INTERNATIONAL STANDARD

ISO 20474-8

Second edition
2017-07

Earth-moving machinery — Safety —

Part 8: Requirements for graders

Engins de terrassement — Sécurité —

Partie 8: Exigences applicables aux niveleuses

Reference number
ISO 20474-8:2017(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Safety requirements and protective measures **2**
4.1 General 2
4.2 Operator station 2
4.2.1 Operator's seat 2
4.2.2 Rear windows 2
4.3 Fenders 2
4.4 Steering system 2
4.4.1 General 2
4.4.2 Controls 2
4.4.3 Steering performance test 2
4.4.4 Safety requirements for travelling mode 2
5 Information for use **2**
Annex A (informative) **Illustrations** **4**
Bibliography **5**

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html

This document was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 2, *Safety, ergonomics and general requirements*.

This second edition cancels and replaces the first edition (ISO 20474-8:2008), which has been technically revised with the following changes:

— references to national and regional provisions in the withdrawn ISO/TS 20474-14 have been deleted;

— new safety requirements and protective measures have been added, including requirements for the operator station.

— new information-for-use requirements have been added.

It is intended to be used in conjunction with ISO 20474-1.

A list of all parts in the ISO 20474 series, published under the general title, *Earth-moving machinery — Safety,* can be found on the ISO website.

Introduction

This document is a type-C standard as stated in ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

ISO 20474 provides acceptable safety requirements for earth-moving machinery. This standard does not necessarily provide requirements to meet all national and regional regulatory provisions, e.g. Japan does not allow object handling with earth-moving machinery.

Earth-moving machinery — Safety —

Part 8: Requirements for graders

1 Scope

This document gives the safety requirements specific to graders as defined in ISO 6165. It is intended to be used in conjunction with ISO 20474-1, which specifies general safety requirements common to two or more earth-moving machine families. The specific requirements given in this document take precedence over the general requirements of ISO 20474-1.

This document deals with all significant hazards, hazardous situations and events relevant to the earth-moving machinery within its scope (see ISO 20474-1:2017, Annex A) when used as intended or under conditions of misuse reasonably foreseeable by the manufacturer. It specifies the appropriate technical measures for eliminating or reducing risks arising from relevant hazards, hazardous situations or events during commissioning, operation and maintenance.

This document is not applicable to machines manufactured before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 6165, *Earth-moving machinery — Basic types — Identification and terms and definitions*

ISO 7134, *Earth-moving machinery — Graders — Terminology and commercial specifications*

ISO 20474-1:2017, *Earth-moving machinery — Safety — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20474-1, ISO 7134, and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
grader
self-propelled wheeled machine with an adjustable blade positioned between the front and rear axles, which can be equipped with a front-mounted blade or scarifier that can also be located between the axles

Note 1 to entry: The machine is primarily designed for grading, sloping, ditching and scarifying of materials through its forward motion.

Note 2 to entry: See Annex A for illustrations.

[SOURCE: ISO 6165:2012, 4.8, modified — By adding Note 2.]

4 Safety requirements and protective measures

4.1 General

Graders shall comply with the safety requirements and protective measures of ISO 20474-1, in as far as those are not modified by the specific requirements of this clause.

4.2 Operator station

4.2.1 Operator's seat

Graders shall be equipped with a suspension seat.

4.2.2 Rear windows

ISO 20474-1:2017, 4.3.2.7 and 4.3.2.9 shall apply for rear windows, with the following additional provisions:

— arrangements for defrosting the rear windows shall be made;

— the rear windows shall be fitted with a motorized washer and wipers.

4.3 Fenders

ISO 20474-1:2017, 4.14.7, shall apply with the exception that front wheels do not require fenders.

4.4 Steering system

4.4.1 General

ISO 20474-1:2017, 4.6.1 and 4.6.2 shall apply with the additions given in 4.4.2 and 4.4.3 below.

4.4.2 Controls

Wheel, articulated and bogie steering shall be actuated by separate controls.

4.4.3 Steering performance test

ISO 20474-1:2017, 4.6.2 shall apply with the following additions:

— the steering performance test shall be conducted with the front steering system (Ackermann steering system) only;

— during testing, leaning front wheels and articulated or bogie steering systems shall be kept in the vertical and straight ahead positions respectively.

4.4.4 Safety requirements for travelling mode

It shall be possible for the controls of a leaning front wheel system to be mechanically locked in the vertical position.

5 Information for use

ISO 20474-1:2017, 6.2, shall apply with the following additions:

— instructions shall be provided on how to use grader steering on public roads;

— instruction shall be given that all blades and equipment are to be placed in their transport position such that they are within the defined transport width of the machine.