

# New Electronic NSK Product Guide

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## 1. Introduction

For use with personal computers, NSK has offered its Bearing Pro on floppy disk and CAD data on CD-ROM. Now we have combined technical information and dimension tables from our general catalog on rolling bearings, examples of bearing damage from our Bearing Doctor, and bearing CAD data into one CD-ROM to meet the needs of customers in various industries. In this article, we present a summary of the recently issued NSK Product Guide for bearings (a second CD-ROM for precision products is being prepared and will be released in the near future).

## 2. Summary of the Electronic Product Guide

### 2.1 Operating environment

The following operating environment is recommended for the electronic product guide:

- CPU: Pentium 166 MHz or faster
- OS: Windows 95 with Internet Explorer 3.02
- Memory: at least 32 MB
- Display: at least 640 × 480 pixels and 256 colors

### 2.2 Structure of the electronic guide to NSK bearings

When the CD-ROM starts up, the Top display shown in Fig. 1 appears. Clicking on any of the three pictures (Bearings, Overview of Products or Corporate Information) takes the user to that section. To quickly return to this initial display, the user need only click the word Top on the bottom row of each display. Next we describe the three sections: Bearings, Overview of Products, and Corporate Information.



Fig. 1 Top display

### 2.3 Bearings

When you click the Bearings icon in the Top display, the Main display shown in Fig. 2 will appear. The section on bearings consists of six menus: Bearing ABCs (basic bearing knowledge), Bearing Pro (technical bearing calculations), Bearing Pro Manual, Bearing Doctor (examples of bearing damage), CAD Data, and Dimension Tables.

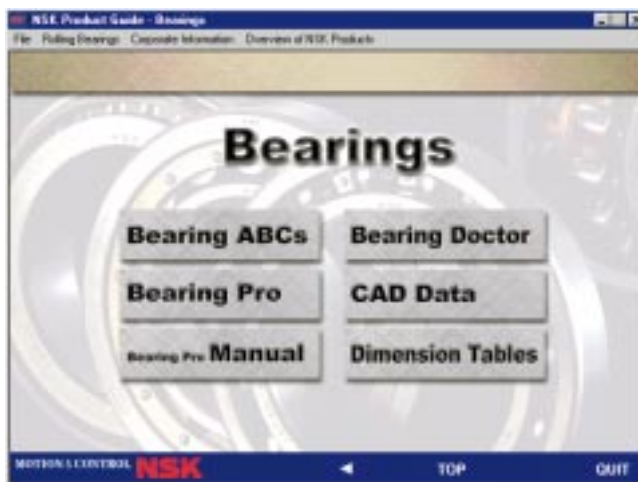


Fig. 2 Main display in "Bearings"

#### (1) Bearing ABCs (basic bearing knowledge)

The Bearing ABCs menu allows the technical information in NSK's general catalog on rolling bearings<sup>1)</sup> to be accessed easily and quickly. Information is provided under thirteen headings: Types and Features of Rolling Bearings, Selection of Bearing Arrangement, Selection of Bearing Size, Limiting Speed, Boundary Dimensions and Identifying Bearing Numbers, Bearing Tolerances and Running Accuracy, Fits and Internal Clearances, Preload, Design of Shafts and Housings, Lubrication, Bearing Materials, Bearing Handling, and Running Traces and Applied Loads.

For example, Fig. 3 shows the display for the heading "Types and Features of Rolling Bearings." Clicking any of the 13 types of bearings listed on the left shows the user an illustration of the bearing and provides a brief explanation of its features and characteristics. By clicking "Table of Types and Characteristics of Rolling Bearings" in the lower left, the table shown in Fig. 4 will be shown. This table can be scrolled both horizontally and vertically to quickly compare the characteristics of different types of bearings. Clicking any of the images of the bearings shown on the top row provides the user with a description of the bearing; clicking the same image at the bottom of the table shows dimension tables for the bearing.

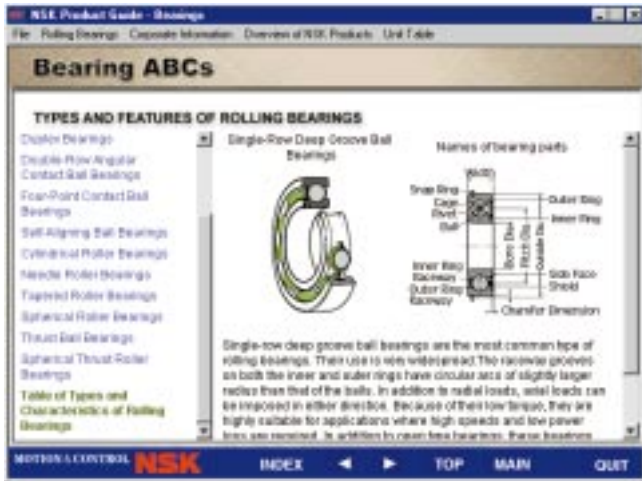


Fig. 3 "Types and Features of Rolling Bearings"

