INTER PLANT STANDARD - STEEL INDUSTRY

IPSS	ACCEPTANCE NORMS FOR BELT CONVEYOR SYSTEM	IPSS:2-03-010-97
	Corresponding IS does not exist	

0. FOREWORD

0.1 This Inter Plant Standard prepared by Standards Committee on Conveyors, IPSS 2:3 with the active participation of the representatives of steel plants, established manufacturers of belt conveyor systems and reputed consultancy organizations, was adopted in May 1997.

1. SCOPE

1.1 This Inter Plant Standard covers the norms for completeness, dimensional checks, testing and acceptance of conveyor system for steel industry at the time of trial run and commissioning.

1.2 This Standard does not cover the acceptance norms for individual structures and mechanical and electrical components of the belt conveyor system. These shall conform to relevant Interplant Standard or Indian Standard or drawings/design practices as mutually agreed between the purchaser and the supplier.

NOTE: Completeness shall mean compliance of the installation with the approved drawings specifications and agreement between the purchaser and the supplier.

2. ACCEPTANCE TOLERANCES

2.1 Conveyor Pulley Assemblies

2.1.1 Distance 'X' of all pulleys with respect to the stringer structures shall be within 5.0 mm. (See Fig-1)

2.1.2 Centering of each of the head, tail, snub, bend and take up pulleys with respect to the nominal centre line of the conveyor system shall be within ± 1.0 mm. (See Fig-2)

2.1.3 Angular misalignment of pulleys with respect to nominal centre line of conveyor system shall be within ± 1.0 mm per meter width of drum/pulley. (See Fig-3)

2.1.4 Horizontal level difference of all pulleys of width less than 750 mm shall be within 0.5 mm. (See Fig-4)

2.1.5 Horizontal level difference of all pulleys of width more than 750 mm shall be within ± 1.0 mm. (See Fig-4)

2.2 Idler Assemblies

2.2.1 Centering of idler assemblies with respect to nominal centre line of conveyor system shall be within ± 2.0 mm.

2.2.2 Horizontal level difference of central roller of carrying idler assembly shall be within ± 2.0 mm. (See Fig-5)

2.2.3 Horizontal level difference of return idler shall be within ± 2.0 mm. (See Fig-6)

2.2.4 Angular misalignment of individual idler assembly with respect to nominal centre line of conveyor shall be within ± 1.5 mm per meter. (See Fig-7)

2.2.5 It shall be ensured that an empty belt rests on all the idlers except those near the trippers and on either side of the training idlers.

2.3 Take up Assemblies

2.3.1 For take up pulley, squareness and angular misalignment shall be within ± 1 deg (See Fig-8).

2.4 Drive Assemblies

2.4.1 Top level of composite base frame shall be within ± 0.5 mm of the designed level.

2.4.2 The alignment of motor, coupling and gear box shall be as per manufacturer's recommendations.

3. SAFETY PROVISIONS

3.1 Safety devices/arrangements shall be available in the belt conveyor system conforming to IPSS:2-03-003-96 `Design considerations for provision of safety in belt conveyor system (*first revision*)'.

4. MAINTENANCE FACILITIES

4.1 The maintenance facilities shall be available in the belt conveyor system conforming to IPSS:2-03-009-96 `Design parameters for maintenance facilities in conveyor system (*first revision*)'

5. LIGHTING PROVISIONS

5.1 The lighting provisions shall be available in the junction houses, galleries and tunnels of the conveyor system conforming to IPSS:2-03-005-95 `Design considerations for lighting of junction houses, conveyors galleries and tunnels (*first revision*)'.

6. ELECTRICAL SYSTEMS

6.1 All switches shall be tried and their proper functioning shall be ensured.

6.2 All electrical sequence of operation, including interlocking, shall be checked for their proper functioning.

7. TRIAL RUN AND COMMISSIONING

7.1 The trial run shall consist of no load test (i.e. belt running empty) and full load test.

7.2 The trial run shall be on full load for 100 hours in 15 days or as mutually agreed between the purchaser and the supplier.

