ATI TEST LABORATORY
ISO 9001, NQA-1, & DOE CERTIFIED

Filter Test Facility Report On The Testing of HEPA Filters for the DOE

Nuclear Air Cleaning Conference *August 2008*

Air Techniques International Test Laboratory
1708 Whitehead Rd., Baltimore, MD 21207

Air Techniques International Test Laboratory Overview

- Air Techniques International established an independent Filter Test Laboratory in Baltimore, Maryland
- DOE performs a ASME/ANSI NQA-1 Quality Audit
- DOE issued contract to ATI Filter Test Laboratory (ATITL) to perform tasks of the former DOE Filter Test Facility
- Secretary of Energy Memo, June 4, 2001, the Filter Test Lab is to be utilized by DOE Site Contractors
- Testing service is provided to the DOE complex
- DOE work has top priority

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Rejection Categories

Resistance: Criteria of ≤ 1.0 " w.g. for filters rated ≥ 500-1250 cfm and 1.3" w.g. for filters rated ≤125 - ≥2000 cfm

Penetration: ≤0.03%

Manufacturing Defects:

- Filter Frame/Case Defective
- Gaskets
- Faceguard installation
- Filter pack installation
- Defective media
- Sealant problems
- Separators
- Missing rivets or bolts
- Dimensional tolerance
- Out of square measurements

Rejection Categories

P.O/ Specification Discrepancy:

- Missing UL labels
- Labeled incorrectly
- Filters rated incorrectly
- Wrong model number
- Packaging

Shipping Damage:

- (Inspect Damage to Shipping Crates, Pallets & Filter Cartons)
- Reject Filter when Damaged

Summary Of Filter Rejections

Fiscal Year (Oct 1 – Sept. 30)	Number Tested	Number Rejected	Percentage Rejected
2000	3,597	354	9.8%
2001	2,722	217	8.0%
2002	2,127	102	4.8%
2003	2,772	151	5.4%
2004	3,441	215	6.3%
2005*	2,331	168	7.2%
2006	2044	213	10.4%
2007	2472	485	19.6%
2008**	1554**	184**	11.8%**

- *Test facility closed 5 months for relocation and audit
- **Partial Year

Summary Of Filter Rejections

Fiscal Year (Oct 1 – Sept. 30)	Resistance	Penetration	Mfg. Defects	P.O./Spec Discrepancy	Shipping Damage	Total
2000	0	43	36	270	5	354
2001	0	30	174	9	4	217
2002	0	20	42	32	8	102
2003	0	26	93	27	5	151
2004	3	36	86	86	4	215
2005*	8	19	56	81	2	166
2006	0	47	81	84	1	213
2007	6	27	238	214	0	485
2008**	0	38	92	54	0	184