Feature	101	102	103	104	105	106
Radial Load Capacity	○	●	⊗	⊙	⊗	○
Axial Load Capacity	○	●	⊗	⊙	⊗	○
Combined	○	●	⊗	⊙	⊗	○
High Speed	○	●	⊗	⊙	⊗	○
High Accuracy	○	●	⊗	⊙	⊗	○
Low Noise and Torque	○	●	⊗	⊙	⊗	○
Rigidity	○	●	⊗	⊙	⊗	○
Angular Misalignment	○	●	⊗	⊙	⊗	○

Fig. 4 "Table of Types and Characteristics of Roller Bearings"

**(2) Bearing Pro (technical bearing calculations)**

In the Bearing Pro section, four technical calculations can be performed: life calculations for individual bearings, life calculations for two bearings supporting a geared shaft and gear load, calculation of fits and clearances, and calculation of bearing frequency vibration ranges. This program can be viewed on the NSK home page at

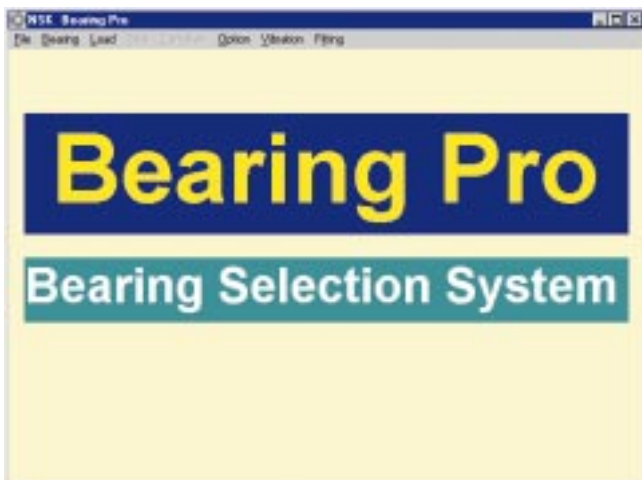


Fig. 5 Initial display in Bearing Pro section

<http://www.nsk.com> and as mentioned above, has already been made available to customers on floppy disk. Fig. 5 shows the initial display in the Bearing Pro section. By clicking Option on the menu bar and selecting "One Bearing," the life of one bearing can be calculated. Clicking "Two Bearings" allows the user to calculate the load and life of each of two bearings supporting a geared shaft. To facilitate calculation, the user can view the gear system from three perspectives: front, side and isometric. Fig. 6 shows the three perspectives and Fig. 7 the calculation results on the loading conditions of the gears and bearings in a gear system.

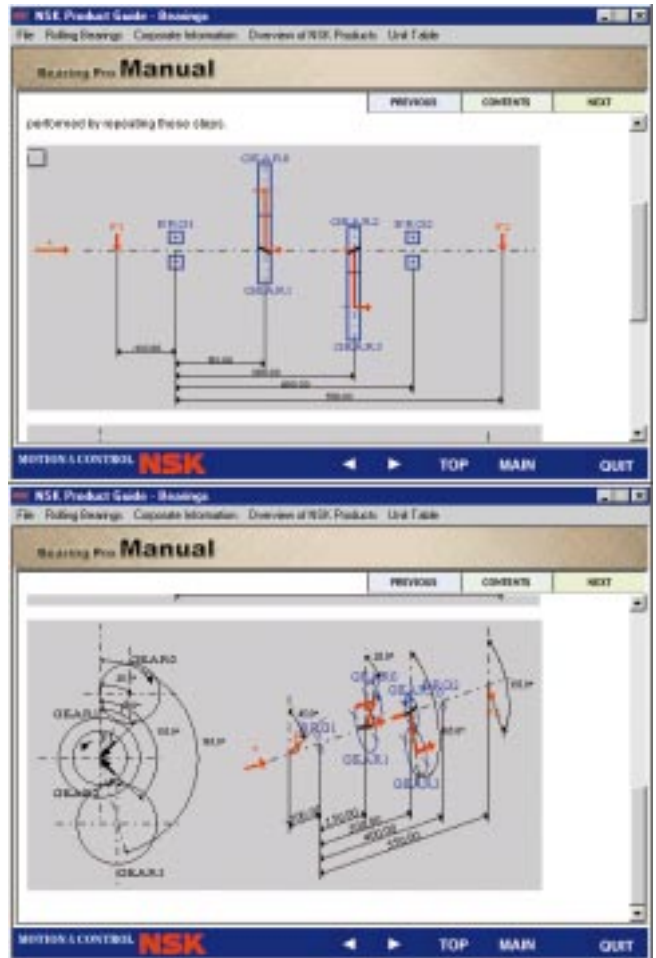


Fig. 6 Front, side and isometric views of bearings on a shaft with spur and helical gears

**(3) Bearing Pro Manual**

This explains the technical calculation method in the Bearing Pro section. Studying the calculation method by inputting values given in the exercises in the manual will enable the user to perform calculations for even complex cases. We recommend printing out this manual and reading it carefully to perform calculations most efficiently.

