

# Lawrence Berkeley National Laboratory

## Recent Work

### Title

CONDITION OF COMMERCIAL HIGH-EFFICIENCY FILTERS UPON RECEIPT OR INSTALLATION

### Permalink

<https://escholarship.org/uc/item/9zg896rd>

### Author

Thaxter, Myron D.

### Publication Date

1959-07-01

UNIVERSITY OF  
CALIFORNIA  
*Ernest O. Lawrence*  
*Radiation*  
*Laboratory*

TWO-WEEK LOAN COPY

*This is a Library Circulating Copy  
which may be borrowed for two weeks.  
For a personal retention copy, call  
Tech. Info. Division, Ext. 5545*

BERKELEY, CALIFORNIA

## **DISCLAIMER**

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.

Non Std. Dist

UCRL-8862

**UNIVERSITY OF CALIFORNIA**

**Lawrence Radiation Laboratory  
Berkeley, California**

**Contract No. W-7405-eng-48**

**CONDITION OF COMMERCIAL HIGH-EFFICIENCY FILTERS  
UPON RECEIPT OR INSTALLATION**

**Myron D. Thaxter**

**July 1959**

**Printed for the U. S. Atomic Energy Commission**

**CONDITION OF COMMERCIAL HIGH-EFFICIENCY FILTERS  
UPON RECEIPT OR INSTALLATION**

**Myron D. Thaxter**

**Lawrence Radiation Laboratory  
University of California  
Berkeley, California**

**July 1959**

**ABSTRACT**

**AEC-type high-efficiency filters have recently been received with media breaks. A survey under AEC auspices at other sites shows that our experience is not unique.**

**Filter bypassing may also be due to other factors such as gasket failures or installation errors.**

## CONDITION OF COMMERCIAL HIGH-EFFICIENCY FILTERS UPON RECEIPT OR INSTALLATION

Myron D. Thaxter

Lawrence Radiation Laboratory  
University of California  
Berkeley, California

July 1959

The quality of fabrication of commercial filters has come under study at Lawrence Radiation Laboratory, Berkeley, within the past year. One shipment was inspected visually; media rips necessitated 100% rejection. Two subsequent replacement shipments from the same supplier were 100% and 80% rejected, respectively. Similar rejections were noted at the Livermore site. Some of the defects observed are shown in Figs. 1 through 4.

Several features make it difficult to evaluate filters visually:

- (a) less than 10% of the media of these filters is visible;
- (b) some of the high-efficiency filters now being offered are assembled in such a manner that visual examination is impossible;
- (c) even if all the media could be inspected by eye, the efficiency specification of 99.96% is far more rigorous than can be perceived by eye.

These observations, though distressing, would not in the larger view be serious were they the troubles of but one user. The problem, however, was brought to the attention of the AEC, which conducted a survey of several other contractors (reported by another speaker), and in general it was found that the experience at Lawrence Radiation Laboratory is not unique. This problem, then, warrants further consideration.

Even if proper DOP testing equipment and personnel were available at users' sites we should not forget that testing upon receipt is expensive and an unwarranted duplication of the manufacturer's test procedure.

Furthermore, acceptability tests on receipt do not assure the performance for which such filters are purchased--to wit, as installed in the duct system. It has been shown that inattention to details in fabrication and inspection of filterbank hardware, in assembly bolt pressures, and in other such minutiae can result in actual leakage around the filter and consequent pollution downstream. One weak item is the multipieced gasket on the filter face, frequently a butt-joint layup of low integrity.

A possible factor in as-installed performance--one which has not yet been evaluated--is the skill and care employed in installation. There is the possibility of substantial differences, at various laboratories, in the abilities of contractors' employees and in the local conditions of accessibility, radiation exposure, need for protective clothing, and dexterity required.

No solution is proposed here. Our purpose has been to state a real problem and invite further study leading to possible solutions. Meanwhile we had better sample our off-gas stacks continuously and carefully.

LEGENDS

- Fig. 1. Commercial high-efficiency filter with glass media and kraft separators, showing transverse media break.
- Fig. 2. Commercial high-efficiency filter with glass media and aluminum separators, showing pleat-edge media break.
- Fig. 3. Commercial high-efficiency filter with glass paper media and asbestos separators, showing transverse media breaks.
- Fig. 4. Commercial high-efficiency filter with glass paper media and kraft separators, showing damage on receipt (external shipping carton undamaged).



