

# American National Standard

*for Adaptive Sports Equipment –*  
**Volume 1:**  
**Winter Sports Equipment**

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# RESNA

Rehabilitation Engineering and Assistive Technology Society of North America

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**ANSI/RESNA  
ASE-1:2014**

2014-11-21

American National Standard  
for Adaptive Sports Equipment –

# **Volume 1: Winter Sports Equipment**

Secretariat

**Rehabilitation Engineering and Assistive  
Technology Society of North America**

Approved 21 November 2014

**Rehabilitation Engineering and Assistive  
Technology Society of North America**

Approved 07 November 2014

**American National Standards Institute, Inc.**

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Published in the United States of America

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## Foreword

This standard covers the requirements and test methods for the testing of adaptive sports equipment (ASE). Volume 1 pertains to the testing of winter sports equipment. Winter sports equipment is generally tested as a complete system in a standard reference configuration that facilitates comparison of test results among different manufacturers and models. Accessory manufacturers would test their product on one piece of winter sports equipment for which the accessory is recommended and determine those performance specifications that are affected by the addition of the accessory to the winter sports equipment.

The standards are test procedures designed to produce objective information about adaptive sports equipment. Some of the test methods establish minimum performance criteria for durability and safety reasons. In all cases, the information that is disclosed with regard to the testing should be considered with respect to the following note: the results obtained are based on testing one or more adaptive winter sports devices of a specific make, model and type. The performance a specific user gets from his/her own equipment will depend upon their skill, personal user habits, weight, and mass distribution, user techniques, the make, model, and condition of the attached ski, and the condition in which the equipment is maintained and may not represent the results obtained using the standardized RESNA test procedures.

ANSI/RESNA ASE Volume 1 consists of the following section under the general title Adaptive Sports Equipment:

### **Volume 1: Winter Sports Equipment**

Section 1: **Requirements and Test Methods for Sit-skis, Mono-skis, and Bi-skis**

The following ANSI/RESNA ASE Volume is also available:

### **Volume 2: Adaptive Golf Cars**

Section 1: **Adaptive Golf Cars Safety and Performance Specifications**

This standard is a revision of the American National Standard – RESNA ASE-1:2007. This standard had its inception in December of 1995 when the first meeting of the RESNA Standards Committee on Adaptive Sports Equipment met to begin the creation of requirements and test procedures for sit-skis, mono-skis, and bi-skis. This work was begun in parallel with changes that were being made to the American's with Disabilities Act (ADA) Accessibility Guidelines for outdoor recreation access for ski areas. The ANSI B77.1 American National Standard for Passenger Ropeways - Aerial Tramways, Aerial Lifts, Surface Lifts, Tows, and Conveyors - Safety Requirements had begun making revisions for accessibility to skiers using sit-skis, mono-skis, and bi-skis at this time. The B77.1 Standard has approved and implemented the revisions. Programmatic guidelines for accessibility were also being drafted for application to ski areas operating on public land which the United States Department of Agriculture (USDA) Forest Service has since implemented and adopted. To facilitate and enable the compatibility of standardized adaptive ski equipment with ski area lift equipment and ski area instructional programming, the need for requirements and test procedures for sit-skis, mono-skis, and bi-skis became evident.

The RESNA Standards Committee on Adaptive Sports Equipment is composed of a variety of people including sit-ski, mono-ski, and bi-ski manufacturers and designers, adaptive ski program directors, ski alpine industry representatives, lift equipment manufacturers and operators, governmental representatives (US Access Board and USDA Forest Service), and adaptive skiers.

RESNA is accredited as a standards organization and the RESNA Assistive Technology Standards Board oversees the work of the RESNA standards committees. RESNA is an interdisciplinary organization that promotes assistive technology for people with disabilities.

Suggestions for the improvement of this standard are welcome. They should be sent to the following address:

**RESNA Assistive Technology Standards Board  
1700 North Moore Street, Suite 1540  
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This standard was approved by the RESNA Standards Committee on Adaptive Sports Equipment and the RESNA Assistive Technology Standards Board for submittal to ANSI. Committee approval of the standard does not necessarily imply that all the committee members voted for its approval or the approval of every test method or requirement in the standard. At the time the standard was revised, the RESNA Standards Committee on Adaptive Sports Equipment consisted of the following members:

<b>Organization Represented</b>	<b>Name of Representative</b>
Beneficial Designs, Inc. ....	Peter Axelson, Chair
Lounsbury Adaptive Ski Program .....	Stephen O'Neill, Vice-Chair
National Ski Areas Association. ....	Sid Roslund, Secretary
AbilityPlus Mt Snow .....	Sue Tatem
Adaptive Snowsports .....	Christina Bruno
Adaptive Sports Center .....	Chris Read
.....	Jeff Perambo
Adaptive Sports Partners of the North Country.....	Sandy Olney
.....	Cris Criswell
Baltimore Adaptive Recreation Sports .....	Jerry Miserandino
Bart J Ruggiere Adaptive Sports Center .....	Joe Hurley
Breckenridge Outdoor Education Center .....	Gene Gamber
DynAccess .....	Chiharu Tokura
.....	Joachim Grenestedt
Enabling Technologies.....	Chris Witte
.....	Woody Witte
Framesmith, LLC .....	Glen Smith
Freedom Factory.....	Andy Tirums
.....	Lynn Tirums
Hands on Concepts 2, Inc.....	Steve Holub

Mountain Man .....	Darvin Vadergrift
.....	Robert Pavlic
National Sports Center for the Disabled .....	Pat Campanello
.....	Paul Saarela
New England Handicapped Sports Association (NEHSA) .....	Tom Kersey
Radventures, Inc.....	Genie Goodman
.....	Jeff Goodman
.....	Joel Goodman
Ski Star Technologies .....	Mike Miltner
Spokes 'N Motion.....	Paul Speight
USDA Forest Service.....	Kevin Kennedy
VA Central Office .....	Kendra Betz
Waterville Valley Adaptive Sports .....	Linda Whittle
Wood River Ability Program.....	Marc Mast



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## Scope of Volume 1

Volume 1: Winter Sports Equipment of the RESNA Standard for Adaptive Sports Equipment applies to sit-skis, mono-skis, and bi-skis.

This standard does not apply to: (1) adaptive sports equipment intended for special purposes, such as one of a kind custom-made adaptive sports equipment or (2) adaptive sports equipment specially designed and fabricated for specific people with disabilities.

NOTE 1 Changes such as different sizes or production upon receipt of an order do not qualify an adaptive sports equipment as "one of a kind."

NOTE 2 Appropriate sections of this standard may be applied to adaptive sports equipment and adaptive sports equipment accessories outside this scope, to the extent that it is practical.

This standard specifies requirements and test methods for determining adaptive sports equipment performance. It also specifies requirements for the disclosure of the test results.

These test methods may be used to verify manufacturers' claims that a product exceeds the minimum requirements of this standard.

Standardized means of preparing and adjusting adaptive sports equipment are provided to enable the test results to be used for the comparison of performance.

**WARNING:** This RESNA Standard calls for the use of procedures that may be injurious to the testing technician if adequate precautions are not taken.

## **Section 1**

# **Requirements and Test Methods for Sit-skis, Mono-skis, and Bi-skis**

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## Section 1 Introduction

At the time of this publication, Section 1, the only section at this time, pertains to the testing of sit-skis, mono-skis, and bi-skis (SMBs). An SMB is generally tested as a complete system in a standard reference configuration that facilitates comparison of test results among different manufacturers and models. Accessory manufacturers would test their product on one SMB for which the accessory is recommended and determine those performance specifications that are affected by the addition of the accessory to the SMB.

In all cases, the information that is disclosed with regard to the testing should be considered with respect to the following note: the results obtained are based on testing one or more SMBs of a specific make, model and type. The performance a specific skier gets from his/her own SMB will depend upon their skill, personal skier habits, weight and mass distribution, skiing techniques, the make, model and condition of the attached ski and the condition in which the SMB is maintained and may not represent the results obtained using the standardized RESNA test procedures.

# Section 1: Requirements and Test Methods for Sit-skis, Mono-skis, and Bi-skis

## 1 Scope

This document establishes a standard for the design, manufacture, construction, operation, and maintenance of sit-skis, mono-skis, and bi-skis (SMBs). Wherever possible, this standard should be applied to all types of sit-skiing equipment, regardless of the position or orientation that the skier is in while skiing and regardless of the number of skis the device uses to expand access to more skiers of all abilities.

The purpose of this standard is to develop a system of principles, specifications, and performance criteria that will meet the following objectives:

- a) Reflect the current state-of-the-art of SMB design and use;
- b) Be acceptable for adoption by government agencies and others.

It is recognized that certain dangers and risks are inherent in the use of SMBs. This standard is intended to result in SMBs that are designed, constructed, and operated in a manner that helps reduce danger and exposure of risk to skiers and to encourage improvements in productivity, efficiency, development, and progress consistent with the objectives.

Such a system with these stated objectives constitutes a safety standard.

## 2 References

### 2.1 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.

National Ski Area Association (NSAA) – *Ski & Snowboard Safety, Your Responsibility Code*

### 2.2 Informative references

The following referenced documents are provided as additional information 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.

ASTM F944-97 Standard Specification for Properties of Adult Alpine ski Boots

ISO 5355 (2006) *Alpine ski-boots – Requirements and test methods*