**(4) Bearing Doctor (examples of bearing damage)**

In this section the user can study causes of and countermeasures for 85 instances of 17 kinds of bearing damage including flaking, peeling, scoring, fracture and others. The color images are from NSK's previously

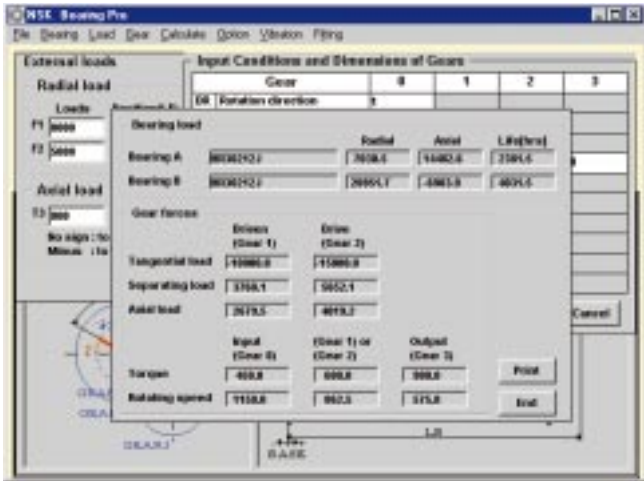


Fig. 7 Calculation results on bearings on a shaft with spur and helical gears

published "New Bearing Doctor." 2)

Fig. 8 shows the contents page of the Bearing Doctor section. Clicking any of the pictures shows the user a description of the type of damage, its causes and countermeasures, and photos. Fig. 9a shows the section on flaking. Clicking any of the small photos enlarges it for better viewing (Fig. 9b).

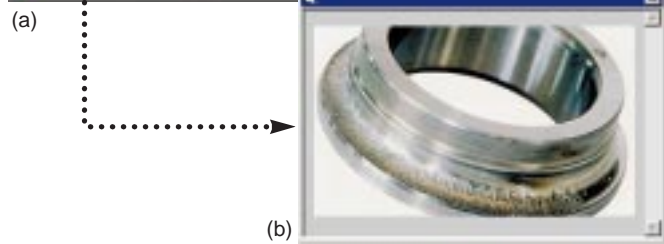
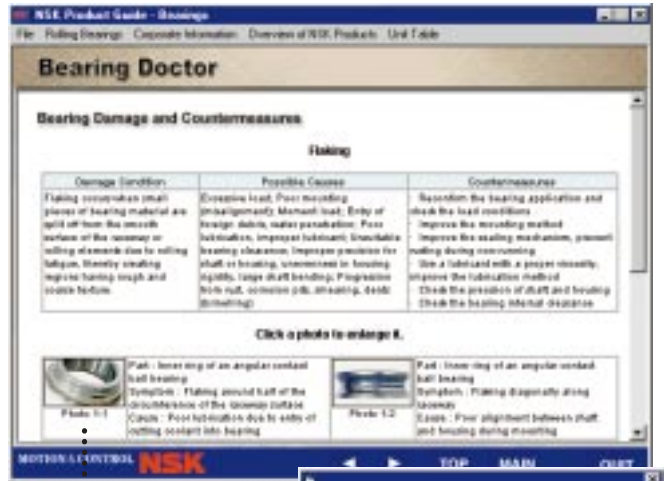


Fig. 9 a. Information on flaking in Bearing Doctor section  
b. Clicking a photo enlarges it



