



Geared Bearing

Application and Selection Guide

Based on Nexen's innovative Roller Pinion technology, the Geared Bearing comes complete with a gear and a precision grade, high capacity bearing. With a wide range of sizes and ratios, all with zero backlash, a Geared Bearing can fit in any application.

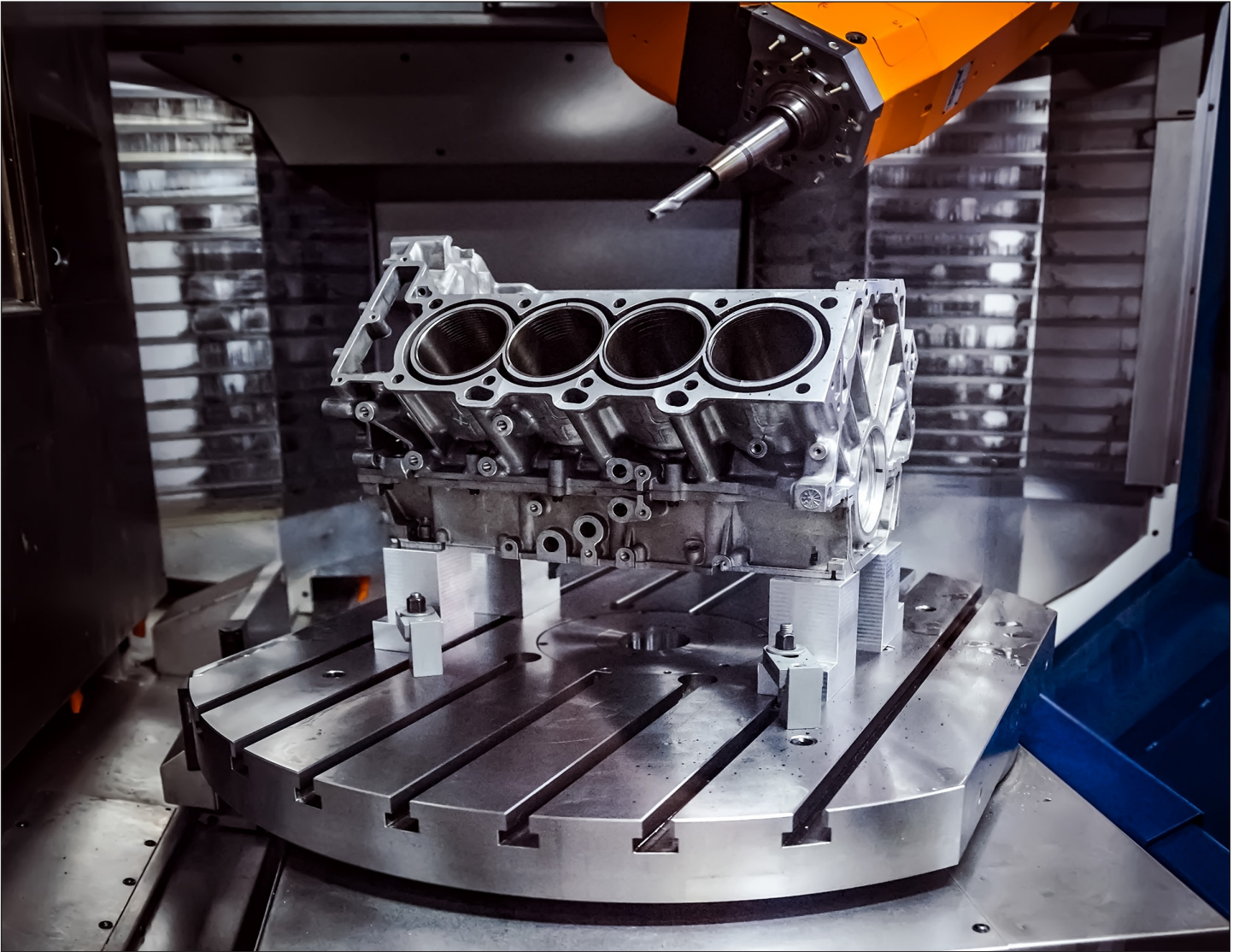


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Zero Backlash Gearing Advantage

Based on Nexen's innovative Roller Pinion technology, the Roller Pinion System Geared Bearing (RPS-GB) comes complete with a precision zero backlash gear mounted and dialed in on a precision grade high capacity bearing.

With many possible sizes and gear ratios, all with zero backlash, the Nexen Geared Bearing can be incorporated into any precision rotary motion control application.



High Indexing Precision

With an indexing precision as low as ± 30 ArcSec and repeatability as low as ± 5.0 ArcSec, Nexen's Geared Bearing offers unmatched mechanical system capabilities.

Zero Backlash

Based on Nexen's RPS technology, the Geared Bearing offers a rigid, zero backlash system.

