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ENGINEERING DEPARTMENT

SPECIAL RE-REVIEW

FINAL DETERMINATION

Declassification Confirmed

By: *[Signature]*Re-Reviewed 2-2-82

Date

By:

Re-Reviewed

J. N. TILLEY

EXPLOSIVES DEPARTMENT - TNX

ATTENTION: W. R. HUEY

PROJECT 9536

METAL TURNINGS - FIRE HAZARD

August 27, 1943

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DECLASSIFIED
 CLASSIFICATION CANCELLED
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 DOC, May 1973
 By *[Signature]* 8-24-73

This letter acknowledges yours of July 31, 1943, and August 11, 1943, relative to methods of extinguishing fires of T-metal turnings and will summarize our findings and conclusions on this subject.

The turnings have proved to be highly inflammable and subject to spontaneous ignition. Several experiments have been conducted at Herring-Hall-Marvin Safe Company, Hamilton, Ohio, and Baker Brothers, Inc., Toledo, Ohio, and in addition there have been a number of accidental fires, of which at least three were spontaneous. Fires of quantities ranging from several pounds to several hundred pounds have been experienced and a number of extinguishers have been tried. Records of this work are available in our files. While the work to date does not constitute an exhaustive survey of the problem, we believe that it is now safe to outline precautionary and protective measures.

We draw the following conclusions from our experience and investigation:

1. T-metal turnings can be easily ignited by a hot chip or small burning object and may ignite spontaneously. Fire, once started, will spread rapidly through the turnings.

2. The rate of burning can be retarded but the fire not extinguished by cutting off air. This can be done by a tight cover to a tight drum or by powder type extinguishers. Of the powder type extinguishers tested, Pyrene G-1 was most effective. However, even with the G-1 powder, burning continued for some time under the powder blanket.

3. Water is effective in quenching a fire provided it is used in sufficient quantity to cool the mass of turnings.

more rapidly than additional heat is generated through reaction of the water. Small streams of water are not only completely ineffective but seriously augment the fire. If sufficient water is available to thoroughly flood the container, water is effective. However, if but limited quantities are available, water definitely should not be used on a fire of turnings.

4. Light (18 gauge) metal drums will burn through with a turnings fire inside and make the problem of controlling the fire considerably more difficult.

5. The most practicable method of minimizing the fire hazard would appear to be as follows:

- a. Turnings should be handled inside a machine shop in containers of 10 to 15 gallons capacity equipped with a tight cover. The cover should be kept on at all times except when actually filling the drum and care taken that hot chips do not get into the drum when the cover is removed. In case of fire in the shop the cover can be applied, Pyrene G-1 powder used, or the drum rapidly flooded with water.
- b. All storage and transfer of turnings from container to container should be outside of the shop building where a fire will cause least disturbance or damage. Storage should be in 14 gauge drums preferably of 30 to 55 gallon size. Drums should be spaced so that a fire in one container will not communicate to an adjacent one. In case of fire the container should be rapidly filled with water or the turnings thoroughly flooded with low pressure water.

CONSTRUCTION DIVISION

C. E. Daniels, District Supt.
War Construction

CED/ms

CC: R. M. Evans
C. H. Greenwalt
S. W. Pratt
H. T. Daniels
J. H. Shaw

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p
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