- *Test facility closed 5 months for relocation and audit
- **Partial Year

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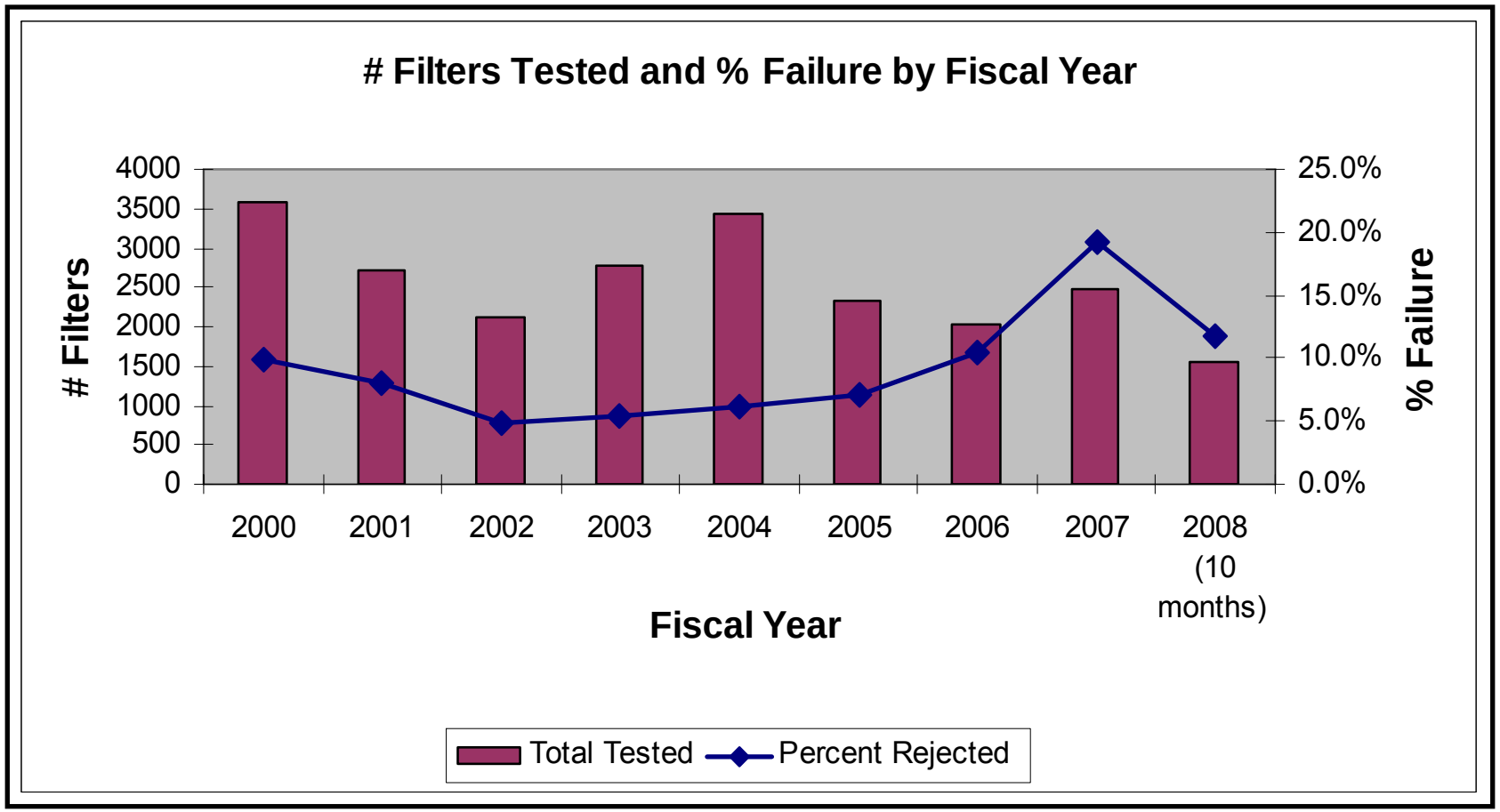
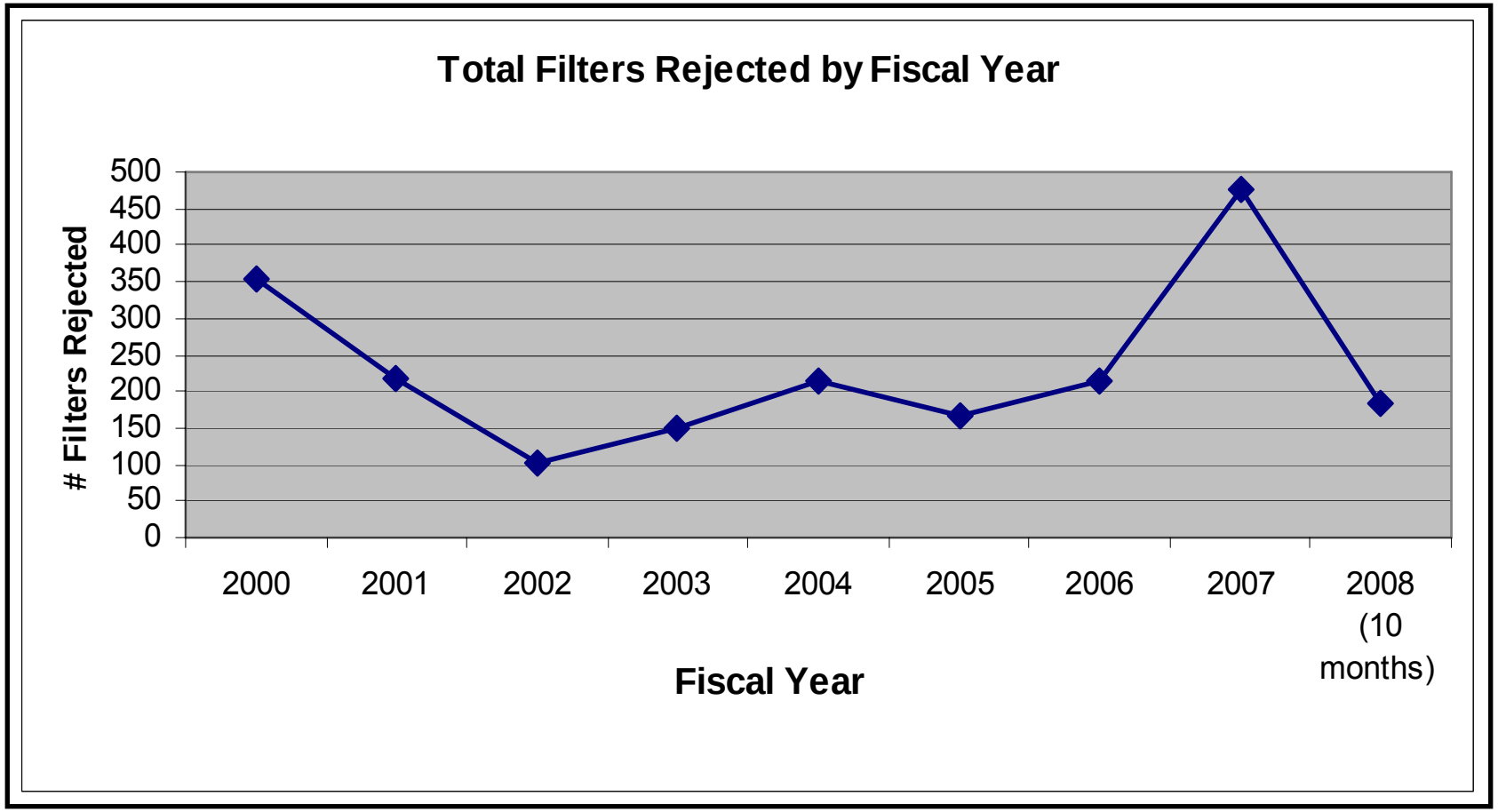
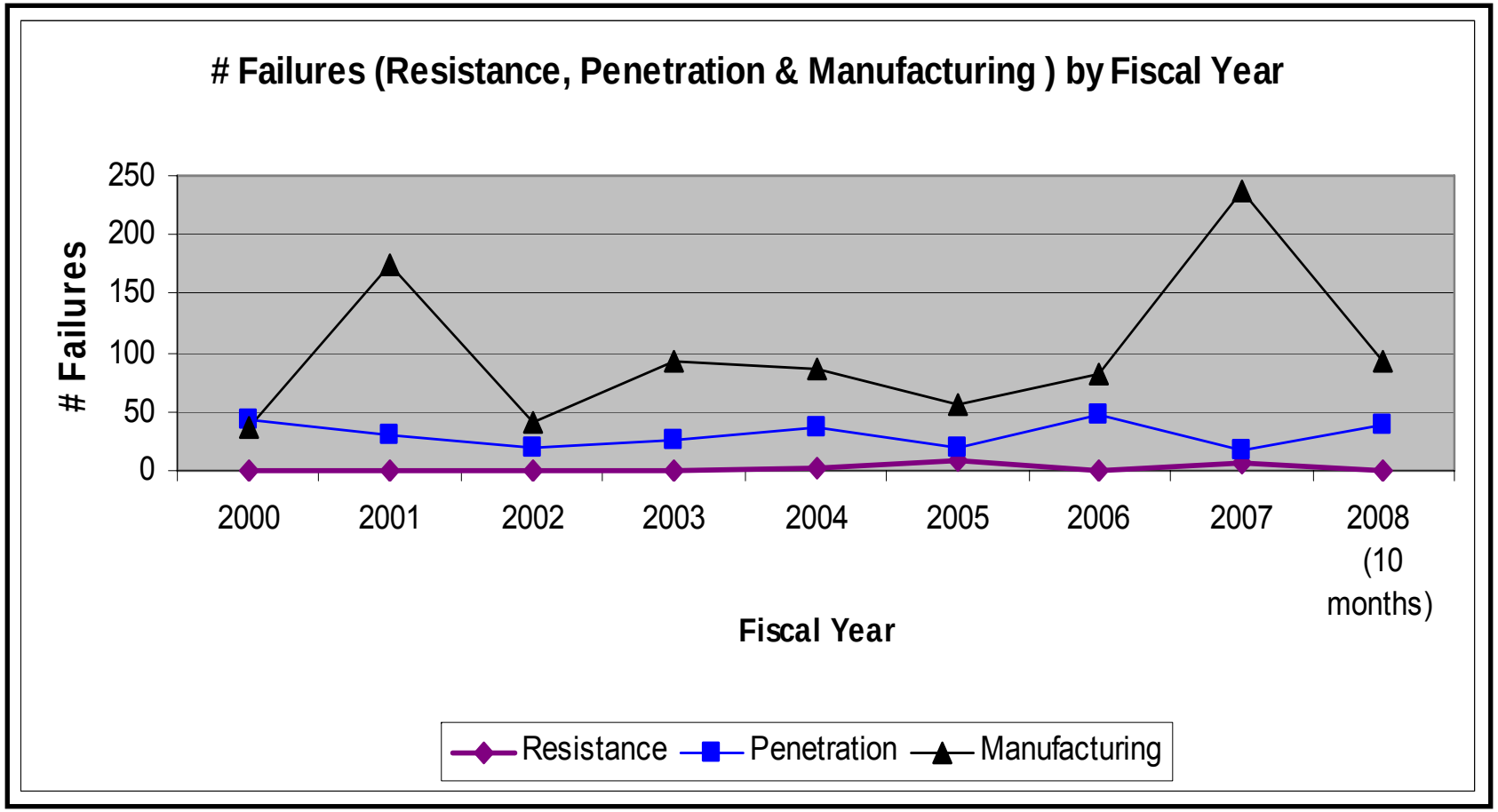
HEPA FILTERS TESTED / REJECTED