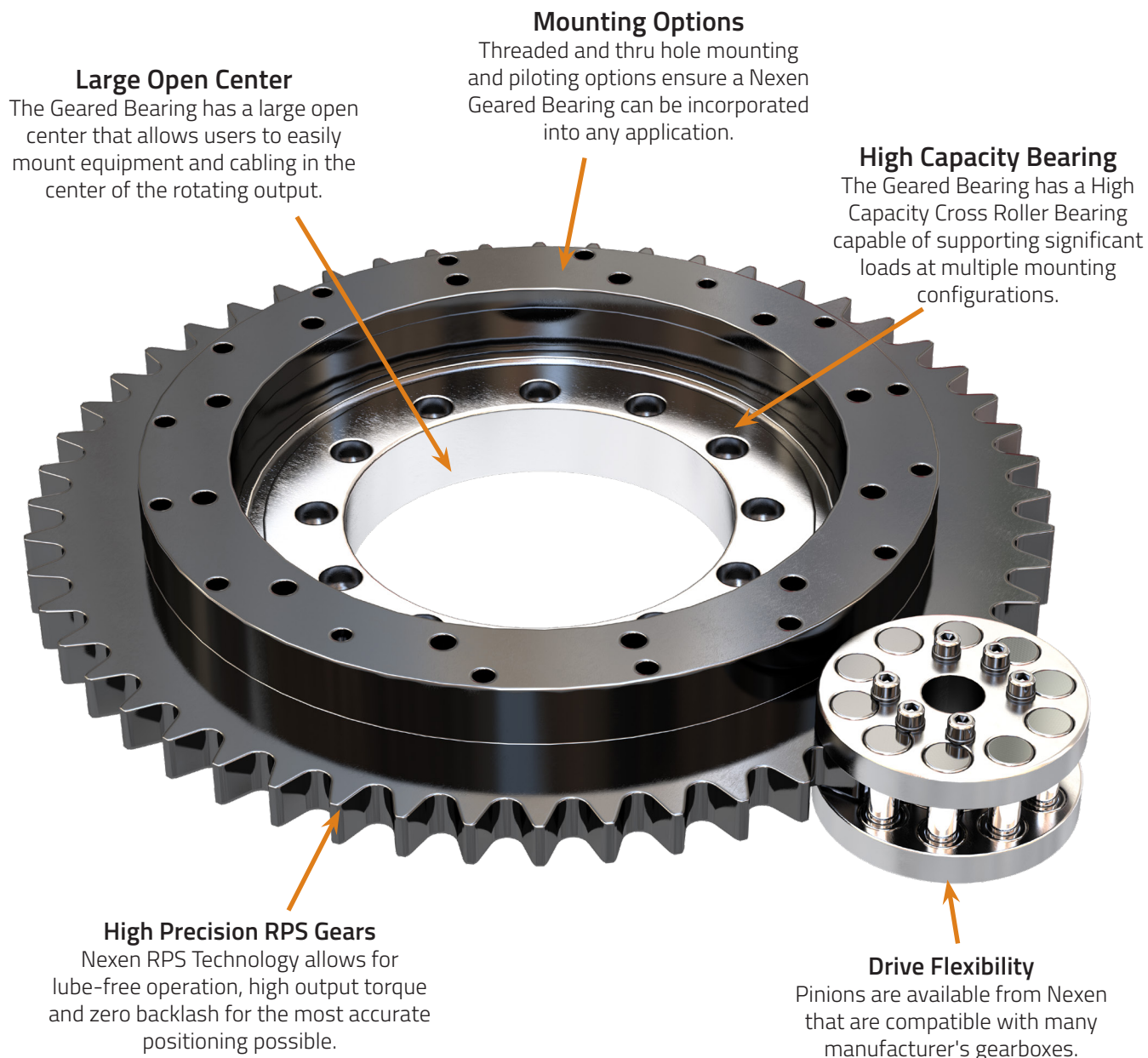
High Output Load Capacity

The Nexen Geared Bearing is supported by a precision grade, high load capacity cross-roller bearing.

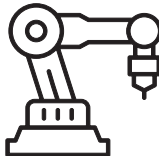
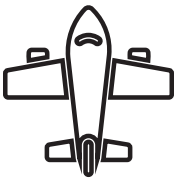
High Speed

The Nexen Geared Bearings can handle speeds up to 632 RPM.

Nexen's Geared Bearings offer machine builders the accuracy and repeatability that are required for the most demanding designs.



Applications

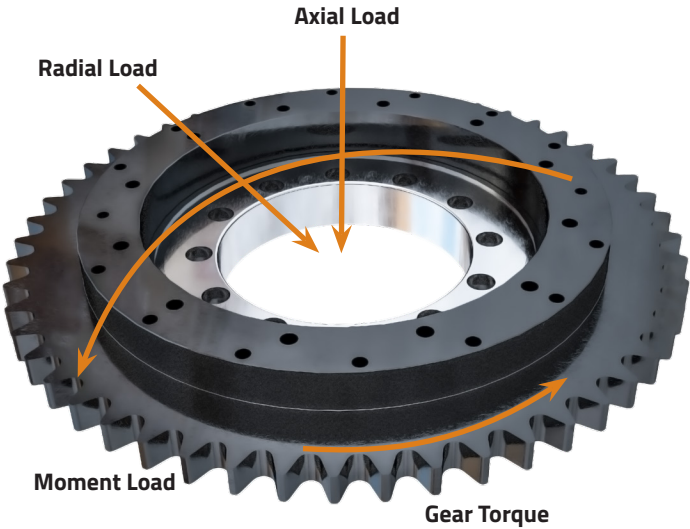
					
Food Production	Robotics	Material Handling	Machine Tool	Cutting Systems	Aerospace

Geared Bearing Selection Process

The Nexen Geared Bearing product line offers many solutions to ensure there is an option that optimizes your needs. Because there is a unique interaction between the gear, bearing, applied load and applied torque, optimizing your selection is a multiple step process. Below Nexen has created steps to assist in ensuring all application aspects are considered to end up with the best solution for the application.

Step 1: Determine Application Requirements:

Application Requirements for Geared Bearing Selection	Customer Data (Record your values below)
Maximum Static Gear Torque	Nm
Maximum Dynamic Gear Torque	Nm
Average Dynamic Gear Torque	Nm
Envelope size (Gear O.D.)	mm
Maximum Static Moment Load	N
Maximum Dynamic Moment Load	N
Average Dynamic Moment Load	N
Maximum Static Radial Load	N
Maximum Dynamic Radial Load	N
Average Dynamic Radial Load	N
Maximum Static Axial Load	N
Maximum Dynamic Axial Load	N
Average Dynamic Axial Load	N
Average Gear Speed	RPM
Accuracy	± ArcSec



Step 2: Select Geared Bearing

Enter application requirements: Starting with Application torque, use the Geared Bearing Specifications and Dimensions tables in this catalog to determine the best products for your needs.

Geared Bearing Selected	
Part #:	
RPS Size:	
# of Teeth:	
Bearing #:	

Step 3: Calculate Bearing Drag Torque

With a Geared Bearing selected, refer to Specifications section to find the bearing number associated with it. Calculate the chosen product's Bearing Drag Torque (T_{BD}) using calculations provided on Pages 20 and 21.

Bearing Drag Torque
Nm

Step 4: Calculate Total Gear Torque Required

Using the application torque and bearing drag torque, calculate the chosen product's Total Gear Torque using calculations provided on Page 21.

Total Required Gear Torque
Nm

Step 5: Verify Total Gear Torque

Verify the Total Required Gear Torque calculated in Step 4 is less than the Max Gear Torque specification for your selected gear. Do this by using the product tables in the Specifications section. If Total Required Gear Torque exceeds Max Torque, select a Geared Bearing in a larger RPS size.

Step 6: Calculate Bearing Load Capacity

With a Geared Bearing selected, refer to Specifications section to find the bearing number associated with it. Calculate the chosen product's Bearing Load Capacity using calculations provided on Page 19. Verify the calculated safety factor is adequate for the given service conditions.

Static Safety Factor
$f_s =$

Step 7: Verify System Life

With a Geared Bearing selected, calculate RPS Pinion life using calculations provided on Pages 22 and 23. If calculated pinion life does not meet application expectations, choose a unit in a larger RPS size. Now, calculate Bearing Life using calculations provided on Pages 27 and 28. If calculated bearing life does not meet application expectations, choose a unit with a larger size bearing. Bearings are available in 7 sizes: 42mm, 66mm, 85mm, 124mm, 148mm, 178mm and 228mm.