7.3 Proper recording shall be made of all the relevant operating parameters during the trial run. For general guidance, a sample format is given at Appendix A. None of these parameters shall exceed the allowable limit.

7.3.1 For the purpose of recording, a suitable format shall be agreed upon between the purchaser and the supplier.

7.4 Limits of Operating Parameters During Trial Run

7.4.1 The temperature in the gear box shall not exceed 60°C.

7.4.2 The temperature in the bearings shall not exceed 60°C.

7.4.3 No load current of the motor (i.e. belt running empty) and full load current of the motor shall be consistent with the motor characteristics curve supplied by the manufacturer.

7.4.4 Vibration level of the drive system shall be in accordance with the vibration severity chart as given at Fig-9.

7.4.5 The belt shall run centrally, however, momentary sway shall be limited to:

a) Offset running of conveyor belt at head pulley shall be within ± 20 mm.

b) Offset running of conveyor belt at tail pulley shall be within 30 mm.

7.4.6 Offset running of conveyor belt at gravity take up pulley shall be within ± 25 mm.

7.4.7 Offset running of conveyor belt over carrying idlers shall be within ± 30 mm.

7.4.8 Offset running of conveyor belt over return idlers shall be within ± 25 mm.

8. GENERAL

8.1 Central loading of the conveyor belt shall be ensured.

8.2 Take up position shall be checked at 'No load - belt stationary' condition and at 'Full load - belt start' condition. In either case, there shall be unobstructed movement of take up.

8.3 Soundness of the belt splice joint shall be ensured.

8.4 It shall be ensured in the take up arrangement that the belt has provision for making one extra spliced joint.

APPENDIX - A

(Clause 7.3)

SAMPLE FORMAT FOR RECORDING OF OPERATING PARAMETERS DURING TRIAL RUN OF CONVEYOR SYSTEM

1. Conveyor No: 2. Size of Conveyor

3. Date & Time of starting the trial run:

4. Period of trial run:

5. Other relevant details:

Sl No.	Parameters	Acceptance Limits	Measured Value	Remar
1.	Maximum gearbox temperature	60°C		
2.	Maximum bearing temperature	60°C		
3.	No load current of the drive motor			
4.	Full load current of the drive motor			
5.	Vibration level measured at bearing cap of gearbox			
6.	Maximum offset running of belt			
	a) at head pulley	± 20 mm		
	b) at tail pulley	± 30 mm		
	c) at gravity take up	± 25 mm		
	d) at carrying idlers	± 30 mm		
	e) at return idlers	± 25 mm		
7.	Central loading of conveyor belt			
8.	Movement of take up between "No load - belt stationary" condition and "Full load - belt start" condition	Smooth and unobstructed		
9.	Soundness of belt splice joint			
10.	Provision of atleast one extra splice joint in the take up arrangement			
11.	Load carrying capacity			
12.	No. of hours on full load/day.			