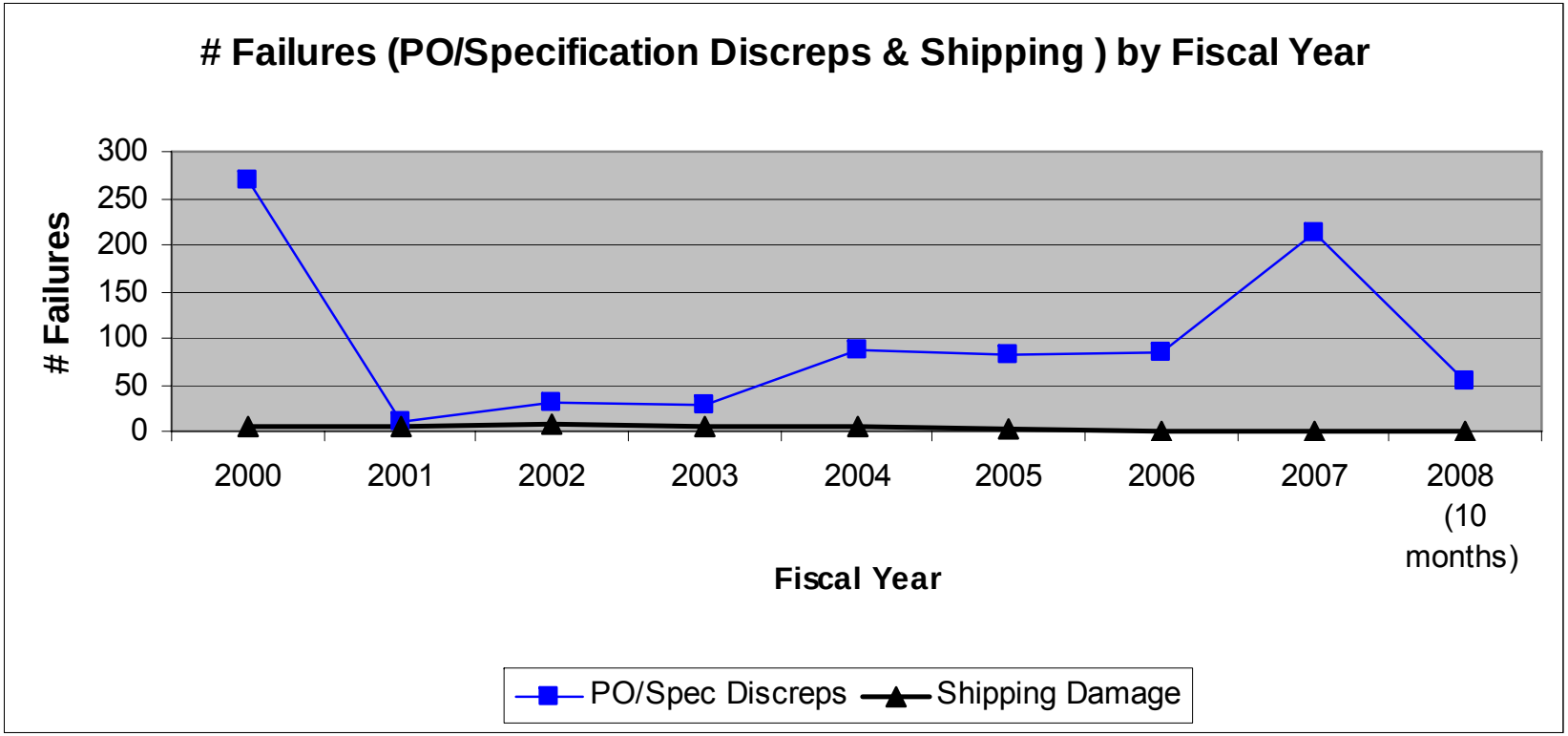
HEPA FILTER REJECTION BY NUMBER



HEPA FAILURES BY TYPE



HEPA FAILURES BY TYPE



ATI FILTER TEST FACILITY OPERATIONS

ATITL Quality Program Plan

1.0 POLICY

2.0 SCOPE

3.0 REFERENCES

4.0 DEFINITIONS

5.0 ORGANIZATION

- 5.1 Structure
- 5.2 Functional Responsibilities

6.0 QUALITY ASSURANCE REQUIREMENT

7.0 DESIGN CONTROL

8.0 PROCUREMENT CONTROL

9.0 INSPECTION & TEST

10.0 DOCUMENT CONTROL

ATITL Quality Program Plan

11.0 CONTROL OF PURCHASED ITEMS AND SERVICES

12.0 IDENTIFICATION AND CONTROL OF ITEMS

13.0 CONTROL OF PROCESSES

14.0 PERSONNEL TRAINING, QUALIFICATION AND CERTIFICATION

15.0 CONTROL OF MEASURING AND TEST EQUIPMENT

16.0 HANDLING, STORAGE AND SHIPPING

17.0 INSPECTION, TEST AND OPERATING STATUS

18.0 CONTROL OF NONCONFORMING ITEMS

19.0 CORRECTIVE ACTIONS

20.0 QUALITY ASSURANCE RECORDS

21.0 QUALITY ASSURANCE AUDITS

APPENDICES

Figures – Organization Chart

RECOMMENDED SHIPPING CRATE

NOT RECOMMENDED FILTER SHIPPING METHODS

UNLOADING FILTER BOXES

INSPECTION CHECK LIST

AIR TECHNIQUES INTERNATIONAL TESTING LABORATORY
— FILTER VISUAL INSPECTION CHECK LIST —

Customer: P.O.#: Date:

Specific Reference for Acceptance Criteria: _____

RECEIVING INSPECTION

	Satisfactory	Unsatisfactory	N/A
Number of Filters IAW Shipping Papers	☐	☐	☐
Filters Received Upright (pleats vertical)	☐	☐	☐
Cartons/Filters Undamaged	☐	☐	☐
Crates/Pallets Undamaged	☐	☐	☐

Characteristics As Specified In Customer Purchase Order or Specifications:

		Satisfactory	Unsatisfactory	N/A
Number of Filters		☐	☐	☐
Frame Material		☐	☐	☐
Frame Construction		☐	☐	☐
Gaskets:	**Type**	☐	☐	☐
	Location/Size	☐	☐	☐
	Construction	☐	☐	☐
Capacity ----------	----------	☐	☐	☐
UL-586 Label		☐	☐	☐
Faceguards		☐	☐	☐
Separators ----------	----------	☐	☐	☐
Required Labels/Marking/Identification		☐	☐	☐
Exposed Edges of Frame Sealed		☐	☐	☐
Frame Edges/Faces Free of Splinters/Rough	**Edges**----------	☐	☐	☐
Gaskets Secure and Undamaged		☐	☐	☐
Fluid Seal Gasket Undamaged		☐	☐	☐
No Damage to Filter Media ----------	----------	☐	☐	☐
Filter Dimensions		☐	☐	☐
Squareness of Frame		☐	☐	☐
Hidden Shipping Damage ----------	----------	☐	☐	☐
Filter Pack Tightness		☐	☐	☐
Filter Workmanship		☐	☐	☐
Other:		☐	☐	☐

