

**(R) CAPACITY RATING—DOZER BLADES**

Equivalent to ISO 9246

**Foreword**—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

**1. Scope**

- 1.1** This standard applies only to straight, angling, semi-U, and U-blades for crawler and wheel tractors. It applies to angling blades only in the straight (not angled) position.
- 1.2** This standard does not apply to angled blades or other tools used to side cast materials, nor does it apply to any blade with design features such as end plates extended beyond the blade face.
- 1.3** This standard assumes the blade face to be flat and vertical, and does not consider the blade included volume (Figure 1).
- 1.4** Although provisions are presented for some deviations, this standard is intended for rectangular blades whose width/height ratios are at least 1.0.
- 1.5 Purpose**—The purpose of this standard is to provide a uniform method for calculating the capacities of dozer blades. It is intended for relative comparisons of dozer blade capacity, and not for predicting capacities or productivities in actual field conditions. Such determinations would need to consider other parameters, such as efficiency of the blade design, tractor power, tractive effort, soil properties, terrain, operator technique, and duty cycle.

**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 J729—Nomenclature and Specification Definitions—Dozers

SAE J1057—Identification Terminology of Earthmoving Machines

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-8512 FAX: (724) 776-0243  
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790  
SAE WEB ADDRESS <http://www.sae.org>

### 3. Definitions

#### 3.1 Straight Blade

- 3.1.1 BLADE PROJECTED AREA (A, FIGURE 2)—Blade area in square meters, exclusive of the end bit extensions, projected on a vertical plane parallel to the width of the blade. The blade is located in the mid-pitch position with the cutting edge at ground line.
- 3.1.2 BLADE WIDTH (W, FIGURE 3)—The distance in meters from outside to outside of the blade, exclusive of the end bits. W corresponds to dimension F in SAE J729.
- 3.1.3 EFFECTIVE BLADE HEIGHT (H, FIGURE 3)—The vertical height in meters that with W width, produces a projected area equal to A; that is,  $H = A/W$ .
- 3.1.4 EFFECTIVE BLADE FACE (FIGURE 3)—Simplified representation of the blade face for calculating the blade capacity. It is the vertical plane bounded by W and H.

#### 3.2 Semi-U and U-Blades:

- 3.2.1 BLADE PROJECTED AREA (A)—Identical to straight blade (paragraph 3.1.1)
- 3.2.2 BLADE WIDTH (W)—Identical to straight blade (paragraph 3.1.2).
- 3.2.3 EFFECTIVE BLADE HEIGHT (H)—Identical to straight blade (paragraph 3.1.3).
- 3.2.4 EFFECTIVE BLADE CONTOUR (FIGURE 4)—Simplified representation of the blade face for calculating the blade capacity. It is established by intersecting planes extending vertically from the cutting edge at ground line, with the blade in the mid-pitch position. The frontal dimensions are W and H.
- 3.2.5 WING ANGLE ( $\infty$ , FIGURE 4)—Angle in degrees measured at the cutting edge at ground line with the blade in the mid-pitch position. This angle describes the orientation of the intersecting planes that establish the effective blade contour.
- 3.2.6 WING LENGTH (Z, FIGURE 4)—Length in meters parallel to the blade width.

#### 3.3 Angling Blade in the Straight Position:

- 3.3.1 BLADE WIDTH (W, FIGURE 5)—The minimum blade width in meters.
- 3.3.2 EFFECTIVE BLADE HEIGHT (H, FIGURE 5)—Vertical height in meters with the blade in the mid-pitch position. H corresponds to dimension B in SAE J729.
- 3.3.3 EFFECTIVE BLADE FACE (FIGURE 5)—Simplified representation of the blade face for calculating the blade capacity. It is the vertical plane bounded by W and H.

