BRITISH STANDARD

BS 6914-7: 1992
ISO 9245: 1991

Terminology (including definitions of dimensions and symbols) for earth-moving machinery —

Part 7: Vocabulary, symbols and units for machine performance

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee B/513, Construction equipment and plant, and site safety, to Subcommittee B/513/1, Earth-moving machinery, upon which the following bodies were represented:

Associated Offices Technical Committee
British Coal Corporation
Construction Plant (Hire Association)
Federation of Civil Engineering Contractors
Federation of Manufacturers of Construction Equipment and Cranes
Health and Safety Executive
Institution of Civil Engineers
Institution of Highways and Transportation
Ministry of Defence
Silsoe Research Institute

This British Standard, having been prepared under the direction of Technical Committee B/513, was published under the authority of the Standards Board and comes into effect on 1 May 1992

The following BSI references relate to the work on this standard:
Committee reference B/513/1
Draft for comment 89/14733 DC

ISBN 0 580 20827 3

Amendments issued since publication

Amd. No.	Date	Comments

Contents

National foreword

This Part of BS 6914 has been prepared under the direction of Technical Committee B/513, "Construction equipment and plant, and site safety", and is identical with ISO 9245:1991 "*Earth-moving machinery — Machine productivity — Vocabulary, symbols and units*" published by the International Organization for Standardization (ISO).

ISO 9245 was prepared by Subcommittee 4, "Commercial nomenclature, classification and rating", of ISO Technical Committee 127, "Earth-moving machinery", with the active participation and approval of the UK.

Cross-references

International Standard	Corresponding British Standard
ISO 6165:1987	BS 6914 *Terminology (including definitions of dimensions and symbols) for earth-moving machinery* Part 1:1988 *Glossary of terms for basic types of earth-moving machinery* (Identical)

Annex A of this Part of BS 6914 is for information only. The corresponding British Standards for the ISO standards listed are as follows.

ISO 6483:1980	BS 6113:1981 *Method for volumetric rating of dumper bodies used for earth-moving* (Identical)
ISO 6484:1986	BS 6114:1987 *Method for measurement of volumetric ratings of elevating scrapers used for earth-moving* (Identical)
ISO 6485:1980	BS 6074:1981 *Method for determination of the volumetric rating of tractor-scrapers for earth-moving machinery* (Identical)
ISO 7451:1983	BS 6421:1983 *Method for volumetric rating of hoe type buckets of hydraulic excavators used for earth-moving* (Identical)
ISO 7546:1983	BS 6422:1983 *Method for volumetric rating of loader and front loading excavator buckets used for earth-moving* (Identical)
ISO 9246:1988	BS 6911 *Testing earth-moving machinery* Part 1:1988 *Method for determination of volumetric rating of crawler and wheel tractor dozer blades* (Identical)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Earth-moving machinery — Machine productivity — Vocabulary, symbols and units

1 Scope

This International Standard gives a vocabulary of terms, their definitions, symbols and units used in the determination and presentation of the productivity of earth-moving machinery as defined in ISO 6165, except for graders, rollers, compactors and pipelayers.

It does not in itself specify any rules for the determination of productivity nor does it give details on the form in which the productivity of earth-moving machinery should be presented.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 6165 : 1987, *Earth-moving machinery — Basic types — Vocabulary*.

3 Terms and definitions

In terms 3.1, 3.1.1 and 3.1.2, "productivity" requires that the following details, amongst others, shall be given:

a) technical data of the machine, equipment and attachments fitted which would influence productivity;

b) type of material in accordance with national soil classifications and, if required, soil characteristics such as particle-size distribution, density, humidity;

c) condition of material on which the productivity is based, e.g. bank or loose soil;

Engins de terrassement — Productivité de l'engin — Vocabulaire, symboles et unités

1 Domaine d'application

La présente Norme internationale donne un vocabulaire des termes, avec leurs définitions ainsi que les symboles et les unités correspondants, employés pour déterminer et présenter la productivité des engins de terrassement, tels que définis dans l'ISO 6165, sauf les niveleuses, les rouleaux, les compacteurs et les tracteurs poseurs de canalisations.

