



BSI Standards Publication

Lasers and laser-related equipment - Determination of laser resistance of tracheal tube shaft and tracheal cuffs

National foreword

This British Standard is the UK implementation of EN ISO 11990:2018. It is identical to [ISO 11990:2018](#). It supersedes [BS EN ISO 11990-2:2014](#) and [BS EN ISO 11990-1:2014](#), which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee CPW/172, Optics and Photonics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Amendments/corrigenda issued since publication

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English Version

**Lasers and laser-related equipment - Determination of
laser resistance of tracheal tube shaft and tracheal cuffs
(ISO 11990:2018)**

Lasers et équipements associés aux lasers -
Détermination de la résistance au laser des axes et
ballonnets de tubes trachéaux (ISO 11990:2018)

Laser und Laseranlagen - Bestimmung der
Laserresistenz von Trachealtubusschaft und
Trachealtubusmanschette (ISO 11990:2018)

This European Standard was approved by CEN on 5 August 2018.

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European foreword

This document (EN ISO 11990:2018) has been prepared by Technical Committee ISO/TC 172 "Optics and photonics" in collaboration with Technical Committee CEN/TC 123 "Lasers and photonics" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2019, and conflicting national standards shall be withdrawn at the latest by April 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes [EN ISO 11990-1:2014](#) and EN ISO 11990-2:2014.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZA, which is an integral part of this document.

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Endorsement notice

The text of [ISO 11990:2018](#) has been approved by CEN as EN ISO 11990:2018 without any modification.

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	3
5 Significance and use of the test	3
6 Apparatus	4
6.1 General	4
6.2 Containment box	4
6.3 Specimen holder	5
6.4 Lasers and delivery systems	7
6.5 Power meter	7
6.6 Gas supply system	7
6.7 Environment	7
6.7.1 Ambient air conditions	7
6.7.2 Oxygen enriched atmospheres	8
6.8 Smoke evacuation device	8
7 Reagents and materials	8
8 Preparation of test specimens	8
9 Preparation of apparatus	9
10 Test methods	9
10.1 General conditions	9
10.2 Shaft	9
10.3 Cuff 10	9
11 Interpretation of results	11
12 Test report	11
Bibliography	13

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).

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For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 9, *Laser and electro-optical systems*.

This third edition of [ISO 11990](#) cancels and replaces [ISO 11990-1:2011](#) and [ISO 11990-2:2010](#) which have undergone a revision in order to adjust the two documents to each other thereby eliminating redundancies and unintended discrepancies.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

A fire in the airway is always a serious matter. In addition to local damage in the larynx, injury can occur to the lower airway and the parenchymal tissue in the lung. The products of combustion can be blown into the lungs.

Procedures performed in the airway, where a tracheal tube and a laser are used, bring together an oxygen-enriched atmosphere, a fuel and high power, the three ingredients necessary to create a fire. The likelihood that a laser beam will contact the tracheal tube during airway procedures is high. This led to the development of a test method, described in this document, to assist the clinician in determining which tracheal tube shaft was the most laser-resistant under a defined set of conditions.

Unfortunately, fires with tracheal tubes, whose shafts were laser-resistant according to this document have continued to occur. Investigations have shown that the cuff, and not the shaft, of the tracheal tube is the area of lowest laser resistance and most likely to be contacted by the laser beam, even when used according to the manufacturer's instructions. Clinical experience has shown that not only perforation of the part of the shaft below the cuff has happened, but also ignition of the outer surface of the cuff. This could then ignite other parts of the tracheal tube, such as the tip, which is normally unprotected.