INTERPLANT STANDARD – STEEL INDUSTRY		
	ACCEPTANCE NORMS FOR CRANE GEAR BOX FOR TWO STAGE HORIZANTAL	**IPSS:1-08-020-18 (Third Revision)**
	Corresponding IS does not exist	Formerly: IPSS:1-08-020-14 (Second Revision)

0. FOREWORD

0.1 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 manufacturers of crane hooks and leading consultants and was first adopted with second revision in June, 2014.

0.2 The Standard discussed again in presence of experts from SAIL, RINL, TATA STEEL, ESSAR, JSPL and Consultants of MECON, HEC & DASTURCO and revised with third revision in **August, 2018**.

0.3 Interplant 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 for existing equipment (or while placing orders for additional requirements) 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.

1. SCOPE

1.1 This Interplant Standard lays down the acceptance norms for the general purpose gear boxes conforming to IPSS:1-08-014-18.

1.2 This standard also covers Vertical Gear Boxes for which a standard is already under formulation.

2. DIMENSIONAL CHECKS

2.1 The following dimensions shall be checked:

a) Diameters and keyways dimensions of input and output shafts.

b) Projection of input and output shafts beyond foundation holes and centre lines of gear box.

c) Centre distance between input and output shafts.

d) Centre height.

e) Distance between foundation holes with respect to centre line of the output shaft and distance of foundation holes from centre line of the gearbox.

f) Overall dimensions

3. BACKLASH

3.1 The backlash shall be checked by either of the following methods:

a) By pressing a lead sheet / lead _____ between the meshing teeth

b) By dial gauge (see **Fig.1**)

3.2 The backlash shall be within the limits specified in the drawing. If the value of the backlash allowed is not specified in the drawing, the allowed backlash shall be as given in **Table-1**.

4. AREA OF CONTACT

4.1 Area of contact shall be taken by applying Prussian Blue or any other suitable method. The contact area shall be within the limits mentioned below (Refer Fig.2)

For final stage of hoist gearing:

$$\frac{h}{H} \quad \text{shall be more than 30\%}$$

$$\frac{a - c}{b} \quad \text{shall be more than 40\%}$$

For all other gears:

$$\frac{h}{H} \quad \text{shall be more than 40\%}$$

$$\frac{a - c}{b} \quad \text{shall be more than 50\%}$$

5. RUNNING TEST

5.1 The gear box shall be run under no-load condition at the rated speed for minimum four hours in each direction and the following are to be checked:

a) All bolts at joints remain tight

b) All gear mesh lines are getting enough lubrication

c) All bearings are getting enough lubrication

d) Bearing temperatures after running for four hours in each direction shall not exceed 50oC or 15oC above ambient, whichever is higher. Temperature shall be checked after every hour.

e) Vibration: Maximum limit shall be 125 microns at double amplitude

f) Sound: The gear box shall not emit unusual sound as obtained under conditions of hard meshing, high spots etc. Maximum sound level shall be 87 decibel (dB) at a distance of 1000 mm and 91 dB at a distance of 300 mm.

g) There shall be no oil leakage at parting lines, bearing housings or inspection covers.

6. GENERAL

6.1 In addition to the above specific points, the following general points shall be ensured:

a) Inspection pockets are provided as required.

b) Gear box casings have at least 2 Nos. fit bolts / dowels at the partings

c) Dip sticks with min / max level markings are provided

d) Drain plugs are provided at convenient locations, preferably at the vertical wall of the housing

e) Breathers are provided

f) Lifting lugs or Eye bolts are provided as required in the standard

g) Where bearings are having splash lubrication, oil retainers are provided

h) Gear box castings are painted with oil proof paint inside and red oxide outside

i) In case of vertical gear boxes, having more than two-stage reduction, forced lubrication is also provided

j) Name plate should provide information like ratio, kW rating, size, manufacturer's name etc

6.2 **Test Certificate** – The supplier shall furnish a test certificate conforming to the material specification, hardness and heat treatment report of the individual component as was agreed to at the time of ordering.

TABLE-1

BACKLASH FOR GEARING SPECIFIED BY MODULE

(Clause 3.1)

Centre distance in mm		Tolerance in microms		
			Maximum	
Above	Upto	Minimum	For gears other than drum gears	For drum gears
			For all modules 1 to 50	For all modules 2.5 to 50
–	50	85	240	230
50	80	105	320	380
80	120	130	360	420
120	200	170	470	530
200	320	210	540	640
320	500	260	660	740
500	800	340	820	880
800	1250	420	970	1040
1250	2000	530	1200	1280
2000	3150	710	1500	1670
3150	5000	850	1810	1980

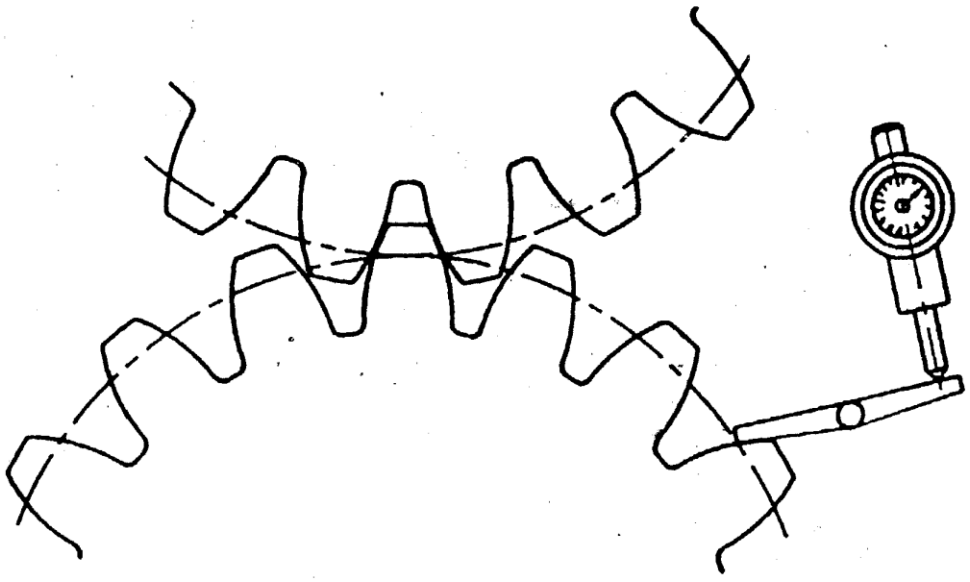

FIG.1 MEASUREMENT OF BACKLASH

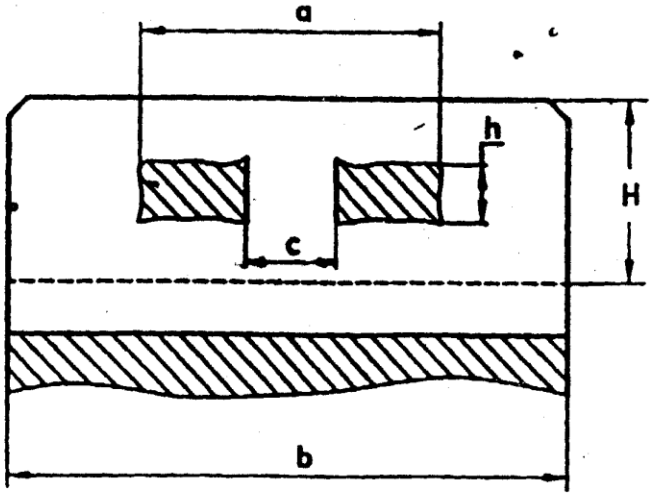

FIG.2 AREA OF CONTACT OF GEAR TEETH