Pinion Life in Hours
$N_{hours} =$ hrs

Bearing Race Life in Hours
$N_{hours} =$ hrs

Geared Bearing Selected	
Part #:	
RPS Size:	
# of Teeth:	
Bearing #:	

Geared Bearing Selection

RPS 10					
Product Number	Dynamic Max Gear Torque (Nm)	Gear OD Size (mm)	Accuracy (±ArcSec)	Gear Ratio	# Teeth
967226	15.2	126	106	3.8 : 1	38
967227	16.0	132	101	4.0 : 1	40
967228	16.8	138	96	4.2 : 1	42
967229	17.6	144	92	4.4 : 1	44
967230	18.4	150	88	4.6 : 1	46
967231	19.2	156	84	4.8 : 1	48
967232	20.0	162	81	5.0 : 1	50
967233	20.8	168	78	5.2 : 1	52
967234	21.6	174	75	5.4 : 1	54
967235	22.4	182	72	5.6 : 1	56
967236	23.2	188	69	5.8 : 1	58
967237	24.0	194	67	6.0 : 1	60
967238	24.8	200	65	6.2 : 1	62
967239	25.6	206	63	6.4 : 1	64
967240	26.4	212	61	6.6 : 1	66
967241	27.2	218	59	6.8 : 1	68
967242	28.0	224	58	7.0 : 1	70
967243	28.8	230	56	7.2 : 1	72
967244	29.6	236	55	7.4 : 1	74
967245	30.4	242	53	7.6 : 1	76
967246	31.2	248	52	7.8 : 1	78
967247	32.0	254	51	8.0 : 1	80
967248	32.8	262	49	8.2 : 1	82
967249	33.6	268	48	8.4 : 1	84
967250	34.4	274	47	8.6 : 1	86
967251	35.2	280	46	8.8 : 1	88
967252	36.0	286	45	9.0 : 1	90
967253	36.8	292	44	9.2 : 1	92
967254	37.6	298	43	9.4 : 1	94
967255	38.4	304	42	9.6 : 1	96
967256	39.2	310	41	9.8 : 1	98
967257	40.0	316	40	10.0 : 1	100
967258	40.8	322	40	10.2 : 1	102
967259	41.6	328	39	10.4 : 1	104
967260	42.4	334	38	10.6 : 1	106
967261	43.2	342	37	10.8 : 1	108
967262	44.0	348	37	11.0 : 1	110
967263	44.8	354	36	11.2 : 1	112
967264	45.6	360	35	11.4 : 1	114
967265	46.4	366	35	11.6 : 1	116
967266	47.2	372	34	11.8 : 1	118
967267	48.0	378	34	12.0 : 1	120
967268	48.8	384	33	12.2 : 1	122
967269	49.6	390	32	12.4 : 1	124
967270	50.4	396	32	12.6 : 1	126
967271	51.2	402	31	12.8 : 1	128
967272	52.0	408	31	13.0 : 1	130
967273	52.8	414	31	13.2 : 1	132
967274	53.6	422	30	13.4 : 1	134

RPS 12					
Product Number	Dynamic Max Gear Torque (Nm)	Gear OD Size (mm)	Accuracy (±ArcSec)	Gear Ratio	# Teeth
967185	30.4	129	104	3.2 : 1	32
967186	32.3	135	99	3.4 : 1	34
967187	34.2	143	93	3.6 : 1	36
967188	36.1	151	88	3.8 : 1	38
967189	38.0	157	84	4.0 : 1	40
967190	39.9	165	80	4.2 : 1	42
967191	41.8	173	76	4.4 : 1	44
967192	43.7	179	73	4.6 : 1	46
967193	45.6	187	70	4.8 : 1	48
967194	47.5	195	67	5.0 : 1	50
967195	49.4	201	65	5.2 : 1	52
967196	51.3	209	62	5.4 : 1	54
967197	53.2	217	60	5.6 : 1	56
967198	55.1	225	58	5.8 : 1	58
967199	57.0	231	56	6.0 : 1	60
967200	58.9	239	54	6.2 : 1	62
967201	60.8	247	52	6.4 : 1	64
967202	62.7	253	51	6.6 : 1	66
967203	64.6	261	49	6.8 : 1	68
967204	66.5	269	48	7.0 : 1	70
967205	68.4	275	47	7.2 : 1	72
967206	70.3	283	45	7.4 : 1	74
967207	72.2	291	44	7.6 : 1	76
967208	74.1	297	43	7.8 : 1	78
967209	76.0	305	42	8.0 : 1	80
967210	77.9	313	41	8.2 : 1	82
967211	79.8	321	40	8.4 : 1	84
967212	81.7	327	39	8.6 : 1	86
967213	83.6	335	38	8.8 : 1	88
967214	85.5	343	37	9.0 : 1	90
967215	87.4	349	37	9.2 : 1	92
967216	89.3	357	36	9.4 : 1	94
967217	91.2	365	35	9.6 : 1	96
967218	93.1	371	34	9.8 : 1	98
967219	95.0	379	34	10.0 : 1	100
967220	96.9	387	33	10.2 : 1	102
967221	98.8	393	32	10.4 : 1	104
967222	100.7	401	32	10.6 : 1	106
967223	102.6	409	31	10.8 : 1	108
967224	104.5	417	30	11.0 : 1	110
967225	106.4	423	30	11.2 : 1	112

RPS 16					
Product Number	Dynamic Max Gear Torque (Nm)	Gear OD Size (mm)	Accuracy (±ArcSec)	Gear Ratio	# Teeth
967100	159	141	97	2.6 : 1	26
967101	171	151	90	2.8 : 1	28
967102	183	159	85	3.0 : 1	30
967103	196	169	80	3.2 : 1	32
967104	208	179	75	3.4 : 1	34
967105	220	189	71	3.6 : 1	36
967106	232	199	67	3.8 : 1	38
967107	244	209	63	4.0 : 1	40
967108	257	219	60	4.2 : 1	42
967109	269	229	58	4.4 : 1	44
967110	281	237	55	4.6 : 1	46
967111	293	247	53	4.8 : 1	48
967112	306	257	51	5.0 : 1	50
967113	318	267	49	5.2 : 1	52
967114	330	277	47	5.4 : 1	54
967115	342	287	45	5.6 : 1	56
967116	354	297	44	5.8 : 1	58
967117	367	307	42	6.0 : 1	60
967118	379	315	41	6.2 : 1	62
967119	391	325	40	6.4 : 1	64
967120	403	335	39	6.6 : 1	66
967121	415	345	37	6.8 : 1	68
967122	428	355	36	7.0 : 1	70
967123	440	365	35	7.2 : 1	72
967124	452	375	34	7.4 : 1	74
967125	464	383	34	7.6 : 1	76
967126	477	393	33	7.8 : 1	78
967127	489	403	32	8.0 : 1	80
967128	501	413	31	8.2 : 1	82
967129	513	423	30	8.4 : 1	84

