International Standard 7546

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Earth-moving machinery — Loader and front loading excavator buckets — Volumetric ratings

Engins de terrassement — Godets de chargeuses et de pelles à chargement frontal — Évaluations volumétriques

First edition — 1983-04-01

UDC 621.879.3 : 731.73 **Ref. No. ISO 7546-1983 (E)**

Descriptors : earth handling equipment, pails, capacity of load, volume, ratings.

Price based on 8 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 7546 was developed by Technical Committee ISO/TC 127, *Earth moving machinery*, and was circulated to the member bodies in December 1981.

It has been approved by the member bodies of the following countries:

Australia	France	Spain
Austria	Germany, F.R.	Sweden
Belgium	Italy	United Kingdom
Brazil	Mexico	USA
Bulgaria	Poland	USSR
Czechoslovakia	Romania	
Egypt, Arab Rep. of	South Africa, Rep. of	

The member body of the following country expressed disapproval of the document on technical grounds:

Japan

Printed in Switzerland

Earth-moving machinery — Loader and front loading excavator buckets — Volumetric ratings

1 Scope and field of application

1.1 This International Standard specifies a procedure for approximating the volume of typical materials contained in the bucket of front end loaders and excavators with front loading bucket. The volume ratings are based on the inside dimensions of the bucket and representative volumes on top of the bucket.

1.2 The method employs the technique of dividing the complex shape of the material in the bucket into simple geometric forms to allow volume calculations of different bucket configurations.

1.3 The rating method is intended to provide a consistent means of comparing bucket capacities. It is not intended to define actual capacities that might be observed in any specific application.

2 References

ISO 7131, *Earth-moving machinery — Loaders — Terminology.*[1)]

ISO 7135, *Earth-moving machinery — Excavators — Terminology.*[1)]

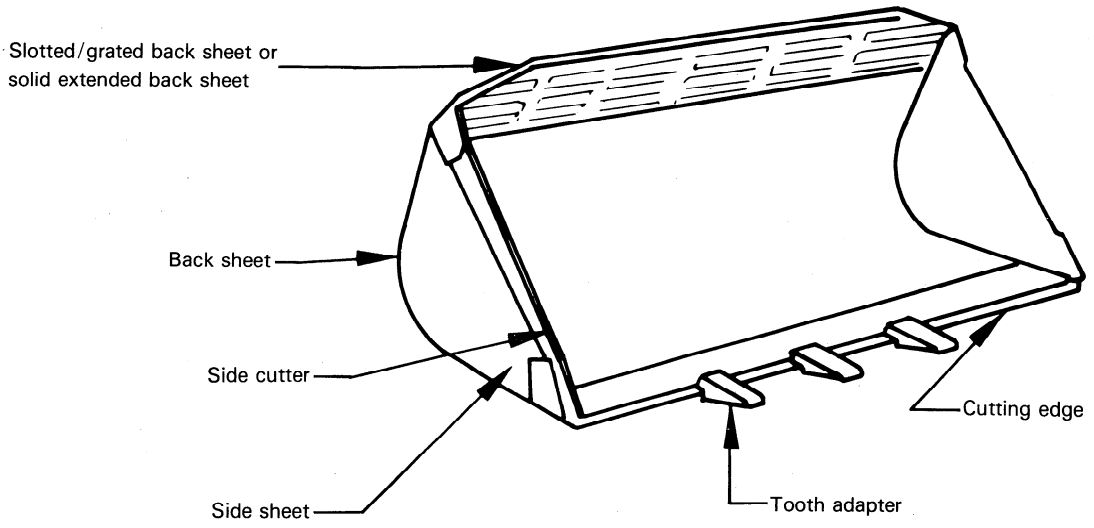


Figure 1 — Bucket

1) At present at the stage of draft.

3 Restrictions and limitations

3.1 The effect on volumes of local discontinuities such as bucket teeth, tooth adapters, and gussets shall be ignored.

3.2 Grated or slotted back sheets attached to the bucket to protect the machine or operator from material that might spill over the back of the bucket shall not be included in the capacity calculations. Solid extended back sheets providing the same function may be included in the capacity calculations only if they are an integral part of the bucket.