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DAMAGED BOX & FILTER

INSPECTION

CASE SQUARE INSPECTION

PENTRATION / RESISTANCE TEST

ATI – Air Techniques International
TEST LABORATORY
FILTER TEST REPORT

PAGE 1 OF 1

CUSTOMER		**TEST CRITERIA**		NUMBER ORDERED	DATE RECEIVED
PURCHASE ORDER NO.		DOP PENETRATION .03 % @ RATED FLOW	.03 % @20% RATED FLOW	NUMBER RECEIVED	DATE TESTED
FILTER MODEL NUMBER		RESISTANCE IN., W.G. @ 100 % RATED FLOW		NUMBER ACCEPTED	DATE SHIPPED
MANUFACTURER		SPECIFICATION DOE STD 3020		**REJECTS**	
FILTER DESCIPTION		**TEST CONDITIONS**		PENETRATION	RESISTANCE
P.O. Approved By: DWC/JKF	RATED FLOW (ACFM)	TEMPERATURE ° F	TEST FLOW (ACFM)	DAMAGE	OTHER
		BAROMETRIC PRESS mm HG.	Humidity in % RH		

ITEM No.	FILTER SERIAL NUMBER	INSPECTION RESULTS	TEST RESULTS		
			RESISTANCE	% PENETRATION 100%	% PENETRATION 20 %
1		Accept			
2		"			
3		"			
4		"			
5		"			

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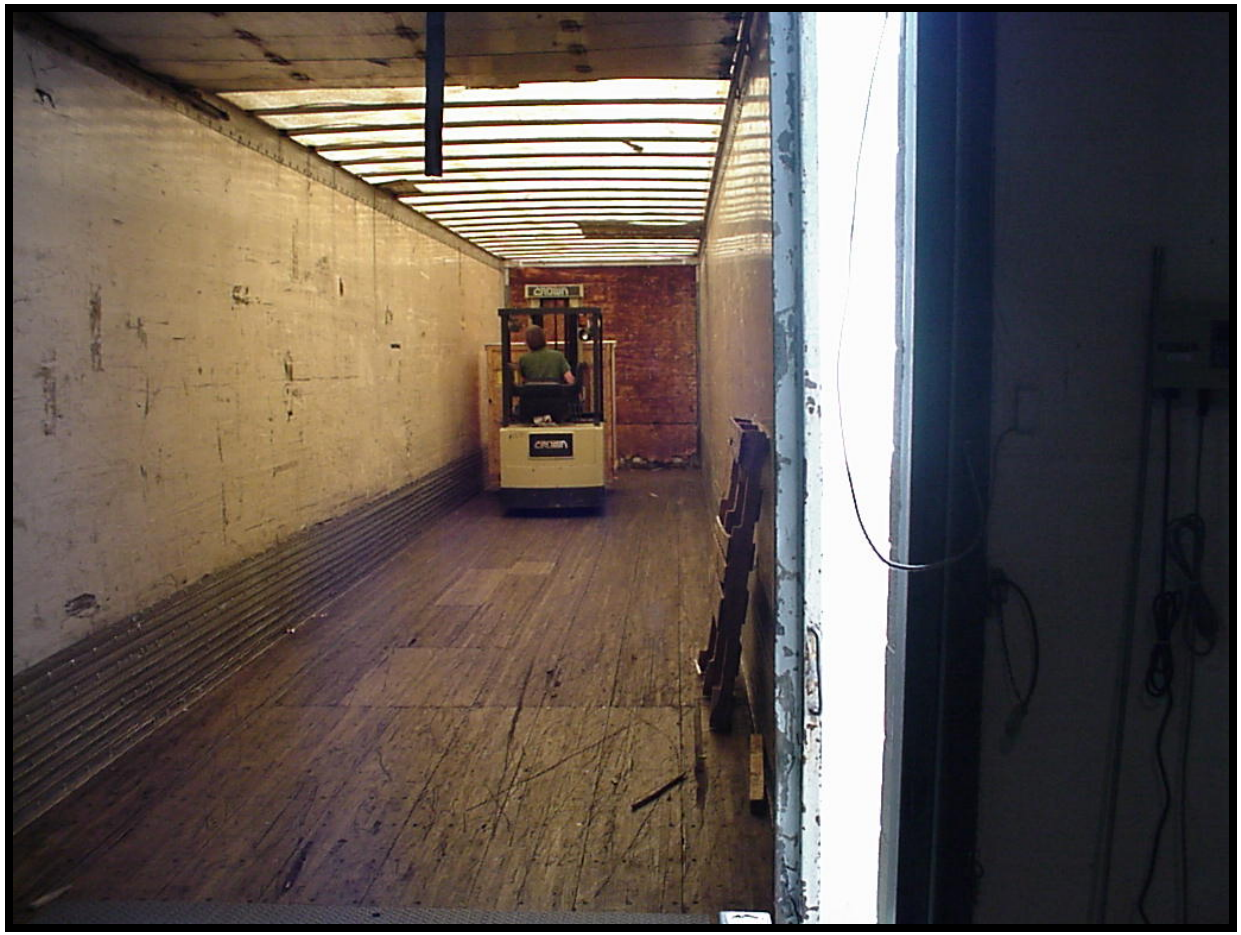
FILTER TEST

