INTER PLANT STANDARD IN STEEL INDUSTRY		
IPSS	**SPECIFICATION OF BUSH PIN TYPE FLEXIBLE COUPLINGS**	**IPSS:1-01-003-18 (Second Revision)**
	Based on IS -2693	Formerly : IPSS:1-01-003-95 (First Revision)

0. FOREWORD

0.1 Interplant standardization in steel industry has been initiated under the aegis of the Indian Standards Institution (ISI) and the Steel Authority of India Limited (SAIL). The Interplant Standards prepared by the standard committee on Mechanical Drives, IPSS 1:1, with the active participation of the representatives of all the steel plants and leading consultants and was first adopted in 1986. Thereafter, this standard was revised with first revision in 1995 and with second revision in **November, 2018.**

0.2 Interplant standardization for steel industry primarily aims at achieving rationalization and unification of capacities and characteristics of remote control hydraulic jacks used in steel plant and provides guidance in indenting stores or equipment for existing or new installations by individual steel plants. For exercising effective control on the inventories, it is advisable to select a fewer number of sizes (or type) from among the products mentioned in this standards for the purpose of company standards of individual steel plants. It is not desirable to make deviations in technical requirements.

0.3 This revision is an updated version to take care of the latest procedural requirements.

1. SCOPE

1.1 This Inter Plant Standard covers the requirement of bush pin type flexible couplings used in steel industry.

2. MATERIALS

2.1 The materials for the various components shall be as specified in Table -1.

2.2 The general shape of the coupling shall be as given in Figure-1 of IPSS 1-01-006-18. The toothed hubs and the covers shall be machined all over for balancing. The couplings shall be fitted with suitable grease nipples for lubricating the teeth and grids. Suitable seals shall be fitted to prevent leakages of lubricants.

2.3 Spring Washers – shall conform to IS: 4072-1975 “Specification for steel for spring washers’. Mild steel plain washers may be used if required by the customer.

3. RATINGS

3.1 The ratings of the couplings shall be as given under column 2 of Table 2.

4. **DIMENSIONS**

4.1 The dimensions of the couplings, pins and bushes shall be as given in Table-2, 3 and 4 respectively.

5. **GENERAL REQUIREMENT**

5.1 The allowable maximum peripheral velocity of the coupling shall not be more than 30 meters per second when made of cast iron.

5.2 The keys shall conform to the dimensions given in IS 2048: 1983 'Specification for parallel keys and keyways (second revision) or IS 2292: 1974 (R2001) 'Specification for Taper keys and keyways. For drives subjected to reversing torque, a fully fitted taper key is recommended.

5.3 All coupling shall have pilot bore.

5.4 Unless otherwise specified the value of radius or chamfer shall be as specified in IS 3457: 2009 ' Radii for rounding for General Engineering Purposes:

5.5 Unless otherwise specified all the dimensional tolerances shall be as specified in IS 2102 (Part 1): 1993 'General Tolerances for dimensions and form and position : Part 1 General Tolerances for linear and angular dimensions.

5.6 The load ratings given inTable-1, the maximum allowable ratings at 100 rev/min per unit service factor- To determine the ratings of the couplings required for any given application with known power and speed, the following formula shall be used :

$$\frac{\text{KW of power of application X service factor X 100}}{\text{Rev / min of application}} = \text{Maximum rating at 100 rev/ min of required coupling}$$

5.7 The service factor shall be selected from IPSS: 1-01-007-18 'Code of practice for selection of coupling',

6. **DESIGNATION**

6.1 The coupling shall be designated by the outside diameter (See A Ø (DIA) Table-2) along with the prefix "BP". For example, a bush pin coupling having an outside diameter of 160mm shall be designated as :

BP 160, IPSS: 1-01-003-18

7. **MARKING**

7.1 When applicable, the driving and driven halves of the coupling shall be clearly marked so as to ensure that they are assembled in correct position relative to each other.

