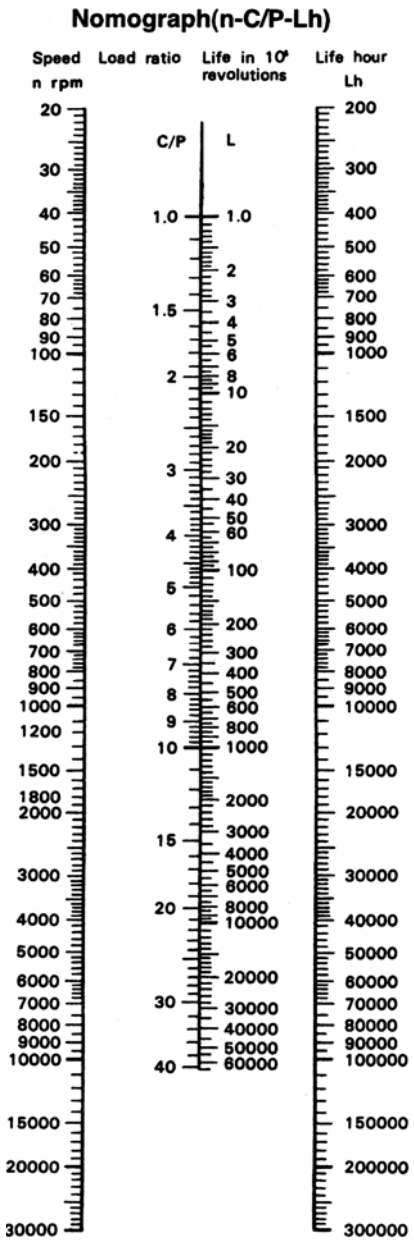
Life and basic dynamic load rating

Bearings are incessantly subjected to repetitive stresses on outer and inner rings and rolling elements during operation. Even when normally run, flaking eventually occurs in raceways and surfaces of rolling elements due to fatigue.
The bearing life is expressed in total number of revolutions (or hours at constant speed) which a bearing attains before fatigue failure occurs on either bearing race or rolling element. As there is variation in the lives of identical bearings operating under the same conditions, the bearing life is defined as total number of revolutions (or hours at constant speed) at which 90% of a group of identical bearings attain or exceed before onset of fatigue failure, when individual bearings are operated under the same conditions. This life of the bearing is called Rating Life, which is about 1/5 of the average life of the bearing. Basic dynamic load rating represents such load that does not vary in magnitude and direction and under which rating life of the bearing will be one million revolutions with the inner ring rotating and the outer ring stationary. For the self-contained bearing for mounted bearing units, central radial load is taken as the basic dynamic load rating.



Calculation of rating life

Relation among rating life, basic dynamic load rating and operating load on the bearing is formularized as follows:

$$L = (C/P)$$

Where

L = Rating Life	10rev
C = Basic dynamic load rating	kg
P = Dynamic equivalent load	kg

When it is convenient to express rating life in hours rather than number of revolutions, the following formula is used:

$$Lh = (10x\ L)\ (60 \times n) = (10/60xn) \times (C/P)$$

Where

Lh = Life hours of bearing	h
n = Shaft speed	rpm

For life calculation of the bearing, a Nomograph, which represents a relation between C/P value and rating life, may be used.

LOAD RATINGS

Bearing Numbers					Shaft Diameter		Basic Load Rating	Radial Load Rating in Pounds Force (based on 500 hours minimum life)					
Normal Duty			Light Duty		inch	mm	lbs	100	300	900	1500	2400	5000
UC	UEL	SER	SA	SB									
			201	201		12							
			201-8	201-8	1/2								
			202	202		15	2112	1463	1012	704	594	506	396
			202-10	202-10	5/8								
			203	203		17							
201	201	201				12							
201-8	201-8	201-8			1/2								
202	202	202				15							
202-10	202-10	202-10			5/8		2816	1947	1364	935	792	671	528
203	203	203				17							
204-12	204-12	204-12	204-12	204-12	3/4								
204	204	204	204	204		20							
205-14	205-14	205-14	205-14	205-14	7/8								
205-15	205-15	205-15	205-15	205-15	15/16		3080	2134	1474	1023	858	737	572
205	205	205	205	205		25							
205-16	205-16	205-16	205-16	205-16	1								
206-18	206-18	206-18	206-18	206-18	1 1/8								
206	206	206	206	206		30	4290	2970	2068	1430	1210	1034	
206-19	206-19	206-19	206-19	206-19	1 3/16								
206-20	206-20	206-20	206-20	206-20	1 1/4								
207-20	207-20	207-20	207-20	207-20	1 1/4								
207-21	207-21	207-21	207-21	207-21	1 5/16								
207-22	207-22	207-22	207-22	207-22	1 3/8		5654	3916	2728	1881	1584	1353	
207	207	207	207	207		35							
207-23	207-23	207-23	207-23	207-23	1 7/16								
208-24	208-24	208-24	208-24	208-24	1 1/2								
208-25	208-25	208-25	208-25	208-25	1 9/16		6402	4433	3080	2134	1793	1540	
208	208	208	208	208		40							

LOAD RATINGS

Bearing Numbers					Shaft Diameter		Basic Load Rating	Radial Load Rating in Pounds Force (based on 500 hours minimum life)					
Normal Duty			Light Duty		inch	mm	lbs	100	300	900	1500	2400	5000
UC	UEL	SER	SA	SB									
209-26	209-26	209-26			1 5/8								
209-27	209-27	209-27			1 11/16		7194	4983	3454	2398	2024	1727	
209-28	209-28	209-28			1 3/4								
209	209	209				45							
210-30	210-30	210-30			1 7/8								
210-31	210-31	210-31			1 15/16		7722	5346	3718	2574	2167	1859	
210	210	210				50							
211-32	211-32	211-32			2								
211-34	211-34	211-34			2 1/8		9526	6600	4576	3168	2684	2288	
211	211	211				55							
211-35	211-35	211-35			2 3/16								
212-36	212-36	212-36			2 1/4								
212	212	212				60	11528	7986	5544	3850	3234		
212-38	212-38	212-38			2 3/8								
212-39	212-39	212-39			2 7/16								
213-40	213-40				2 1/2		12584	8734	6050	4202	3542		
213	213					65							
214-44	214-44				2 3/4		13684	9482	6578	4554	3850		
214	214					70							
215-47	215-47				2 15/16								
215	215					75	14828	10274	7128	4950	4158		
215-48	215-48				3								

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