

---

---

**Protective equipment for use in ice  
hockey —**

**Part 5:  
Neck laceration protectors for ice  
hockey players**

**iTeh STANDARD PREVIEW**  
*Équipement protectif destinées à être utilisées en hockey sur glace —  
Partie 5: Protège-cous contre les lacérations pour joueurs de hockey  
sur glace*  
(standards.iteh.ai)

[ISO 10256-5:2017](https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017)

<https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017>



**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO 10256-5:2017

<https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 General requirements</b> .....	<b>2</b>
4.1 Innocuousness/materials.....	2
4.2 Ergonomics, ease of use and adjustment.....	2
4.3 Protected area and area of coverage.....	3
4.4 Cut resistance.....	3
4.5 Permanence of markings.....	3
<b>5 Test methods</b> .....	<b>3</b>
5.1 Test apparatus tolerances.....	3
5.2 Test samples and conditioning.....	3
5.2.1 Test samples.....	3
5.2.2 Sample preparation and conditioning.....	3
5.3 Test procedures.....	4
5.3.1 Innocuousness.....	4
5.3.2 Ergonomics.....	4
5.3.3 Verification of the protected area and area of coverage and examination of sizing.....	4
5.3.4 Permanence of markings.....	5
5.3.5 Cut testing.....	5
<b>6 Test report</b> .....	<b>5</b>
<b>7 Markings and labelling</b> .....	<b>6</b>
7.1 Markings.....	6
7.2 Labelling.....	6
<b>8 Information for users</b> .....	<b>6</b>
<b>Annex A (normative) Cut test using guided horizontal monorail apparatus</b> .....	<b>9</b>
<b>Annex B (normative) Cut test using guided drop apparatus</b> .....	<b>13</b>
<b>Annex C (normative) Anatomical forms</b> .....	<b>18</b>
<b>Bibliography</b> .....	<b>22</b>

## 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](http://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](http://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](http://www.iso.org/iso/foreword.html). (standards.iteh.ai)

The committee responsible for this document is ISO/TC 83, *Sports and other recreational facilities and equipment*, Subcommittee SC 5, *Ice hockey equipment and facilities*.

This first edition of ISO 10256-5, together with ISO 10256-1, ISO 10256-2, ISO 10256-3, ISO 10256-4 and ISO 10256-6, cancels and replaces ISO 10256:2003, which has been technically revised.

This document was developed primarily from neck laceration protector standards previously published by Bureau de Normalisation du Québec (BNQ) (CAN/BNQ 9415-370) and the European Committee for Standardization (CEN/TS 15256:2005).

A list of all the parts in ISO 10256 can be found on the ISO website.

## Introduction

The intention of neck laceration protection is to reduce the frequency and severity of lacerations to the neck while playing ice hockey. The protective function is such that the penetration of a skate blade is counteracted.

Neck laceration protection for use in ice hockey consists of a neck laceration protector. To achieve the performance of which it is capable and to ensure stability on the neck, a neck laceration protector should be as closely fitting as possible consistent with comfort. In use, it is essential that the neck laceration protector is securely fastened according to the manufacturer's instructions.

ISO/TC 83/SC 5 is aware that specifications for the performance of the neck laceration protector are required to reduce the risk of injury in ice hockey. The goal of the subcommittee is to promote the use of improved materials and/or constructions as they become available to meet the future requirements of the sport of ice hockey. ISO/TC 83/SC 5 recognizes that in order to provide for comfort, fit and use, neck laceration protectors should be constructed from materials providing the appropriate performance characteristics.

The intent of this document is to reduce the risk of lacerations to the neck without compromising the form or appeal of the game.

Ice hockey is a sport in which there is a risk of injury. This document is intended only for neck laceration protectors used for ice hockey. Ice hockey neck laceration protectors do not afford protection from impacts to the neck or spine, nor do they protect against axial compressive loading of the cervical spine. Severe head, brain or spinal injuries, including paralysis or death, may occur even though an ice hockey neck laceration protector meeting the requirements of this document is used.

