Rexroth
Bosch Group

Linear Motion Technology Handbook

The Drive & Control Company

Linear Motion and Assembly Technologies

www.boschrexroth.com/brl

1.1 Foreword

Reliable guidance and precise positioning – Rexroth provides a complete linear motion technology range for these tasks, from guides through to drive units. Linear motion technology components are the interface between static and moving machine elements. They significantly affect the machine characteristics. Linear motion technology comes into play whenever precision and high load-bearing capability are required, as is above all the case in machine construction and automation. Rexroth's guidance components are profiled rail systems and linear bushings and shafts. Ball screw assemblies are the drive components used for positioning. Both of these functions are combined in linear motion systems. However, Rexroth offers much more than just linear motion products. As a global equipment provider for machinery and plant construction, Rexroth provides all the relevant drive, control and motion technologies – from mechanics, hydraulics and pneumatics through to electronics.

This linear motion technology handbook provides specialized knowledge about Rexroth's linear motion technology products, giving users insights into the world of linear motion. The handbook is not designed to replace the Rexroth product catalogs but simply as a supplement to them. The dimensions, performance data and product versions, etc. must still be taken from the catalogs. The handbook, however, contains extensive advice on system characteristics, product selection, design and calculation. It is designed for all linear motion technology users.

The handbook is divided into a general Principles chapter, equally applicable to all Rexroth products, and into additional special chapters on the individual linear motion technology components.

The Principles chapter describes the physical background knowledge for linear motion technology. This includes rolling contact with all its usual practical manifestations, as well as generally accepted methods for calculating nominal life. Also described are system characteristics common to all products, such as preload, rigidity, accuracy and friction. The following chapters on Profiled Rail Systems, Linear Bushings and Shafts, Ball Screw Drives and Linear Motion Systems refer to the respective Rexroth products and their characteristics. These chapters cover additional basic knowledge, system properties, advice on product selection, and design hints for users of these products. A substantial part of the handbook covers how to calculate, dimension and configure the guidance and drive components. This includes detailed calculation of the components' life expectancy, calculation of the static load safety factors, determination of the critical screw speed, and drive dimensioning. The structural design and the functionalities of the individual types, versions and components are also described. The reader is therefore provided with an overview of each product's special characteristics.

We hope that you will enjoy reading and using this handbook.

Bosch Rexroth AG
The Drive & Control Company
Linear Motion and Assembly Technologies

1.2 Contents

1.2 Contents

1.2 Contents

1.2 Contents

1.2 Contents