RPS 20					
Product Number	Dynamic Max Gear Torque (Nm)	Gear OD Size (mm)	Accuracy (±ArcSec)	Gear Ratio	# Teeth
967147	203	152	92	2.2 : 1	22
967148	222	166	84	2.4 : 1	24
967149	240	178	77	2.6 : 1	26
967150	258	190	72	2.8 : 1	28
967151	277	202	67	3.0 : 1	30
967152	295	214	63	3.2 : 1	32
967153	314	226	59	3.4 : 1	34
967154	332	240	56	3.6 : 1	36
967155	351	252	53	3.8 : 1	38
967156	369	264	50	4.0 : 1	40
967157	388	276	48	4.2 : 1	42
967158	406	288	46	4.4 : 1	44
967159	425	300	44	4.6 : 1	46
967160	443	312	42	4.8 : 1	48
967161	462	326	40	5.0 : 1	50
967162	480	338	39	5.2 : 1	52
967163	498	350	37	5.4 : 1	54
967164	517	362	36	5.6 : 1	56
967165	535	374	35	5.8 : 1	58
967166	554	386	34	6.0 : 1	60
967167	572	400	32	6.2 : 1	62
967168	591	412	31	6.4 : 1	64
967169	609	424	30	6.6 : 1	66

Geared Bearing Selection

RPS 25					
Product Number	Dynamic Max Gear Torque (Nm)	Gear OD Size (mm)	Accuracy ($\pm$ ArcSec)	Gear Ratio	# Teeth
967130	318	174	81	2.0 : 1	20
967131	350	190	73	2.2 : 1	22
967132	382	206	67	2.4 : 1	24
967133	414	220	62	2.6 : 1	26
967134	446	236	58	2.8 : 1	28
967135	478	252	54	3.0 : 1	30
967136	509	268	50	3.2 : 1	32
967137	541	282	47	3.4 : 1	34
967138	573	298	45	3.6 : 1	36
967139	605	314	42	3.8 : 1	38
967140	637	328	40	4.0 : 1	40
967141	669	344	38	4.2 : 1	42
967142	700	360	37	4.4 : 1	44
967143	732	374	35	4.6 : 1	46
967144	764	390	34	4.8 : 1	48
967145	796	406	32	5.0 : 1	50
967146	828	420	31	5.2 : 1	52

RPS 32					
Product Number	Dynamic Max Gear Torque (Nm)	Gear OD Size (mm)	Accuracy ($\pm$ ArcSec)	Gear Ratio	# Teeth
967170	1283	260	53	2.0 : 1	24
967171	1390	280	49	2.16 : 1	26
967172	1497	300	45	2.3 : 1	28
967173	1604	320	42	2.5 : 1	30
967174	1711	338	40	2.6 : 1	32
967175	1818	358	37	2.83 : 1	34
967176	1925	378	35	3.0 : 1	36
967177	2031	398	33	3.16 : 1	38
967178	2138	416	32	3.3 : 1	40

RPS 40					
Product Number	Dynamic Max Gear Torque (Nm)	Gear OD Size (mm)	Accuracy ($\pm$ ArcSec)	Gear Ratio	# Teeth
967179	2750	331	42	2.0 : 1	24
967180	2980	355	39	2.16 : 1	26
967181	3209	379	36	2.3 : 1	28
967182	3438	403	34	2.5 : 1	30

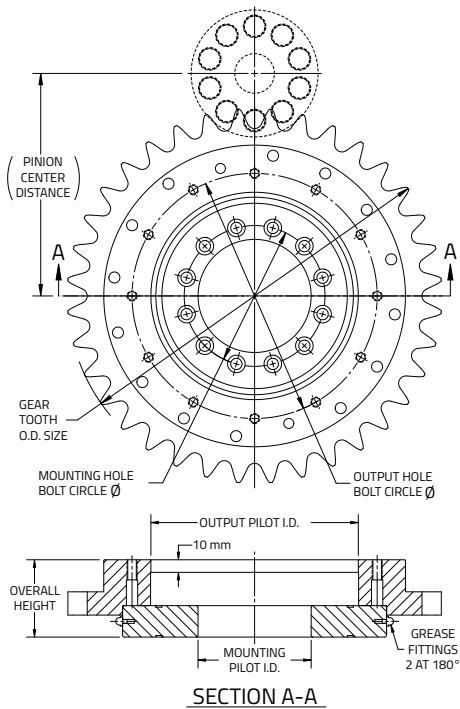
Geared Bearing Specifications by Product Number

