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INTERNATIONAL
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SURFACE VEHICLE STANDARD

SAE J1702

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Self-Propelled Sweepers Sweep-Ability Performance

***Foreword*—**This Document has not changed other than to put it into the new SAE Technical Standards Board Format. Definitions have changed to Section 2. All other section numbers have changed accordingly.

***1. Scope*—**This SAE Standard establishes a method of disclosing the sweep-ability performance of self-propelled sweepers that use broom means for sweeping and collection, together with either a mechanical- or pneumatic-conveyance system for the transfer of "sweepings" into a collection hopper.

1.1 Purpose—The purpose of this document sets out to describe a test practice for gauging the sweep-ability performance by sweepers described in SAE J2130 together with a format for the presentation of the test results. The document can be used to disclose or compare particular operating performance criteria for similar conditions.

2. References

2.1 Applicable Publication—The following publication forms a part of this specification to the extent specified herein. Unless otherwise noted, the latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J2130—Self-Propelled Sweepers

3. Definitions

3.1 Sweeper—A self-propelled sweeper is primarily designed to sweep material from highways, parking lots, airport complexes, industrial and construction sites, and during road maintenance work. The sweeper may use broom means to dislodge and direct material into a collection mechanism, which may be mechanical, pneumatic, or a combination of both systems to convey the swept material into a collection hopper.

3.2 Test Site—Level paved area (±3%) on which the sweeping test is conducted.

3.3 Test Material—Prepared materials used in the sweeping tests.

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4. Technical Requirements

4.1 Test Method—There are three separate tests—using an assortment of consistent test materials for each test.

4.2 Condition of Sweeper—Prior to a test, the sweeper shall be set at the normal operational settings according to the manufacturer's specification. Brooms and swept material containment curtains, etc., should be in like-new condition. Where the sweeper has variable duties of operation described in its instruction manual, then the sweeper shall be operated at its maximum-duty cycle. These settings shall be stated in the test report. Dust suppression systems if provided shall be active during the test.

4.3 Weather Conditions—Weather conditions shall be dry, with a wind speed less than 20 km/h and such that it will not disturb objects on the test course as depicted in test 3.

4.4 Test Site

4.4.1 SITE—During the test run, the sweeping brooms (channel(s) or gutter broom(s)) shall be directed along the guideline depicted in the test site pattern in 4.4.3.

4.4.2 SITE PREPARATION—The position and pattern of the test material placement zones is shown in the test site pattern in 4.4.3. If the type and sweeping width of the sweeper being assessed lacks sufficient capacity, then the zone size and materials can be varied, in which case full descriptions should be recorded with description of the criteria recorded in the test report.

