

ANSI B71.4-2004

American National Standard

ANSI B71.4-2004

*for Commercial Turf Care Equipment –
Safety Specifications*



ANSI B71.4-2004
Revision and redesignation
of ANSI/OPEI B71.4-1999

American National Standard
for Commercial Turf Care Equipment -
Safety Specifications

Secretariat
Outdoor Power Equipment Institute, Inc.

Approved February 24, 2004
American National Standards Institute, Inc.

American National Standard

Approval of an American National Standard requires review by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgement of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made towards their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

Published by

**American National Standards Institute, Inc.
25 West 43rd Street, New York, NY 10036**

Copyright © 2004 by American National Standards Institute
All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without prior written permission of the publisher.

Printed in the United States of America

Contents

	Page
Foreword	iii
1 Scope	1
2 Normative references	1
3 Definitions	2
4 General requirements	5
4.1 Guarding and shielding.....	5
4.2 Labels and instructions.....	6
4.3 Requirements for low-voltage electrical components	8
4.4 Operator zone.....	8
4.5 Operator's controls	9
5 Pedestrian-controlled units	11
5.1 Operator's controls - Self-propelled	11
5.2 Braking requirements and tests.....	12
5.3 Handle structure	13
5.4 Sulky units	13
6 Ride-on units, ride-on turf tractors, and attachments	15
6.1 Operator's controls	15
6.2 Operator position	18
6.3 Stability requirements and tests for ride-on units and ride-on turf tractors	18
6.4 Braking requirements and tests for ride-on units and ride-on turf tractors	20
6.5 Lighting and marking for ride-on units and ride-on turf tractors used on public roads	22
6.6 Lateral upset operator protection recommendations and tests for ride-on mowing equipment	22
7 Implements	23
7.1 General requirements.....	23
7.2 Operating controls	23
8 Functional components	23
8.1 General requirements (in addition to those in 4.5.8)	23
8.2 Requirements for rotary mower components	24
8.3 Test for rotary mower components.....	25
8.4 Requirements for flail mowers and flail power rakes	33
8.5 Requirements for reel mower components.....	35
8.6 Tests for reel mower components	35
Figures	
1 Operator zone - Pedestrian-controlled units.....	37
2 Operator zone - Ride-on units	37
3 Safety practices for commercial turf care equipment	38
4 Finger probe	39

	Page
5	Machine position on the platform 40
6	Machine at equilibrium 40
7	Characteristic dimensions of a ride-on vehicle 41
8	Impact test fixture for mowers with the blade tip circle diameter less than 775 mm (30.5 in) for all blades 42
9	Foot probe 43
10	Structural integrity test fixture for mowers with the blade tip circle diameter less than 775 mm (30.5 in) for all blades..... 45
11	Thrown object test fixture 49
12	Impact test fixture for mowers with the blade tip circle diameter of 775 mm (30.5 in) or greater and blade thickness of 8 mm (0.312 in) or greater for one or more blades 57
13	Structural integrity and thrown objects test fixture for mowers with the blade tip circle diameter 775 mm (30.5 in) or greater and blade thickness of 8 mm (0.312 in) or greater for one or more blades..... 58
14	Flail forward trajectory 61
15	Flail mower test obstruction..... 61
16	Side coverage of reels..... 62
17	Guarding of rear-throw mowers..... 62
18	Guarding of front-throw mowers 62
19	Guarding of pedestrian-controlled reel mowers..... 63
20	Pitch 64
21	Roll 65
22	Yaw 66
Annexes	
A	Rationale 67
A.1	Overview of the format of the standard 67
A.2	Standard references 67
A.3	Rationale for requirements of the standard 67
B	Drop distance calculations 81
C	Safety pictorials 82
D	Bibliography 83

Foreword (This foreword is not part of American National Standard ANSI B71.4-2004.)

This standard is a revision of *American National Standard for Commercial Turf Care Equipment - Safety Specifications*, ANSI/OPEI B71.4-1999. The first edition of this standard was approved and published by the American National Standards Institute in 1980. It has been revised four times since initial publication, including this revision.

The present revision was prepared by the Outdoor Power Equipment Institute (OPEI) Subcommittee on Commercial Turf Care Equipment as part of OPEI's continuing work on standards.

A summary of the principal changes included in this revision follows:

- Addition of definition and requirements for Stand-on Machines and Sulky units
- Changes to the temperature requirements for hot surfaces
- Changes to the safety sign requirements to allow for no-text signs
- Addition of stability requirements for machines with grass catchers
- Harmonization of pressurized components requirements with ISO Standards
- Changed stability requirements for zero-turn machines with ROPS
- Harmonization of thrown objects text criteria with ISO/CEN standards

Consensus for this standard was achieved by the use of the Canvass Method.

There are four annexes in this standard. Annexes A, B, C, and D are informative and are not considered part of this standard.

Suggestions for improvement of the standard will be welcome. They should be sent to the Outdoor Power Equipment Institute, 341 South Patrick Street, Alexandria, VA 22314.

The following organizations recognized as having an interest in the standardization of safety requirements for power lawn mowers, land and garden tractors, and lawn tractors were contacted prior to the approval of this revision of the standard. Inclusion in the list does not necessarily imply that the organization concurred with the submittal of the proposal to ANSI.

American Consulting
American Nursery & Landscape
American Society of Agricultural Engineers
Deere & Company
McCanse Consulting
SGS US Testing Company, Inc.
Texas Tech University
Textron Golf, Turf & Specialty
The Toro Company
Underwriters Laboratories, Inc.

American National Standard

for Commercial Turf Care Equipment – Safety Specifications

1 Scope

The safety specifications in this standard apply to powered pedestrian-controlled, towed, and ride-on machines intended for marketing as commercial turf care equipment and that are customarily used by hired operators. Equipment covered may consist of two or more components that are functionally connected and may be produced by different manufacturers. Each functional component shall conform to each section of this standard as it logically applies. Additionally, this standard applies to all aftermarket parts, attachments and accessories provided by the original equipment manufacturer and others. Any manufacturer of aftermarket parts, attachments and accessories is responsible for ensuring compliance to this standard.

These specifications are not intended to apply to:

- turf care equipment that is designed primarily for personal use by a consumer in or around a permanent or temporary household or residence;
- equipment that is designed primarily for agricultural purposes; and
- equipment that is designed primarily for cutting grass and other growth on highways and is designed for operation with agricultural/industrial tractors.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI Z535.4-2002, *Product safety signs and labels*

ANSI/ASAE S279.10-OCT98, *Lighting and marking of agricultural equipment on highways*

ANSI/SAE J517-FEB98, *Hydraulic hose*

ANSI/SAE J1163-AUG97 (RMAY00), *Determining seat point index*

ANSI/SAE J1362-JUL97, *Graphical symbols for operator controls and displays on off-road self-propelled work machines*

ANSI/UL 73-1998, *Standard for safety for motor-operated appliances*

ASAE S217.11-DEC91, *Three-point free-link hitch attachment of implements to agricultural wheeled tractors*¹⁾

ASAE S278.6-DEC84, *Attachment of implements to agricultural wheel tractors equipped with quick attaching coupler for three-point free-link hitch*

ASAE S318.11-MAR95, *Safety for agricultural field equipment*

¹⁾ ASAE standards are available from the American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085-9569.