RPS 10

General Specs					Gear Torque			Speed		Precision			Load			Inertia	
Product Number	Number of Teeth	Gear Ratio	Bearing Number	Module of Gear Teeth (mm)	Static Torque (Nm)	Dynamic Torque at MIN Life (Nm)	Dynamic Torque at MAX Life (Nm)	Max Speed (RPM)	Max Lube-Free Speed (RPM)	Angular Accuracy (±ArcSec)	One-Way Repeatability (±ArcSec)	Angular Backlash (±ArcSec)	Max Dynamic Moment Load @ Max Life & Avg Torque (kNm) ⁽¹⁾	Max Dynamic Radial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Max Dynamic Axial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Moment of Inertia OUTER (kg/m²)	Moment of Inertia INNER (kg/m²)
967226	38	3.8 : 1	42	2.1	23	15.2	15.2	632	82	106	17.6	0	0.0	2.3	3.6	.0026	.000019
967227	40	4.0 : 1	42	2.1	24	16.0	16.0	600	78	101	16.8	0	0.0	2.3	3.6	.0028	.000019
967228	42	4.2 : 1	42	2.1	26	16.8	16.8	571	74	96	16.0	0	0.0	2.3	3.6	.0030	.000019
967229	44	4.4 : 1	42	2.1	27	17.6	17.6	545	71	92	15.3	0	0.0	2.3	3.6	.0033	.000019
967230	46	4.6 : 1	66	2.1	28	18.4	18.4	522	68	88	14.6	0	0.2	6.0	9.1	.0058	.00015
967231	48	4.8 : 1	66	2.1	29	19.2	19.2	500	65	84	14.0	0	0.2	6.0	9.1	.0062	.00015
967232	50	5.0 : 1	66	2.1	30	20.0	20.0	480	62	81	13.5	0	0.2	6.0	9.1	.0065	.00015
967233	52	5.2 : 1	66	2.1	32	20.8	20.8	462	60	78	13.0	0	0.2	6.0	9.1	.0070	.00015
967234	54	5.4 : 1	85	2.1	33	21.6	21.6	444	58	75	12.5	0	0.3	7.0	10.6	.012	.00039
967235	56	5.6 : 1	85	2.1	34	22.4	22.4	429	55	72	11.9	0	0.3	7.0	10.6	.012	.00039
967236	58	5.8 : 1	85	2.1	35	23.2	23.2	414	53	69	11.5	0	0.3	7.0	10.6	.013	.00039
967237	60	6.0 : 1	85	2.1	36	24.0	24.0	400	52	67	11.1	0	0.3	7.0	10.6	.014	.00039
967238	62	6.2 : 1	85	2.1	38	24.8	24.8	387	50	65	10.8	0	0.3	7.0	10.6	.014	.00039
967239	64	6.4 : 1	85	2.1	39	25.6	25.6	375	48	63	10.5	0	0.3	7.0	10.6	.015	.00039
967240	66	6.6 : 1	85	2.1	40	26.4	26.4	364	47	61	10.2	0	0.3	7.0	10.6	.016	.00039
967241	68	6.8 : 1	124	2.1	41	27.2	27.2	353	46	59	9.9	0	0.7	11.6	17.5	.032	.0028
967242	70	7.0 : 1	124	2.1	43	28.0	28.0	343	44	58	9.6	0	0.7	11.6	17.5	.033	.0028
967243	72	7.2 : 1	124	2.1	44	28.8	28.8	333	43	56	9.3	0	0.7	11.6	17.5	.034	.0028
967244	74	7.4 : 1	124	2.1	45	29.6	29.6	324	42	55	9.1	0	0.7	11.6	17.5	.035	.0028
967245	76	7.6 : 1	124	2.1	46	30.4	30.4	316	41	53	8.9	0	0.7	11.6	17.5	.037	.0028
967246	78	7.8 : 1	124	2.1	47	31.2	31.2	308	40	52	8.6	0	0.7	11.6	17.5	.038	.0028
967247	80	8.0 : 1	124	2.1	49	32.0	32.0	300	39	51	8.4	0	0.7	11.6	17.5	.040	.0028
967248	82	8.2 : 1	124	2.1	50	32.8	32.8	293	38	49	8.2	0	0.7	11.6	17.5	.042	.0028
967249	84	8.4 : 1	148	2.1	51	33.6	33.6	286	37	48	8.0	0	1.3	17.4	26.1	.080	.0063
967250	86	8.6 : 1	148	2.1	52	34.4	34.4	279	36	47	7.8	0	1.3	17.4	26.1	.082	.0063
967251	88	8.8 : 1	148	2.1	54	35.2	35.2	273	35	46	7.6	0	1.3	17.4	26.1	.084	.0063
967252	90	9.0 : 1	148	2.1	55	36.0	36.0	267	34	45	7.4	0	1.3	17.4	26.1	.086	.0063
967253	92	9.2 : 1	148	2.1	56	36.8	36.8	261	34	44	7.3	0	1.3	17.4	26.1	.089	.0063
967254	94	9.4 : 1	178	2.1	57	37.6	37.6	255	33	43	7.1	0	2.5	28.6	42.9	.12	.015
967255	96	9.6 : 1	178	2.1	58	38.4	38.4	250	32	42	7.0	0	2.5	28.6	42.9	.13	.015
967256	98	9.8 : 1	178	2.1	60	39.2	39.2	245	32	41	6.9	0	2.5	28.6	42.9	.13	.015
967257	100	10.0 : 1	178	2.1	61	40.0	40.0	240	31	40	6.7	0	2.5	28.6	42.9	.13	.015
967258	102	10.2 : 1	178	2.1	62	40.8	40.8	235	31	40	6.6	0	2.5	28.6	42.9	.13	.015
967259	104	10.4 : 1	178	2.1	63	41.6	41.6	231	30	39	6.5	0	2.5	28.6	42.9	.14	.015
967260	106	10.6 : 1	178	2.1	64	42.4	42.4	226	29	38	6.3	0	2.5	28.6	42.9	.14	.015
967261	108	10.8 : 1	178	2.1	66	43.2	43.2	222	29	37	6.2	0	2.5	28.6	42.9	.15	.015
967262	110	11.0 : 1	228	2.1	67	44.0	44.0	218	28	37	6.1	0	4.2	37.2	55.6	.25	.044
967263	112	11.2 : 1	228	2.1	68	44.8	44.8	214	28	36	6.0	0	4.2	37.2	55.6	.25	.044
967264	114	11.4 : 1	228	2.1	69	45.6	45.6	211	27	35	5.9	0	4.2	37.2	55.6	.26	.044
967265	116	11.6 : 1	228	2.1	71	46.4	46.4	207	27	35	5.8	0	4.2	37.2	55.6	.26	.044
967266	118	11.8 : 1	228	2.1	72	47.2	47.2	203	26	34	5.7	0	4.2	37.2	55.6	.27	.044
967267	120	12.0 : 1	228	2.1	73	48.0	48.0	200	26	34	5.6	0	4.2	37.2	55.6	.27	.044
967268	122	12.2 : 1	228	2.1	74	48.8	48.8	197	25	33	5.5	0	4.2	37.2	55.6	.28	.044
967269	124	12.4 : 1	228	2.1	75	49.6	49.6	194	25	32	5.4	0	4.2	37.2	55.6	.28	.044
967270	126	12.6 : 1	228	2.1	77	50.4	50.4	190	25	32	5.3	0	4.2	37.2	55.6	.29	.044
967271	128	12.8 : 1	228	2.1	78	51.2	51.2	188	24	31	5.2	0	4.2	37.2	55.6	.29	.044
967272	130	13.0 : 1	228	2.1	79	52.0	52.0	185	24	31	5.2	0	4.2	37.2	55.6	.30	.044
967273	132	13.2 : 1	228	2.1	80	52.8	52.8	182	24	31	5.1	0	4.2	37.2	55.6	.31	.044
967274	134	13.4 : 1	228	2.1	81	53.6	53.6	179	23	30	5.0	0	4.2	37.2	55.6	.32	.044

⁽¹⁾ Load types are mutually exclusive for comparison purposes. For combined loads and high loads, see Bearing Load Section.

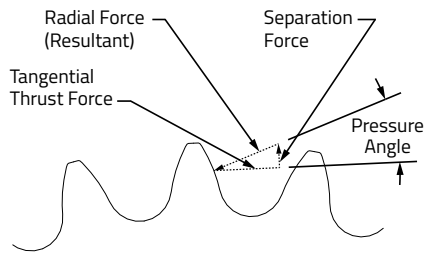
Geared Bearing Dimensions and Specifications by Product Number



Dimensions shown in mm unless otherwise noted.

