SURFACE VEHICLE STANDARD

J3078™/6	FEB2026

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Superseding J3078/6 FEB2023

Off-Road Self-Propelled Work Machines Operator Enclosure Environment Part 6: Determination of Effect of Solar Heating

RATIONALE

Changed “Surface Vehicle Recommended Practice” to “Surface Vehicle Standard.”

1. SCOPE

SAE J3078/6 specifies a test method for simulating solar heating in the laboratory and measuring the radiant heat energy from a natural or simulated source. It is applicable to off-road self-propelled work machines as defined in SAE J1116 and tractors and machinery for agriculture and forestry as defined in ANSI/ASAE S390.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (U.S. and Canada only) or +1 724-776-4970 (outside U.S. and Canada), www.sae.org.

SAE J1116 Categories of Off-Road Self-Propelled Work Machines

SAE J1503 Performance Test for Air-Conditioned, Heated, and Ventilated Off-Road, Self-Propelled Work Machines

2.1.2 ANSI Publications

Copies of these documents are available online at https://webstore.ansi.org.

ANSI/ASAE S390 Tractors and Machinery for Agriculture and Forestry - Basic Types – Vocabulary

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3. DEFINITIONS

3.1 SOLAR HEATING

Heating factor from the sun to be considered in determining air circulation and cooling requirements necessary to maintain comfortable temperature inside the operator enclosure.

3.2 SOLAR RADIANT ENERGY

Process by which solar heating is generated.

3.3 MAJOR GLAZED SURFACE

Normally, the largest glazed surface of the operator enclosure. However, there may be enclosure configurations where two or more adjacent glazed surfaces contribute the greatest solar load.

3.4 LIGHT SYSTEM

Groups of lamps in banks or other configurations relating to the major glazed surface.

3.5 FULL SPECTRUM SOLAR SIMULATION

Lamps designed to produce energy across the full visible spectrum as shown in Table 1.

Table 1 - Spectral power distribution

Wavelength Range	Percent of Total Spectrum
<320 nm	0%
320-400 nm	0%- 7%
400-780 nm	45%-55%
>780 nm	35%-53%

4. GENERAL

4.1 The intended result of this method is to record the radiant heat energy affecting an operator enclosure during tests of the air-conditioning system.

4.2 This method should be used in conjunction with the test given in SAE J1503.

5. MEASUREMENT OF SOLAR RADIANT ENERGY DURING FIELD TESTS

5.1 Place an appropriate measuring device such as a pyranometer, with an accuracy of ±3% of the observed values, in the same general area as the operator enclosure under test. Measure the radiance at 10-minute intervals during the test period. These readings shall be averaged and recorded as part of the reported results.

5.2 A measured average solar radiant energy of 950 W/m^2 ± 95 W/m^2 is considered “normal” test conditions.

6. METHOD OF SIMULATING SOLAR RADIANT ENERGY DURING LABORATORY TESTS

6.1 Method One

6.1.1 Place lamps in banks above the operator enclosure being tested and in a horizontal plane.

6.1.2 The area within the perimeter of the light banks shall extend 25% beyond the projected area of the operator enclosure under test when measured in all four directions.

Documents
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