7.2 The coupling shall be marked with the designation and manufacturer logo with abbreviated name.

8. PACKING

8.1 The coupling assembly shall be suitably packed to withstand rough handling during transit.

8.2 The spare pins and nuts shall be given a protective coating against rust and suitably packed.

8.3 The spare rubber bushes shall be packed in polythene bags.

TABLE -1

MATERIAL FOR COMPONENTS PARTS OF BUSH PIN TYPE FLEXIBLE COUPLINGS

SL. NO.	COMPONENTS	MATERIAL	REQUIREMENT
1	Couplings	Cast Iron	Conforming to Grade 20 of IS 210: 'Specification for grey Iron casting"
		Cast Steel	Conforming to Grade 2 of IS 1030:1998 Specification for carbon steel castings for General engineering purpose(Fifth Revision)
		Forged Steel or Rolled Steel	Conforming to Class 4 of IS 1875: 1992(R2014) Specification for Carbon Steel billets, Blooms, Slabs and Bars for forging (Fifth Revision)
2	Pins & Nuts	Steel	Conforming to class 4 of IS 1875:1992(R2014) and IS 1364 (Part 5): 2002 Hexagon head, Bolts, Screws, nuts of product grade A and B: Part 5 Hexagon thin Nuts (Unchamfered) (size range M1.6 to M10 (fourth revision) with IS 4218 (Part 6) : 1978(R1996) ISO Metric screw threads : Part 6 Limits of sizes for commercial bolts and nuts (diameter range 1 to 52mm) and property class 6 for Nuts.
3	Bushes	Rubber	Hardness : 70± 5 (degree) A shore(IRHD) Tensile Strength : 100 kg/cm2 (When tested as per dumb bell method of IS 3400(Part-1) : 2012 Methods of test for vulcanized rubbers (Second Revision); Elongation : not more than 250 % at break and tested as per ring method of IS 3400 (Part-1): 2012. Ageing : After ageing at 70± 1 degree for a period of 72 hours by oven method in accordance with IS 3400 (Part-4) : 2012 the variation in Tensile strength shall not exceed ± 20% to 10% from the original value before ageing. After swelling of the material when tested in transformer oil (IS 335: 1993) for 72 hours at 70+ 1 degree C, the change in volume shall not be more than 5% when tested according to IS 3400 (Part-6): 2012
4	Lining in the Rubber Bushes	Mild Steel	Conforming to IS 2062: 2011 Hot Rolled Medium and High Tensile Structural Steel (Seventh Revision)

