Australian Standard®

Offshore containers and associated lifting sets

Part 2: Lifting sets—Design, manufacture and marking (EN 12079-2:2006, MOD)

First published as AS EN 12079.2—2010.

Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia

ISBN 978 0 7337 9438 4

PREFACE

This Standard was prepared by the Standards Australia Committee ME-025, Lifting Tackle.

The objective of this Standard is to improve the alignment of Australian and international practice with regard to inspection, examination and testing of offshore containers and associated lifting sets.

The terms 'normative' and 'informative' are used to define the application of the annex or appendix to which they apply. A normative annex or appendix is an integral part of a standard, whereas an informative annex or appendix is only for information and guidance.

This Standard is an adoption, with national variations, of EN 12079-2:2006, *Offshore containers and associated lifting sets*, Part 2: *Lifting sets—Design, manufacture and marking*. The variations for application in Australia are listed in Appendix ZA.

As this Standard is reproduced from a European standard, the following applies:

(a) Its number appears on the cover and title page.

(b) In the source text 'EN 12079' should read 'AS EN 12079'.

(c) In source text 'this European Standard' should read 'this Australian Standard'.

(d) A full point substitutes for a comma when referring to a decimal marker.

Listed below are Australian Standards with similar scopes (not identical) to the documents referenced in the European Standard.*

Reference to European Standard		*Australian Standard*
EN		
818	Short link chain for lifting purposes—Safety	AS 3775.1
818-4	Part 4: Chain slings—Grade 8	
1677	Components for slings—Safety	AS 3585
1677-1	Part 1: Forged steel components, Grade 8	AS 3776, AS 3777
10045	Metallic materials—Charpy impact test	AS 1544.2, AS 1544.3
10045-1	Part 1: Test method	
10204	Metallic products—Types of inspection documents	
13414	Steel wire rope slings—Safety	AS 1666.1
13414-1	Part 1: Slings for general lifting service	
13889	Forged steel shackles for general lifting purposes—Dee shackles and bow shackles—Grade 6—Safety	AS 2741

* Appendix ZA lists clauses where Australian Standards may be used.

EN ISO		
15613	Specification and qualification of welding procedures for metallic materials—Qualification based on pre-production welding test (ISO 15613:2004)	AS 1554.1, AS 1554.4, AS 1554.5

Titles of Australian Standards listed above are as follows:

AS	
1554	Methods for impact tests on metals
1554.1	Part 1: Izod
1554.2	Part 2: Charpy V-notch
1554.3	Part 3: Charpy U-notch and keyhole notch
1554.4	Part 4: Calibration of the testing machine
1554.5	Part 5: Assessment of fracture surface appearance of steel
1666	Wire-rope sling
1666.1	Part 1: Product specification
2741	Shackles
3585	End fittings for flat-webbing slings
3775	Chain slings—Grade T
3775.1	Part 1: Product specifications
3777	Lifting components for Grade T chain slings

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AUSTRALIAN STANDARD

Offshore containers and associated lifting sets

Part 2:
Lifting sets—Design, manufacture and marking
(EN 12079-2:2006, MOD)

1 Scope

This part of EN 12079 specifies requirements for lifting sets for use with containers in offshore service.

Other parts of the standard are:

EN 12079-1, *Offshore containers and associated lifting sets - Part 1: Offshore container - Design, manufacture and marking*

EN 12079-3, *Offshore containers and associated lifting sets - Part 3: Periodic inspection, examination and testing*

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 818-4:1996*, Short link chain for lifting purposes — Safety — Part 4 — Chain slings — Grade 8*

EN 1677-1, *Components for slings — Safety — Part 1: Forged steel components, Grade 8*

EN 10045-1, *Metallic materials - Charpy impact test - Part 1: Test method*

EN 10204, *Metallic products - Types of inspection documents*

EN 13414-1, *Steel wire rope slings - Safety - Part 1: Slings for general lifting service*

EN 13889, *Forged steel shackles for general lifting purposes - Dee shackles and bow shackles - Grade 6 – Safety*

EN ISO 15613, *Specification and qualification of welding procedures for metallic materials - Qualification based on pre-production welding test (ISO 15613:2004)*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1
lifting set
items of integrated lifting equipment used to connect the offshore container to the lifting appliance. This can comprise one or multi leg slings (with or without a top leg) and shackles, whether assembly secured or not.