3.3 Only buckets with an X/Y ratio greater than 12 shall be considered by the rating method(s). (See figure 2.)

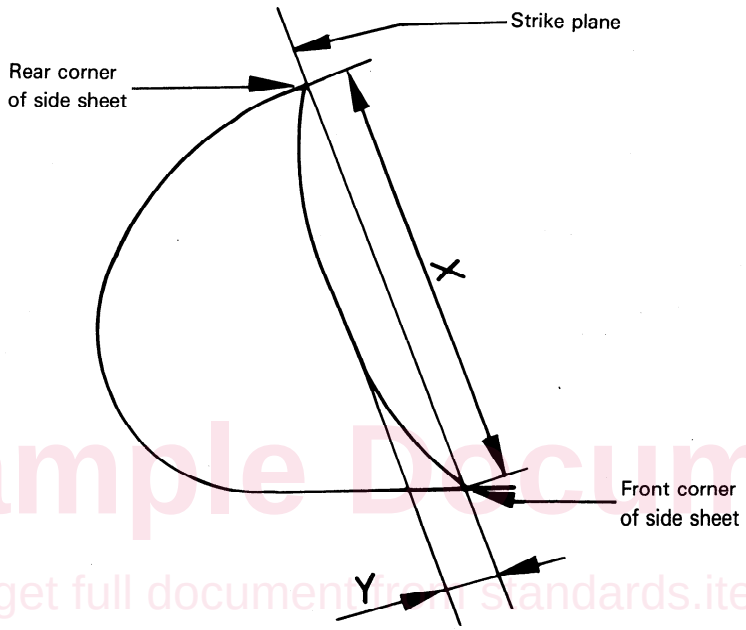


Figure 2 — X and Y dimensions for irregular side sheet

4 Definitions and symbols

4.1 bucket component

See figure 1 and ISO 7131 and 7135.

4.2 strike plane : Horizontal plane across the width of the bucket from the cutting edge to the back sheet.

(See clause 5 for different bucket shapes.)

4.3 struck volume V_S : Volume which lies beneath the strike plane.

4.4 top volume V_T : Volume of material, a 2:1 slope, which lies on top of the strike plane.

4.5 rated bucket volume V_R : Rated bucket capacity.

This capacity is calculated by adding the struck and top volumes : $V_R = V_S + V_T$.

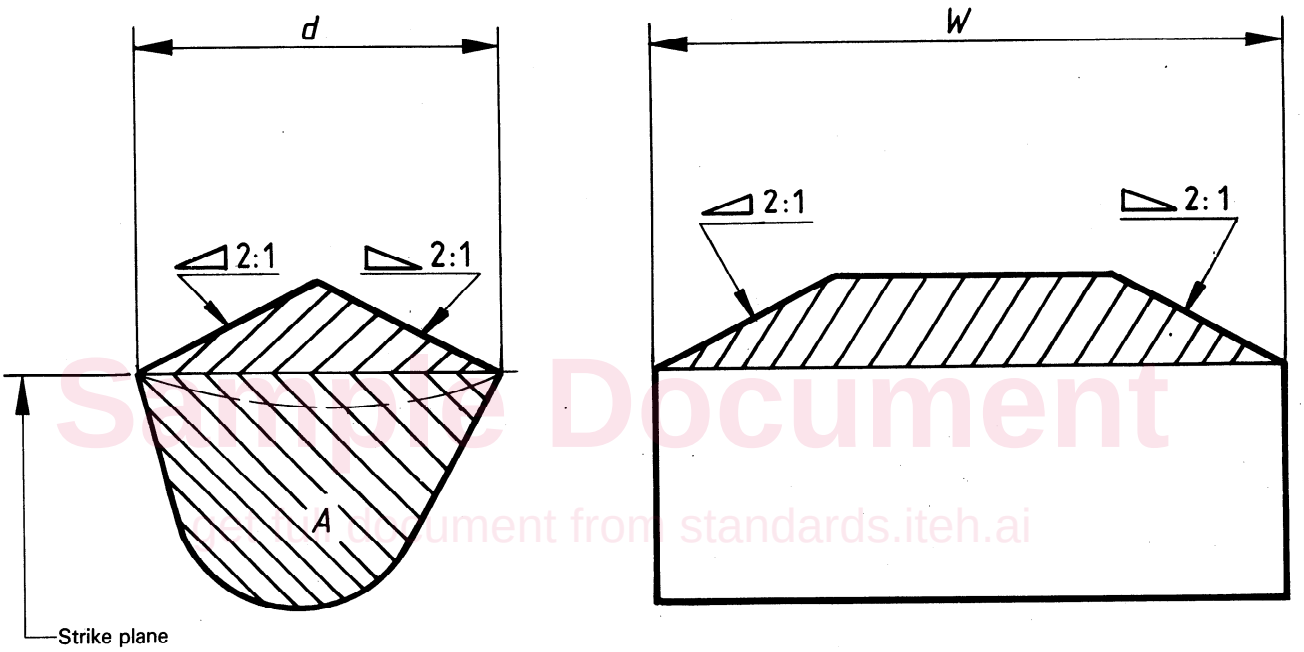
5 Volumetric ratings

5.1 Basic bucket

The back sheet does not extend beyond a transverse line connecting the rear corners of the side sheets and the cutting edge does not extend beyond a transverse line connecting the front corners of the side sheets.

5.1.1 The strike plane passes through a line along the top of the back sheet at the rear and a line along the top of the cutting edge at the front as shown in figure 3.

5.1.2 The volumetric capacity is calculated as shown in figure 3.



Struck volume : $V_S = AW$

A is the interior cross section area

W is the interior width of the bucket

Top volume : $V_T = \frac{d^2W}{8} - \frac{d^3}{24}$

d is at transverse middle of bucket

The rated capacity is expressed as follows : $V_R = V_S + V_T$

Figure 3 — Basic bucket