Nederlandse norm

NEN-ISO 14397-1

(en)

Earth-moving machinery - Loaders and backhoe loaders - Part 1: Calculation of rated operating capacity and test method for verifying calculated tipping load (ISO 14397-1:2007,IDT)

Vervangt NEN-ISO 14397-1:2002

ICS 53.100

oktober 2007

Als Nederlandse norm is aanvaard:

- ISO 14397-1:2007,IDT

Normcommissie 341 044 "Mobiele bouwmachines"

NEN

©2007 Nederlands Normalisatie-instituut
Postbus 5059, 2600 GB Delft
Telefoon (015) 2 690 390, Fax (015) 2 690 190

INTERNATIONAL STANDARD

ISO 14397-1

Second edition
2007-09-15

Earth-moving machinery — Loaders and backhoe loaders —

Part 1: Calculation of rated operating capacity and test method for verifying calculated tipping load

Engins de terrassement — Chargeuses et chargeuses-pelleteuses —

Partie 1: Calcul de la charge utile nominale et méthode d'essai pour vérifier la charge de basculement calculée

Reference number
ISO 14397-1:2007(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14397-1 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 14397-1:2002), which has been technically revised.

ISO 14397 consists of the following parts, under the general title *Earth-moving machinery — Loaders and backhoe loaders*:

— *Part 1: Calculation of rated operating capacity and test method for verifying calculated tipping load*

— *Part 2: Test method for measuring breakout forces and lift capacity to maximum lift height*

INTERNATIONAL STANDARD **ISO 14397-1:2007(E)**

Earth-moving machinery — Loaders and backhoe loaders —

Part 1: Calculation of rated operating capacity and test method for verifying calculated tipping load

1 Scope

This part of ISO 14397 specifies the means for determining the rated operating capacity of wheeled or crawler loaders or of the loader portion of backhoe loaders, having buckets and material handling forks, as defined in ISO 6165. It gives standard methods for the calculation and test verification of the tipping load (mass).

It is applicable only to the use of buckets and forks on loaders.

NOTE Certain attachments can exceed the normal operating capacity and will require restricted machine operating conditions, such as reduced machine speed or limited lifting height. Refer to the attachment manufacturer's instructions for the intended use of the attachment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6016:1998, *Earth-moving machinery — Methods of measuring the masses of whole machines, their equipment and components*

ISO 6165:2006, *Earth-moving machinery — Basic types — Identification and terms and definitions*

ISO 6746-1:2003, *Earth-moving machinery — Definitions of dimensions and codes — Part 1: Base machine*

ISO 7546:1983, *Earth-moving machinery — Loader and front loading excavator buckets — Volumetric ratings*

ISO 9248:1992, *Earth-moving machinery — Units for dimensions, performance and capacities, and their measurement accuracies*

ISO 14397-2, *Earth-moving machinery — Loaders and backhoe loaders — Part 2: Test method for measuring breakout forces and lift capacity to maximum lift height*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6165 and ISO 6746-1, and the following, apply.

3.1
rated operating capacity
N
calculated value, in kilograms, representing normal loading under typical operating conditions

3.2
tipping load at maximum reach
m_{tip}
minimum mass, in kilograms, that, when placed in the loader bucket or on forks at maximum moment arm position, will cause the loader to achieve the tipping limit condition in its least stable configuration, with the loader placed on a hard, level surface and the resultant force acting vertically through the centroid of the rated bucket volume as specified in ISO 7546 or the fork load centre as specified in 5.2.6 and shown in Figure 1

3.3
lift capacity to maximum height
m_{lift}
mass, in kilograms, which can be lifted from the ground to maximum height using the lift cylinder or cylinders at hydraulic circuit working pressure, with the bucket positioned to hold the maximum load or the forks positioned horizontally, and with the resultant force acting vertically through the centroid of the rated bucket volume as specified in ISO 7546 or the fork load centre as specified in 5.2.6 and shown in Figure 1

NOTE See also ISO 14397-2.

3.4
maximum moment arm
n
maximum horizontal distance from the load centre of gravity to the tipping line when the bucket is positioned to hold the maximum load or the forks are positioned horizontally

See Figures 2 to 8.

3.5
tipping limit condition
⟨wheeled loaders⟩ condition in which at least one of the wheels farthest from the tipping line no longer touches the ground

3.6
tipping limit condition
⟨crawlers with rigid frame suspension⟩ condition when the front track rollers no longer touch the track

NOTE For other types of suspension, the tipping limit condition is as specified by the manufacturer.

3.7
tipping line
line about which the loader tips

See Figures 2 to 8.

3.8
operating mass
mass of the base machine with equipment and empty attachment as specified by the manufacturer, and with the operator (75 kg), full fuel tank and all fluid systems at the levels specified by the manufacturer

3.9
hydraulic circuit working pressure
pressure applied to the specific hydraulic lifting circuit by the hydraulic pump or pumps

3.10
swing loader
loader having a swing type lift arm which can rotate to the left and right of the straight position

3.11
stability factors
k
factors accounting for the effects of the operating surface and of the dynamic forces caused by travel speed, tyre deflection, etc., used in rated operating capacity calculation

4 Symbols and abbreviated terms

$A1$	articulation angle, as defined in ISO 6746-1	°
D	load centre of gravity distance	m
G_1	measured load on the front wheel at the opposite side of the tipping line (without load in bucket)	kg
G_2	measured load on the rear wheel at the opposite side of the tipping line (without load in bucket)	kg
G_H	measured load on the rear axle (without load in bucket)	kg
k	stability factors (see Table 1)	—
$L2$	crawler base, as defined in ISO 6746-1	m
$L3$	wheel base, as defined in ISO 6746-1	m
$L5$	rear axle to hinge (pivot of the articulated steering), as defined in ISO 6746-1	m
m_{lift}	lift capacity to maximum height	kg
m_{tip}	tipping load at maximum reach	kg
N	rated operating capacity	kg
n	maximum moment arm	m
n_1	moment arm of load G_1 (horizontal distance between centre of action of G_1 and side tipping line)	m
n_2	moment arm of load G_2 (horizontal distance between centre of action of G_2 and side tipping line)	m
$W1$	maximum width, as defined in ISO 6746-1 (see also ISO 14397-2)	m
$W2$	track gauge, as defined in ISO 6746-1 (see also ISO 14397-2)	m
$W3$	tread (wheel type), as defined in ISO 6746-1	m
$W4$	track shoe width, as defined in ISO 6746-1 (see also ISO 14397-2)	m

NEN
CONNECT

ALTIJD DE ACTUELE NORM IN UW BEZIT HEBBEN?

Nooit meer zoeken in de systemen en uzelf de vraag stellen: â€˜Is NEN-ISO 14397-1:2007 en de laatste versie?â€™

Via het digitale platform NEN Connect heeft u altijd toegang tot de meest actuele versie van deze norm. Vervallen versies blijven ook beschikbaar. **U en uw collega's** kunnen de norm via NEN Connect makkelijk raadplagen, online en offline.

Kies voor slimmer werken en bekijk onze mogelijkheden op **www.nenconnect.nl**.

Heeft u vragen?
Onze Klantenservice is bereikbaar maandag tot en met vrijdag, van 8.30 tot 17.00 uur.

Telefoon: 015 2 690 391
E-mail: klantenservice@nen.nl