3.2
assembly secured shackle
A shackle fitted to a sling leg and secured by a seal or similar device, so as to signal unambiguously, whether or not the shackle has been exchanged

4 Symbols

R the rating i.e. the maximum gross mass of the container including permanent equipment and its cargo, in kg but excluding the lifting set;

T the tare mass i.e. the mass of an empty container including any permanent equipment but excluding cargo and lifting set in kg;

P the payload i.e. the maximum permissible mass of cargo which may be safely transported by the container, in kg;

NOTE 1 $P = R - T$

NOTE 2 R, T and P are, by definition in units of mass, kilograms (kg). Where design requirements are based on the gravitational forces derived from these values, those forces are indicated thus: Rg, Tg and Pg the units of which are in newtons or multiples thereof.

T_D the design air temperature, i.e. a minimum reference temperature used for the selection of steel grades used in offshore containers and equipment expressed in degrees centigrade;

S mass of the lifting set, in kg

5 Technical requirements

5.1 General requirements

5.1.1 Slings shall be rated for their intended angle of use. In all cases four leg slings shall be rated as for three leg slings. In no case shall a sling be rated for an angle of the sling leg to the vertical in excess of 45 °

NOTE For specific angles less than 45 ° the sling may be rated at the WLL according to the particular angle of the legs to the vertical. This should be calculated by the formula: For two leg slings used at an angle β to the vertical, the working load limit should be given by the formula WLL = 2 x WLL for a single leg x cos β. For four leg slings used at an angle β of any leg to the vertical, the working load limit shall be given by the formula WLL = 3 x WLL for a single leg x cos β.

For chain slings this is in accordance with the alternative method of rating in EN 818-4:1996, Annex A.

5.1.2 Where two 2-leg slings are selected to function as a 4-leg sling, they shall be calculated as for a 4-leg sling.

5.1.3 Hinge type coupling components shall not be used.

NOTE This restriction is to avoid the possibility of the coupling seizing in the folded position due to corrosion and subsequently failing when forced straight under load.

5.2 Dimensions and strength of lifting Sets

5.2.1 To allow for the dynamic amplification that will be experienced in offshore lifting in adverse weather and sea states, the working load limit of the lifting sets for offshore containers shall be determined using Annex A. Except for containers with ratings below 2000 kg, the container rating R shall be multiplied by an enhancement factor to give the WLL min of the lifting set. For intermediate container ratings the working load limit values shall be interpolated.

5.2.2 The minimum working load limit (WLL min) from Annex A shall be used for determination of the nominal size of the lifting set.

NOTE It is recommended that the master link to be attached to the crane hook shall have minimum dimensions 270 mm x 140 mm, internal.

5.2.3 The minimum working load limit of each shackle (WLL_s) shall be calculated as given in Table 1.

Table 1 — Required minimum shackle working load limit (WLL_s)

Required minimum shackle working load limit (WLL_s)		
4 leg sling	2 leg sling	Single leg sling
WLL min / (3 x cos β)	WLL min / (2 x cos β)	WLL min

where β is the angle of the sling leg from the vertical and WLL min is the minimum WLL determined from Annex A

5.2.4 The lifting set shall be of sufficient length to allow easy handling by operators. The top link or master link shall be able to reach down to a height of no more than 1.3m above the container bottom when the sling hangs over the long side of the container.

5.3 Chain slings

5.3.1 Chain slings shall meet all requirements of EN 818-4.

5.4 Wire rope slings

5.4.1 Wire rope slings shall meet all requirements of EN 13414-1 with restrictions as applied in 5.4.2 and 5.4.3.

5.4.2 Wire rope shall be 6-stranded and of one of type 6 x 19 or 6 x 36.

5.4.3 The termination of wire rope shall be a ferrule secured thimble.

NOTE As an aid to in service inspection, ferrules which permit the tail end of the rope to be visible are recommended.

5.4.4 Wire rope grade 1770 or 1960 shall be used. The working load limit shall be calculated on the basis of the actual rope grade used.

