

---

---

**Earth-moving machinery — Volumetric  
ratings for hydraulic excavator buckets and  
backhoe loader buckets**

*Engins de terrassement — Évaluations volumétriques des godets de  
pelles hydrauliques travaillant en rétro*



## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7451 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 1, *Test methods relating to machine performance*.

This second edition cancels and replaces the first edition (ISO 7451:1983), which has been technically revised.

© ISO 1997

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization  
Case postale 56 • CH-1211 Genève 20 • Switzerland  
Internet central@iso.ch  
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

# Earth-moving machinery — Volumetric ratings for hydraulic excavator buckets and backhoe loader buckets

## 1 SCOPE

This International Standard specifies a method for estimating the volume of materials which a hoe-type bucket of an excavator or backhoe loader can normally contain (see figure 1). The volume assessments are based on the internal dimensions of the bucket and on the representative volumes at the top of the bucket.

The method employs the technique of dividing the complex shape of the material in the bucket into simple geometric shapes.

This method of assessment is intended to provide a conventional means of comparing bucket capacities. It is not intended to be used to define true capacities.

This International Standard is not applicable to buckets of rope-operated excavators.

## 2 DEFINITIONS AND SYMBOLS

**2.1 bucket components:** Components as shown in figure 2.

**2.2  $X$  dimension:** Distance between the cutting edge (or face) of the leading edge and the contact edge of the horizontal plane on the backsheet (see figures 6 and 7).

**2.3  $Y$  dimension:** Maximum depth of the indentation, perpendicular to the horizontal plane.

**2.4 strike plane:** Horizontal plane extending over the width of the bucket from the face of the leading edge to the contact edge between the horizontal plane and the backsheet (see figure 6).

**2.5 strike surface:** Cylindrical surface of radius  $R$  which traverses the edges of the strike plane (face of the leading edge and contact edge of the backsheet) and which is tangential to a plane parallel to the strike plane and at a distance  $Y$  (see figure 7).

**2.6 struck volume,  $V_S$ :** Volume which lies beneath the strike plane or the strike surface.

**2.7 top volume,  $V_T$ :** Volume of the material with a 1:1 inclination which is situated above the strike plane.

**2.8 volumetric rating,  $V_r$ :** Volume determined by the method detailed in this International Standard which provides a means of comparing the capacities of buckets.