### 4. Volume And Capacity Formulas (Figure 6):

#### 4.1 Volume, Effective Blade Face (Vs)

$$V_s = 0.8W(H)^2 \quad (m^3)$$

#### 4.2 Volume, Effective Blade Contour (Vu)

$$V_u = ZH(W-Z) \tan \quad (m^3)$$

#### 4.3 Capacity Straight and Angling Blade

$$V1 = V_s \quad (m^3)$$

#### 4.4 Capacity Semi-U and U-Blade

$$V2 = V_s + V_u \quad (m^3)$$

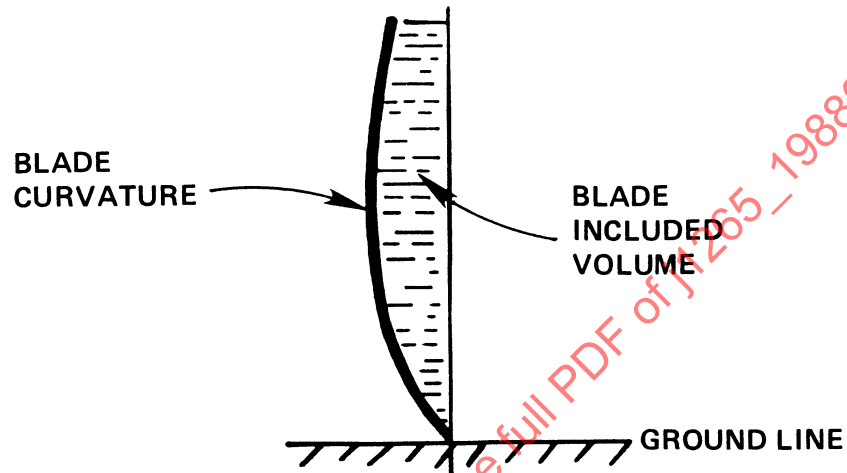


FIGURE 1—BLADE INCLUDED VOLUME

