

Capacity Rating—Loader Bucket

Foreword—This Document has not changed other than to put it into the new SAE Technical Standards Board Format. Scope was changed to Section 1, followed by Purpose 1.1. References were added as Section 2.

1. Scope

- 1.1 This standard applies to buckets of loaders (as defined by SAE J1057a, Identification Terminology of Earthmoving Machines).
- 1.2 This method applies primarily to buckets having parallel sides and a cutting edge parallel to the top edge of the back sheet. Moderately clipped back sheet corners will introduce no appreciable errors. Bucket teeth, tooth adapters, as well as other similar local discontinuities are ignored.

- a. Interpretation of irregular shaped cutting edges is identified in 4.4.
b. Interpretation of irregular shaped side sheets is identified in 4.5.

- 1.3 **Purpose**—The purpose of this standard is to provide a uniform method for determining the SAE struck capacity and rated capacity. The volume calculations used result in a realistically conservative heaped volume. The calculations are based on the inside physical dimensions of the bucket only without regard to bucket action provided by any particular machine.

For rating purposes, a nominal heaped load with a 2:1 angle of repose is to be used with bucket orientation dictated by the strike plane defined in 3.1. This in no way implies that the loader linkage must carry the bucket oriented in this attitude, or that all materials will naturally have a 2:1 angle of repose.

2. References

- 2.1 **Applicable Publications**—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

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

SAE J731—Component Nomenclature—Loader
SAE J1057—Identification Terminology of Earthmoving Machines

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3. Definitions

3.1 Struck Capacity—The volume enclosed by the interior surfaces and a strike plane across the width of the bucket. The strike plane is to rest on the cutting edge and on the uppermost portion of the back sheet. (See SAE J731, Component Nomenclature—Loader.) The position of the strike plane for irregular shaped cutting edges or side sheets is further defined in 4.4 or 4.5.

3.2 Rated Capacity—Defined as the Struck Capacity plus an additional volume above the strike plane bounded by 2:1 slopes as described in Section 4.

3.2.1 Rated Capacity shall be expressed in cubic meters (cubic yards) and stated as the *SAE rating (nominally heaped)* according to Table 1:

TABLE 1—

Range of rated sizes m^3 (yd^3)	Increments m^3 (yd^3)
Under 0.6 (0.8)	0.02 (0.025) or (0.7 ft^3)
0.6–2.6 (0.8–3.4)	0.1 (0.13)
2.6–5 (3.4–6.5)	0.2 (0.26)
5–10 (6.5–13)	0.5 (0.65)
Over 10 (13)	1 (1.3)

3.2.2 If the calculated value falls below a given rating interval by more than 2%, the next lower interval shall be the rating.

EXAMPLE—A calculated value of 1.46 m^3 (1.91 yd^3) is under 1.5 m^3 (1.96 yd^3) by more than 2%, and therefore, the proper rating on the basis of the measurements and calculations is 1.4 m^3 (1.83 yd^3).

3.2.3 The addition of any auxiliary guard to protect against spillage of material which might injure the operator will not be included in bucket capacity calculations.

4. Calculation

4.1 Definitions

A—Cross sectional area at the center of the bucket.

W—Inside width of the bucket.

a—Height of that portion of the back sheet extending above the side cutters and measured at the center of the bucket width normal to the strike plane.

b—Length of opening at the center of the bucket width.

c—A length required to establish the loss in volume due to the end slope conditions. This is the length of a line drawn normal to the strike plane, from the intersection (crest) of the 2:1 slopes to the intersection with a line drawn from the cutting edge to the junction of the leading edge of the side cutter and the back sheet.

h—Distance measured from the intersection of the leading edge of the side cutters and the cutting edge, to the most forward point of an irregular shaped cutting edge.