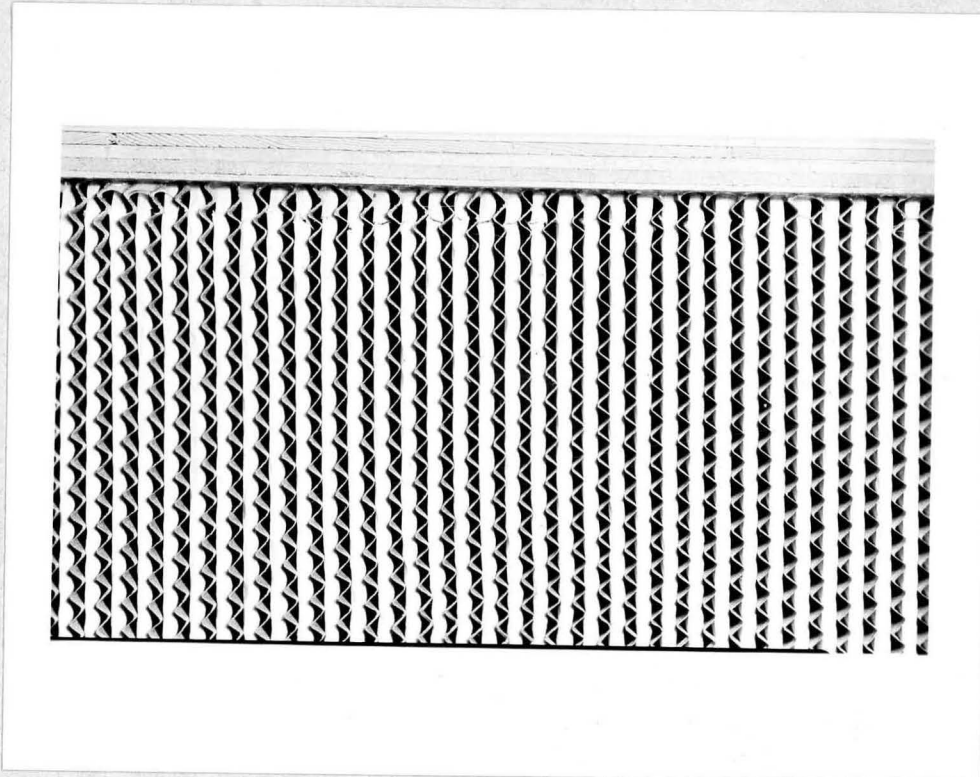


Fig. -1

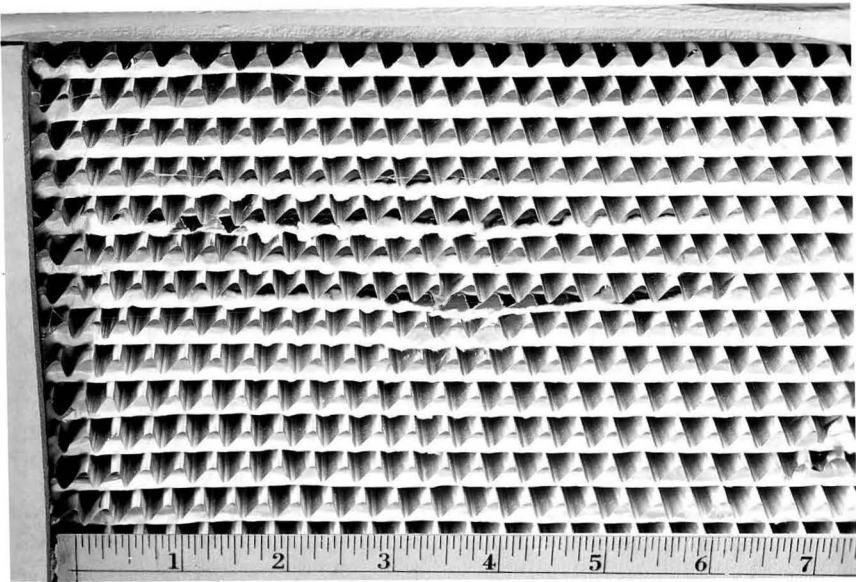


Fig. 2

25% COTTON FIBER  
FLOWER BOND

*Comparison*

