ANSI/ASABE S613-4 AUG2017
Tractors and self-propelled machinery for agriculture — Air quality systems for cabs — Part 4: Performance test of a cab

American Society of Agricultural and Biological Engineers

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Tractors and self-propelled machinery for agriculture — Air quality systems for cabs — Part 4: *Performance test* of a cab

Proposed by the ASABE Environment within Ag Vehicle Enclosures subcommittee; approved by the Power and Machinery Community and approved as an American National Standard August 2017.

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1 Scope

1.1 This part of the S613 standard series defines a performance test for a cab for use in a risk management program in contaminated environments as part of an Occupational Health and Safety Management System (OHSMS). This document is intended to be a guide for engineers and field technicians who are responsible for cabs in agricultural applications.

1.2 While this standard provides guidance for use of these systems and defines a way to test the level of protection provided, as defined by the OHSMS. It is expected that other tests may provide cabs that are as well suited for this purpose; it is up to the user to demonstrate equivalency.

1.3 The S613 standard series is not intended to qualify cabs for use in poison gas or oxygen depleted environments, such as where an oxygen supply respirator is required per the product label and therefore are not covered by this standard.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies unless noted. For undated references, the latest approved edition of the referenced document (including any amendments) applies.

ANSI/ASABE S613-1; Tractors and self-propelled machinery for agriculture — Air quality systems for cabs — Terminology and Overview

ANSI/ASABE S613-2; Tractors and self-propelled machinery for agriculture — Air quality systems for cabs — Part 2: Cab & HVAC design

ASABE S613-3; Tractors and self-propelled machinery for agriculture — Air quality systems for cabs — Part 3: Filters for environmental cab HVAC systems

ISO 29463-1; High efficiency filters and filter media for removing particles from air — Part 1 Classification, performance testing and marking

ISO 14269-5:1997; Tractors and self-propelled machines for agriculture and forestry — Operators enclosure environment — Part 5: Pressurization system test method

3 Maintenance

Cab to be maintained per the manufacturer's recommendations.

4 Cab Pressurization

Any cab to be used in contaminated environments shall have the cab pressurized per ISO 14269-5, with the exception of the operating conditions, in order to assure the operator is protected during use. The manufacturer shall specify the operating conditions at which the cab can meet this requirement.

Following sections renumbered due to addition of section 3 maintenance.

5 Particle Counting Test Method for Measuring Cab Integrity

This tests the cab to measure the level of air leakage into the cab. When doing this procedure, check the outside of the cab for apparent leaks.

5.1 Replace the inlet filter with a HEPA filter; one that is 99.95% efficient, or equivalent reference ISO 29463, class 35H. As an option, a better performing filter may be used.

5.2 Remove any recirculation or secondary filters from the system

5.3 Test methods and conditions

The testing shall be conducted using particle counters

5.3.1 The cab to be tested shall be mounted on an end use machine

5.3.2 The testing shall be conducted when the background wind is less than 16 km/hr,

5.3.3 Tests shall be conducted when the relative humidity is below 80%

5.3.4 The unit shall be operated with the fan(s) on the specified blower setting per the manufacturer's instructions in the operator's manual and with the engine at rated speed.

NOTE: If the cab manufacturer's operating condition (fan speed and cab pressure) without the recirculation filter is not met, the recirculation duct may need to be restricted so that the test condition matches the cab operating specifications.

5.3.5 Two particle counters shall be used, one measuring the concentration outside the cab, C_o, at the cab air inlet area, the other measuring the concentration inside the cab, C_i, approximately at the drivers breathing area. The particles to be counted shall range from 0.3 to 0.5 µm (optical particle size diameter), as operated in test procedure section 6.2.1.

NOTE: If problems occur due to a lack of an adequate number of particles in this range it may be necessary to expand the range of particles counted to include more particles in the range; i.e. a range of 0.3 to 1.0 µm.

5.3.6 Static resistive sampling tubes from the counters for the inside and outside measurements shall be the same material, inside diameter, and length.

5.3.7 A minimum of four 10-min. tests, after equilibrium has been reached, shall be conducted.

5.3.7.1 The test equipment (particle counters) measuring source shall be switched between inside and outside measurement after each minimum 5-min. measuring period during each of the above tests.