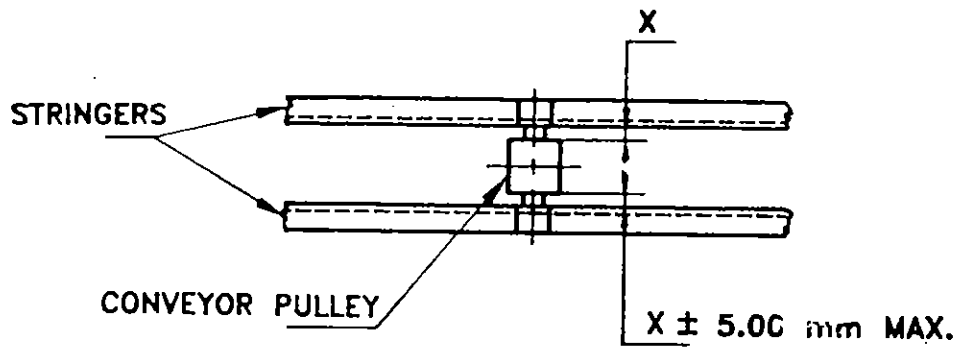


FIG. 1 DISTANCE 'X' OF PULLEYS WITH RESPECT TO STRINGER STRUCTURE

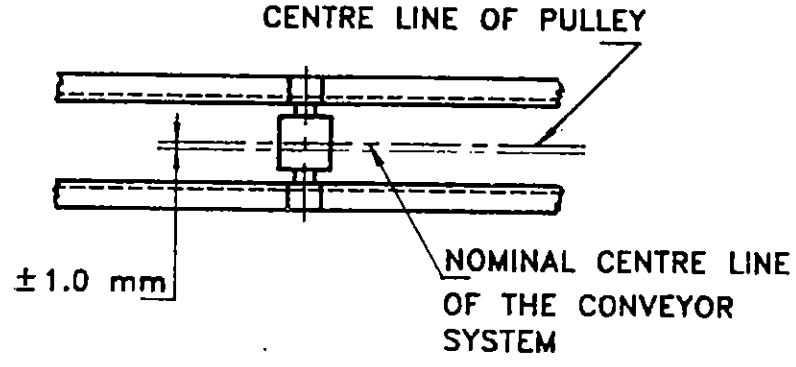


