

SMOKE ABSORBERS - NOTES & COMMENTS

HEPA FILTER TESTS.

The HEPA filters¹ supplied by EcoAir² for the HJ3080 and HJ3100 are individually tested to meet the required efficiency of 99.97% (HJ3080) and 98% (HJ3100) on 0.3 μ D. O. P. particles³.

The efficiency test meets the requirements of MIL-STD-282. The smoke challenge is D. O. P. (dioctyl phthalate), a plasticiser oil normally used in PVC plastic to provide flexibility.

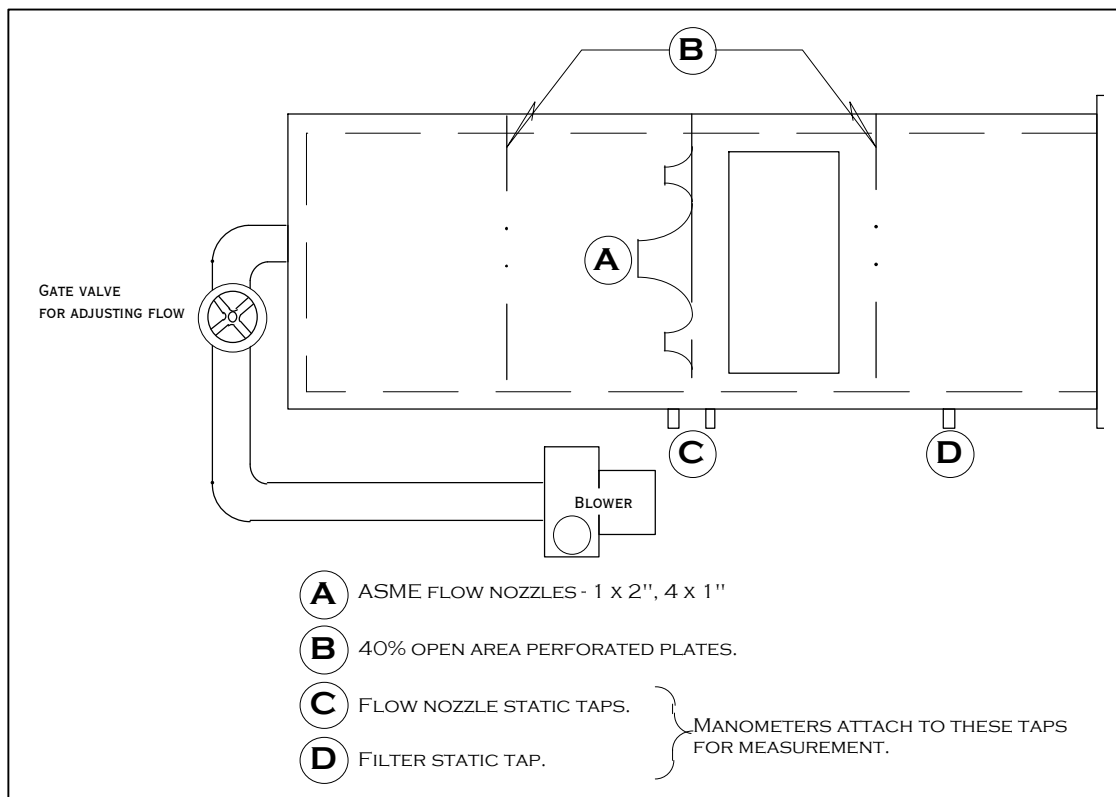
A special test apparatus is used to comply with MIL-STD-282, usually a Q-107 which can test up to approximately 1500 cfm.

The air entering the filter usually has 80-100 mg./litre of D. O. P. as the challenge.

The downstream air, after passing through the filter, is sampled by an aerosol photometer, which detects the percentage of the inlet concentration vs. the outlet penetration.

AIRFLOW AND EFFICIENCY.

American Hakko caused to be made, and purchased, a piece of test-equipment to evaluate the efficiency of blower configurations, filters, filter combinations, and other aspects of fume extractor design. This Infernal Machine, illustrated below, operates on this simple principle:



The equipment being tested draws air from the outside world and passes it through its ingestion and filtering mechanism to a plenum chamber. A blower within the machine extracts air from the plenum; valves control the flow of air through this blower so that the amount of air entering the chamber is exactly balanced by the flow of air

¹ HEPA STANDS FOR 'HIGH EFFICIENCY PARTICULATE AIR' - ANY OTHER TRANSLATION OF THIS ACRONYM IS A GOOD, HONEST LIE.

² SINCE SUPERSEDED BY MEISSNER INDUSTRIES. ECOAIR STILL EXISTS, BUT NO LONGER SUPPLIES FILTERS TO HAKKO.

³ REFER TO NOTE ON FILTER TESTING CRITERIA FOR AN EXPLANATION OF DOP.

leaving it. The pressure drop across the test equipment blower is measured using a set of selectable manometers. To date only the HJ3100 has been evaluated. Test results follow:

AIR FLOW MEASUREMENTS - HJ3100

TABLE I.

FILTER	IN. H ₂ O	CFM
NONE	2.4	235
HEPA ONLY	1.92	150
HEPA/PREFILTER	1.23	120
CARBON	1.60	196
DUST	1.85	207
EMPTY PLENUM	1.85	207

ABOVE DATA TAKEN WITH FOUR PORT COVER, 999-173.

TABLE II.

FILTER	IN. H ₂ O	CFM
NONE	1.8	203
HEPA ONLY	.855	140
HEPA/PREFILTER	1.03	110
CARBON	1.30	175
DUST	1.45	182
EMPTY PLENUM	1.23	168

ABOVE DATA TAKEN WITH TWO PORT COVER, 999-172.

Tests were conducted as follows: The HJ3100 was attached to the test fixture, configured as shown in Tables I and II, and turned on. Air-flow through the test fixture was regulated, using the check valve, until the system and HJ air-flows cancelled. Data were then recorded from the manometers; pressure drop to flow is determined from a calibration chart.