In order for a neck laceration protector to perform adequately, it needs to be in good condition, fit properly, be worn properly and not be altered in any way.

[ISO 10256-5:2017](https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017)

<https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO 10256-5:2017](https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017)

<https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017>

# Protective equipment for use in ice hockey —

## Part 5: Neck laceration protectors for ice hockey players

### 1 Scope

This document specifies performance requirements and test methods for neck laceration protectors used in ice hockey. Neck laceration protectors are needed to reduce the risk of direct laceration to the neck caused by contact of a hockey skate blade.

The tests required to ensure that a neck laceration protector conforms to the requirements of this document do not attempt to predict the performance of the neck protector in all possible situations. This document does not address protection from the impact of pucks, sticks or other objects.

This document does not address accessories that are associated with a neck laceration protector.

### 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 6330, *Textiles — Domestic washing and drying procedures for textile testing*

<https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5406f02ac410/iso-6330-2017>

ISO 10256-1:2016, *Protective equipment for use in ice hockey — Part 1: General requirements*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10256-1 and the following apply.

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

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

— ISO Online browsing platform: available at <https://www.iso.org/obp/>

#### 3.1

##### **anatomical form**

solid or hollow object defined by its shape and size, used to support a *neck laceration protector* (3.6) for the verification of the test requirements of this document

#### 3.2

##### **anvil**

round or square sectioned rigid metal block with a specified shape at its upper end used to transmit the force of impact from the inside of the test specimen to the force transducer

#### 3.3

##### **bib**

part of a *neck laceration protector* (3.6) that lies over the anterior thoracic region

**3.4  
median plane**

vertical plane that passes through the *neck laceration protector* (3.6) from front to back and divides the neck laceration protector into right and left halves

**3.5  
model**

category of a *neck laceration protector* (3.6) that does not differ in essential elements

Note 1 to entry: The essential elements are the materials, design, construction, marking requirements and retention system.

Note 2 to entry: The same model can be available in several sizes and colours.

**3.6  
neck laceration protector**

cut resistant device worn to reduce the risk of external laceration injury from skate blades in the *protected area* (3.8)

**3.7  
neck part**

part of a *neck laceration protector* (3.6) that surrounds the cylindrical portion of the anatomical neck form

**3.8  
protected area**

area of the *neck laceration protector* (3.6) that is subject to testing as defined in this document

**3.9  
easy access**

ability to open the protector and position it away from the wearers neck without any tools when the wearer is laying supine (i.e. on the back, facing upward) and without lifting the head from the ground

<https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017>

**4 General requirements**

**4.1 Innocuousness/materials**

**4.1.1** In addition to the requirements of ISO 10256-1:2016, 4.1, the requirements in 4.1.2 to 4.1.4 shall apply. Examination shall be made according to 5.3.1.

**4.1.2** The neck laceration protector shall be made with no removable parts in the protected area.

**4.1.3** If any of the materials used tend to shrink when laundered, this aspect shall be taken into consideration in order to assure that the protective material covers the protected area after laundering.

**4.1.4** The protective materials shall be attached securely to each other and to the other materials in such a way that they provide continuous protection in the protected area, ensure the comfort of the user and do not shift during normal use.

**4.2 Ergonomics, ease of use and adjustment**

**4.2.1** The neck protector shall comply with the requirements of ISO 10256-1:2016, 3.2.

**4.2.2** The neck laceration protector shall be compatible with other equipment such as shoulder pads, helmet and facial protector.



**4.2.3** The neck laceration protector shall be quickly and easily adjustable and in the event of an emergency, it shall allow easy access to the protected area.

**4.2.4** The neck laceration protector shall be designed and manufactured so that it remains in place during normal ice hockey play when worn according to the manufacturer's instructions.

### 4.3 Protected area and area of coverage

When examined according to [5.3.3.1](#), the protective material of the neck laceration protector shall cover the protected area as shown in [Figure 1](#).

### 4.4 Cut resistance

When tested according to [5.3.5](#), the protective area of the neck laceration protector shall meet the specified minimum cut resistance requirements for the test method performed.