FIG. 2 CENTERING OF PULLEYS WITH RESPECT TO NOMINAL CENTRE LINE

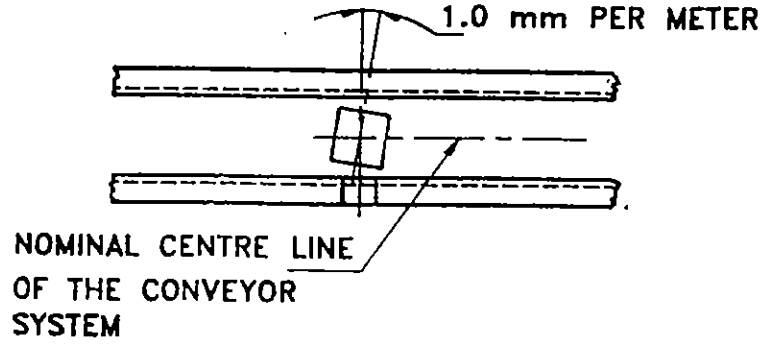


FIG. 3 ANGULAR MISALIGNMENT OF PULLEYS WITH RESPECT TO NOMINAL CENTRE LINE

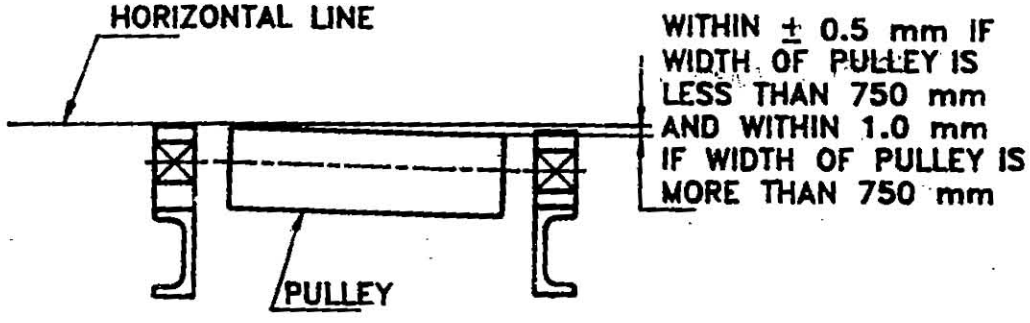


FIG. 4 HORIZONTAL LEVEL DIFFERENCE OF PULLEYS

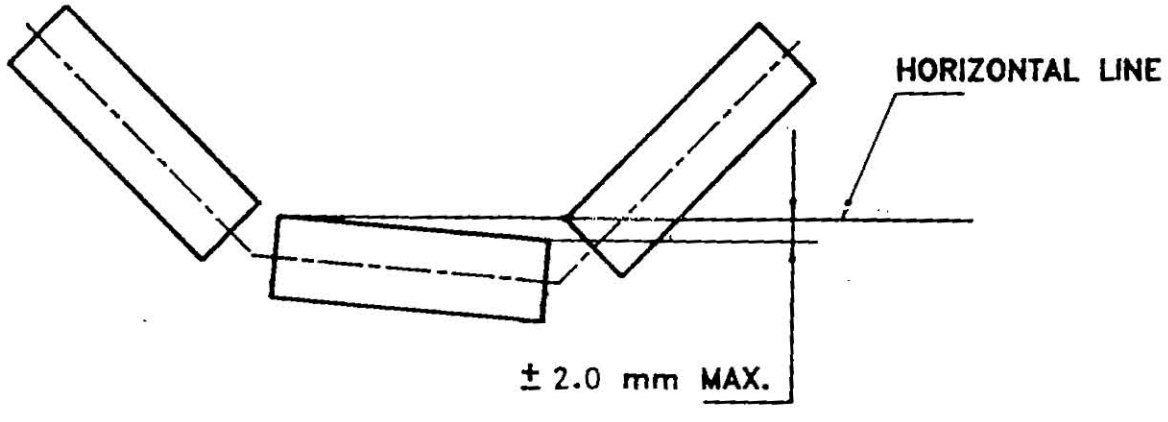
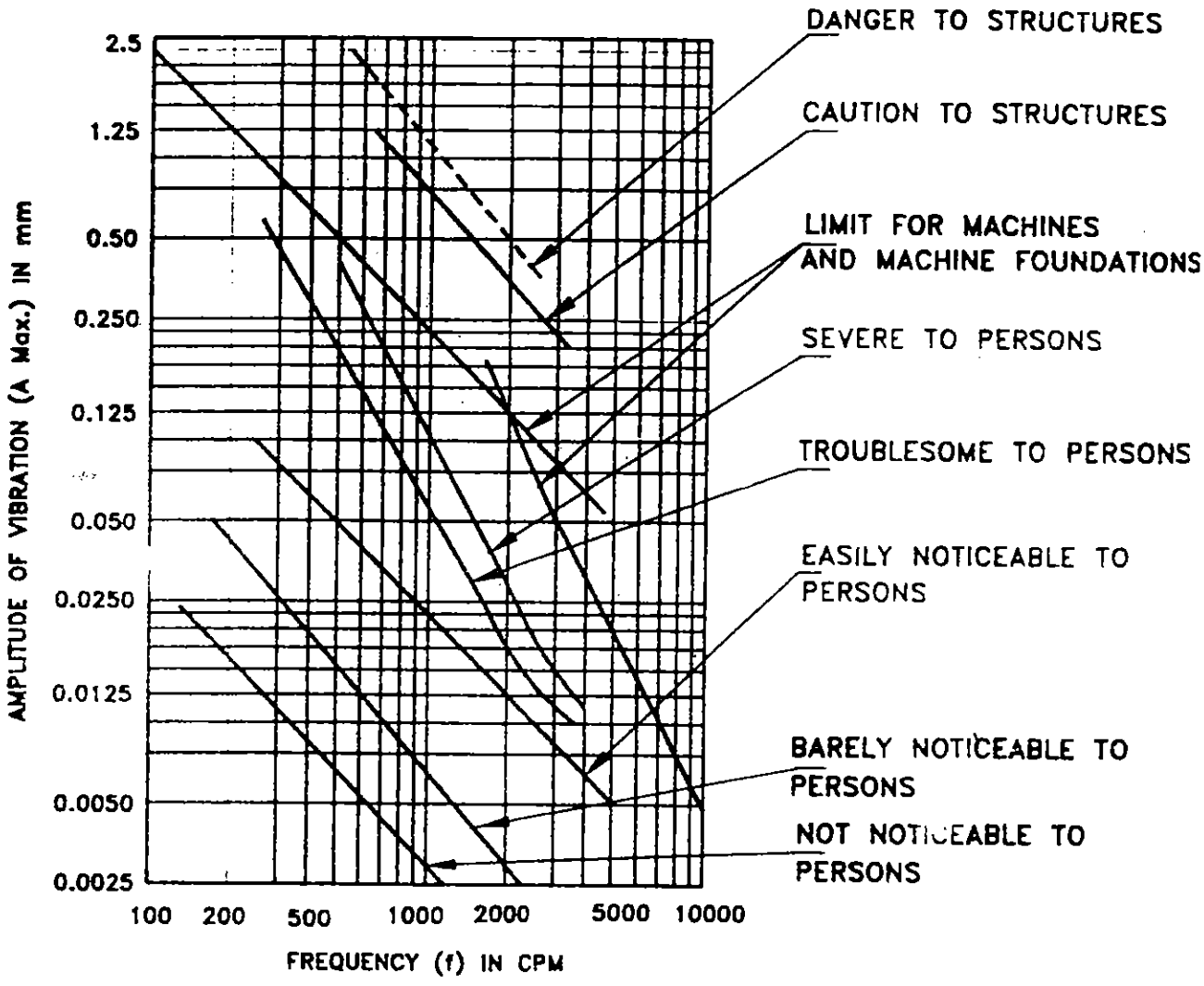