TEST LABEL - REPACKING

RE-BOX FILTER

RE-PACK FILTERS IN CRATE

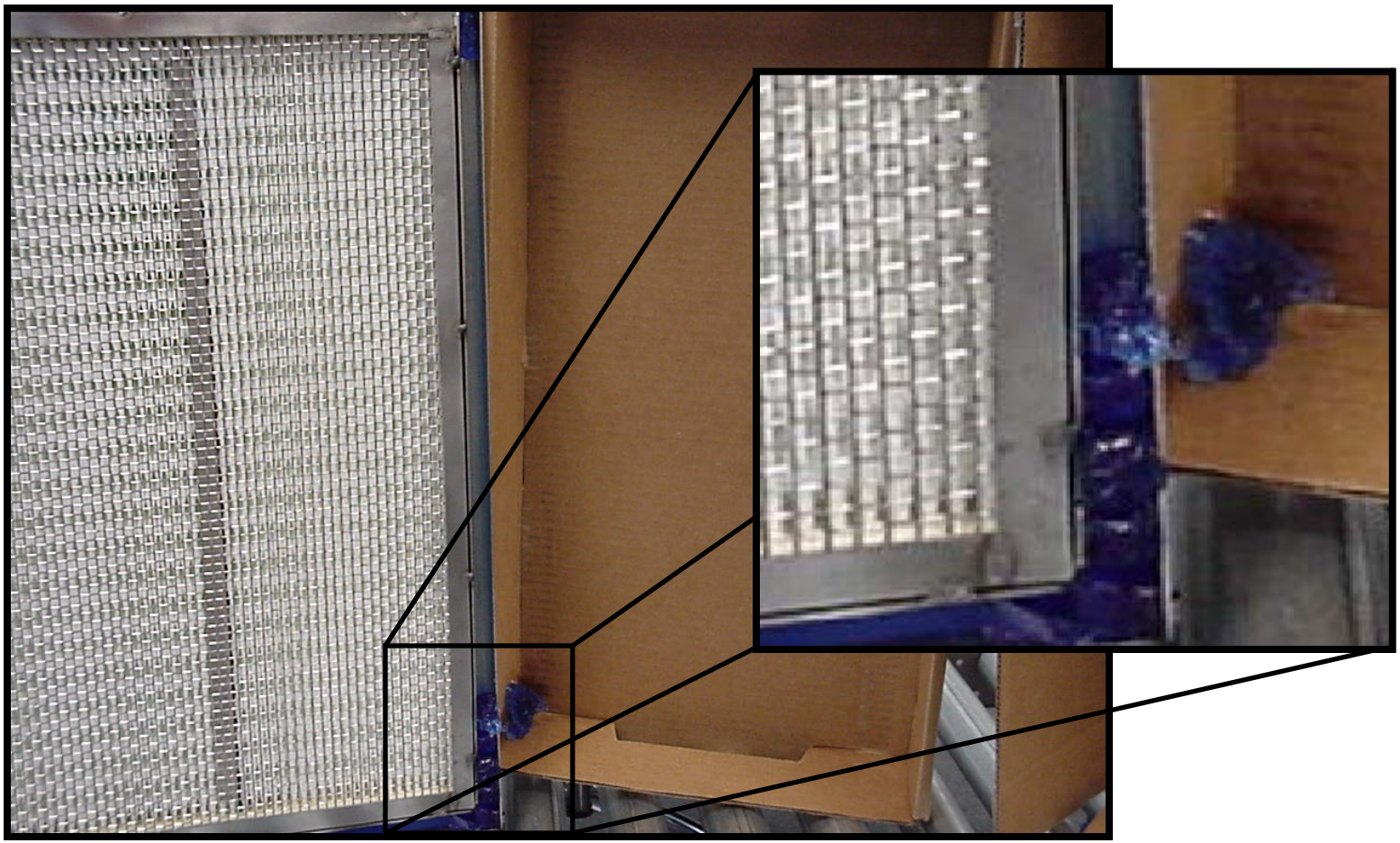
SHIPPING



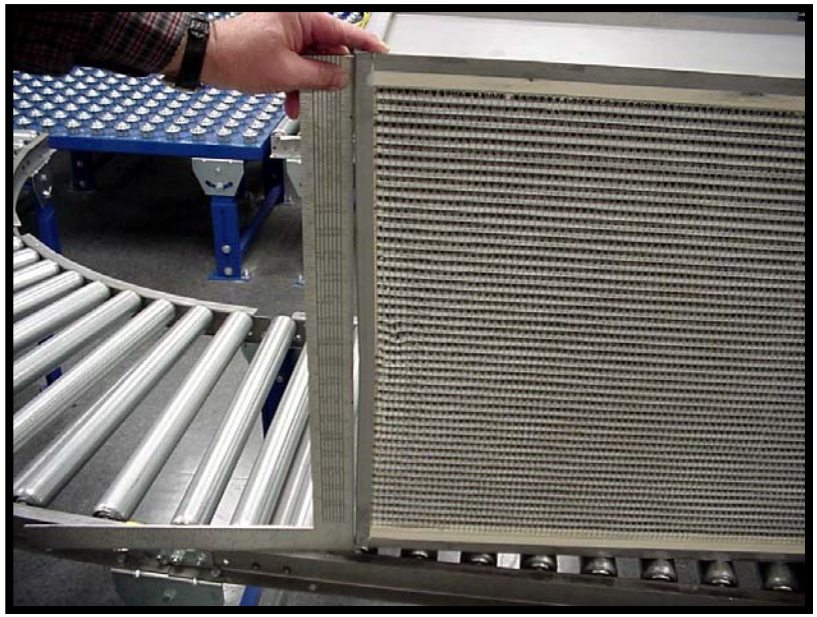
REJECT EXAMPLES

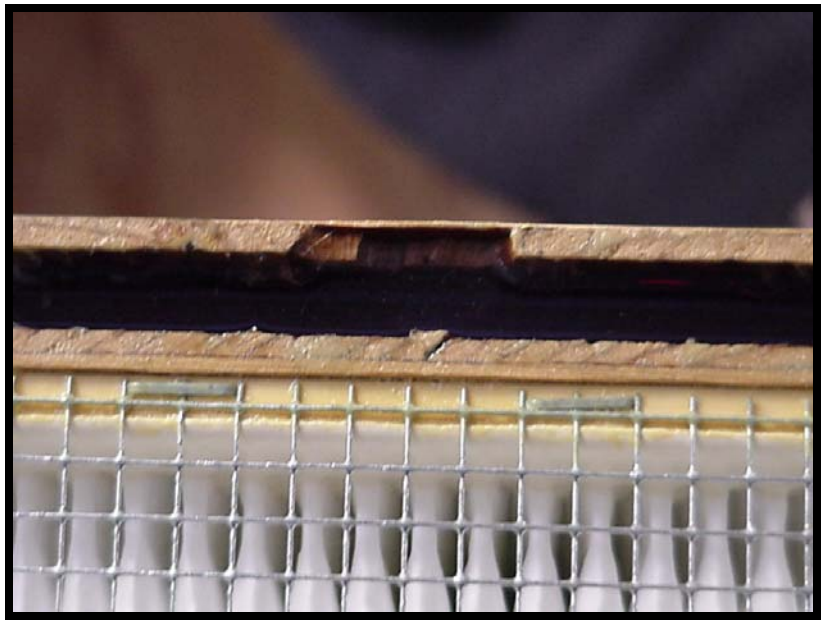
GASKET - REJECT

FLUID SEAL - REJECT

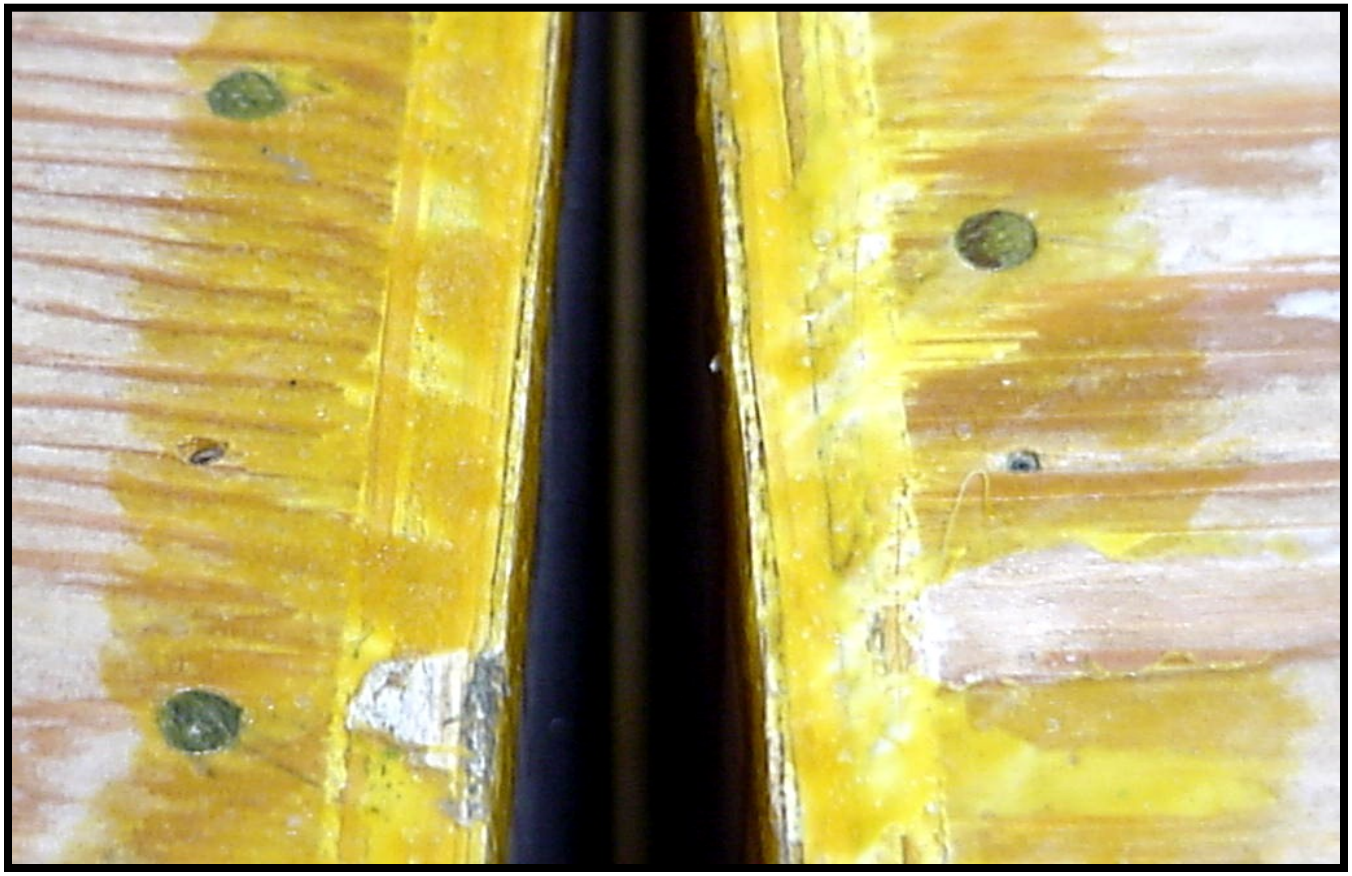