4.4.3 TEST SITE PATTERN—See Figure 1.

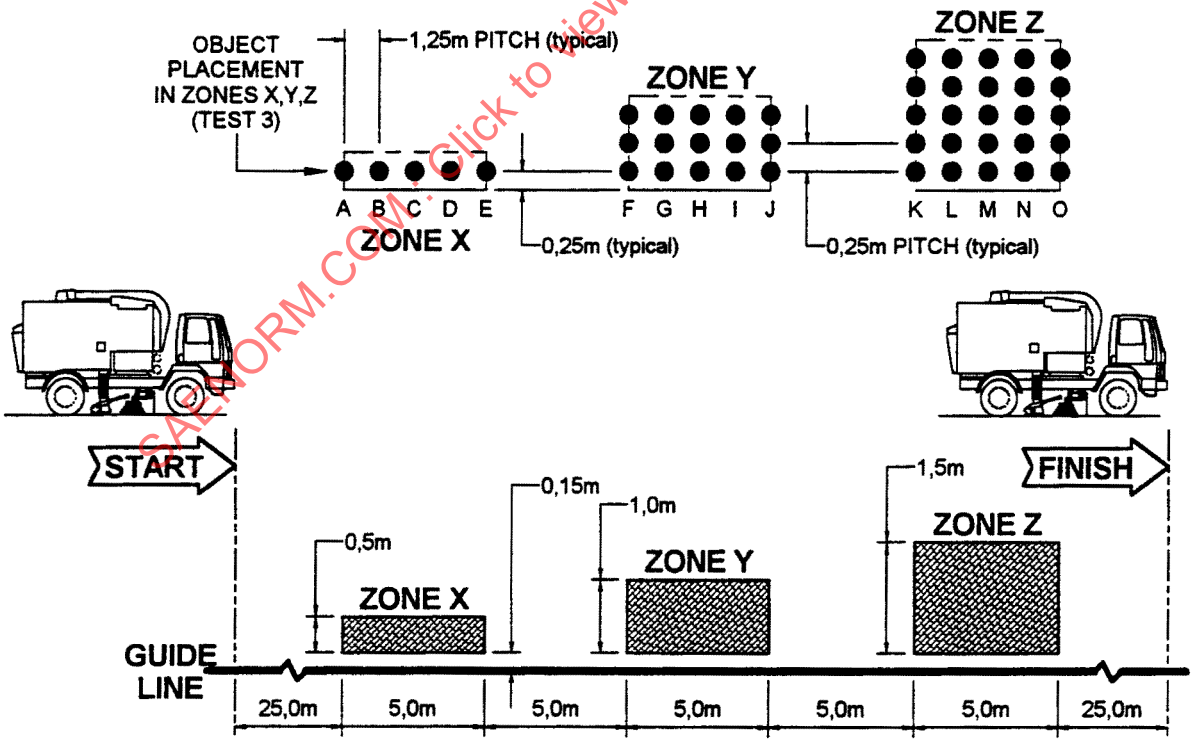

FIGURE 1—TEST SITE PATTERN

4.5 Test Material

4.5.1 TEST MATERIAL PATTERN—The test material defined in 4.5.2 shall be placed in the three placement zones. The test material can be arranged to the right or to the left of the guideline to suit the construction and layout of the sweeper.

4.5.2 TEST MATERIAL—Tables 1, 2, and 3 define the type and quantity of test material for tests 1, 2, and 3. The test material media and quantities can be varied according to the type and capacity of sweeper being assessed. The substituted test material quantity and placement shall be stated in the test report.

TABLE 1—TEST 1—SAND SPREAD QUANTITY

Zone	Test Material	Spread Quantity (Uniform Distribution)
X	Builders sharp sand	50 kg
Y	Average grain size 0.5 mm	50 kg
Z	Density ~ 1600 kg/m^3 (dry)	50 kg
		Total quantity 150 kg

TABLE 2—TEST 2—GRAVEL SPREAD QUANTITY

Zone	Test Material	Spread Quantity (Uniform Distribution)
X	Gravel-granite road stone chips	50 kg
Y	12 mm sieve 100% pass	50 kg
Z	Density ~ 1800 kg/m^3	50 kg
		Total quantity 150 kg

TABLE 3—TEST 3—OBJECTS

Zone	Item	Object	Test Material (Simulant)	Quantity	Score Rating Per Item	Total Score Rating
X	A	Exhaust pipe	Steel tube 50 mm × 1.6 mm × 300 mm long	1	6	6
	B	Stick	Wooden dowel - 25 mm × 500 mm long	1	6	6
	C	Plastic bag	Polythene - 300 mm × 300 mm	1	6	6
	D	Carton (flattened)	Corrugated cardboard sheet - 300 mm × 300 mm	1	6	6
	E	Muffler/bottle	Steel tube 100 mm × 2.0 mm × 300 mm long	1	6	6
Y	F	Cobble stone	50 mm spherical flint cobble stone	3	3	9
	G	Beverage can (flattened)	Aluminum sheet - 80 mm × 150 mm × 2.0 mm thick	3	3	9
	H	Paper sheet	A3, 80 g copy paper	3	3	9
	I	Rope	10 mm hemp rope × 1000 mm	3	3	9
	J	Wooden baton	25 mm × 25 mm soft wood × 150 mm long	3	3	9
Z	K	Bolt	M16c hex head steel screw × 75 mm long	5	1	5
	L	Nut	M16c hex head steel nut	5	1	5
	M	Nail	5.0 steel bar × 75 mm long	5	1	5
	N	Washer	30 × 2 mm thick steel disk	5	1	5
	O	Pin	12.0 steel bar × 40 mm long	5	1	5
				Total score 100 or 100%		

4.6 Sweeping Tests—The sweeper shall make three separate test runs over each of the three prescribed test courses in tests 1, 2, and 3 to collect measured amount of test material in a specific time or at a specific speed of operation. Test material for test 1 and test 2 shall be dry, though tests can be made with wet sand, in which case this must be stated with an indication of water inclusion in the test report. Test objects in test 3 that are beyond the capability of the sweeper can be removed from the test course but should be recorded as not swept material. Any test material or objects being deflected out of or carried beyond the test course shall be reported as not “swept” in the test report.

4.7 Travel Speed—During each test run, the sweeper shall be driven at a predetermined speed or timed from start to finish.

In order to assess any quantities of residual test material being carried beyond the test course finish line in a speed related test, the sweeping mechanisms shall be disabled at the finish line. For a time-based test, the time taken to disable the sweeping mechanism shall be recorded within the total test time.

5. Results

5.1 Test Analysis—All not-swept test material described in 4.5.2 resulting from each test run shall be collected and compared to the total amount initially distributed throughout the three test material placement zones (X, Y, and Z).

5.2 Ratings—In test 3, each object is to be rated using the score rating values in Table 3 in the test material schedule. The maximum value is 100 or 100% if all objects are swept and collected.

6. Test Result Presentation—In order to present the results of a sweep-ability performance test, a suggested test sheet of the following format could be adopted (Figure 2).