NOTE This also applies when slings are rated and marked in accordance with the note in 5.1.1

5.5 Shackles

5.5.1 Shackles shall meet all requirements of EN 13889 or EN 1677-1 with the additional requirement that the tolerance on the nominal diameter of the shackle pin shall be – 0 + 3 %.

5.5.2 Shackles shall be restricted to:

— bolt type pin with hexagon head, hexagon nut and split cotter pin;

5.6 Materials

5.6.1 Impact Testing

Steels shall be impact tested by the Charpy impact (V-notch) method in accordance with EN 10045-1. The impact test temperature shall be equal to the design air temperature T_D and the minimum average impact energy shall be 42 J. However, for welded components (chains, links, rings) it shall be sufficient only to take impact test samples in the weld with the notch centred in the fusion line. The position of the weld shall be accurately identified by etching with a suitable reagent before cutting the notches. The minimum average impact energy of the weld shall be 27 J.

Where the cross section of the material to be tested is too small to allow the standard test specimen to be taken (10 x 10 mm), the required energy values shall be reduced as follows:

— 10 mm x 7.5 mm : 5/6ths of the above value;

— 10 mm x 5.0 mm : 2/3rds of the above value.

NOTE For tests where the size of the test piece is too small (diameter less than 13 mm), tests may be carried out on sample material which shall be of the same specification and heat treatment.

5.6.2 Welding

In addition to the requirements of EN 818-4, qualification of the welding process shall be in accordance with EN ISO 15613.

5.6.3 Materials used in wire rope slings

Materials in wire ropes, ferrules and thimbles shall be in accordance with applicable standards.

5.6.4 Galvanising

Galvanising shall only be carried out under the control of the manufacturer of the component.

5.6.5 Material certificates.

The materials used in all components shall be supplied with an inspection certificate to either EN 10204 type 3.1 B or, in the case of materials in ferrules and thimbles, to EN 10204 type 2.2 with content as detailed in Clause 6.

6 Certification

6.1 Preparation of certificates

Certificates provided in support of claims of compliance with the requirements of this European Standard shall be prepared in accordance with EN 10204 and contain the information specified in the relevant product standard, together with that specified in 6.2 or 6.3 as appropriate.

6.2 Single component certificates

Single components used in slings conforming to this European Standard, shall have certificates as specified in 5.6.5, containing the information specified in the relevant product standard together with the following, as a minimum:

- manufacturer's name, mark and contact location;
- date of issue for the certificate (YYYY-MM-DD);
- certificate number;
- description of the component;
- identification of the relevant product standard;
- material specification including chemical composition and mechanical properties;
- results from tests specified in the relevant product standard and this standard;
- record of the unique identification number or mark carried by the component;
- manufacturers authorized signature.

6.3 Sling certificates

Slings conforming to this European Standard shall be supplied with a certificate (type EN 10204, 3.1 B) containing the information specified in the relevant product standard together with the following, as a minimum:

- manufacturer's name, mark and contact location;
- date of issue for the certificate (YYYY-MM-DD);
- sling certificate number;
- description of the sling, including unique identification number or mark;
- reference to each single components unique identification mark (if new components are installed before re-certification reference to previous certificate number and the new components unique identification mark);
- nominal size and length of the sling;
- working load limit (WLL) together with the appropriate angle to the vertical for multi-leg slings and the method of rating;

— date of sling manufacture or re-certification;

— a statement that the sling described has been designed, manufactured and tested in accordance with this European Standard;

— manufacturers authorized signature.

In addition:

— for wire rope slings, the grade of terminal fittings and the rope together with a statement that the sling conforms to EN 13414-1;

— for chain slings, the grade mark 8 and a statement confirming that the sling conforms to EN 818-4 and providing cross reference to the results of any final testing of mechanical properties after heat treatment.

7 Marking

7.1 In addition to the marking required by the relevant individual component standards, the requirements of 7.2-7.4 apply.

7.2 Shackles fitted to a sling, without being assembly secured, shall be indelibly marked with a unique identification.

NOTE In practice, this marking should be applied using 'low stress' stamps, the height of which should be a minimum of 5 mm, and positioned away from areas of highest tensile stress i.e. applied to the straight section of the body adjacent to the eye.

7.3 Slings shall be marked with an identification tag permanently attached to the top assembly of the sling. The tag shall be made of metal with the marking permanently embossed or stamped. The tag shall be 8-sided for chain slings and round for wire rope slings.

