TEST REPORT

STRUCTURAL ENGINEERING LABORATORY

PROJECT	:	**REPORT ON K2, FREE FLOAT TYPE POT–CUM-PTFE BEARING TEST**
CLIENT	:	**M/S UNITECH COUPLERS INDIA PVT LTD, COIMBATORE.**
CONSULTANT	:	**AMLAN K. SENGUPTA PROFESSOR & HEAD OF LABORATORY**
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DATE: 10-05-2018

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Title: REPORT ON TESTING OF FREE FLOAT TYPE POT-CUM-PTFE BEARING
Client: M/S. Unitech Couplers India Pvt Ltd, Coimbatore.

INTRODUCTION

M/s. Unitech Couplers India Pvt Ltd, had requested Structural Engineering Laboratory, IIT Madras, to carryout vertical load, rotation and friction test on the free float type pot-cum-PTFE bearings. Accordingly three tests were carried out in accordance with IRC 83 (part III) specifications. This report deals with the details of the test, observations made and the result obtained from the test.

Details of test

Design Vertical Load	: 220 Tonnes
Test Load	: 275 Tonnes (1.25 times of Design Vertical Load)
Size of Sliding Plate	: 505 × 435 mm
Specification	: IRC 83 (Part-III)-2002 (Clause 928.6.2.3)
Date of Testing	: 25-04-2018

Test setup

Free Float Guided Pot-Cum-PTFE Bearing consist of Pot, Elastomeric disc (Pad), Sealing ring, Piston, PTFE, Stainless Steel Sheet and Top plate. A PTFE module was fixed in the top of the middle part. The horizontal load was applied using jack with reaction frame and vertical load was applied under a compression testing machine. Typical test setup for vertical load, rotation & friction tests are shown in figures 1, 2 & 3 respectively.

Test procedure

1. Vertical load test

The bearing was placed centrally and aligned well under a compression testing machine. Initially the load was applied upto a load of 1.25 times the design vertical load (Test load) under a compression testing machine. The corresponding deflection was noted. This load was held for 30 minutes. The deflection was again

measured after 30 minutes. Four number of dial gauges were placed at four corners of the sample for measuring deflection. The vertical deflection under sustained load shall be not more than 4 % of the thickness of elastomeric pad. After complete unloading the bearings were visually verified for cracks, scoring or any other defects.

2. Rotation test

The rotation test was performed on the bearings for design rotation under minimum design vertical load. The vertical load was applied under a compression testing machine till it reaches the design vertical load. The permissible deflection shall not exceed 15 percentage of thickness of elastic pad. The corresponding deflection was noted and bearings were removed off for visual verification after unloading.

3. Friction test

A pair of bearing samples was tested under each category. The samples were oriented such that the top plate was free to move in the direction of horizontal force applied using a hydraulic jack. The design vertical load was applied and held constant till sliding occurs due to horizontal load. The corresponding horizontal load was recorded. After unloading the bearings were removed off and visually examined for any defects.

Testing equipment and measurement devices

The axial load was applied through a Compression Testing Machine of capacity 6000 kN and the horizontal load was applied using jack with reaction frame. All the measuring devices were well calibrated at the time of testing as per standards. The observations were tabulated.

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Test results:

One sample of free float type pot-cum-PTFE bearing

1. Vertical Load Test

Thickness of elastic pad = 22mm
Permissible vertical deflection = 0.88 mm
Increase in vertical deflection under sustained load = 0.015mm
Visual verification - O.K.

S.No	Load (T)	Average Deformation (mm)
1	275	0.487
After 30 minutes, the reading was taken under same load		
2	275	0.502

2. Rotation Test

Thickness of elastic pad = 22 mm
Permissible value of deflection = 3.3 mm
Deflection at rotation under test load = 0.871 mm
Visual verification – O.K.

S.No	Design Load(T)	Average Deformation (mm)
1	0	0.871
2	220	

Two samples of free float type pot-cum-PTFE bearing

3. Friction Test

As per IRC 83 (Part III) - 2002 the value of co-efficient of friction shall not exceed 2/3rd of the value specified in clause 926.2.4.2 depending on the actual average pressure on PTFE due to the applied design vertical load). The calculated value of coefficient of friction is less than the permissible value.

S.No	Vertical Load (T)	Horizontal Load (T)	PTFE Dia (mm)	Frictional Coefficient (μ)	Permissible Value
1	220	4.08	320	0.019	0.033

CONCLUSION

The tests conducted on bearing samples are found to yield Satisfactory results, meeting the relevant acceptance criteria specified in IRC 83 (part III) - 2002.

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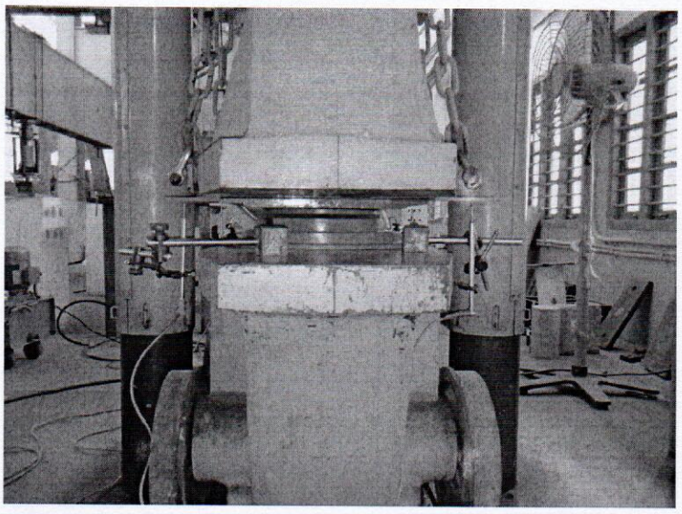

Figure 1. Test set up for vertical load test

Figure 2. Test set up for rotation test

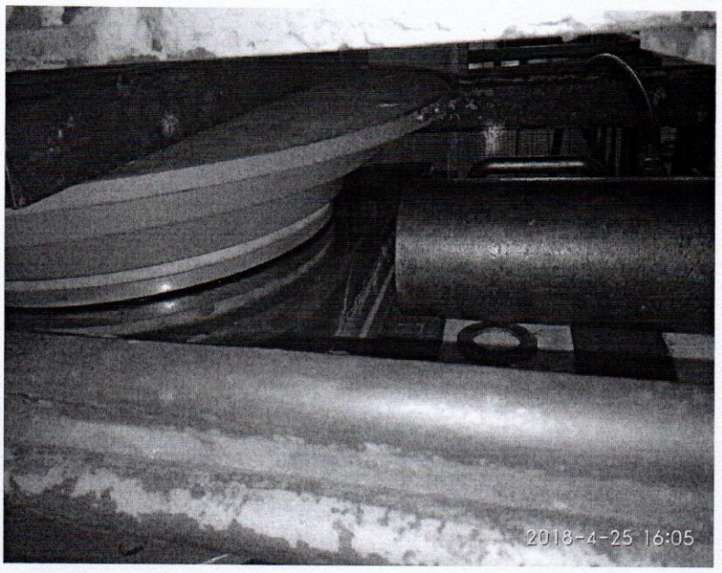

Figure 3. Test set up for friction test