When tested according to the method in [Annex A](#), there shall be no cuts detected on the artificial neck foam, nor cut through the bottom layer (the one found in contact with the skin of the user) of the neck laceration protector.

When tested according to the method in [Annex B](#), there shall be no cut through the entire thickness of the neck protector within the cut test area.

### 4.5 Permanence of markings

When tested in accordance with [5.3.4](#), permanent markings shall remain legible for the useful life of the neck laceration protector under normal use and maintenance following the manufacturer's care and maintenance recommendations.

ITEH STANDARD PREVIEW

(standards.iteh.ai)

ISO 10256-5:2017

<https://standards.iteh.ai/catalog/standards/sist/9852be53-7263-475e-a59d-5488e802aefa/iso-10256-5-2017>

## 5 Test methods

### 5.1 Test apparatus tolerances

Unless otherwise specified, the dimensions of the cut test apparatus shall have a tolerance of  $\pm 2$  %.

### 5.2 Test samples and conditioning

#### 5.2.1 Test samples

Only new and complete neck laceration protectors, as offered for sale, shall be tested. The neck laceration protectors shall be inspected visually, and by hand, prior to conditioning. The number of samples required for each test is specified in [Table 1](#).

#### 5.2.2 Sample preparation and conditioning

##### 5.2.2.1 Washed and dried

All neck laceration protector samples shall be washed three times according to ISO 6330 using the manufacturer's instructions.

After each wash, the protector shall be hung in ambient conditions according to ISO 6330 and according to the manufacturer's instructions.

### 5.2.2.2 Conditioning

Unless otherwise specified, neck laceration protector samples for the cut test shall be

- a) dry condition — dry conditioned under ambient temperatures according to ISO 10256-1, and
- b) wet condition — submerged in water at a temperature of  $(20 \pm 2)$  °C for at least 4 h. After removal from the water, the protector shall be hung for  $(30 \pm 5)$  min in ambient conditions according to ISO 10256-1:2016, 6.1.

## 5.3 Test procedures

### 5.3.1 Innocuousness

The neck laceration protector shall be examined visually and or by hand to determine that there are no items that might injure the user or another player during normal use.

Documents supplied by the manufacturer shall be examined to determine whether the claim that the materials are suitable for use in ice hockey protective clothing and equipment is justified. If the documentation is deemed inadequate, the model shall not be tested.

The results of the examination for innocuousness shall be recorded in the test report.

### 5.3.2 Ergonomics

The protector shall fulfil the ergonomics requirements in ISO 10256-1 and [4.2](#).

### 5.3.3 Verification of the protected area and area of coverage and examination of sizing

#### 5.3.3.1 Verification of coverage of the protected area

The protected area of a neck laceration protector shall include a neck part (collar) and a bib.

Verification of the protected area shall be carried out on an anatomical form manufactured according to the specifications in [Annex C](#). The size of the anatomical form shall correspond to the size indicated on the neck laceration protector.

When the neck laceration protector is installed on the anatomical form and held in place according to the manufacturer's recommendations, the protective material shall cover the protected area requirements of the neck part and the bib (see [Figure 1](#)).

The protected area of the neck part shall be defined on each anatomical form corresponding to the size(s) indicated on the neck protector. This verification of the protected area of the neck part shall be carried out according to the following conditions:

- a) Neck laceration protector shall be placed on corresponding size of anatomical form. The median plane of the protector shall be lined up with points F and J of the anatomical form (see [Figure 1](#)).
- b) In order to simulate a standard fit, a 10 mm diameter × 15 cm long piece of foam shall be placed over the front part of the anatomical form between the form and the neck laceration protector. This bar shall be lined up at midpoint of the anatomical form. The lower centre part of the bar shall be lined up with point J and the piece of foam shall extend up for width to be centred over point F of the anatomical form.
- c) If the neck laceration protector employs a hook and loop or similar fastening system, the neck laceration protector shall be installed on the anatomical form so that the two parts of the fastening system are parallel.
- d) After positioning the neck laceration protector on the form, the bar shall be removed during the verification of the protected area.