- Basic gear dimensions shown for selection purposes only and subject to change.
- Visit www.nexengroup.com for detailed drawings and CAD models.
- Please contact Nexen Group for a design to meet your specification.

System Reaction Forces Under Maximum Torque Condition



Common Attributes for All Gears

Estimated Life	See System Life section.
Operating Temperature Range (°C)	-5 to 40
Tooth Grease	Part Number 853901
Gear Finish	Black Oxide
Bearing Finish	Steel
External Ratings/Standards	CE, RoHS
Operational Noise (dB)	up to 80 (speed dependent)

RPS 10

Part ID.		Dimensions								System Reaction Forces (Under Max. Torque Condition)			
Product Number	Number of Teeth	Gear Tooth O.D. Size (mm)	Output Hole Bolt Circle Ø (mm)	Output Pilot I.D. (mm)	Mounting Hole Bolt Circle Ø (mm)	Mounting Pilot I.D. (mm)	Pinion Center Distance (mm)	Overall Height (mm)	Weight/Mass (kg)	Average Separation (N)	Max Separation (N)	Average Torque Induced Radial (N)	Max Torque Induced Radial (N)
967226	38	126	60	50	28	20	74	38	1.7	79	113	271	283
967227	40	132	60	50	28	20	77	38	1.8	79	113	271	283
967228	42	138	60	50	28	20	80	38	1.8	78	113	271	283
967229	44	144	60	50	28	20	83	38	1.9	77	113	272	284
967230	46	150	85	75	45	35	86	39.5	2.5	77	113	272	284
967231	48	156	85	75	45	35	89	39.5	2.5	77	113	272	284
967232	50	162	85	75	45	35	92	39.5	2.6	76	113	272	284
967233	52	168	85	75	45	35	95	39.5	2.7	76	113	272	284
967234	54	174	107.5	95	65	55	98	39.5	3.4	75	113	272	285
967235	56	182	107.5	95	65	55	102	39.5	3.5	82	116	271	284
967236	58	188	107.5	95	65	55	105	39.5	3.5	81	116	272	284
967237	60	194	107.5	95	65	55	108	39.5	3.6	81	116	272	284
967238	62	200	107.5	95	65	55	111	39.5	3.7	81	116	272	284
967239	64	206	107.5	95	65	55	114	39.5	3.8	80	116	272	284
967240	66	212	107.5	95	65	55	117	39.5	3.9	80	116	272	284
967241	68	218	150	135	97	80	120	44	5.9	79	116	272	285
967242	70	224	150	135	97	80	123	44	6.0	79	116	272	285
967243	72	230	150	135	97	80	126	44	6.1	79	115	272	285
967244	74	236	150	135	97	80	129	44	6.2	78	115	272	285
967245	76	242	150	135	97	80	132	44	6.3	78	115	272	285
967246	78	248	150	135	97	80	135	44	6.4	78	115	272	285
967247	80	254	150	135	97	80	138	44	6.5	78	115	272	285
967248	82	262	150	135	97	80	142	44	6.6	82	117	272	284
967249	84	268	195	165	112	90	145	45.5	9.8	82	117	272	285
967250	86	274	195	165	112	90	148	45.5	9.9	81	117	272	285
967251	88	280	195	165	112	90	151	45.5	10.0	81	117	272	285
967252	90	286	195	165	112	90	154	45.5	10.0	81	117	272	285
967253	92	292	195	165	112	90	157	45.5	10.0	80	117	272	285
967254	94	298	220	195	139	115	160	47	12.0	80	117	272	285
967255	96	304	220	195	139	115	163	47	12.0	80	117	272	285
967256	98	310	220	195	139	115	166	47	13.0	80	117	272	285
967257	100	316	220	195	139	115	169	47	13.0	79	117	272	285
967258	102	322	220	195	139	115	172	47	13.0	79	117	272	285
967259	104	328	220	195	139	115	175	47	13.0	79	117	272	285
967260	106	334	220	195	139	115	178	47	13.0	79	116	272	286
967261	108	342	220	195	139	115	182	47	13.0	82	118	272	285
967262	110	348	275	250	184	160	185	51	18.0	82	118	272	285
967263	112	354	275	250	184	160	188	51	18.0	81	118	272	285
967264	114	360	275	250	184	160	191	51	18.0	81	118	272	285
967265	116	366	275	250	184	160	194	51	18.0	81	118	272	285
967266	118	372	275	250	184	160	197	51	19.0	81	118	272	285
967267	120	378	275	250	184	160	200	51	19.0	81	118	272	285
967268	122	384	275	250	184	160	203	51	19.0	80	118	272	285
967269	124	390	275	250	184	160	206	51	19.0	80	118	272	285
967270	126	396	275	250	184	160	209	51	19.0	80	117	272	286
967271	128	402	275	250	184	160	212	51	19.0	80	117	272	286
967272	130	408	275	250	184	160	215	51	19.0	80	117	272	286
967273	132	414	275	250	184	160	218	51	20.0	79	117	272	286
967274	134	422	275	250	184	160	222	51	20.0	82	119	272	285

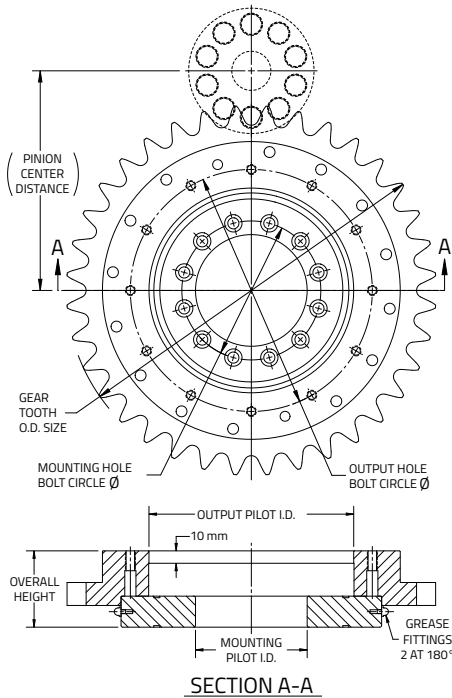
Geared Bearing Specifications by Product Number