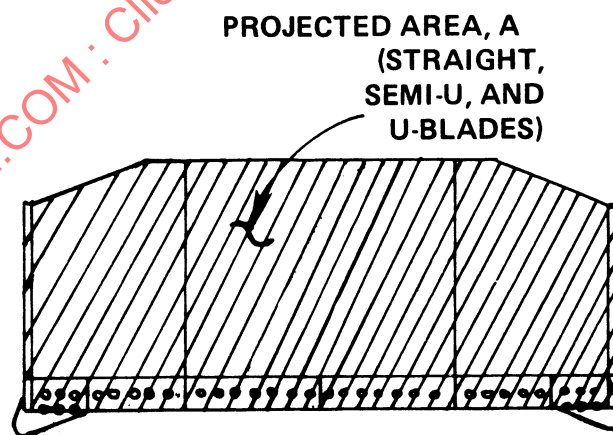


FIGURE 2—BLADE PROJECTED AREA

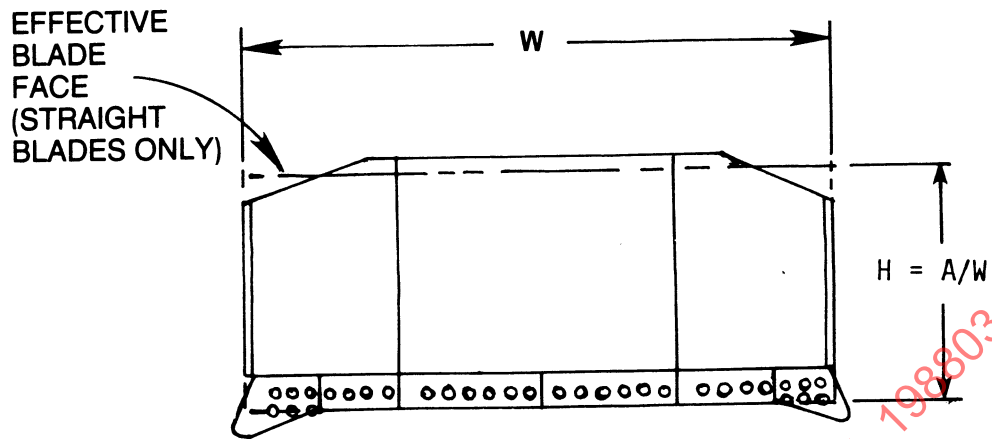


FIGURE 3—STRAIGHT, SEMI-U, U-BLADE DIMENSIONS

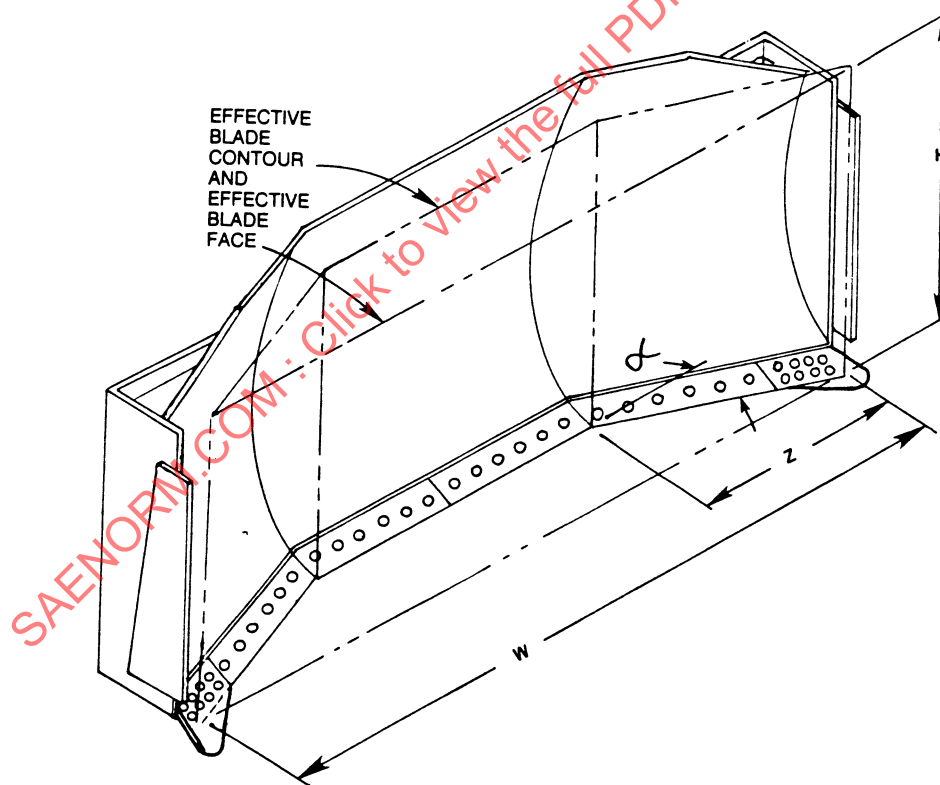


FIGURE 4—EFFECTIVE BLADE CONTOUR—SEMI-U AND U-BLADES

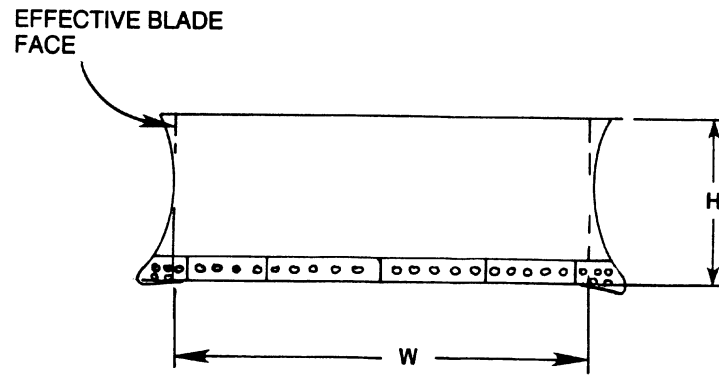


FIGURE 5—ANGLING BLADE DIMENSIONS

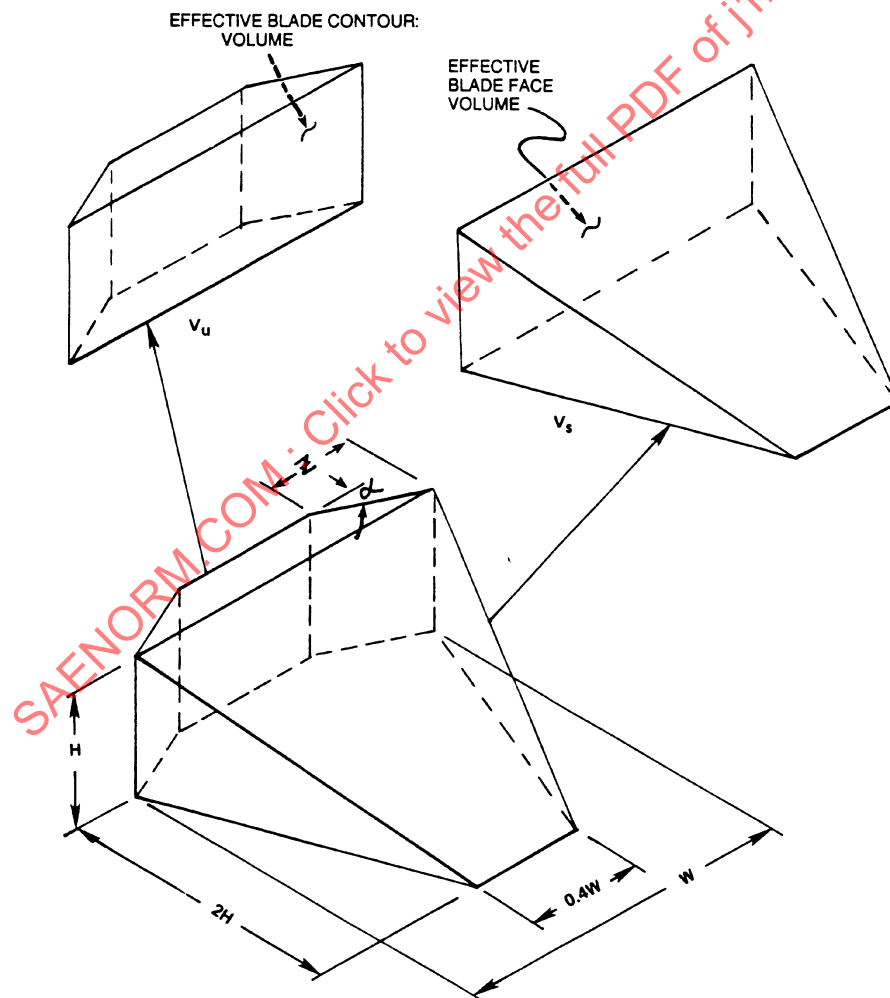


FIGURE 6—BLADE VOLUME