7.4 Where two 2-leg slings are selected to function as a 4 leg sling, both shall be marked as a 4 leg sling.

7.5 The marking on tags for chain and wire rope slings shall include:

— number of this standard;

— unique identification number of the sling;

— number of legs;

— diameter of chain or wire rope used, including the top leg where fitted;

— working load limit (WLL) in tonnes;

— maximum angle of the sling legs from the vertical.

— mass of the lifting set (S) in Kg;

NOTE An example of an identification tag for chain slings, is shown in Annex B.

Annex A
(normative)

Determination of working load limit (WLL min) of the lifting set

Table A 1 — Determination of working load limit

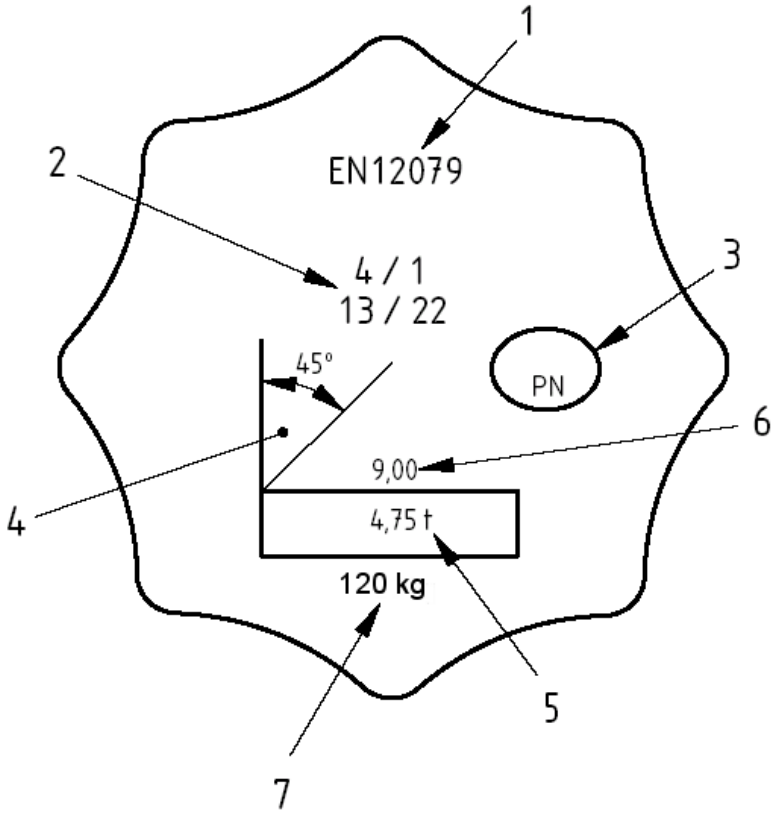
Container Rating (R) kg	Enhancement factor	Minimum required Working Load Limit of the lifting set (WLL min) tonnes
500	-	7,00
1000	-	7,00
1500	-	7,00
2000	3.500	7,00
2500	2.880	7,20
3000	2,600	7,80
3500	2,403	8,41
4000	2,207	8,83
4500	1,962	8,83
5000	1,766	8,83
5500	1,766	9,71
6000	1,766	10,59
6500	1,733	11,26
7000	1,700	11,90
7500	1,666	12,50
8000	1,633	13,07
8500	1,600	13,60
9000	1,567	14,10
9500	1,534	14,57
10000	1,501	15,01
10500	1,479	15,53
11000	1,457	16,02
11500	1,435	16,50
12000	1,413	16,95
12500	1,391	17,38
13000	1,368	17,79
13500	1,346	18,18
14000	1,324	18,54
14500	1,302	18,88

Table A 1 — Determination of working load limit

Container Rating (R) kg	Enhancement factor	Minimum required Working Load Limit of the lifting set (WLL min) tonnes
15000	1,280	19,20
15500	1,267	19,64
16000	1,254	20,06
16500	1,240	20,47
17000	1,227	20,86
17500	1,214	21,24
18000	1,201	21,61
18500	1,188	21,97
19000	1,174	22,31
19500	1,161	22,64
20000	1,148	22,96
20500	1,143	23,44
21000	1,139	23,92
21500	1,135	24,39
22000	1,130	24,86
22500	1,126	25,33
23000	1,121	25,79
23500	1,117	26,25
24000	1,112	26,70
24500	1,108	27,15
25000	1,104	27,59