RPS 12

General Specs					Gear Torque			Speed		Precision			Load				Inertia	
Product Number	Number of Teeth	Gear Ratio	Bearing Number	Module of Gear Teeth (mm)	Static Torque (Nm)	Dynamic Torque at MIN Life (Nm)	Dynamic Torque at MAX Life (Nm)	Max Speed (RPM)	Max Lube-Free Speed (RPM)	Angular Accuracy (±ArcSec)	One-Way Repeatability (±ArcSec)	Angular Backlash (±ArcSec)	Max Dynamic Moment Load @ Max Life & Avg Torque (kNm) ⁽¹⁾	Max Dynamic Radial Load@ Max Life & Avg Torque (kN) ⁽¹⁾	Max Dynamic Axial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Moment of Inertia OUTER (kg/m²)	Moment of Inertia INNER (kg/m²)	
967185	32	3.2 : 1	42	2.4	46	30.4	30.4	625	80	104	17.3	0	0.0	1.9	3.2	.003	.00002	
967186	34	3.4 : 1	42	2.4	48	32.3	32.3	588	76	99	16.5	0	0.0	1.9	3.2	.003	.00002	
967187	36	3.6 : 1	42	2.4	51	34.2	34.2	556	72	93	15.5	0	0.0	1.9	3.2	.003	.00002	
967188	38	3.8 : 1	66	2.4	54	36.1	36.1	526	68	88	14.6	0	0.2	5.6	8.7	.006	.00015	
967189	40	4.0 : 1	66	2.4	57	38.0	38.0	500	65	84	14.0	0	0.2	5.6	8.7	.006	.00015	
967190	42	4.2 : 1	66	2.4	60	39.9	39.9	476	62	80	13.3	0	0.2	5.6	8.7	.007	.00015	
967191	44	4.4 : 1	66	2.4	63	41.8	41.8	455	59	76	12.7	0	0.2	5.6	8.7	.007	.00015	
967192	46	4.6 : 1	85	2.4	66	43.7	43.7	435	57	73	12.2	0	0.3	6.7	10.3	.012	.0004	
967193	48	4.8 : 1	85	2.4	68	45.6	45.6	417	54	70	11.7	0	0.3	6.7	10.3	.013	.0004	
967194	50	5.0 : 1	85	2.4	71	47.5	47.5	400	52	67	11.1	0	0.3	6.7	10.3	.014	.0004	
967195	52	5.2 : 1	85	2.4	74	49.4	49.4	385	50	65	10.8	0	0.3	6.7	10.3	.014	.0004	
967196	54	5.4 : 1	85	2.4	77	51.3	51.3	370	48	62	10.4	0	0.3	6.7	10.3	.015	.0004	
967197	56	5.6 : 1	85	2.4	80	53.2	53.2	357	46	60	10.0	0	0.3	6.7	10.3	.017	.0004	
967198	58	5.8 : 1	124	2.4	83	55.1	55.1	345	44	58	9.6	0	0.7	11.3	17.2	.033	.0028	
967199	60	6.0 : 1	124	2.4	86	57.0	57.0	333	43	56	9.3	0	0.7	11.3	17.2	.034	.0028	
967200	62	6.2 : 1	124	2.4	88	58.9	58.9	323	42	54	9.0	0	0.7	11.3	17.2	.036	.0028	
967201	64	6.4 : 1	124	2.4	91	60.8	60.8	313	40	52	8.7	0	0.7	11.3	17.2	.038	.0028	
967202	66	6.6 : 1	124	2.4	94	62.7	62.7	303	39	51	8.5	0	0.7	11.3	17.2	.039	.0028	
967203	68	6.8 : 1	124	2.4	97	64.6	64.6	294	38	49	8.2	0	0.7	11.3	17.2	.041	.0028	
967204	70	7.0 : 1	148	2.4	100	66.5	66.5	286	37	48	8.0	0	1.3	17.1	25.8	.080	.0063	
967205	72	7.2 : 1	148	2.4	103	68.4	68.4	278	36	47	7.8	0	1.3	17.1	25.8	.082	.0063	
967206	74	7.4 : 1	148	2.4	105	70.3	70.3	270	35	45	7.6	0	1.3	17.1	25.8	.085	.0063	
967207	76	7.6 : 1	148	2.4	108	72.2	72.2	263	34	44	7.3	0	1.3	17.1	25.8	.088	.0063	
967208	78	7.8 : 1	178	2.4	111	74.1	74.1	256	33	43	7.2	0	2.5	28.3	42.6	.12	.015	
967209	80	8.0 : 1	178	2.4	114	76.0	76.0	250	32	42	7.0	0	2.5	28.3	42.6	.13	.015	
967210	82	8.2 : 1	178	2.4	117	77.9	77.9	244	32	41	6.8	0	2.5	28.3	42.6	.13	.015	
967211	84	8.4 : 1	178	2.4	120	79.8	79.8	238	31	40	6.6	0	2.5	28.3	42.6	.13	.015	
967212	86	8.6 : 1	178	2.4	123	81.7	81.7	233	30	39	6.5	0	2.5	28.3	42.6	.14	.015	
967213	88	8.8 : 1	178	2.4	125	83.6	83.6	227	29	38	6.3	0	2.5	28.3	42.6	.14	.015	
967214	90	9.0 : 1	178	2.4	128	85.5	85.5	222	29	37	6.2	0	2.5	28.3	42.6	.15	.015	
967215	92	9.2 : 1	178	2.4	131	87.4	87.4	217	28	37	6.1	0	2.5	28.3	42.6	.15	.015	
967216	94	9.4 : 1	228	2.4	134	89.3	89.3	213	28	36	5.9	0	4.2	36.9	55.3	.25	.044	
967217	96	9.6 : 1	228	2.4	137	91.2	91.2	208	27	35	5.8	0	4.2	36.9	55.3	.26	.044	
967218	98	9.8 : 1	228	2.4	140	93.1	93.1	204	26	34	5.7	0	4.2	36.9	55.3	.26	.044	
967219	100	10.0 : 1	228	2.4	143	95.0	95.0	200	26	34	5.6	0	4.2	36.9	55.3	.27	.044	
967220	102	10.2 : 1	228	2.4	145	96.9	96.9	196	25	33	5.5	0	4.2	36.9	55.3	.28	.044	
967221	104	10.4 : 1	228	2.4	148	98.8	98.8	192	25	32	5.4	0	4.2	36.9	55.3	.28	.044	
967222	106	10.6 : 1	228	2.4	151	100.7	100.7	189	24	32	5.3	0	4.2	36.9	55.3	.29	.044	
967223	108	10.8 : 1	228	2.4	154	102.6	102.6	185	24	31	5.2	0	4.2	36.9	55.3	.30	.044	
967224	110	11.0 : 1	228	2.4	157	104.5	104.5	182	23	30	5.1	0	4.2	36.9	55.3	.31	.044	
967225	112	11.2 : 1	228	2.4	160	106.4	106.4	179	23	30	5.0	0	4.2	36.9	55.3	.32	.044	

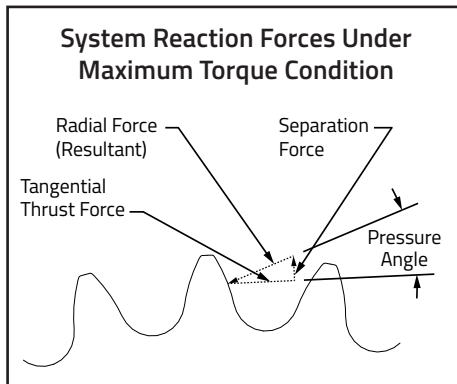
⁽¹⁾ Load types are mutually exclusive for comparison purposes. For combined loads and high loads, see Bearing Load Section.

