Bullivants

OFFSHORE RIGCHECK CARD

Rigging Equipment Working Load Limits for Offshore Use

More Experience – More Products – More Locations
18 Convenient Locations – Australia Wide
Leaders in Lifting, Rigging, Safety & Workwear

Site policies & procedures may overide the information provided in this card.

PHONE: 1300 LIFTING

For Locations and more Information regarding Bullivants Products & Services Visit www.bullivants.com

This RIGCHECK card has been produced as a 'guide only' based on manufacturers specifications and Australian Standards. Bullivants accepts no responsibility should any product fail in service based on information within this card.

BV-QMS-TD-04A

All information provided is correct at the time of printing and is subject to change without notice.

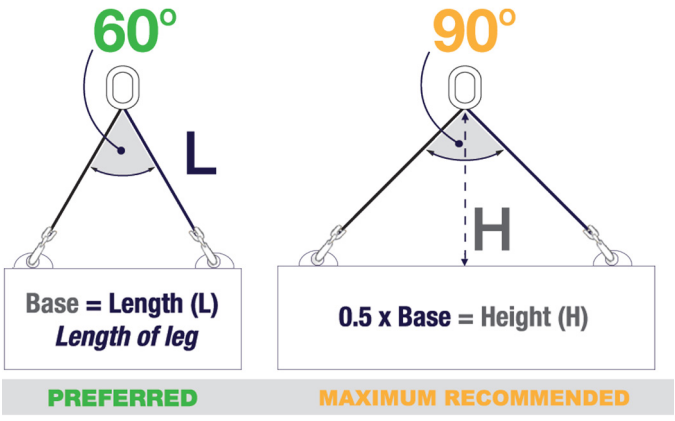
DNV

NATA
WORLD RECOGNISED ACCREDITATION

LIFTING PLAN

1. Know the **WEIGHT** of the load, if not, ask your supervisor
2. Know the **APPLICATION** requirements (single or multi leg, basket or choke hitch)
3. Ensure the **CORRECT** gear is selected for the lift
4. **INSPECT** all gear before use
5. **FLOAT** the load and check for **BALANCE**
6. **LIFT** the load slowly and controlled
7. Establish a **LANDING PAD** with packers to prevent crush of the lifting gear
8. Always **RE-INSPECT** the gear
9. **STORE** gear off the ground in a clean dry area

LIFTING LIMITATIONS
How to calculate a safe angle for lifting



WIRE ROPE SLINGS – SINGLE, TWO & FOUR LEG WITH FERRULE SECURED EYES IN ACCORDANCE WITH EN 13414-1:2003

	METHOD OF LOADING SLING			DIRECT LOADED			
				Two Leg Sling @		Four Leg Sling @	
	Included Angle		Single Leg & Forerunner	45°	30°	45°	30°
	Nom. Dia. (mm)	MBF (kN)					
			WORKING LOAD LIMITS (TONNES)				
1960 GRADE STEEL CORE	18	226	4.1	5.9	7.2	8.8	10.8
	20	279	5.1	7.2	8.9	10.8	13.3
	22	338	6.2	8.8	10.7	13.1	16.1
	24	402	7.4	10.4	12.8	15.6	19.2
	28	547	10.0	14.2	17.4	21.3	26.1
	32	715	13.1	18.6	22.7	27.8	34.1
	36	9.4	16.6	23.5	28.7	35.2	43.1
	40	1120	20.6	29.0	35.6	43.6	53.4
	44	1350	24.8	35.0	42.9	52.5	64.4
	48	1610	29.5	41.8	51.2	62.6	76.7
	52	1890	34.7	49.0	60.1	73.5	90.1
	56	2190	40.2	56.8	69.6	85.2	104.4
	60	2510	46.0	65.10	79.8	97.9	119.7

Notes: 1. Ropes with WLL values below 7.0 may not be used on offshore containers.
2. Choked (Round Load) reduce above values by 20%
3. WLL of shackles must be at least equal to the WLL of the sling leg to which they are attached.

WIRE ROPE SLINGS – SINGLE, TWO & FOUR LEG WITH FERRULE SECURED EYES IN ACCORDANCE WITH EN 13414-1:2003

	METHOD OF LOADING SLING			DIRECT LOADED			
				Two Leg Sling @		Four Leg Sling @	
	Included Angle		Single Leg & Forerunner	45°	30°	45°	30°
	Nom. Dia. (mm)	MBF (kN)					
	WORKING LOAD LIMITS (TONNES)						
1770 GRADE STEEL CORE	18	204	3.7	5.2	6.4	7.8	9.6
	20	252	4.6	6.5	8.0	9.8	12.0
	22	305	5.6	8.0	9.8	12.0	14.7
	24	363	6.7	9.5	11.6	14.2	17.4
	26	426	7.8	11.0	13.5	16.5	20.3
	28	494	9.0	12.7	15.6	19.1	23.4
	32	646	11.8	16.7	20.4	25.0	30.7
	36	817	15.0	21.2	26.0	31.8	39.0
	40	1010	18.5	26.2	32.0	39.2	48.1
	44	1220	22.5	31.8	39.0	47.7	58.5
	48	1450	26.0	36.8	45.0	55.2	67.5
	52	1710	31.5	44.5	54.6	66.8	81.8
	56	1930	36.0	50.9	62.4	76.4	93.5
	60	2270	42.0	59.4	72.7	89.1	109.1

Notes: 1. Ropes with WLL values below 7.0 may not be used on offshore containers.
2. Choked (Round Load) reduce above values by 20%
3. WLL of shackles must be at least equal to the WLL of the sling leg to which they are attached.

GRADE 80 ALLOY CHAIN SLINGS – SINGLE, TWO & FOUR LEG ASSEMBLIES

	METHOD OF LOADING SLING		DIRECT LOADED									
			Two Leg Sling @					Four Leg Sling @				
	Included Angle	Single Leg & Forerunner	45°	40°	35°	30°	25°	45°	40°	35°	30°	25°
	Nom. dia (mm)											
	WORKING LOAD LIMITS (TONNES)											
GRADE 80	10[1]	3.15	4.5	4.8	5.2	5.5	5.7	6.7	7.24	7.7	8.2	8.6
	13	5.30	7.5	8.1	8.7	9.2	9.6	11.2	12.2	13.0	13.8	14.4
	16	8.00	11.3	12.3	13.1	13.9	14.5	17.0	18.4	19.7	20.8	21.8
	18	10.0	14.1	15.3	16.4	17.3	18.1	21.2	23.0	24.6	26.0	27.2
	19	11.2	15.8	17.2	18.3	19.4	20.3	23.8	25.7	27.5	29.1	30.5
	20	12.5	17.7	19.2	20.5	21.7	22.7	26.5	28.7	30.7	32.5	34.0
	22	15.0	21.2	23.0	24.6	26.0	27.2	31.8	34.5	36.9	39.0	40.8
	23	16.0	22.6	24.5	26.2	27.7	29.0	33.9	36.8	39.3	41.6	43.5
	25	20.0	28.3	30.6	32.8	34.6	36.3	42.4	46.0	49.1	52.0	54.4
	26	21.2	30.0	32.5	34.7	36.7	38.4	45.0	48.7	52.1	55.1	57.6
	28	35.0	35.4	38.3	41.0	43.3	45.3	53.0	57.5	61.4	65.0	68.0
	32	31.5	44.5	48.3	51.6	54.6	57.1	66.8	72.4	77.4	81.8	85.6
	36	40.0	56.6	61.3	65.5	69.3	72.5	84.9	91.9	98.3	103.9	108.8
	40	50.0	70.7	76.6	81.9	86.6	90.6	106.1	114.9	122.9	129.9	135.9

Notes: 1. Slings with WLL values below 7.0 may not be used on offshore containers.
2. Choked (Round Load) reduce above values by 20%
3. WLL of shackles must be at least equal to the WLL of the sling leg to which they are attached.

SYNTHETIC SLINGS (SHORE BASED VALUES)
FLAT WEBBING SLINGS – AS1353, ROUND SLINGS – AS4497

MATERIAL COLOUR	DIRECT LOAD	VERTICAL WLL	CHOKE WLL	BASKET WLL	30° WLL	60° WLL	90° WLL	120° WLL
								
WORKING LOAD LIMITS (TONNES)								
Violet	1	1	0.8	2	1.9	1.7	1.4	1
Green	2	2	1.6	4	3.8	3.4	2.8	2
Yellow	3	3	2.4	6	5.7	5.1	4.2	3
Grey	4	4	3.2	8	7.6	6.8	5.6	4
Red	5	5	4	10	9.5	8.5	7	5
Brown	6	6	4.8	12	11.4	10.2	8.4	6
Blue	8	8	6.4	16	15.2	13.6	11.2	8
Orange	10	10	8	20	19	17	14	10

The colour of the Working Load Limit tag shall identify the type of fibre used for round and flat type synthetic slings as follows:

Nylon - Green	Polyester - Blue
Polypropylene - Brown	Aramid Polymide - Yellow

OFFSHORE INSPECTION & TESTING CRITERIA

Marine Orders Part 32 (Cargo handling equipment) i.e. rigging equipment only
CVI = At intervals not exceeding 1 yr
NDE – further Testing maybe requested by the Inspector
Load Test – at intervals not exceeding 5 yrs

DNV 2.7-1 certified equipment / slings and rigging:
CVI – At intervals not exceeding 1 yr
NDE – at intervals not exceeding 4 yrs
Load Test – after substantial repair or alteration*

*Substantial repair or alteration means any repair and/or alteration which may alter the primary elements of the lifting set or lifted equipment (slings or lifted equipment e.g. container or module).

Bullivants are DNV Certified to manufacture lifting sling sets.

Additional Information

A lift from a work boat or barge direct across water to fixed or floating off-shore installation requires equipment that has full engineering verification on Slings / Rigging and any Lifting Frame / Apparatus. This is generally referred to as a CCLE (Certificate of Compliance for Lifted equipment) and has to be carried out by an approved engineer as there are dynamic factors involved that need to be engineered into the size of rigging.

Marine orders Part 32 applies to the loading / unloading of a ship in a port. It does not apply to the loading / unloading of an offshore vessel at an offshore facility. Company policies and standards may overide the information provided within this card.

Legend

CVI – Certified Visual Inspection
MPI – Magnetic Particle Inspection
CCLE – Certificate of Compliance for Lifted Equipment
NDE – Non-Destructive Examination

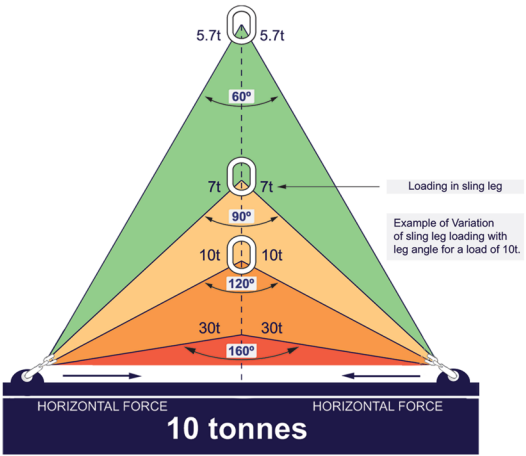
Bullivants can provide all inspection services as detailed, nationally we have accredited testing and inspection people; the most unique testing facilities in Australia. Inspection Colour Code Tags are available.

SLING ANGLES
Why do angles affect loads?

45° to the Vertical is the maximum design angle refer DNV 2.7-1 clause 8.3

All multi-leg slings exert a horizontal component of force, which increases as the included angle becomes greater.

No sling should be used if the included angle exceeds 120°, as beyond this point the forces in the legs drastically increase, as indicated in the diagram.



DO NOT USE MULTI-LEG SLINGS AT ANGLES WITHIN SHADED AREA

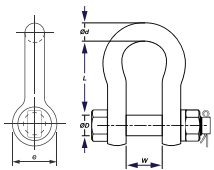
Angles of less than 15 should also be avoided as these can lead to the load becoming unstable.

SHACKLES – EN 13889 FOR LIFTING APPLICATIONS – DNV

Alloy Bow & Dee Type Shackles, Quality Grade 6 (screw pin & safety pin available)

WLL (TONNES)	SIZE d (MM)	D (MM)	W (MM)	e (MM)	BOW TYPE L (MM)	DEE TYPE L (MM)
1.5	11	13	19	25	43	–
2	13.5	16	22	34	51	43
3.25	16	19	27	40	64	51
4.75	19	22	31	44	76	59
6.5	22	25	36	52	83	73
8.5	25	28	43	59	95	85
9.5	28	32	47	67	108	90
12	32	35	51	73	115	94
13.5	35	38	57	79	133	115
17	38	42	60	88	146	127
25	45	50	74	104	178	149
35	50	57	83	112	197	171
42.5	57	65	95	132	222	190
55	65	70	105	145	260	203
85	75	83	127	167	330	229

Other sizes up to 1500T available upon request



The minimum working load limit of each shackle (WLL) shall be calculated as shown below:

REQUIRED MINIMUM SHACKLE WORKING LOAD LIMIT (WLL)		
Four Leg Sling	Two Leg Sling	Single Leg Sling
WLL min. / (3 x cos β)	WLL min. / (2 x cos β)	WLL min.

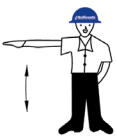
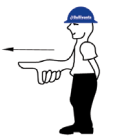
Where β is the angle of the sling leg from the vertical and WLL min. is the minimum WLL determined from Annex A.

DETERMINATION OF WORKING LOAD LIMIT (WLL MIN.) OF THE LIFTING SET – Refer to as EN 12079.2-2010 offshore containers and associated lifting sets

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

Container Rating (R) kg	Enhancement Factor	Minimum Required Working Load Limit of the lifting set (WLL min) (tonnes)
13000	1,368	17,79
13500	1,346	18,18
14000	1,324	18,54
14500	1,302	18,88
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

CRANE MOTION	Hoisting raise	Luffing boom up	Slewing right	Jib-trolley out: telescoping boom extended	Travel and traverse
HAND SIGNAL					
WHISTLE, BELL OR BUZZER SIGNAL	2 short ●●	3 short ●●●	1 long, 2 short –●●	1 long, 3 short –●●●	Not applicable

CRANE MOTION	Hoisting lower	Luffing boom down	Slewing left	Jib-trolley out: telescoping boom retract	Stop
HAND SIGNAL					
WHISTLE, BELL OR BUZZER SIGNAL	1 long –	4 short ●●●●	1 long, 1 short –●	1 long, 4 short –●●●●	1 short ●