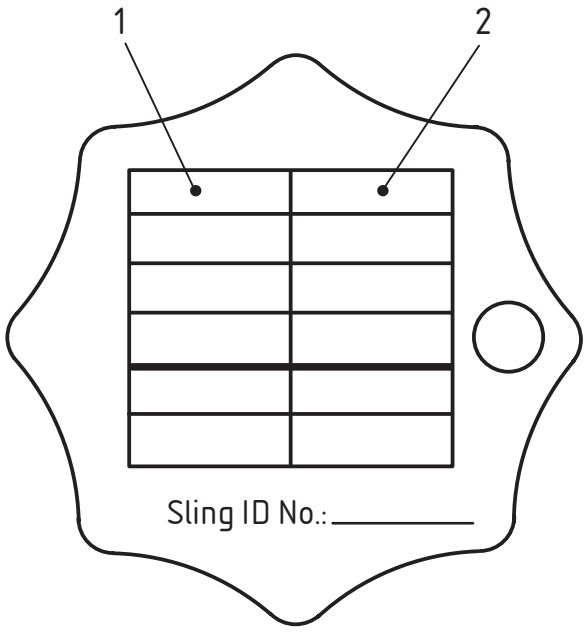
Annex B
(informative)

Example of identification tag for chain slings.



1 EN number
2 4 legs of 13mm, 1 forerunner of 22mm (example)
3 Manufacturers mark
4 Sling angle
5 Shackle size
6 WLL (t)
7 Mass of the lifting set

Figure B.1 — Front of identification tag



1 Date (yy-mm-dd)
2 Shackle ID

Figure B.2 — Back of identification tag

Bibliography

[1] EN 1677-4, *Components for slings - Safety — Part 4: Links, Grade 8*

[2] EN 12079-1, *Offshore containers and associated lifting sets - Part 1: Offshore container - Design, manufacture and marking*

[3] EN 12079-3, *Offshore containers and associated lifting sets - Part 3: Periodic inspection, examination and testing*

APPENDIX ZA

VARIATIONS TO EN 12079-2:2006 FOR APPLICATION IN AUSTRALIA

(Normative)

ZA1 INTRODUCTION

This Appendix provides variations to EN 12079-2:2006 for application in Australia. It also provides interpretation of EN 12079.2 to assist with the different terminologies and practices in Australia.

Products in compliance with EN 12079 series are deemed to be in compliance with this Standard.

NOTE: The Preface lists Australian Standards covering a similar scope to the referenced European Standards. Except as indicated in Paragraph ZA2, the requirements of the referenced European Standards apply.

ZA2 VARIATIONS

Clause 1

Add the following at the end of the Clause:

This Standard does not apply to sling assemblies for ‘on platform’ or ‘on shore’ use. For ‘on platform’ and ‘on shore’ use, refer to AS 1666.1 and AS 1666.2, AS 3775.1 and AS 3775.2.

Clause 3.1

Add the following note:

NOTE Lifting sets are also known as sling assemblies.

Clause 3

Add the following definitions:

3.3
shall
indicates a statement is mandatory.

3.4
should
indicates a statement is a recommendation.

Clause 5.1.1

Add the following Notes:

NOTE 1 Australian Standards for slings specify the included angle of sling assemblies, whereas this Standard specifies angle to the vertical. A 30° angle from the vertical (β) equates to 60° included angle. A 45° angle from the vertical (β) equates to 90° included angle [see Figures 5.1.1(A) and 5.1.1(B)]. The preferred included angle is 60° and should be measured across the diagonal of the container.

NOTE 2 This Standard differs from other Australian Standards for general lifting. Under this Standard, three-leg and four-leg slings may be rated on the capacity of any three legs supporting the total load. Other Australian Standards rate three-leg and four-leg slings on the capacity of two opposite legs supporting the load.

