RAILS/BEARINGS/COMPONENT SETS

INTRODUCTION

Crossed roller components offer exceptional load carrying capability, approximately 2 to 2 1/2 times that of comparably sized ball bearings. They can provide up to 5 times the life expectancy of the ball bearing without degradation of performance. Crossed roller bearings are rated for over 100 million inches of travel at specified load. They can withstand load from any direction and guide linear motion with precision accuracy. They can be used in linear motion applications where high precision, repeatability, low friction and starting force are essential.

CONSTRUCTIONS

Rails and rollers are made of high quality tool steel ground and hardened (Rc59-61). Mounting surfaces and bearing surfaces are precision ground flat, square, and parallel. Roller retainers vary according to application and can be captive or non-captive. Endpieces or screws are provided to ensure that no overtravel of retainers occurs. When properly preloaded sideplay is eliminated, friction minimized, and a uniform coefficient of friction (.003 or less) exist.

STRUCTURE AND FEATURES

High rigidity and precision finish of rails and rollers ensure frictional resistance is low, and stable, high rolling accuracy and long life are attainable. The crossed roller bearing system consist of (2) strips of rollers with each roller oriented in alternating 90 degree axes riding in a 45 degree "V" way. Crossed rollers provide a larger contact surface and greater load carrying capability than comparable sized ball bearings. In order to maintain precision accuracy (4) rails are manufactured and graded to ensure matching height of the "V" way to the mounting base (within .0001"), mated with (2) roller retainers, endpieces, and supplied as one set. "V" way is ground parallel to base and back reference sides within .000020"/in.

CROSSED ROLLER RAIL SET LIFE/LOAD RATING

10 million inches of travel with maximum dynamic load can be expected for any rail set. As the load is decreased the expected life increases. At 1/2 the maximum dynamic load the life increases to 100 million inches and at 1/4 load life increases to 900 million inches. Dynamic capacity is the load which may be applied for a bearing life of 10 million inches of travel with no evidence of fatigue appearing in 90% of the bearings. The maximum load carrying capacity for the 118 series is 29 lbs./ bearing, 14 lbs./bearing for the 079 series, 120 lbs./bearing for the 236 series and 220 lbs./bearing for the 354 series. (Please note: only 1/2 the actual roller count is load bearing when calculating carrying capacity). These load carrying capacities are based on the fundamentals established by ISO for the calculation of roller bearings. Static load should not be more than dynamic load due to fatigue behavior which is always initiated at the highest loaded point.

OPERATING TEMPERATURE

It is recommended that the linear bearings not be operated at temperatures above 170˚F (80˚C). Temperatures up to 250˚F (120˚C) can be tolerated using brass retainers for short periods of time. For prolonged high temperature applications, always specify stainless steel components.