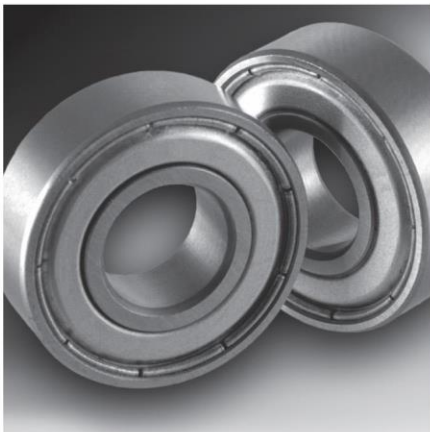




AMERICAN NATIONAL STANDARD

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Load Ratings and Fatigue Life for Roller Bearings ANSI/ABMA 11:2014 (Revision of ANSI/ABMA 11:1990)



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Manufacturers Association**

ANSI/ABMA 11:2014



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**Load Ratings and Fatigue Life For
Roller Bearings**

CONTENTS

SECTION	PAGE
1. Introduction	1
1.1 Purpose of Standard	1
1.2 Life Criterion	1
1.3 Static Load Criterion	1
2. Symbols	2
3. Definitions	3
3.1 Life	3
3.2 Reliability	3
3.3 Static Load	3
3.4 Pitch Diameter of a Roller Set, D_{pw}	4
3.5 Rating Life	4
3.6 Basic Rating Life, L_{10}	4
3.7 Adjusted Rating life, L_{na}	4
3.8 Basic Dynamic Radial Load Rating, C_r	4
3.9 Basic Static Radial Load Rating, C_{0r}	4
3.10 Basic Dynamic Axial Load Rating, C_a	4
3.11 Basic Static Axial Load Rating, C_{0a}	4
3.12 Dynamic Equivalent Radial Load, P_r	4
3.13 Static Equivalent Radial Load, P_{0r}	4
3.14 Dynamic Equivalent Axial Load, P_a	4
3.15 Static Equivalent Axial Load, P_{0a}	5
3.16 Static Safety Factor, S_0	5
3.17 Roller Diameter, D_{we}	5
3.18 Effective Roller Length, L_{we}	5
3.19 Nominal Contact Angle, α	5
3.20 Line Contact	5
3.21 Point Contact	5
3.22 Optimized Contact	5
3.23 Conventional Operating Conditions	5
3.24 Viscosity ratio, κ	5
3.25 Film Parameter, Λ	6
3.26 Pressure-viscosity Coefficient	6
3.27 Bearing Arrangements: Paired Mounting	6
3.28 Bearing Arrangements: Back-to-back	6
3.29 Bearing Arrangements: Face-to-face	6
3.30 Bearing Arrangements: Tandem	6
4. Scope	6
4.1 Bearing Types	6
4.1.1 General	6
4.1.2 Basic Types.....	6
4.1.3 Double Row	6
4.2 Limitations	6
4.2.1 Truncated Contact Area	6
4.2.2 Materials	7
4.2.3 Bearing Types	7
4.2.4 Lubrication	7
4.2.5 Ring Support and Alignment	7
4.2.6 Internal Clearance	7
4.2.7 High Speed Effects	7
4.2.8 Interference Fits	7
4.2.9 Residual Stress	7
4.2.10 Stress Concentrations	8

4.2.11	Tolerances	8
4.2.12	Plastic Deformation in the Contact Area	8
4.3	Operating Parameters	8
5	Radial Roller Bearings	9
5.1	Basic Dynamic Radial Load Rating	9
5.1.1	Basic Dynamic Radial Load Rating for Single Bearings	9
5.1.2	Basic Dynamic Radial Load Rating for Bearing Combinations	9
5.2	Dynamic Equivalent Radial Load	11
5.2.1	Dynamic Equivalent Radial Load for Single Bearings	11
5.2.2	Dynamic Equivalent Radial Load for Bearing Combinations	11
5.3	Basic Rating Life	11
5.3.1	Life Equation	11
5.3.2	Loading Restriction on the Life Equation	12
5.4	Basic Static Radial Load Rating	12
5.4.1	Basic Static Radial Load Rating for Single Bearings	12
5.4.2	Basic Static Radial Load Rating for Bearing Combinations	12
5.5	Static Equivalent Radial Load	12
5.5.1	Static Equivalent Radial Load for Single Bearings	12
5.5.2	Static Equivalent Radial Load for Bearing Combinations	13
6	Thrust Roller Bearings	13
6.1	Basic Dynamic Axial Load Rating	13
6.1.1	Basic Dynamic Axial Load Rating for Single-row Bearings	13
6.1.2	Basic Dynamic Axial Load Rating for Bearings with Two or More Rows of Rollers	14
6.1.3	Basic Dynamic Axial Load Rating for Bearing Combinations	14
6.2	Dynamic Equivalent Axial Load	14
6.3	Basic Rating Life	18
6.3.1	Life Equation	18
6.3.2	Loading Restriction on the Life Equation	18
6.4	Basic Static Axial Load Rating	18
6.4.1	Basic Static Axial Load Rating for Single-direction and Double-direction Bearings	18
6.4.2	Basic Static Axial Load Rating for Bearings Mounted in a Tandem Arrangement	19
6.5	Static Equivalent Axial Load	19
6.5.1	Static Equivalent Axial Load Rating for Single-direction and Double-direction Bearings	19
6.5.2	Static Equivalent Axial Load Rating for Bearings Mounted in a Tandem Arrangement	19
7	Static Safety Factor	19
7.1	General	19
8	Adjusted rating Life	20
8.1	General	20
8.2	Limitations	20
8.3	Life Adjustment Factor for Reliability, a_1	20
8.4	Life Adjustment Factor for Special Bearing Properties, a_2	21
8.5	Life Adjustment Factor for Operating Conditions, a_3	21
8.5.1	General	21
8.5.2	Viscosity Ratio	22
8.5.3	Calculation of Life Under Low Load Conditions	23