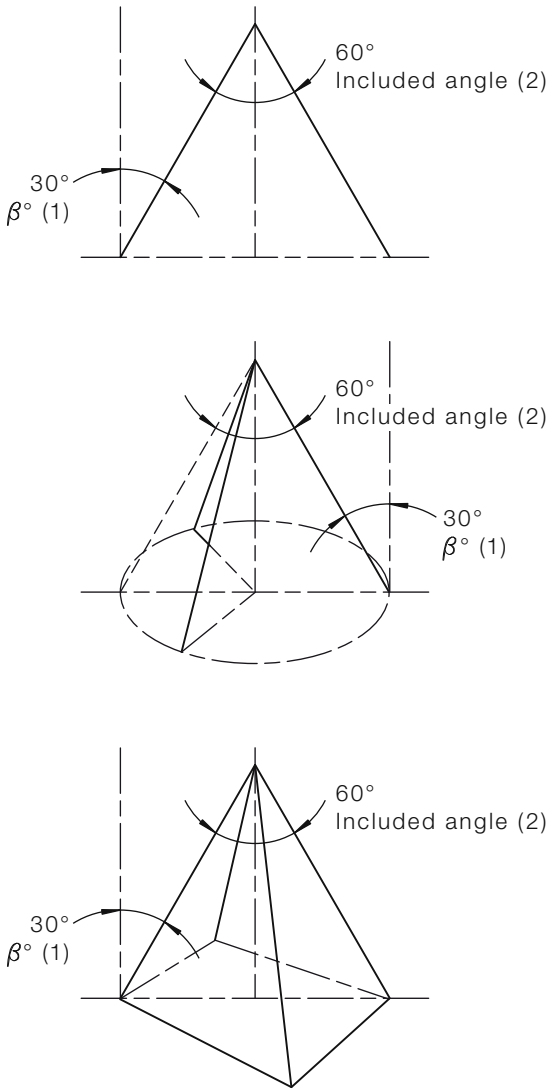


FIGURE 5.1.1(A) SLING ANGLE—30°

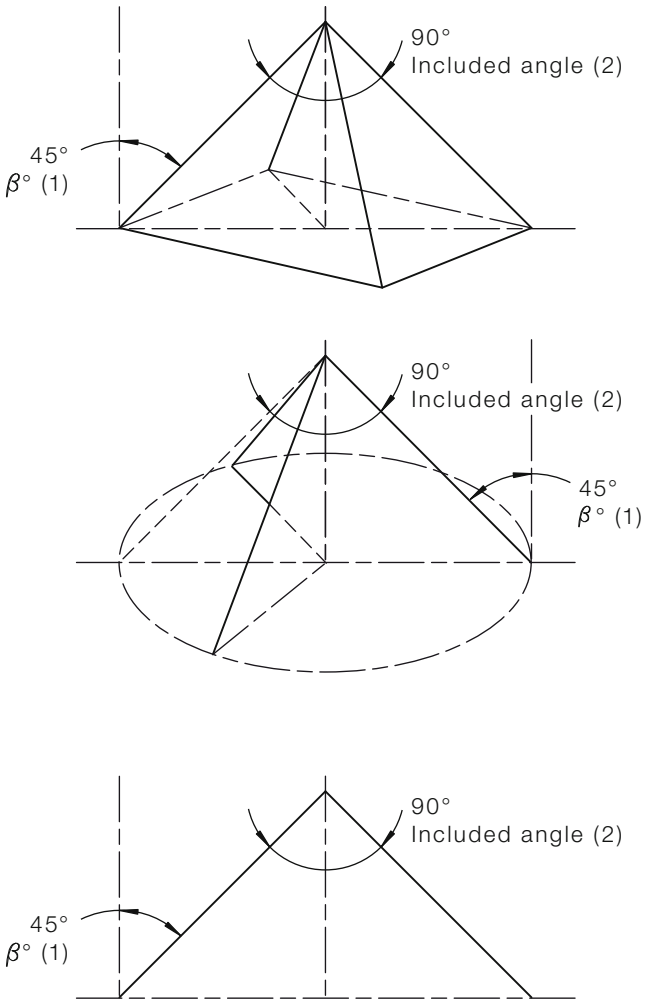


FIGURE 5.1.1 (B) SLING ANGLE— 45°

Clause 5.2.1

Add the following Note:

NOTE For a worked example, see Appendix ZB.