CASE - REJECT

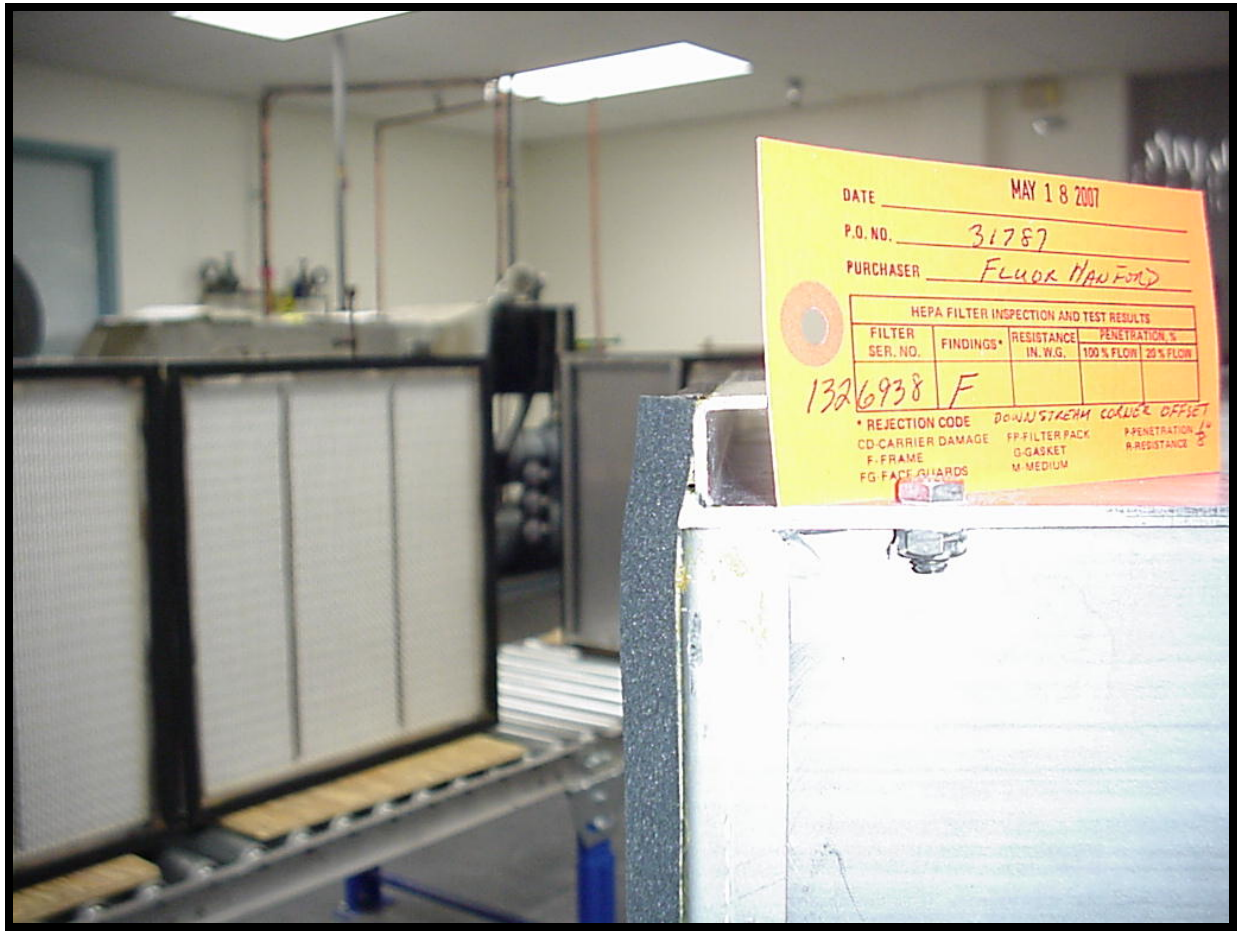




FILTER CASE - REJECT



FILTER CASE - REJECT



Summary

- ALL MANUFACTURERS' FILTER QUALITY HAS VARIED DURING LAST NINE YEARS AS SHOWN BY THE FILTER TEST FACILITY (FTF) REPORTS
- A NEED FOR SPECIFICATION CONSISTENCY
  (Reference To ASME AG-1 &/or DOE-STD-3020-2005)
- A NEED FOR MANUFACTURERS' TO TIGHTEN QUALITY CONTROL
- A NEED FOR QUALITY CONTROL INSPECTIONS OF MANUFACTURERS IN ADDITION TO AUDITS

Any Questions?

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