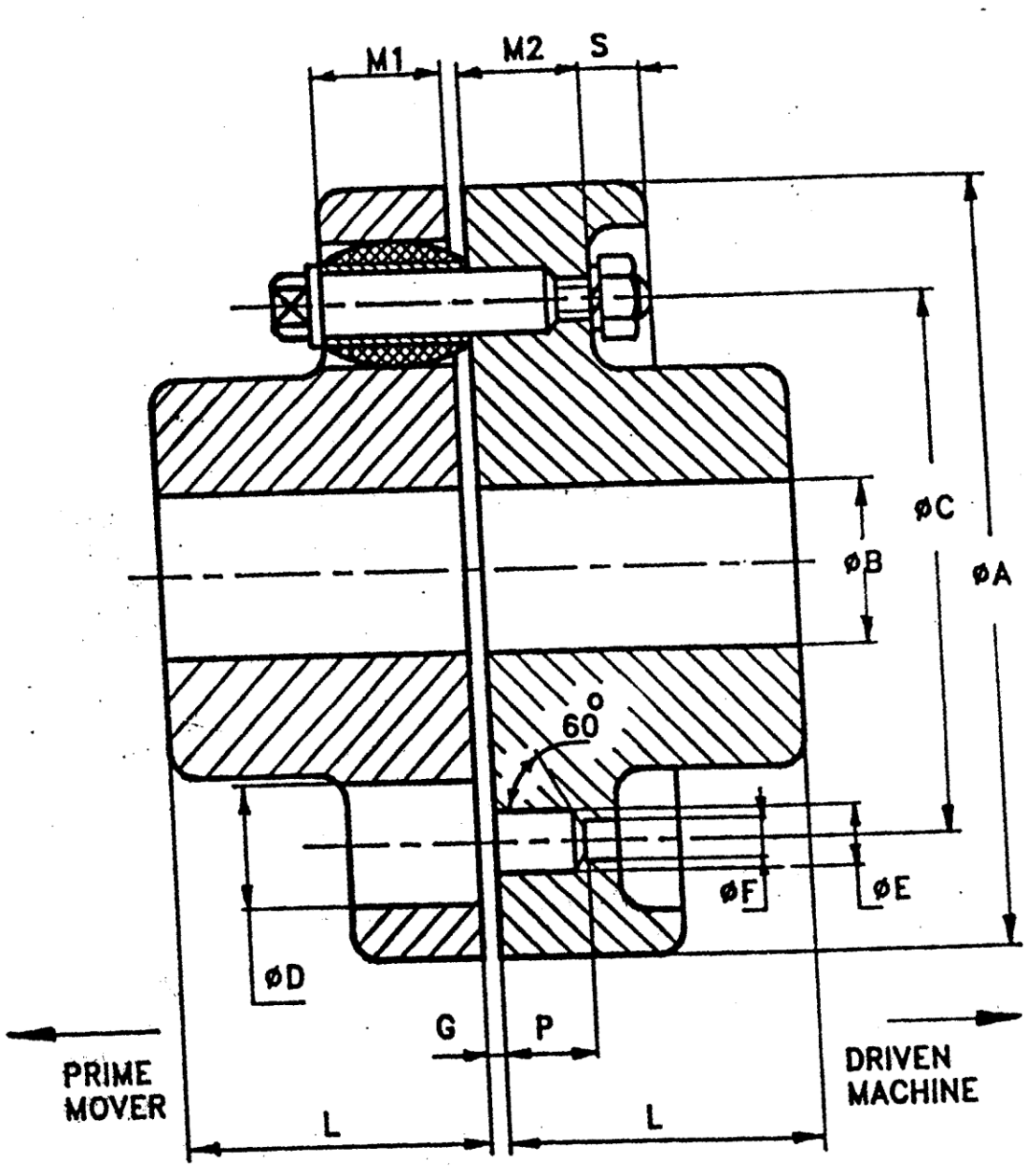

FIGURE -1

BUSH PIN TYPE FLEXIBLE COUPLING

TABLE-2 (Read with Figure-1)

Dimensions of Couplings (All dimensions are in millimeters)

Designation	Nominal kW Rating/100 Rev/min	Nominal Torque Rating Kgm	Maximum permissible Rev/min	Pilot Bore	Maximum Bore	A0	C0 PCD	D0	E0 H7	F	G	L Max	M1	M2	P	S	No. & Sizes of Pins
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
BP 100	0.47	4.5	5000	11	22	100	65	20	10	8	4	35	16	16	13	8	4x10 ϕ
BP 112	1.6	15	4500	18	28	112	80	24	12	8	4	45	20	18	15	8	6x12 ϕ
BP 140	2.39	23	4000	20	35	140	100	32	16	12	4	50	28	24	20	13	8x16 ϕ
BP 160	5.22	50	3600	24	42	160	112	36	18	14	4	60	32	27	22	15	8x18 ϕ
BP 200	8.95	85	3000	34	55	200	145	40	20	14	4	70	36	30	25	15	8x20 ϕ
BP 224	14.92	140	2650	53	65	224	160	46	24	14	7	90	40	36	30	15	10x24 ϕ
BP 315	33.58	320	2000	73	90	315	240	58	30	18	7	120	52	45	38	19	8x30 ϕ
BP 355	49.99	475	1800	78	105	355	270	58	30	18	7	135	52	45	38	19	10x30 ϕ
BP 400	74.62	710	1650	78	125	400	310	70	35	22	10	165	60	52	44	22	8x35 ϕ
BP 450	111.9	1070	1500	78	160	450	360	78	40	22	10	180	68	60	50	22	8x40 ϕ
BP 500	164.2	1575	1250	78	180	500	395	78	40	22	10	200	68	60	50	22	10x40 ϕ
BP 560	253.7	2430	1120	78	200	560	452	88	45	26	12	220	76	68	56	27	10x45 ϕ
BP 630	450.0	4315	1050	78	220	630	500	98	50	26	12	240	86	75	63	27	10x50 ϕ
BP 710	559.7	5370	950	78	250	710	565	108	55	26	12	260	96	82	69	27	10x55 ϕ
BP 800	650	6235	850	80	260	800	600	118	60	26	12	290	100	90	75	27	10x60 ϕ