Clause 5.3.1

Add the following:

Chain slings in accordance with AS 3775 and the requirements below meet the requirements of EN 818-4:

(a) The leg length tolerance requirements given in EN 818-4 shall take precedence and are as follows:

For multiple leg slings, the tolerance for the difference in length between the longest and shortest legs joined by mechanical devices is—

(i) a maximum of 10 mm for nominal lengths up to and including 2 m; and

(ii) a maximum of 5 mm/m for nominal lengths over 2 m.

(b) Material specifications given in EN 818-4 (which references EN 818-2) shall take precedence over the material specifications for chain in AS 3775.1 (which references AS 2321).

NOTE For a worked example, see Appendix ZB.

Clause 5.4.1

Add the following to the Clause:

Compliance with AS 1666.1 meets the requirements in EN 13414-1 for selection of a master link in a wire rope sling assembly. The selection of a master link assembly shall be in accordance with EN 13414-1, EN 1677-4 and the following shall apply:

a) The WLL of each intermediate link ≥1.6 × WLL of each sling leg.

b) The WLL of the master link ≥ WLL of the sling assembly.

For selection of master links, minimum compliance with AS 3776 does not meet this requirement; therefore, EN 1677-4 shall be used.

NOTE 1 For a worked example, see Appendix ZB.

NOTE 2 For a worked example see Annex C.

NOTE 3 Table C1 is reproduced form EN 1677-4, Table 5.

NOTE 4 AS 1666.1 accommodates the Australian practice of proof testing all wire tope slings prior to initial certification. In Australia tested slings are required for all onshore lifts and as the offshore containers still require lifting into the wharf and lifted onto other transport the requirement for the Australian Standard is relevant.

Clause 5.5.1

Add the following to the clause:

Shackles in accordance with AS 2741 are deemed to meet the requirements of the Standard.

NOTE 1 The requirements for shackles in AS 2741 exceed those in EN 13889.

NOTE 2 For a worked example see Appendix ZB.

NOTE 3 In Australia, tested shackles are required for all onshore lifts and, as the offshore containers still require lifting into the wharf and lifting onto other transport, the requirement of the Australian Standard is relevant.

Clause 5.6.1

Add the following note:

NOTE EN 10045-1 sets out the procedure for a Charpy test. The extent of Charpy testing is at the component manufacturer's discretion.

Clause 5.6.2

Add the following:

The requirements of AS/NZS 1554.1, AS/NZS 1554.4 and AS/NZS 1554.5 may be used in place of the requirements of EN 818-4 comply with this clause.

Clause 5.6.5

Add the following note:

NOTE For Type 2.2 materials, EN 10204 requires a document in which the manufacturer declares the products supplied are in compliance with the requirements of the order and in which test results are supplied based on non-specific inspection.

For Type 3.1 materials, EN 10204 requires a document be issued by the manufacturer, which declares that the products supplied are in compliance with the requirements of the order and supplies test results.

The test unit and the tests to be carried out are defined by the product specification, the official regulation and corresponding rules and/or the order.

The document is validated by the manufacturer's authorized inspection representative, independent of the manufacturing department.

The manufacturer may transfer on to the inspection certificate 3.1 relevant test results obtained by specific inspection on primary or incoming products used, provided the manufacturer operates traceability procedures and can provide the corresponding inspection documents required.

Clause 6.3

Add the following to Clause:

The sling manufacturer shall be able to demonstrate traceability of components used in the sling assembly.

Sling assemblies tested in accordance with the testing requirements of AS 1666.1, AS 3775.1 and AS 2741 meet the testing requirements of this Standard.

Clause 7.2

Add the following note:

NOTE The 'unique identification' is interpreted to mean the manufacturer's batch.

Clause 7.3

Add the following:

The shape of the tag is not mandatory.

Annex A, Table A1

Add the following note to Table A1:

NOTE The minimum WLL of 7 t reflects the trend to raise the minimum container rating to 2 t thereby reducing the number of smaller packages and avoid the increasing enhancement factors on small loads.