Elle ne prescrit pas de règles pour la détermination de la productivité et ne donne pas non plus de détails sur le mode de présentation de la productivité des engins de terrassement.

2 Référence normative

La norme suivante contient des dispositions qui, par suite de la référence qui en est faite, constituent des dispositions valables pour la présente Norme internationale. Au moment de la publication, l'édition indiquée était en vigueur. Toute norme est sujette à révision et les parties prenantes des accords fondés sur la présente Norme internationale sont invitées à rechercher la possibilité d'appliquer l'édition la plus récente de la norme indiquée ci-après. Les membres de la CEI et de l'ISO possèdent le registre des Normes internationales en vigueur à un moment donné.

ISO 6165 : 1987, *Engins de terrassement — Principaux types — Vocabulaire*.

3 Termes et définitions

Pour les termes 3.1, 3.1.1 et 3.1.2, la «productivité» nécessite que les détails suivants, entre autres, soient donnés:

a) données techniques sur l'engin, les équipements et accessoires qui auraient une influence sur la productivité;

b) type de matériau, conformément aux classifications nationales de sol, et, s'il y a lieu, les caractéristiques du sol telles que la distribution granulométrique, la densité, l'humidité;

c) état du matériau sur lequel la productivité est basée, par exemple, du remblai ou du sol meuble;

d) type of operation (e.g. trench excavation, loading of spoil, load and carry) and conditions of operation (e.g. excavation depth, cutting height, scraping depth, swing angle of excavator, condition of haul roads and tracks, configuration of ground);

e) type of receiving equipment (e.g. haulage machine, body height, hopper, stockpile);

f) weather (e.g. temperature, rain, snow);

g) place, date and time.

3.1 productivity, Q: Measured volume of material moved per unit of time, in cubic metres per hour.

3.1.1 basic (theoretical) productivity, Q_B: Productivity, in cubic metres per hour, attainable for a short period with the respective equipment under given operating conditions and for a given type of material. Influences liable to reduce the productivity arising from the condition of the equipment, from the organization of the construction site and from the weather are not taken into consideration here. An operator of average ability is assumed.

3.1.2 actual productivity, Q_A: Productivity, in cubic metres per hour, attainable continuously with the respective equipment under given operating conditions and for a given type of material, taking into consideration operating conditions and all data influencing productivity such as the condition and handling of equipment, the organization of the construction site and weather.

3.1.3 job efficiency factor, f_E: Ratio of actual productivity to basic (theoretical) productivity:

$$f_E = \frac{Q_A}{Q_B}$$

3.2 swell factor[1], f_S: Ratio of volume after loosening or picking up to the bank volume or volume before picking up: $f_S > 1$.

3.3 fill factor[1], f_F: Ratio of volume after loosening or picking up per cycle to the rated volume of the attachment.

3.4 rated volume, V_R: Rated capacity, in cubic metres, of the attachment in accordance with the appropriate International Standard. (See annex A.)

1) The term "load factor" (f_L) is also commonly used to express the ratio of fill factor (f_F) to swell factor (f_S), i.e. $f_L = f_F/f_S$. This ratio is identical to the ratio of the bank volume or volume before picking up to the rated volume of the attachment.

d) type d'opération (par exemple creusement de tranchées, chargement de matériau d'excavation, charge et transport) et conditions de service (par exemple profondeur d'excavation, hauteur d'attaque de la pelle, profondeur de creusement, angle d'orientation de la pelle, état des voies de desserte, configuration de la terre);

e) équipement de réception (par exemple engin de transport, hauteur de la benne, trémie, tas);

f) conditions climatiques (par exemple la température, la pluie, la neige);

g) lieu, date et heure.

3.1 productivité, Q: Volume mesuré de matériau déplacé par unité de temps, en mètres cubes par heure.

