

Applications Of Disk Bearings On Large Structures

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Summary

Disk bearings were first developed in the late 1960's as an alternate to pot or spherical devices. The primary component of the disk bearing is the load and rotational element, which is comprised of a polyether urethane elastomer. Now in service for well over 30 years, disk bearings have an outstanding track record on bridges all over the world.

One of the reasons for this success is the simplicity in design, which allows for ease of inspection and maintenance free performance. Disk bearings have been utilized on numerous signature structures as well as many medium span bridges. Some historical and current applications of disk bearings are the Pasco Kennewick Intercity Bridge in Washington, the I-35W Bridge in Minneapolis and The World Trade Center Transportation Hub Building in New York City. Disk bearings offer a viable tool for structural engineers working on intricate structures as a means to accommodate challenging loads, movements and rotations.

Keywords: Bearings, high load multirotational bearings, disk bearings, bridges, polyether urethane, rotation.

1. Introduction

High load multirotational bearings are a necessary tool for structural engineers designing large civil engineering structures. Historically spherical and pot bearings have been the device of choice when the loads, movements and rotations make conventional elastomeric bearings impractical. However the high cost of spherical bearings and the sealing ring problems that have plagued pot bearings (especially in North America) led to the development of an alternative device.

2. Disk Bearings

Disk bearings were developed in the late 1960's as a cost effective means to safely transmit the loads, rotations, and translations of a bridge superstructure to the substructure (Fig. 1). The primary component of the disk bearing is the load and rotational element, which is comprised of a polyether urethane elastomer. Due to this material's inherent compressive strength, there is no need for confinement of the elastomer, which acts much like a conventional elastomeric bearing. [1]