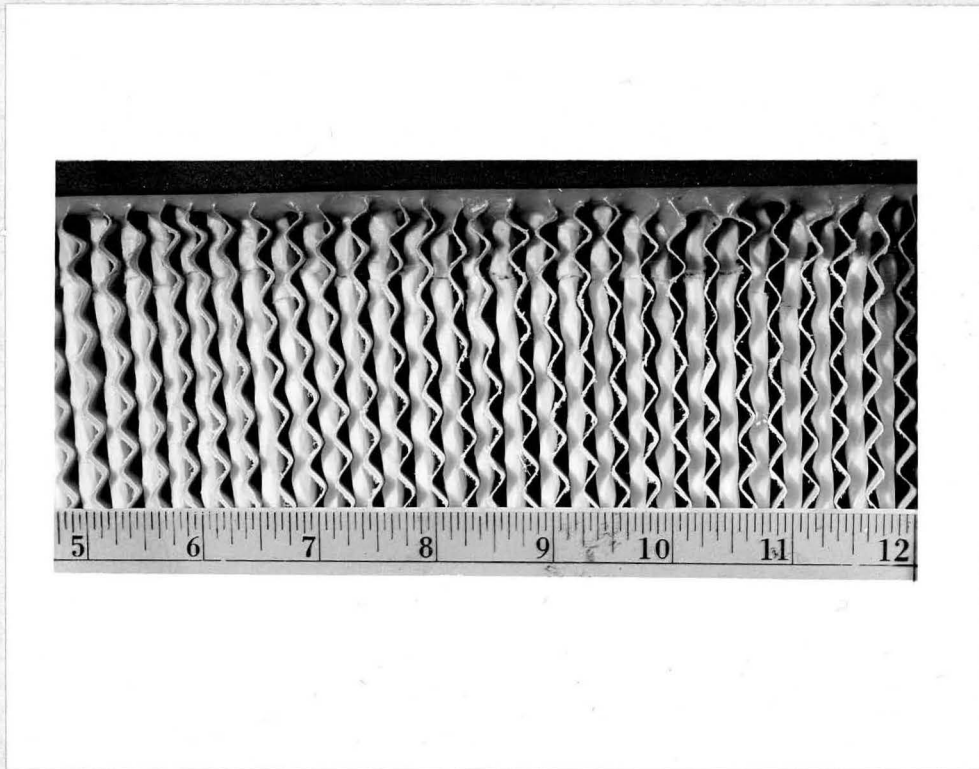


Fig. 3

75% COTTON FIBER  
DIPYER BOND

*Forming*

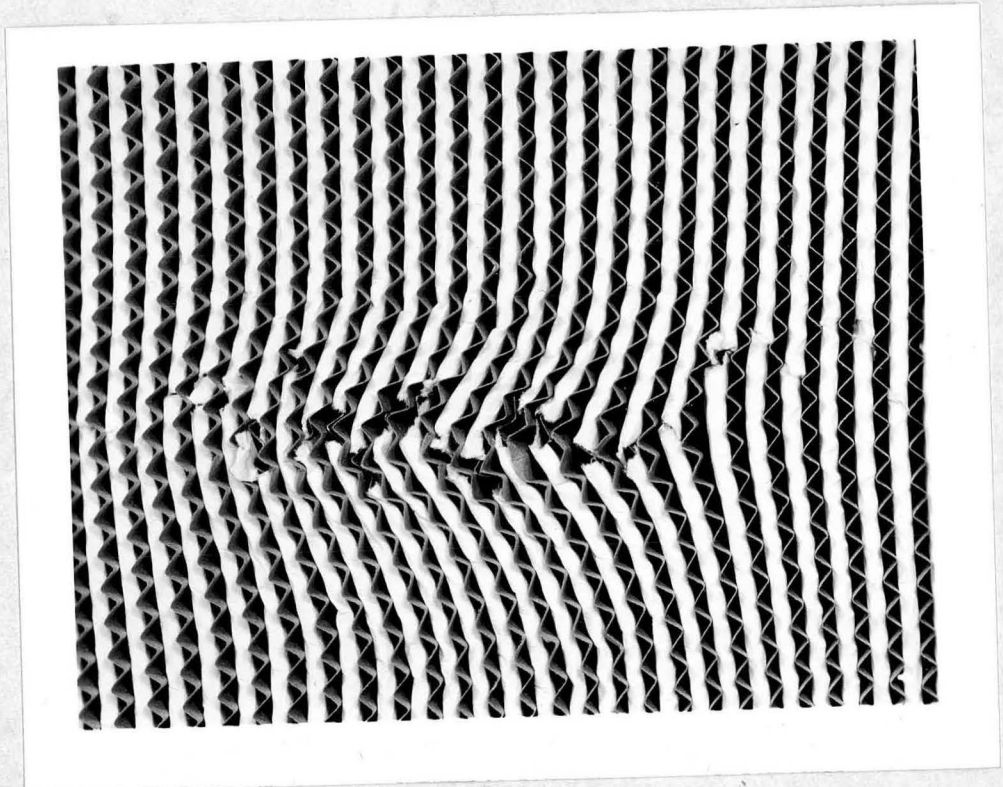


Fig. 4