LIST OF TABLES

TABLE NO.	TITLE	PAGE
RADIAL ROLLER BEARINGS		
1	Values for f_{cm} for Radial Roller Bearings	10
2	Values for X and Y for Radial Roller Bearings	11
3	Values for X_0 and Y_0 for Radial Roller Bearings with $\alpha \neq 0^\circ$	13
THRUST ROLLER BEARINGS		
4	Values of f_{cm} for Tapered Roller Thrust Bearings	15
5	Values for f_{cm} for Cylindrical Roller Thrust Bearings and Needle Roller Thrust Bearings	16
6	Values for f_{cm} for Spherical Roller Thrust Bearings	17
7	Values for X and Y for Thrust Roller Bearings	18
8	Guideline Values of the Static Safety Factor S_0 for Roller Bearings	20
9	Life Adjustment Factor for Reliability, a_1	21

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
1	Reference Kinematic Viscosity, ν_1	23

Load Ratings and Fatigue Life for Roller Bearings

1. INTRODUCTION

1.1 Purpose of Standard

Roller bearing performance is a function of many variables. These include the bearing design, the characteristics of the material from which the bearings are made, the way in which they are manufactured, as well as many variables associated with their application. The only sure way to establish the satisfactory operation of a bearing selected for a specific application is by actual performance in the application. As this is often impractical, another basis is required to estimate the suitability of a particular bearing for a given application. This is the purpose of this standard.

This standard specifies the method of calculating the basic dynamic load rating of rolling bearings within the size ranges shown in the relevant ANSI/ABMA standards, manufactured from contemporary, commonly used, good quality hardened bearing steel in accordance with good manufacturing practice and basically of conventional design as regards the shape of rolling contact surfaces.

This standard also specifies the method of calculating the basic rating life, which is the life associated with 90% reliability, with commonly used high quality material, good manufacturing quality and with conventional operating conditions. In addition, it specifies the method of calculating adjusted rating life, in which various reliabilities, special bearing properties and specific operating conditions are taken into account by means of life adjustment factors.

Furthermore, this standard specifies the method of calculating the basic static load rating and the static equivalent load for roller bearings within the size ranges shown in the relevant ANSI/ABMA Standards, manufactured from good quality hardened bearing steel, in accordance with good manufacturing practice and basically of conventional design as regards the shape of rolling contact surfaces.

1.2 Life Criterion

Even if roller bearings are properly mounted, adequately lubricated, protected from foreign matter, and are not subjected to extreme operating conditions, they can ultimately fatigue. Under ideal conditions, the repeated stresses developed in the contact areas between the roller and the raceways eventually can result in fatigue of the material which manifests itself as spalling of the load carrying surfaces. In most applications the fatigue life is the maximum useful life of a bearing. This fatigue is the criterion of life used as the basis for the first part of this standard.

Fatigue life calculated in accordance with this standard does not represent the maximum that can be attained by applying all known technology to roller bearing design and application. Neither does it represent the minimum that should be expected of a bearing made by a producer lacking skill and experience in the design and manufacture of roller bearings, even though the bearing meets the geometric parameters given below. The calculated fatigue life represents the performance normally expected from high quality bearings made by reputable manufacturers. Manufacturers can supply longer lived bearings by the application of advanced materials and manufacturing processes. The present standard has evolved as a means for bearing users to specify a reasonable standard of performance for the bearing they wish to purchase.

1.3 Static Load Criterion

A static load is a load acting on a non-rotating bearing. Permanent deformations appear in rollers and raceways under a static load of moderate magnitude and increase gradually with increasing load.

It is often impractical to establish whether the deformations appearing in a bearing in a specific application are permissible by testing the bearing in that application. Other methods are therefore required to establish the suitability of the bearing selected.