

This is a preview of "ISO 5840-3:2021". Click here to purchase the full version from the ANSI store.

Second edition
2021-01

Cardiovascular implants — Cardiac valve prostheses —

Part 3: Heart valve substitutes implanted by transcatheter techniques

Implants cardiovasculaires — Prothèses valvulaires —

*Partie 3: Valves cardiaques de substitution implantées par des
techniques transcathéter*



Reference number
ISO 5840-3:2021(E)

© ISO 2021

This is a preview of "ISO 5840-3:2021". Click here to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of "ISO 5840-3:2021". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviations	4
5 Fundamental requirements	5
6 Device description	5
6.1 General	5
6.2 Intended use	6
6.3 Design inputs	6
6.3.1 Operational specifications	6
6.3.2 Performance specifications	6
6.3.3 Implant procedure	7
6.3.4 Packaging, labelling and sterilization	7
6.4 Design outputs	7
6.5 Design transfer (manufacturing verification/validation)	7
6.6 Risk management	7
7 Design verification and validation	8
7.1 General requirements	8
7.2 <i>In vitro</i> assessment	8
7.2.1 General	8
7.2.2 Test conditions, sample selection and reporting requirements	8
7.2.3 Material property assessment	8
7.2.4 Hydrodynamic performance assessment	8
7.2.5 Structural performance assessment	10
7.2.6 Design- or procedure-specific testing	10
7.2.7 Device MRI compatibility	12
7.2.8 Simulated use	12
7.2.9 Human factors and usability assessment	12
7.2.10 Implant thrombogenic and haemolytic potential assessment	12
7.3 Preclinical <i>in vivo</i> evaluation	12
7.3.1 General	12
7.3.2 Overall requirements	13
7.3.3 Methods	14
7.3.4 Test report	15
7.4 Clinical investigations	16
7.4.1 General	16
7.4.2 Study considerations	17
7.4.3 Study endpoints	18
7.4.4 Ethical considerations	19
7.4.5 Pivotal studies: Distribution of subjects and investigators	19
7.4.6 Statistical considerations including sample size and duration	20
7.4.7 Patient selection criteria	22
7.4.8 Valve thrombosis prevention	22
7.4.9 Clinical data requirements	23
Annex A (informative) Description of the transcatheter heart valve system	28
Annex B (informative) Transcatheter heart valve substitute hazard analysis example	30
Annex C (informative) Guidelines for verification of hydrodynamic performance — Pulsatile flow testing	32

This is a preview of "ISO 5840-3:2021". Click here to purchase the full version from the ANSI store.

Annex D (normative) Requirements for delivery system design and evaluation	40
Annex E (informative) Examples of design specific testing	42
Annex F (informative) Preclinical <i>in vivo</i> evaluation	44
Annex G (normative) Adverse event classification during clinical investigation	47
Annex H (informative) Multimodality imaging of TAVI and TMVI pre, peri and post-implantation assessments — Examples	53
Bibliography	56

This is a preview of "ISO 5840-3:2021". Click here to purchase the full version from the ANSI store.

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 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 150, *Implants for surgery*, Subcommittee SC 2, *Cardiovascular implants and extracorporeal systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 285, *Non-active surgical implants*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 5840-3:2013), which has been technically revised.

The main changes compared to the previous edition are as follows: the engineering and clinical requirements in the ISO 5840 series have been updated to current specifications and integrated and harmonized across all parts.

A list of all parts in the ISO 5840 series can be found on the ISO website.

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.

This is a preview of "ISO 5840-3:2021". Click here to purchase the full version from the ANSI store.

Introduction

This document has been prepared for transcatheter heart valve substitutes with emphasis on providing guidance for *in vitro* testing, preclinical *in vivo* and clinical evaluations, reporting of all *in vitro*, preclinical *in vivo*, and clinical evaluations and labelling and packaging of the device. This process is intended to clarify the required procedures prior to market release and to enable prompt identification and management of any subsequent issues.

This document is used in conjunction with ISO 5840-1 and ISO 5840-2.