- e) A manual adjustment of the neck laceration protector is allowed in the vertical axis as long as its centreline remains lined up with point F on the anatomical forms. No further adjustment shall be permitted.
- f) The neck laceration protector can be held in place with manual pressure on the anatomical form during the verification of the protection zone if the rigidity of the neck laceration protector prevents it from staying in contact with the torso part of the anatomical form.
- g) If more than one size is indicated on the neck laceration protector, the verification of protection zone testing shall be carried out on each of the anatomical forms corresponding to each of the indicated sizes.
- h) If a neck laceration protector is integrally attached within a garment, the neck laceration protector shall be cut away from the garment before it is placed on the anatomical form to verify the protected area.
- i) Verification of the protected area of the bib shall be determined by measuring the bib height according to the following conditions:
  - 1) measurements shall be taken at three points on the anatomical form: at 0°, 90° and -90° (see [Figure 1](#));
  - 2) measurements shall be taken from bib seam to bottom edge of bib, at 90° angles from seam.

#### 5.3.3.2 Sizing of each model

All available sizes shall be verified to [5.3.3.1](#). The sizes marked on the samples (see [Table 2](#)) and details in the information supplied by the manufacturer (see [Clause 8](#)) shall be examined to determine whether the test specimens correspond to the marking and to the information given for that neck laceration protector. The results of the examination shall be recorded in the test report.

#### 5.3.4 Permanence of markings

The permanence of the marking shall be verified by testing a specimen (representative part) of the neck laceration protector according to ISO 6330 using the following conditions and requirements:

- a) wash procedure no. 6B: i.e. for textile materials that are expected to withstand repeated hand washing, or equivalent normal machine washing at lukewarm temperatures ( $40 \pm 3$ ) °C;
- b) AATCC 1993 reference detergent WOB (without optical brightener);
- c) number of cycles: 20 continuous wash cycles;
- d) dry procedure no. A (line dry after 20 wash cycles);
- e) undyed adjacent fabric: multifibre test fabric no. 10 (with fibres of acetate, cotton, nylon, polyester, acrylic and wool).

#### 5.3.5 Cut testing

Cut testing of neck laceration protectors shall be performed as described in [Annex A](#) or [Annex B](#).

## 6 Test report

In addition to the requirements in ISO 10256-1:2016, Clause 7, the test report shall include at least the following information:

- a) results of tests according to [Clause 5](#);
- b) correspondence with requirements in [Clauses 4](#), [7](#) and [8](#).

## 7 Markings and labelling

### 7.1 Markings

Markings shall be according to ISO 10256-1:2016, Clause 8.

### 7.2 Labelling

Label(s) securely attached to the neck laceration protector shall contain the following information:

- a) recommendations for maintenance, washing and use;
- b) the date of manufacturer in all numerical format (i.e. year, month, day);
- c) a warning statement stipulating that the neck laceration protector is only designed to reduce the risk of direct laceration caused by contact with a skate blade in the protected zone, and that it therefore does not eliminate risks in all possible situations to which the user may be exposed, including direct blows to the neck;
- d) a warning statement stipulating that if the neck laceration protector is not properly maintained, does not fit, is not worn properly or is altered in anyway, the protection that it provides will be compromised.

## 8 Information for users

In addition to the requirements of ISO 10256-1, each neck laceration protector shall be permanently marked with the size designation of the neck laceration protector and the minimum and maximum neck circumference for which the neck laceration protector is intended.

**Table 1 — Neck laceration protector test specimens**

Test samples required if using Annex A cut testing method			
Test	Conditioned	Samples needed	Model size
Protected area of coverage	Washed	1	All model sizes
Cut test	Dry	3	1 model size
Cut test	Wet	1	1 model size
Test Samples required if using Annex B cut testing method			
Test	Conditioned	Samples needed	Model size
Protective zone of coverage	Washed	1	All model sizes
Cut test	Dry	1	1 model size
Cut test	Wet	1	1 model size