Appendix ZB (new)

Add new Appendix ZB as follows:

APPENDIX ZB

WORKED EXAMPLE OF LIFTING SET DESIGN

(Informative)

ZB.1 WIRE ROPE SLINGS

The following are examples of formulae used to calculate the minimum wire rope breaking force (MBF), in kilonewtons, required for EN 13414-1.

$$\text{MBF} = \frac{R \times E_{\text{h}} \times DF \times 9.81}{n \times \cos(\beta) \times T}$$

where

R = maximum gross mass, in tonnes

E_{h} = enhancement factor

DF = design factor

n = number of legs supporting the load

β = angle from vertical of each sling leg, in degrees

T = termination reduction factor

Example of calculation of a wire rope MBF for a three-leg or four-leg sling with ferrule secured eyes:

Maximum gross load	$R = 5$ t
Enhancement factor from Table A1	$E_{\text{h}} = 1.766$
Termination factor from EN 13414-1 (this differs from the factor in AS 1666.1).	$T = 0.9$
Angle from vertical of the sling leg	$\beta = 45°$
	$\cos 45° = 0.707$
Design factor	$DF = 5$
Number of legs supporting the load	$n = 3$
MBF of wire rope required	$\text{MBF} = \frac{5 \times 1.766 \times 5 \times 9.81}{3 \times 0.707 \times 0.9}$ $= 226.9\ kN$
Nearest suitable size to have this MBF	20 mm 1770 IWRC = 252 kN

ZB.2 SHACKLES

For the selection of shackles, the WLL of shackles is calculated as follows:

Maximum gross load	R	= 5 t
Enhancement factor from Table A1	E_h	= 1.766
Number of legs supporting the load	n	= 3
Angle from vertical of the sling leg	β	= 45°
	cos 45°	= 0.707

Calculation of the minimum working load limit (WLL) for each shackle:

$$\text{WLL} = \frac{R \times E_h}{n \times \cos(\beta)}$$

$$\text{WLL} = 4.16 \text{ t}$$

Therefore, in accordance with EN 13889 or AS 2741, the shackle WLL selected is the next largest size with a WLL of 4.75 t.

ZB.3 MASTER LINK ASSEMBLIES COMPRISING MASTER LINKS AND INTERMEDIATE LINKS

WLL ≥1.6 × WLL of each sling leg

WLL of each intermediate link ≥1.6 × 4.16 = 6.66 t (at 45°)

WLL ≥ WLL of the sling assembly

WLL of the master link ≥5 × 1.766 = 8.84 t

ZB.4 CHAIN SLINGS

For the selection of chain slings, the WLL of sling legs is calculated as follows:

Maximum gross mass	R	= 5 t
Enhancement factor from Table A1	E_h	= 1.766
Number of legs supporting the load	n	= 3
Angle from vertical of the sling leg	β	= 45°
	cos 45°	= 0.707

Calculation of the minimum working load limit (WLL) for each chain sling leg:

$$\text{WLL} = \frac{R \times E_h}{n \times \cos(\beta)}$$

$$\text{WLL} = 4.16 \text{ t for each leg}$$

For the above example EN 818-4 or AS 3775.2 indicates that a 13 mm chain is required for each chain leg.

The WLL of a master link is the same as that for a master link for a three-leg or four-leg 13 mm chain [i.e., 11.2 t (see EN 1677-4)].

TABLE ZB 1
WORKING LOAD LIMIT (WLL)

Master links and lower terminal links	Master links		Immediate master links
Single leg	Two leg	Three and four leg	
WLL t	WLL t	WLL t	WLL t
0.25 0.5 0.8	0.335 0.71 1.12	0.5 1.06 1.6	0.4 0.8 1.25
1.12 1.5 2	1.6 2.12 2.8	2.36 3.15 4.25	1.8 2.5 3.15
2.5 3.15 4	3.35 4.25 5.6	5 6.7 8	4 5 6.3
5.3 6 8	7.5 8 11.2	11.2 12.5 17	8.5 9.5 12.5
10 11.2 12.5	14 16 17	21.2 23.6 26.5	16 18 20
15 16 20	21.2 23.6 28	31.5 35.5 40	23.6 26.5 31.5
21.2 25 31.5	30 33.5 45	45 50 67	33.5 40 50
40 50 63	56 71 90	85 106 132	63 80 100

NOTE The WLL for links are as given in Table 3 of EN 818-4:1996 for multi-leg chain slings.

NOTES

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ISBN 978 0 7337 9438 4