0. FOREWORD

0.1 Interplant Standardization activity in Steel Industry is being pursued by IPSS Secretariat which functions under Centre for Engineering & Technology (CET), the in-house consultancy organization of SAIL.

0.2 This Interplant Standard has been prepared by the Standards Committee on Lifting and hoisting Equipment, IPSS 1:8 with the active participation of the representatives of all the steel plants, established crane manufacturers and leading consultants and was first revised in March 2009. The Standard discussed again in presence of experts from SAIL, RINL, TATA STEEL, ESSAR, JSPL and Consultants of MECON, HEC & DASTURCO and revised with second revision in August, 2018.

0.3 Inter Plant Standards for steel industry primarily aim at achieving rationalization and unification of parts and assemblies used in steel plant equipment and provide guidance in indenting stores or equipment by individual steel plants. For exercising effective control on inventories, it is advisable to select a fewer number of sizes/types from those mentioned in this standard. These limited sizes/types can be adopted as Plant Standards for an individual steel plant. It is not desirable to make deviations in technical requirements.

0.4 This standard was first issued in April 1975. In the first revision, the scope of standard was extended to cover not only sheaves but also the sheave assembly for the EOT cranes in the steel plants. This second revision deletes Table-1 giving the diameter of sheaves. Some of the axle sizes which were felt to be on the higher side, have been reduced along with the change in the bearing sizes. Additionally, the changes, resulting from revision of Indian Standards, have been incorporated.

0.5 In the formulation of this standard assistance has been derived from IS 3177:1999 `Code of practice for electric overhead traveling cranes and gantry cranes other than steel works cranes (second revision)' and IS 4137:1985 `Code of practice for heavy duty electric overhead traveling cranes including special service machines for use in steel works (first revision)'.

1. SCOPE

1.1 This Interplant Standard covers the requirements of sheave assembly used on all duties of EOT cranes.

1.2 For hook block assembly, please refer to IPSS:1-08-007-18.

2. SHEAVE DIMENSIONS – The main dimensions of the sheave (diameter, width, radius of groove, etc) shall be as given in **Table 1**.

3. GROOVING

3.1 Sheaves shall be machine grooved to a depth of not less than 1.5 times the diameter of the rope. The grooves shall be finished smooth and be free from any surface defects liable to damage the rope. The contour at the bottom of the groove shall be circular over an angle of 130 ± 5^{o} .

4. MATERIAL – The materials used in manufacturing the various components of the sheave assembly shall be as follows:

a) Sheaves – Cast steel conforming to 280-520 N of IS 1030:1998 `Specification for carbon steel castings for general engineering purposes (fifth revision).

b) Sleeves – Steel 45 C8 conforming to IS 2004:1991 `Carbon steel forgings for general steel purposes' / IS 5517:1993 `Steels for hardening and tempering – Specification (second revision)'

c) Bearing end covers – Cast steel Gr 230-450 N conforming to IS 1030:1998 or structural steel conforming to IS 2062: 2006 Grade B `Hot rolled low, medium and high tensile structural steel (sixth revision)'.

d) Spacer Rings – Structural Steel conforming to IS 2062:2006 Grade B.

e) End cover fixing screws – Conforming to IS 1364 (Part 2):2002 `Hexagon head bolts, screws and nuts of product grades A & B – Part 2 : Hexagon head screws (fourth revision)' and IS 1367.

f) Spring washer – Conforming to IS 4072:1978 `Specification for steel for spring washers' Grade D.

5. MOUNTING – Sheaves shall be mounted on anti-friction bearings on sleeves as shown in Fig. 1. The sizes of sheaves, bearings, etc shall be chosen from Table-1 according to the relevant class of duty of the crane. The bearing cover shall be suitably designed to prevent leakage of grease and ingress of foreign material. The bearing end cover screws/bolts shall be suitably locked to prevent them from unscrewing.

6. **LUBRICATION** – Lubrication of the sheave bearing shall be through the axle/cross head and the sleeve when mounted on the axle.

7. **DESIGNATION** – The sheave shall be designated by its diameter with suffix A or B for the relevant rope diameter as given in **Table-1** and by the number of this standard.

Example: A sheave having diameter of 315 mm and to be used with 18 mm diameter rope shall be designated as:

Sheave 315 18, IPSS:1-08-002-08

8. **MARKING** – Each sheave assembly shall be marked indelibly with the following inscription:

a) Sheave designation and
b) Diameter of rope

Table - 1

DIMENSIONS FOR SHEAVES

(Clause 7)

All dimensions in millimeters

Sl. No.	Sheave Desig-nation	Sheave Dia D mm	Rope Dia d mm	Dia D1 mm	Bore Dia mm	Groove Radius r mm	L1 mm	L2 mm	L3 mm	PCD mm	No. of sc-re-ws	Hex screw size	Type	Bearing Details	
														Designation & Dimension	
														IS 2398:1967	IS 5669:1970
														Bearing Code No.	ID x OD x width mm
1	200	200	8,10	230	48	6	22	35	95	135	4	M8X20	BB	60 BC 02	60x110x22
2	250	250	10,12,14*	300	78	8	34	50	110	185	4	M8X20	BB	90 BC 02	90x160x30
3	315A	315	10	350	68	6	24	40	100	170	4	M10X25	BB	80 BC 02	80x140x26
4	315B	315	16,18*	375	88	10.5	42	60	120	210	6	M10X25	BB	100 BC 02	100x180x34
5	400A	400	12	445	88	7	30	45	120	210	6	M10X25	BB	100 BC 02	100x180x34
6	400B	400	20,22,24	475	160	13.5	52	70	140	315	6	M10X25	RB	180 RU 01	180x280x46
8	500A	500	14*,16	560	88	8	38	55	120	210	6	M10X25	RB	100 BC 02	100x180x34
9	500B	500	24,26,28	590	200	16	63	80	165	370	6	M10X25	RB	220 RU 10	220x340x56
10	630A	630	18*,20	700	118	11.5	48	65	130	260	6	M10X30	RB	130 BC 02	130x230x40
11	630B	630	30,32,36	750	220	21	83	105	165	380	6	M10X30	RB	240 RU 10	240x360x56
12	710A	710	22,24	790	160	13.5	55	75	140	315	6	M12X30	RB	180 RU 10	180x280x46
13	710B	710	40	830	240	23	85	110	185	450	8	M12X30	RB	260 RU 10	260x400x65
14	800	800	26	890	180	15	61	80	165	345	6	M12X35	RB	200 RU 10	200x310x51
15	900	900	28,30	1000	220	18	70	90	165	395	6	M12X35	RB	240 RU 10	240x360x56
16	1000	1000	32	1110	240	19	76	95	185	450	8	M16X45	RB	260 RU 10	260x400x65
17	1120	1120	36	1240	240	21	88	105	185	450	8	M16X45	RB	260 RU 10	260x400x65

NOTE: Use of sizes marked with (*) should normally be avoided for future applications.
D/d = 29 and above, main sheaves
D/d = 25 and below, equalizer sheaves
Following types of roller bearings shall be used:-
a) NU bearing with angle ring
b) NJ bearing
c) NNCF bearing

Abbreviations: BB – Ball Bearing
RB – Roller Bearing