FIG. 5 HORIZONTAL LEVEL DIFFERENCE OF CENTRAL ROLLER OF CARRYING IDLER ASSEMBLY



Note 1- Resonance in the neighbouring structures will be negligible if the amplitude of vibration is less than 0.20 mm.

Note 2- For foundations of rotary type or machines of low frequency(0 to 300 c/min). It is possible to state that if no resonance is to occure in adjoining building and structure, then the amplitudes of vibrations of foundation shall not exceed 0.30 mm.

FIG. 9 LIMITING AMPLITUDE FOR VERTICAL VIBRATION

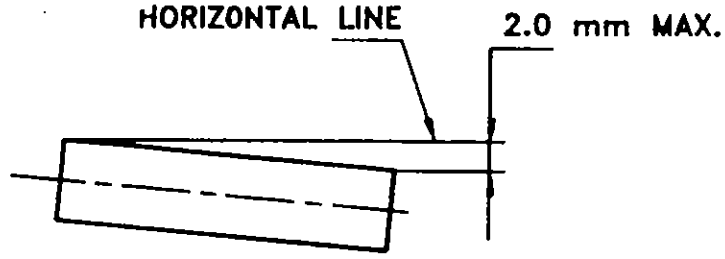


FIG. 6 HORIZONTAL LEVEL DIFFERENCE OF RETURN IDLER

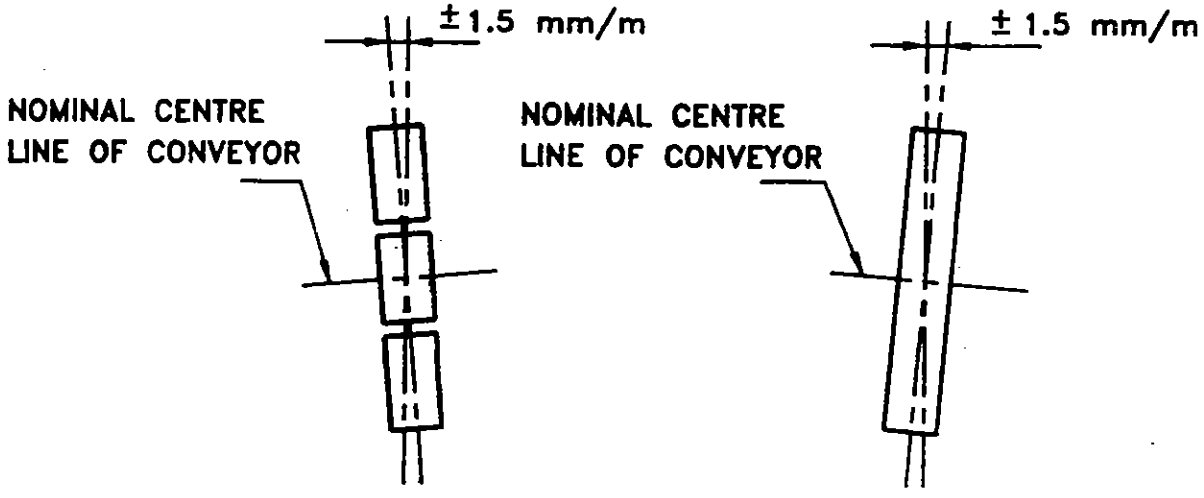


FIG. 7 ANGULAR MISALIGNMENT OF INDIVIDUAL IDLER ASSEMBLY

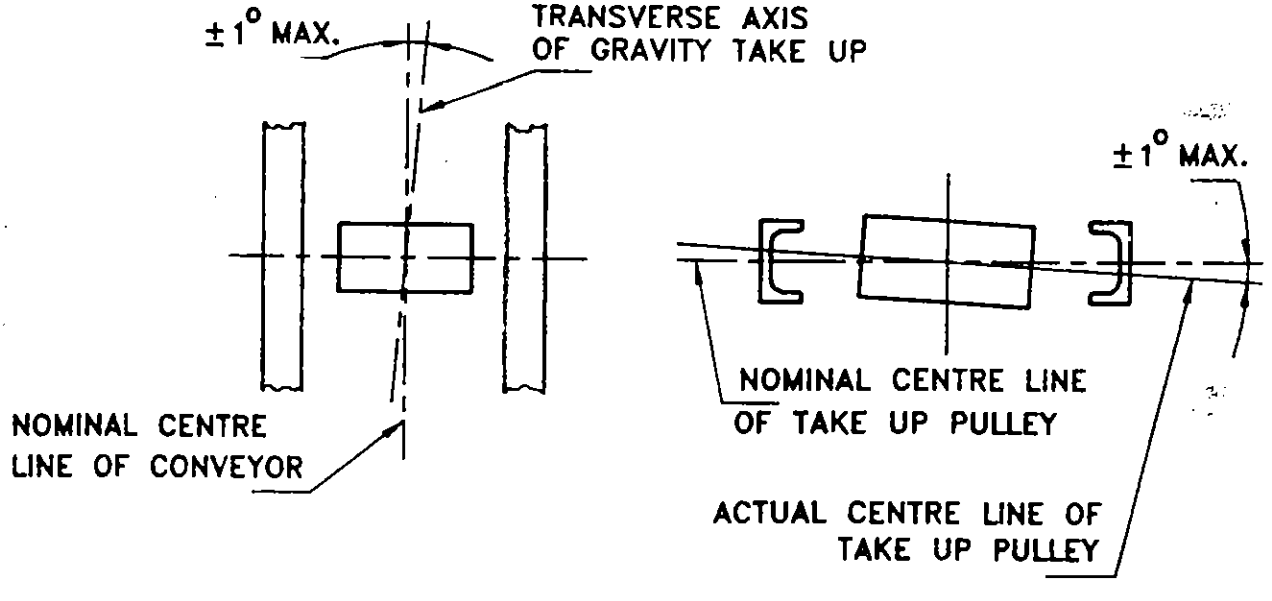


FIG. 8 SQUARENESS AND ANGULAR MISALIGNMENT OF TAKE UP PULLEY