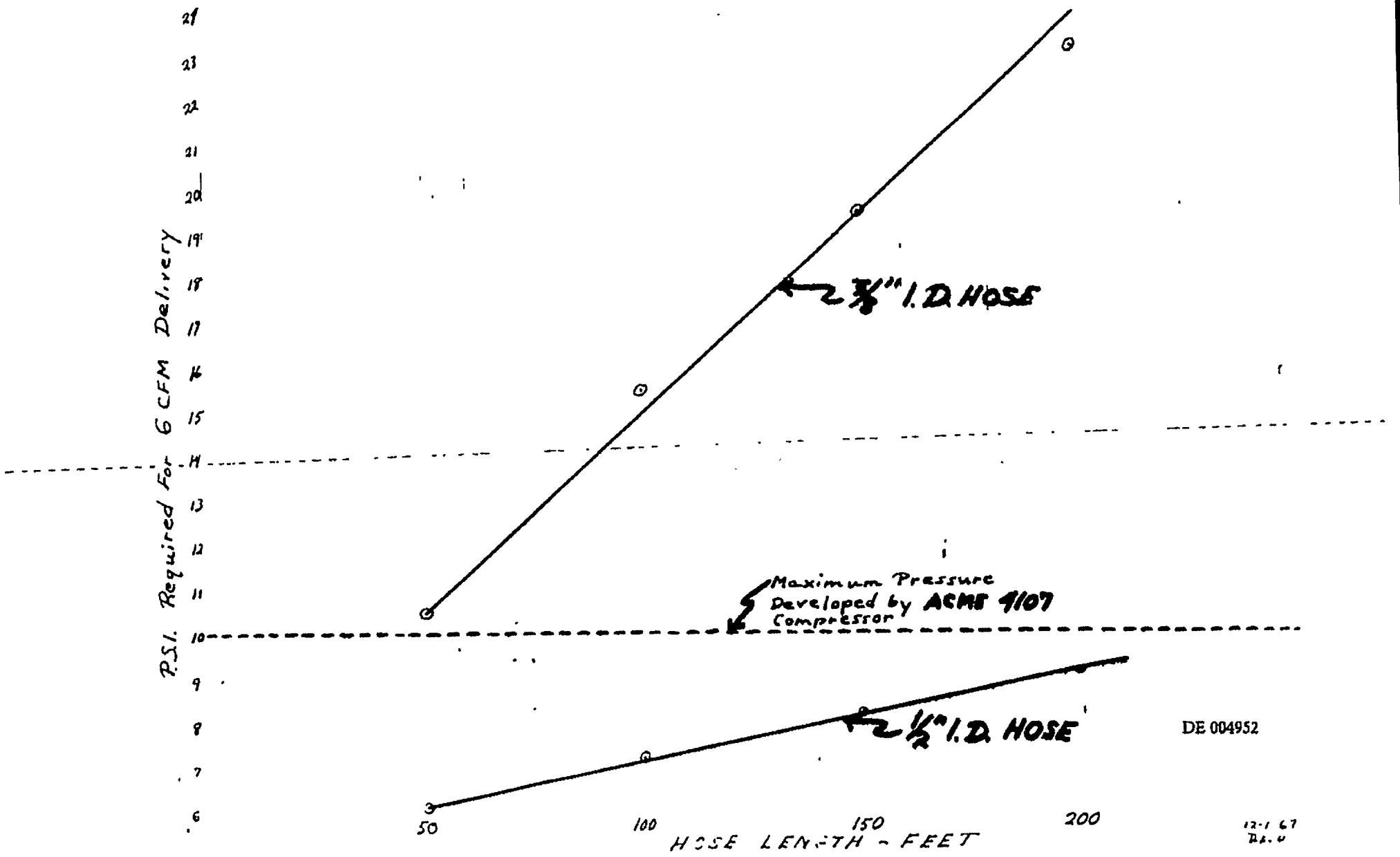
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GRAPH No. 3



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