Fig. 8 Contents page in Bearing Doctor section

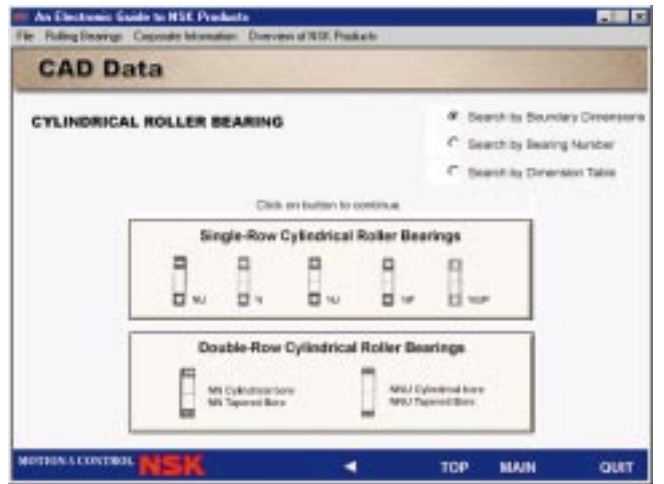


Fig. 10 Display for selecting CAD data on cylindrical roller bearings

### (5) CAD Data

In the CAD Data section the user can select easily from 5 600 CAD drawings of bearings and housings. Using one of three search methods (boundary dimensions, bearing number or dimension table) the user can find and download drawings of nine types of bearings: deep groove ball bearings, angular contact ball bearings, self-aligning ball bearings, cylindrical roller bearings, tapered roller bearings, spherical roller bearings, thrust bearings, ball bearing units, and plummer blocks.

Fig. 10 shows the display for selecting CAD data on cylindrical roller bearings. The user selects one of the three search methods and then clicks the button for either single-row or double-row cylindrical bearings. Fig. 11 shows the display for determining the desired cylindrical

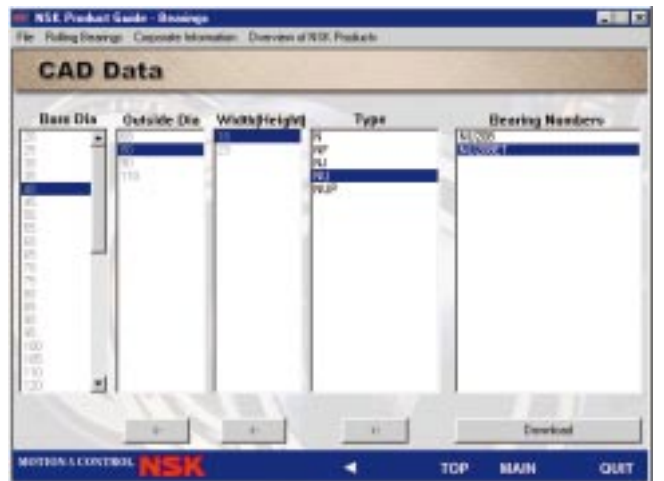


Fig. 11 Determining desired bearing number by bearing dimensions

roller bearing number based on boundary dimensions. After the desired bearing number is determined using the parameters of bore diameter, outside diameter, width (height), and type, the user can download the CAD data.

NOTE: To download and be able to utilize the CAD data in one's personal computer, it is necessary to have DXF software installed beforehand.

**(6) Dimension Tables**

In the Dimension Tables section, the user can look at the boundary dimensions (bore diameter, outside diameter, width, and chamfer dimension), limiting speed, dynamic load rating, static load rating, abutment and fillet dimensions, mass and other details of 10 types of bearings: deep groove ball bearings, small-diameter miniature ball bearings, angular contact ball bearings, self-aligning ball bearings, cylindrical roller bearings, tapered roller bearings, spherical roller bearings, thrust bearings, ball bearing units and plummer blocks. Fig. 12 shows the dimension table for single-row cylindrical roller bearings as an example.

Bearing No.	D	B	r1	r2	Pw	Pw1	Pw2	C	C0	C1000	C2000	C3000	C5000	C10000	C15000
NLJ204	20	47	14	1	0.6	27		15408	12790	19008	10890				24
NLJ304	30	47	14	1	0.6	27		15408	12790	19008	10890				24
NLJ304	30	47	14	1	0.6	27		19408	12790	19008	10890				24
N204	20	47	14	1	0.6		48	15408	12790	19008	10890				25

Fig. 12 Dimension table for single-row cylindrical roller bearings

**2.4 Overview of Products**

Presenting information on bearings, automotive components and precision and electronic products, this section provides an overview of NSK products. Fig. 13 shows part of the segment on automotive products.

**2.5 Corporate Information**

This section provides basic information on NSK and addresses and telephone numbers for NSK locations around the world.

**3. Conclusion**

We have presented here NSK's new Product Guide for bearings. It will enable users to learn about the fundamentals of rolling bearings, obtain specific information on bearings, perform life and gear calculations, and access CAD drawings. Considering the



Fig. 13 Automotive products section in "Overview of Products"

opinions and needs of users, we will work to improve this product and make it even easier for customers to use in future editions.

**References:**

- 1) NSK Rolling Bearing Catalog, CAT. No. E1101b
- 2) NSK New Bearing Doctor, CAT. No. E7005



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