



FINAL REPORT

DETERMINATION OF INHALATION AND EXHALATION RESISTANCE
FOR AIR-PURIFYING RESPIRATORS

PROCEDURE NO. STP0145 REV 02

LABORATORY NO. 489206

PREPARED FOR:

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DETERMINATION OF INHALATION AND EXHALATION RESISTANCE
FOR AIR-PURIFYING RESPIRATORS

LABORATORY NUMBER:	489206
PROCEDURE NUMBER:	STP0145 REV 02
SAMPLE SOURCE:	Global Safety First, LLC
SAMPLE IDENTIFICATION:	Refer to Table 1 P.O. #NL 081709
DEVIATIONS:	None
SAMPLE RECEIVED DATE:	19 Aug 2009
LAB PHASE START DATE:	31 Aug 2009
LAB PHASE COMPLETION DATE:	07 Sep 2009
REPORT ISSUE DATE:	08 Sep 2009

INTRODUCTION:

This report details the results of a differential pressure study in accordance with 42 CFR Part 84.180. The air exchange differential or breathability of respirators was measured for inhalation resistance using NIOSH procedure RCT-APR-STP-0007 and exhalation resistance with NIOSH procedure RCT-APR-STP-0003. The differential pressure technique is a simple application of a basic physical principle employing a water manometer differential upstream and downstream of the test material, at a constant flowrate. There are two primary ways to measure porosity of materials: #1- fix the differential and measure the flow (Frasier) and #2- fix the flow and measure the differential.

ACCEPTANCE CRITERIA:

The resistance measurement for the reference plate must be within ± 3 standard deviations of the mean established in the control chart.

FILTER TESTER SET-UP PROCEDURE:

A complete respirator was mounted to the sponsor provided test plate. The test fixture was assembled into a sample holder by placing a Plexiglas collar around the test fixture and adding another metal disk, with a 3.5 inch opening in the center, as a top plate. The sample holder is held tightly together with clamps and connected to an air source. The manometer is attached to the sample holder by a connection port on the Plexiglas collar.

Global Safety First, LLC
Lab Number 489206

Determination of Inhalation and Exhalation Resistance
For Air-Purifying Respirators

Resistance measurements were taken with a manometer capable of measuring at least 6 inches of water. For inhalation testing a negative airflow (vacuum) was applied and for exhalation a positive airflow (compressed air) was used. Airflow was passed through the sample holder at approximately 85 ± 2 L/min.

Before testing, the manometer was zeroed and the back pressure in the sample holder checked and verified to be negligible. A reference plate was inserted into the sample holder in place of the test fixture and a resistance reading taken. The reference plate consists of a metal plate with pre-drilled holes; this plate provides a consistent, unchanging, reference standard. The reference plate was checked before and after each day of testing, and in the direction of airflow for inhalation and exhalation.

RESULTS:


The inhalation resistance criteria as stated in the 42 CFR Part 84.180 is an initial inhalation not exceeding 35 mm water column height pressure. The samples submitted by the sponsor conform to this NIOSH criterion for airflow resistance.

The exhalation resistance criteria as stated in the 42 CFR Part 84.180 is an initial exhalation not exceeding 25 mm water column height pressure. The samples submitted by the sponsor conform to this NIOSH criterion for airflow resistance.

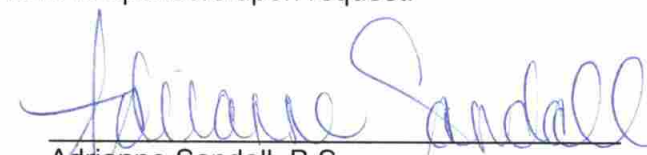
Testing met the acceptance criteria previously stated in this report. The results for the inhalation and exhalation resistance study are summarized in Table 1.

STATEMENT OF UNCERTAINTY:

If applicable, the statement of uncertainty is available to sponsors upon request.



Technical Reviewer



Adrienne Sandall, B.S.
Study Director



Study Completion Date

TABLE 1. Results
Sample Identification: GSF-FAY30

SAMPLE NUMBER	INHALATION RESISTANCE (mm H ₂ O)	EXHALATION RESISTANCE (mm H ₂ O)	NIOSH ACCEPTANCE
1	7.0	10.0	Pass
2	6.8	9.4	Pass
3	7.0	9.8	Pass



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Lab Number 489206

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