3.1.1 productivité de base (théorique), Q_B: Productivité, en mètres cubes par heure, capable d'être atteinte pendant une courte période avec un type d'équipement dans des conditions de fonctionnement données et pour un type de matériau donné. Toute influence susceptible de baisser la productivité résultant de l'état de l'équipement, de l'organisation du chantier et des conditions climatiques n'est pas prise en considération ici. On considère la présence d'un opérateur de compétence moyenne.

3.1.2 productivité effective réelle, Q_A: Productivité, en mètres cubes par heure, capable d'être atteinte en continu avec un type d'équipement dans des conditions de fonctionnement données et pour un type de matériau donné, en tenant compte des conditions de fonctionnement et de toutes les données pouvant agir sur la productivité, telles que l'état et le maniement de l'accessoire, l'organisation du chantier et les conditions climatiques.

3.1.3 facteur d'efficacité du travail, f_E: Rapport de la productivité effective réelle à la productivité de base (théorique):

$$f_E = \frac{Q_A}{Q_B}$$

3.2 coefficient de foisonnement[1], f_S: Rapport du volume après chargement, ou du volume après déchargement, au volume en place, ou au volume avant chargement: $f_S > 1$.

3.3 facteur de remplissage[1], f_F: Rapport du volume après chargement ou déchargement par cycle au volume théorique de l'accessoire.

3.4 volume théorique, V_R: Capacité théorique, en mètres cubes, de l'accessoire, conformément à la Norme internationale particulière. (Voir annexe A.)

1) Le terme «facteur de charge» (f_L) est également employé d'une façon générale pour exprimer le rapport du facteur de remplissage (f_F) au coefficient de foisonnement (f_S), c'est-à-dire $f_L = f_F/f_S$. Ce rapport est identique au rapport du volume en place, ou du volume avant chargement, au volume théorique de l'accessoire.

3.5 cycle: Process which is repeated a number of times with the same sequence of individual operations (for example in the case of a hoe-type bucket excavator: filling, lifting, swinging, dumping, swinging back, lowering).

3.6 cycle time, t: Time, in minutes, taken to carry out a cycle.

3.5 cycle: Procédé qui est répété plusieurs fois avec la même séquence d'opérations individuelles (par exemple dans le cas d'une pelle travaillant en rétro: remplissage, soulèvement, mouvement de rotation, déchargement, mouvement de rotation, descente).

3.6 durée de cycle, t: Temps, en minutes, mis pour effectuer un cycle.

Annex A
(informative)

Bibliography

[1] ISO 6483 : 1980, *Earth-moving machinery — Dumper bodies — Volumetric rating*.

[2] ISO 6484 : 1986, *Earth-moving machinery — Elevating scrapers — Volumetric ratings*.

[3] ISO 6485 : 1980, *Earth-moving machinery — Tractor-scraper volumetric rating*.

[4] ISO 7451 : 1983, *Earth-moving machinery — Hydraulic excavators — Hoe type buckets — Volumetric ratings*.

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

[6] ISO 9246 : 1988, *Earth-moving machinery — Crawler and wheel tractor dozer blades — Volumetric ratings*.

Annexe A
(informative)

Bibliographie

[1] ISO 6483 : 1980, *Engins de terrassement — Bennes de tombereau — Évaluation volumétrique*.

[2] ISO 6484 : 1986, *Engins de terrassement — Décapeuses élévatrices — Évaluations volumétriques*.

[3] ISO 6485 : 1980, *Engins de terrassement — Décapeuse — Évaluation volumétrique*.

[4] ISO 7451 : 1983, *Engins de terrassement — Godets de pelles hydrauliques travaillant en rétro — Évaluations volumétriques*.

[5] ISO 7546 : 1983, *Engins de terrassement — Godets de chargeuses et de pelles à chargement frontal — Évaluations volumétriques*.

[6] ISO 9246 : 1988, *Engins de terrassement — Lames de tracteurs sur chenilles ou sur roues — Évaluations volumétriques*.

Publication(s) referred to

See national foreword.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL