



CSU &FP

PLANT PURCHASE SPECIFICATION

FABRICATION PLANT

DEPARTMENT: PRODUCTION

NO.: BHEL/FP/TS/44

REV NO : 00

REV. DT :

Sheet 1 of 3

BOW SHACKLES

This standard covers Bow shackles having screwed pin with eye and collar, suitable for safe working load (SWL) for 1 to 63 tonnes.

2.0 DESIGNATION

A bow shackle, suitable for safe working load of 2 tonnes shall be designated as

BOW SHACKLE, SWL-2T; For placing indents on purchase

3.0 COMPLIANCE WITH STANDARDS

3.1 DIMENSIONS, FINISH, TOLERANCE AND GENERAL REQUIREMENTS

As per IS: 6132-2003, Part 1 & 2

3.2 MATERIAL

The body and the pin of the bow shackles shall be manufactured from the carbon steel conforming to IS: 1875-1992, class 2 having minimum tensile strength of 410 N/mm² (42 kgf/mm²).

3.3 HEAT TREATMENT

All bodies and pins of the bow shackles shall be heat treated as specified in IS: 6132, Part 1.

3.4 HARDNESS: 120 to 170 HB

3.5 TYPE OF PIN: Screwed pin with eye and collar.

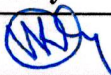
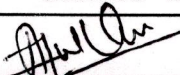
3.6 THREADS: Coarse pitch to IS: 4218, part 2-2001

3.7 MARKING: As stated in IS: 6132, part 1.

1.0 TEST CERTIFICATES

Manufacturer shall supply with each batch of material, three copies of test certificates containing the following information:

In addition, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

	Prepared By	Checked By	Approved By
Signature :			
Name :	V K Choudhary, Sr. Engr.	Atul Verma, Dy. Mgr	Raghvendra Singh, Sr. Manager

**PLANT PURCHASE SPECIFICATION****FABRICATION PLANT****DEPARTMENT: PRODUCTION****NO.: BHEL/FP/TS/44****REV NO : 00****REV. DT :****Sheet 2 of 3****For each batch:****BOW SHACKLES & GRADE**

BHEL order No.

Date of testing

No. & Size

Hardness range

Mechanical properties, Tensile strength & % of elongation

Details of heat treatment

Manufacturer's name

For each item:

Manufacturer's identification No.

Safe working load (kg)

Proof load applied

2.0 PROOF LOAD

As specified in IS: 6132, Part 3, each bow shackle after manufacture and subsequent heat treatment shall be subjected to a proof load at the centre of the pin as per table-2. IS: 6132, part 3 which it shall withstand without showing permanent set. After removal of the proof load each shackle shall be thoroughly examined and shall be accepted only if found free from visible flaw or defect.

3.0 MAXIMUM/BREAK LOAD

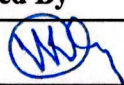
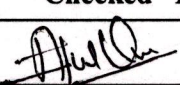
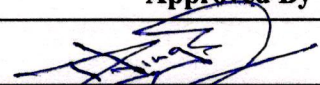
It is recommended that for normal conditions of use, the maximum load for any Bow shackle shall not exceed the safe working load.

4.0 PRECAUTIONS

Periodical inspection/examination shall be done of bow shackles and when the threads show signs of damage or the bow shows appreciate bruising, the bow shackle shall be scrapped.

8.0 REFERRED STANDARDS (Latest publications including amendments)

Nil

	Prepared By	Checked By	Approved By
Signature :			
Name :	V K Choudhary, Sr. Engr.	Atul Verma, Dy. Mgr	Raghvendra Singh, Sr.Manager



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FABRICATION PLANT

DEPARTMENT: PRODUCTION

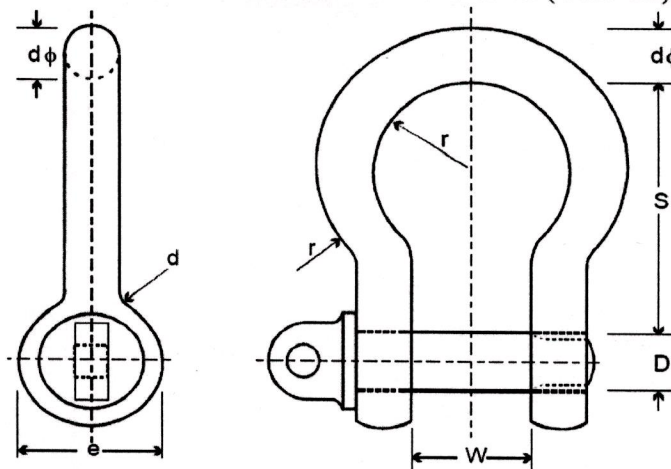
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"BOW" Shackle IS: 6132-1971 (Part- III)



BOW SHACKLE

Jaw Inside Width W	Inside Length s=2.5W	Bow Dia-meter 2r=1.7W	Body Material Diameter d	Pin Diameter D _{min}	Eye Outside Diameter e _{min}	Safe Working Load, Tonnes			
						Grade-30	Grade-40	Grade-63	Grade-80
18	45	31	11	12	24	---	---	1.0	---
20	50	34	13	14	28	---	1.0	1.25	2.0
22	55	37	14	16	32	1.0	1.25	1.6	---
25	63	42	16	19	38	1.25	1.6	2.0	3.25
28	70	48	18	20	40	1.6	2.0	2.5	---
32	80	54	20	22	44	2.0	2.5	3.2	4.75
36	90	61	23	26	52	2.5	3.2	4.0	6.5
40	100	68	25	28	56	3.2	4.0	5.0	8.5
45	110	76	28	31	62	4.0	5.0	6.3	9.5
50	125	85	32	35	70	5.0	6.3	8.0	12
56	140	95	36	39	78	6.3	8.0	10	13.5
63	155	105	40	44	88	8.0	10	12.5	17
70	175	120	45	50	100	10	12.5	16	25
80	200	135	50	55	110	12.5	16	20	35
90	225	155	58	62	124	16	20	25	42
100	250	170	63	69	138	20	25	32	50
107	270	180	68	77	154	25	32	40	65
117	295	200	75	82	164	32	40	45	83
130	325	220	85	91	182	40	45	63	---
140	350	240	88	98	196	50	63	80	100
155	390	265	95	110	220	63	80	---	---

Proof Load = 2 x S. W. L. (upto 25 tonnes) and Proof load = 1.2 x S. W. R. + 20 (above 25 tonnes).

The Pin Diameters actually used may be based on any standard series for sizes of Bar material.

The next size above the minimum pin diameter D_{min} as given in the table should be used.

The above shackles are hand forged by experts Blacksmiths and slight tolerance in sizes S, W and e should be permitted. The Dimensions are for your approximate guidance only and shackle manufacture may not be necessary adhere to the above specifications.

	Prepared By	Checked By	Approved By
Signature :			
Name :	V K Choudhary, Sr. Engr.	Atul Verma, Dy. Mgr	Raghendra Singh, Sr. Manager

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In addition, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

For each batch:

DEE SHACKLES & GRADE

BHEL order No.

Date of testing

No. & Size

Hardness range

Mechanical properties, Tensile strength & % of elongation

Details of heat treatment

Manufacturer's name

For each item:

Manufacturer's identification No.

Safe working load (kg)

Proof load applied

5.0 PROOF LOAD

As specified in IS: 6132, part 2, each Dee shackle after manufacture and subsequent heat treatment shall be subjected to a proof load at the centre of the pin as per table-2. IS: 6132, Part 2 which it shall withstand without showing permanent set. After removal of the proof load each shackle shall be thoroughly examined and shall be accepted only if found free from visible flaw or defect.

6.0 MAXIMUM/BREAK LOAD

It is recommended that for normal conditions of use, the maximum load for any Dee shackle shall not exceed the safe working load.

7.0 PRECAUTIONS

Periodical inspection/examination shall be done of Dee shackles and when the threads show signs of damage or the bow of Dee shackle shows appreciate bruising, the Dee shackle shall be scrapped.

8.0 REFERRED STANDARDS (Latest publications including amendments)

9.0

Nil

	Prepared By	Checked By	Approved By
Signature :			
Name :	V K Choudhary, Sr. Engr.	Atul Verma, Dy Mgr	Raghvendra Singh, Sr. Manager

DEE SHACKLES

1.0 SCOPE

This standard covers Dee shackles having screwed pin with eye and collar, suitable for safe working load (SWL) for 1 to 63 tonnes.

2.0 DESIGNATION

A dee shackle, suitable for safe working load of 2 tonnes shall be designated as

DEE SHACKLE, SWL-2T Grade 80 For placing indents on purchase

3.0 COMPLIANCE WITH STANDARDS

3.1 DIMENSIONS, FINISH, TOLERANCE AND GENERAL REQUIREMENTS

As per IS: 6132-2003, part 1 & 2

3.2 MATERIAL

The body and the pin of the dee shackles shall be manufactured from the carbon steel conforming to IS: 1875-1992, class 2 having minimum tensile strength of 410 N/mm² (42 kgf/mm²)

3.3 HEAT TREATMENT

All bodies and pins of the dee shackles shall be heat treated as specified in IS:6132, part1.

3.4 HARDNESS: 120 to 170 HB.

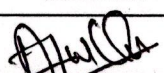
3.5 TYPE OF PIN: Screwed pin with eye and collar.

3.6 THREADS: Coarse pitch to IS: 4218, part 2-2001.

3.7 MARKING: As stated in IS: 6132, part 1.

4.0 TEST CERTIFICATES

Manufacturer shall supply with each batch of material, three copies of test certificates containing the following information:

	Prepared By	Checked By	Approved By
Signature :			
Name :	V K Choudhary, Sr. Engr.	Atul Verma, Dy Mgr	Raghvendra Singh, Sr. Manager



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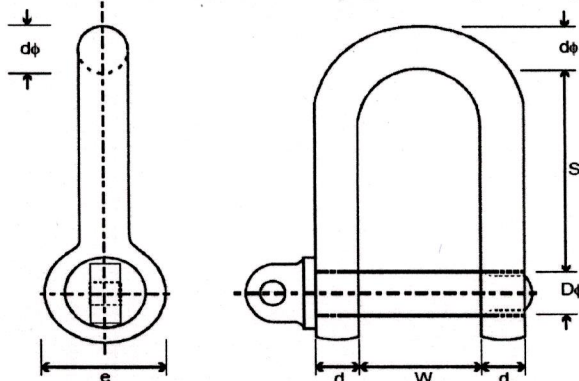
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"DEE" Shackle IS: 6132-1971 (Part- II)



DEE SHACKLE

Jaw Inside Width	Inside Length	Body Material Diameter	Pin Diameter	Eye Outside Diameter	Safe Working Load, Tonnes			
					Grade-30	Grade-40	Grade-63	Grade-80
W	s=2.2 W	d	D _{min}	e _{min}				
18	40	10	12	24	---	---	1.0	---
20	44	12	14	28	---	1.0	1.25	2
22	49	14	16	32	1.0	1.25	1.6	---
25	55	16	19	38	1.25	1.6	2.0	3.25
28	62	17	20	40	1.6	2.0	2.5	---
32	70	19	22	44	2.0	2.5	3.2	4.75
34	79	22	26	52	2.5	3.2	4.0	6.5
40	88	24	28	56	3.2	4.0	5.0	8.5
45	99	27	31	62	4.0	5.0	6.3	9.5
50	110	30	35	70	5.0	6.3	8.0	12
56	124	34	39	78	6.3	8.0	10	13.5
63	139	38	44	88	8.0	10	12.5	17
70	154	43	50	100	10	12.5	16	25
80	176	48	55	110	12.5	16	20	35
90	198	54	62	124	16	20	25	42
100	220	60	69	138	20	25	32	50
107	236	66	76	152	25	32	40	65
117	258	71	82	164	32	40	50	---
130	286	79	91	182	40	50	63	83
140	308	84	97	194	50	63	80	100
153	337	93	110	220	63	80	---	---

Proof Load = 2 x S. W. L. (upto 25 tonnes) and Proofload = 1.2 x S. W. R. + 20 (above 25 tonnes).

The Pin Diameters actually used may be based on any standard series for sizes of Bar material.

The next size above the minimum pin diameter D_{min} as given in the table should be used.

The above shackles are hand forged by experts Blacksmiths and slight tolerance in sizes S, W and e should be permitted.

The Dimensions are for your approximate guidance only and shackle manufacture may not be necessary adhere to the above specifications.

We also manufacture Shackles as per IS 4690 Mooring Buoy, Shackles for Stud Link Anchor Chain and Studless Link Anchor Chain and also as per client's requirements, which are not mentioned in above specifications.

	Prepared By	Checked By	Approved By
Signature :			
Name :	V K Choudhary, Sr. Engr.	Atul Verma, Dy Mgr	Raghvendra Singh, Sr. Manager