Singapore Standards Council

SS 343 : Part 3 : 2014
(ICS 53.020.30)

SINGAPORE STANDARD

Specification for lifting gear

– Part 3 : Shackles

Published by
Enterprise Singapore

SS 343 : Part 3 : 2014
(ICS 53.020.30)

SINGAPORE STANDARD

Specification for lifting gear

– Part 3 : Shackles

ISBN 978-981-4557-55-9

This Singapore Standard was approved by the General Engineering and Safety Standards Committee on behalf of the Singapore Standards Council on 31 October 2014.

First published, 1990
First revision, 2014

The General Engineering and Safety Standards Committee, appointed by the Standards Council, consists of the following members:

		Name	Capacity
Chairman	:	Mr Chan Yew Kwong	*Member, Standards Council*
Deputy Chairman	:	Mr Seet Choh San	*Singapore Institution of Safety Officers*
Secretary	:	Ms Kong Wai Yee	*Singapore Manufacturing Federation – Standards Development Organisation*
Members	:	Ms Barbara Bok	*SPRING Singapore*
		Er. Goh Keng Cheong	*Housing and Development Board*
		Er. Hashim Bin Mansoor	*Building and Construction Authority*
		Assoc Prof Hoon Kay Hiang	*Nanyang Technological University*
		Mr Koh Yeong Kheng	*Association of Small and Medium Enterprises*
		Mr Liu Png Hock	*Land Transport Authority*
		Mr Ng Yek Meng	*Singapore Contractors Association Limited*
		Mr Derek Sim	*Association of Singapore Marine Industries*
		Ms Annabelle Tan	*Packaging Council of Singapore*
		Mr Tan Kai Hong	*Institution of Engineers, Singapore*
		Mr Tan Kee Pin	*National Environment Agency*
		Mr Tay Cheng Pheng	*Society of Loss Prevention in the Process Industries*
		Mr Jonathan Wan	*Access and Scaffold Industry Association*
		Mr Wong Choon Kin	*Singapore Manufacturing Federation*
		Mr Wong Siu Tee	*JTC Corporation*
		Mr Winston Yew	*Ministry of Manpower*
		Assoc Prof Zhou Wei	*Singapore Welding Society*

The Technical Committee on Safety and Health Involving the Use of Equipment, appointed by the General Engineering and Safety Standards Committee and responsible for the preparation of this standard, consists of representatives from the following organisations:

		Name	Capacity
Chairman	:	Assoc Prof Hoon Kay Hiang	*Member, General Engineering and Safety Standards Committee*
Secretary	:	Ms Julia Yeo	*Singapore Manufacturing Federation – Standards Development Organisation*
Members	:	Mr Ang Choon Huat	*Building and Construction Authority*
		Mr Choo Choong Huat	*Singapore Institution of Safety Officers*
		Mr Idilfitri Bin Mohammed Yatim	*Singapore Manufacturing Federation*

Members	:	Mr Lau Huat Poh	*Singapore Contractors Association Limited*
		Mr Lim Cheong	*Ministry of Manpower*
		Er. Manivel Rudrapathi	*Institution of Engineers, Singapore*
		Mr Frederick Neo	*Singapore Polytechnic*
		Mr Patrick Phoa	*Land Transport Authority*
		Mr Seah Chong An	*TÜV SÜD PSB Pte Ltd*
		Mr Alex Teo	*Association of Singapore Marine Industries*

The Working Group, appointed by the Technical Committee to assist in the preparation of this standard, comprises the following experts who contribute in their *individual capacity*:

		Name
Convenor	:	Mr Mohamad Japa Bin Rusdi
Members	:	Mr Chee Chee Chiat
		Assoc Prof Chew Chye Heng
		Mr Chia Chee Yong
		Mr Benjamin Dobbs
		Mr Han Kin Sew
		Er. Winson Lee Soo Hui
		Mr Eddie Seet
		Dr Sun Qiqing
		Mr Jason Tan
		Mr Jonathan Tan Aik Leong
		Mr Yeo Kim Hock

The organisations in which the experts of the Working Group are involved are:

Association of Singapore Marine Industries
Building and Construction Authority
Institution of Engineers, Singapore
Lifting Equipment Engineers Association
Ministry of Manpower
National University of Singapore
Singapore Contractors Association Limited
Singapore Institution of Safety Officers
Teho Ropes and Supplies Pte Ltd
TÜV SÜD PSB Pte Ltd
Workplace Safety and Health Council

(blank page)

Contents

National Foreword

This Singapore Standard was prepared by the Working Group on Lifting Gear appointed by the Technical Committee on Safety and Health Involving the Use of Equipment under the direction of the General Engineering and Safety Standards Committee.

SS 343 consists of the following three parts, under the general title 'Specification for lifting gear':

- Part 1: Wire rope slings (Modified adoption of ISO 7531 : 1987 (2012))
- Part 2: Hooks (Modified adoption of ISO 7597 : 2013)
- Part 3: Shackles (Modified adoption of ISO 2415 : 2004)

This part of SS 343 is a modified adoption of ISO 2415 : 2004 – 'Forged shackles for general lifting purposes – Dee shackles and bow shackles', published by the International Organization for Standardization.

The modification is given as follows:

Clause	Modification
9	*Add* 'See Annex ZA.' at the end of the clause. Explanation: Annex ZA contains an inspection checklist for replacement criteria of shackles to suit local requirements and the needs of the industry.

Attention is drawn to the following:

1. Where the words 'this International Standard' appear, they shall be read as 'this part of SS 343'. The reference to 'ISO 7597' shall be replaced by 'SS 343 : Part 2'.

2. The comma has been used throughout as a decimal marker in ISO 2415, whereas in Singapore Standards it is a practice to use a full-point on the baseline as the decimal marker.

In preparing this standard, reference was made to ASME B30.26 : 2010 'Rigging hardware. Safety standard for cableways, cranes, derricks, hoists, hooks, jacks and slings'.

Acknowledgement is made for the use of information from the above publication.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*

2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR.*

3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 2415 was prepared by Technical Committee ISO/TC 111, *Round steel link chains, chain slings, components and accessories*, Subcommittee SC 3, *Components and accessories*.

This third edition cancels and replaces the second edition (ISO 2415:1987), which has been technically revised.

Specification for lifting gear – Part 3 : Shackles

1 Scope

This International Standard specifies the general characteristics of forged dee and bow shackles in a range of sizes having working load limits of from 0,32 t to 100 t and in Grades 4, 6 and 8, and presents their performance and critical dimensions necessary for their interchangeability and compatibility with other components.

In the case of dee shackles for use with forged steel lifting hooks in conformance with ISO 4779 and ISO 7597, an intermediate component could be necessary for making the connection.

2 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.

ISO 261	ISO general purpose metric screw threads — General plan
ISO 263	ISO inch screw threads — General plan and selection for screws, bolts and nuts — Diameter range 0,06 to 6 in
ISO 643	Steels — Micrographic determination of the apparent grain size
ISO 4779	Forged steel lifting hooks with point and eye for use with steel chains of grade M(4)
ISO 4948-1	Steel — Classification — Part 1: Classification of steels into unalloyed and alloy steel based on chemical composition
ISO 6506-1	Metallic materials — Brinell hardness test — Part 1: Test method
ISO 6508-1	Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)
ISO 7597	Forged steel lifting hooks with point and eye for use with steel chains of grade T(8)