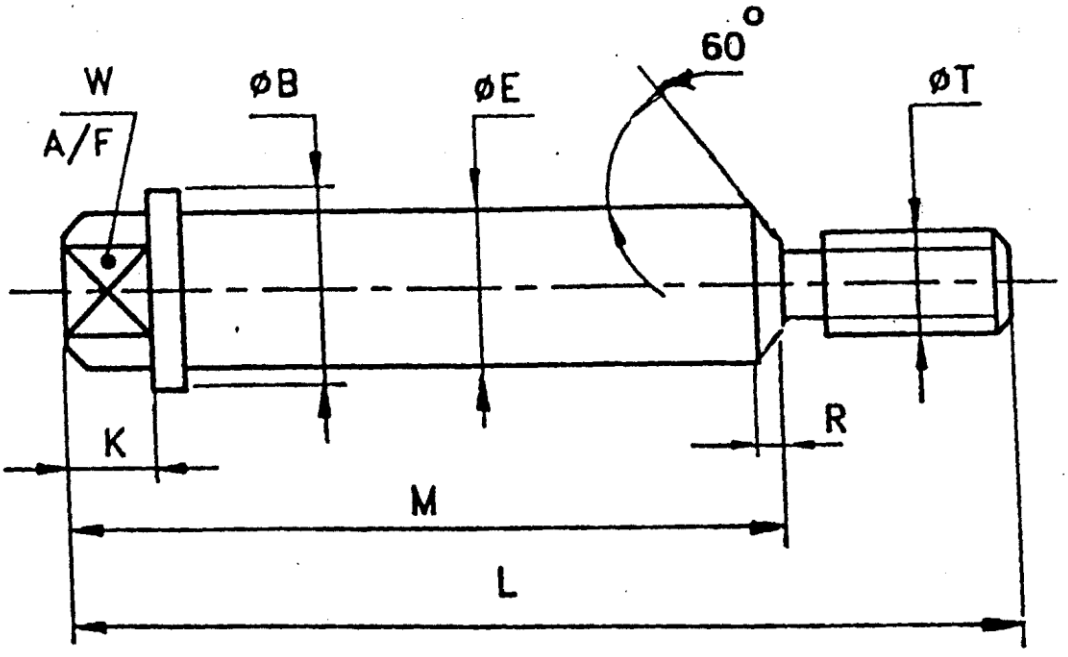

FIG. 2 PIN FOR BUSH PIN TYPE COUPLING

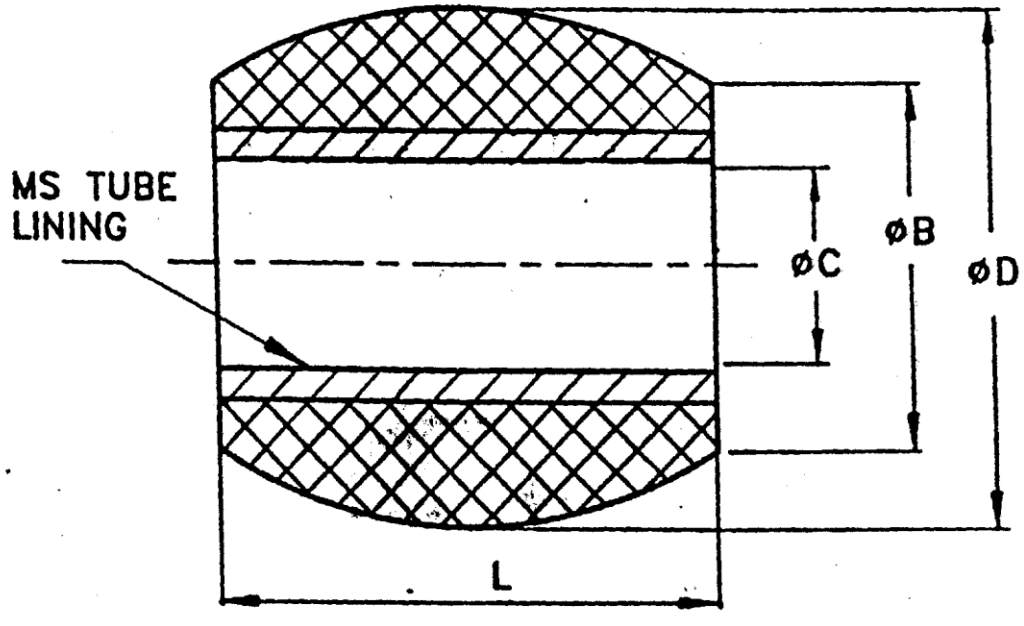

FIG. 3 BUSH FOR BUSH PIN TYPE COUPLING

TABLE 3
(Read with Fig 2)

DIMENSIONS OF PIN
All dimensions in millimetres.

Coupling Desig-nation	B ϕ	E ϕK6	K	L	M	R	T	W A/F
BP 100	14	10	6	52	41	2	M 6	10
BP 112	17	12	6	59	47	2	M 6	12
BP 140	20	16	7	78	62	2	M10	14
BP 160	25	18	8	88	69	2	M12	14
BP 200	27	20	8	95	76	3	M12	17
BP 224	32	24	8	108	88	4	M12	19
BP 315	38	30	10	135	110	4	M16	22
BP 355	38	30	10	135	110	4	M16	22
BP 400	45	35	12	162	131	5	M20	24
BP 450	50	40	12	177	145	6	M20	27
BP 500	50	40	12	177	145	6	M20	27
BP 560	55	45	13	201	162	7	M24	30
BP 630	60	50	13	218	179	8	M24	32
BP 710	65	55	13	234	195	10	M24	36
BP 800	70	60	15	248	208	11	M24	41

TABLE 4
(Read with Fig 3)

DIMENSIONS OF BUSHES
All Dimensions in Millimetres

Coupling Desig-nation	B ϕ	$C_{\phi}^{+0.5}$	D ϕ	$L^{-0.5}$	Minimum thickness of lining
BP 100	15	10	19	20	1
BP 112	18	12	23	24	1
BP 140	24	16	31	32	1
BP 160	26	18	35	36	1
BP 200	30	20	39	40	1
BP 224	35	24	45	47	1
BP 315	40	30	57	59	1
BP 355	40	30	57	59	1
BP 400	50	35	69	70	1
BP 450	60	40	77	78	1
BP 500	60	40	77	78	1
BP 560	65	45	87	88	1
BP 630	75	50	97	98	1
BP 710	80	55	107	108	1
BP 800	89	60	117	112	1