

Australian Standard<sup>®</sup>

## Offshore containers and associated lifting sets

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



This Australian Standard® was prepared by Committee ME-025, Lifting Tackle. It was approved on behalf of the Council of Standards Australia on 23 March 2009. This Standard was published on 19 May 2010.

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## **Offshore containers and associated lifting sets**

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

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## 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.\*

| <i>Reference to European Standard</i> |                                                                                                 | <i>Australian Standard</i> |
|---------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------|
| 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                    |

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\* 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  $45^\circ$

NOTE For specific angles less than  $45^\circ$  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  $\beta$  to the vertical, the working load limit should be given by the formula  $WLL = 2 \times WLL \text{ for a single leg} \times \cos \beta$ . For four leg slings used at an angle  $\beta$  of any leg to the vertical, the working load limit shall be given by the formula  $WLL = 3 \times WLL \text{ for a single leg} \times \cos \beta$ .

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<sub>s</sub>) shall be calculated as given in Table 1.

**Table 1 — Required minimum shackle working load limit (WLL<sub>s</sub>)**

| Required minimum shackle working load limit (WLL <sub>s</sub> ) |                       |                  |
|-----------------------------------------------------------------|-----------------------|------------------|
| 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