SINGAPORE STANDARD

SS 497 : 2011

(ICS 53.020)

CODE OF PRACTICE FOR

Design, safe use and maintenance of gantry cranes, overhead travelling cranes and monorail hoists

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Foreword

This Singapore Standard was prepared by the Technical Committee on Safety and Health involving the Use of Equipment under the purview of the General Engineering and Safety Standards Committee.

It is a revision of SS 497 : 2002 which was for overhead travelling cranes only. This revised standard is based on AS 1418.1:2002 – "Cranes, hoists and winches, Part 1 : General requirements" and is reproduced with permission from SAI Global under Licence 1108-c146. Australian Standards can be purchased online at: http://www.saiglobal.com.

This standard is expanded to include overhead travelling, gantry, jib cranes and hoists on monorails. It is aligned with current industrial practices and legal requirements on the safe use, design, maintenance and testing of such cranes. The salient points are as follows:

(a) The responsibilities of the relevant parties who are involved in the design, use, maintenance, testing and inspection of cranes are delineated.

(b) The requirements under each clause are elaborated to provide a common understanding amongst the various interested parties.

(c) The in-service wind speeds in Table 10 are based on the updated data obtained from the Singapore Meteorological Service and SS EN 1991-1-4: 2009 'Eurocode 1 – Actions on structures – Part 1-4: General actions – Wind actions'.

(d) Section Two covers the basic design considerations for the crane. Where the design and calculations are based on an overseas / established crane standard, there shall be no mix-and-match of the data quoted in this Singapore Standard and the aforesaid crane standard (e.g. the load factors, coefficients, etc).

(e) Various safety limiters and indicating devices are introduced as part of the crane mechanism to ensure safe operation. These include anti-collision devices, overload limiters, etc. Work space limiters are also introduced to prevent operation of cranes in prohibited areas where there is danger of collision of crane structure or load with a permanent object or structure.

(f) When tested with the SWL, the maximum deflection at the centre of the bridge shall not exceed 1/750 of the span. The deflection at end of cantilevered bridge shall not exceed 1/300 of the span of the cantilevered portion of the bridge.

(g) The markings on cranes have been provided to ensure proper identification and SWL limits, particularly for cranes fitted with at least 2 lifting devices.

(h) Manufacturer or supplier of cranes is required to provide complete documentation for the crane installed. It includes operations manual, maintenance manual, parts book and log book.

In preparing this standard, references were made to the following publications:

1.	AS 1418	Cranes, hoists and winches
		Part 3 : 1997 Bridge, gantry and portal cranes (including container cranes)
2.	BS 2573	Rules for the design of cranes
		Part 1 : 1983 Classification, stress calculations and design criteria for structures
		Part 2 : 1980 Classification, stress calculations and design criteria of mechanisms

3.	DIN 15018	Cranes – Steel structures Part 1 : 1994 Verification and analyses
4.	IEC 60204	Safety of machinery – Electrical equipment of machines Part 32 : 1998 Requirements for hoisting machines
5.	ISO 2408 : 1985	Steel wire ropes for general purposes – Characteristics
6.	ISO 4301	Cranes – Classification Part 1 : 1986 General Part 5 : 1991 Overhead travelling and portal bridge cranes
7.	ISO 4308	Cranes and lifting appliances – Selection of wire ropes Part 1 : 1986 General
8.	ISO 4310 : 2009	Cranes – Test code and procedures
9.	ISO 8686	Cranes – Design principles for loads and load combinations Part 1 : 1989 General Part 5 : 1992 Overhead travelling and portal bridge cranes
10.	ISO 9927	Cranes – Inspections Part 1 : 1994 General
11.	ISO 10245	Cranes – Limiting and indicating devices Part 1 : 1994 General Part 5 : 1995 Overhead travelling and portal bridge cranes
12.	ISO 10972	Cranes – Requirements for mechanisms Part 1 : 1998 General
13.	ISO 11660	Cranes – Access, guards and restraints Part 5 : 2001 Bridge and gantry cranes
14.	SS 536 : 2008	Code of practice for the safe use of mobile cranes
15.	SS 559 : 2010	Code of practice for safe use of tower cranes
16.	SS 567 : 2011	Code of practice for factory layout – Safety, health and welfare considerations

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

NOTE

1. *Singapore Standards are subject to periodic review to keep abreast of technological changes and new technical developments. The changes in Singapore Standards are documented through the issue of either amendments or revised editions.*

2. *Compliance with a Singapore Standard does not exempt users from legal obligations.*

Code of practice for design, safe use and maintenance of gantry cranes, overhead travelling cranes and monorail hoists

Section One – General

1 Scope

This standard applies to the following types of powered cranes (hereinafter called “cranes”):

1.1 Gantry cranes

1.2 Overhead travelling cranes

1.3 Jib cranes; and

1.4 Monorail hoists.

It specifies the basic requirements of cranes and lays down the responsibilities of the various parties involved.