Geared Bearing Dimensions and Specifications by Product Number



Dimensions shown in mm unless otherwise noted.

- Basic gear dimensions shown for selection purposes only and subject to change.
- Visit www.nexengroup.com for detailed drawings and CAD models.
- Please contact Nexen Group for a design to meet your specification.



Common Attributes for All Gears	
Estimated Life	See System Life section
Operating Temperature Range (°C)	-5 to 40
Tooth Grease	Part Number 853901
Gear Finish	Black Oxide
Bearing Finish	Steel
External Ratings/Standards	CE, RoHS
Operational Noise (dB)	Up to 80 (speed dependent)

RPS 12

Part ID.		Dimensions								System Reaction Forces (Under Max. Torque Condition)			
Product Number	Number of Teeth	Gear Tooth O.D. Size (mm)	Output Hole Bolt Circle Ø (mm)	Output Pilot I.D. (mm)	Mounting Hole Bolt Circle Ø (mm)	Mounting Pilot I.D. (mm)	Pinion Center Distance (mm)	Overall Height (mm)	Weight/Mass (kg)	Average Separation (N)	Max Separation (N)	Average Torque Induced Radial (N)	Max Torque Induced Radial (N)
967185	32	129	60	50	28	20	78	38	1.7	160	217	536	556
967186	34	135	60	50	28	20	81	38	1.8	146	212	536	558
967187	36	143	60	50	28	20	85	38	1.9	152	215	536	557
967188	38	151	85	75	45	35	89	39.5	2.5	158	218	536	557
967189	40	157	85	75	45	35	92	39.5	2.5	146	214	537	559
967190	42	165	85	75	45	35	96	39.5	2.6	151	217	536	558
967191	44	173	85	75	45	35	100	39.5	2.7	156	219	536	558
967192	46	179	107.5	95	65	55	103	39.5	3.4	146	215	537	560
967193	48	187	107.5	95	65	55	107	39.5	3.5	151	218	537	559
967194	50	195	107.5	95	65	55	111	39.5	3.6	155	220	537	559
967195	52	201	107.5	95	65	55	114	39.5	3.7	146	217	537	560
967196	54	209	107.5	95	65	55	118	39.5	3.8	151	219	537	560
967197	56	217	107.5	95	65	55	122	39.5	3.9	155	221	537	559
967198	58	225	150	135	97	80	126	44	6.0	158	223	537	559
967199	60	231	150	135	97	80	129	44	6.1	150	219	537	560
967200	62	239	150	135	97	80	133	44	6.2	154	221	537	560
967201	64	247	150	135	97	80	137	44	6.4	157	223	537	559
967202	66	253	150	135	97	80	140	44	6.5	150	220	537	561
967203	68	261	150	135	97	80	144	44	6.6	153	222	537	560
967204	70	269	195	165	112	90	148	45.5	9.8	157	223	537	560
967205	72	275	195	165	112	90	151	45.5	9.9	150	220	537	561
967206	74	283	195	165	112	90	155	45.5	10.0	153	222	537	561
967207	76	291	195	165	112	90	159	45.5	10.0	156	223	537	560
967208	78	297	220	195	139	115	162	47	12.0	150	221	537	561
967209	80	305	220	195	139	115	166	47	12.0	153	222	537	561
967210	82	313	220	195	139	115	170	47	13.0	155	224	537	561
967211	84	321	220	195	139	115	174	47	13.0	158	225	537	560
967212	86	327	220	195	139	115	177	47	13.0	152	223	537	561
967213	88	335	220	195	139	115	181	47	13.0	155	224	537	561
967214	90	343	220	195	139	115	185	47	13.0	157	225	537	561
967215	92	349	220	195	139	115	188	47	13.0	152	223	537	562
967216	94	357	275	250	184	160	192	51	18.0	155	224	537	561
967217	96	365	275	250	184	160	196	51	18.0	157	225	537	561
967218	98	371	275	250	184	160	199	51	18.0	152	223	538	562
967219	100	379	275	250	184	160	203	51	19.0	154	224	537	561
967220	102	387	275	250	184	160	207	51	19.0	156	225	537	561
967221	104	393	275	250	184	160	210	51	19.0	152	223	538	562
967222	106	401	275	250	184	160	214	51	19.0	154	224	537	562
967223	108	409	275	250	184	160	218	51	19.0	156	225	537	561
967224	110	417	275	250	184	160	222	51	20.0	158	226	537	561
967225	112	423	275	250	184	160	225	51	20.0	154	224	538	562

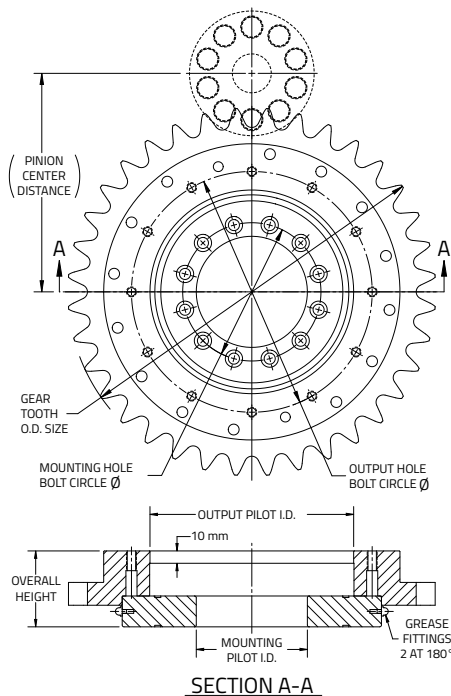
Geared Bearing Specifications by Product Number

RPS 16

General Specs					Gear Torque			Speed		Precision			Load			Inertia	
Product Number	Number of Teeth	Gear Ratio	Bearing Number	Module of Gear Teeth (mm)	Static Torque (Nm)	Dynamic Torque at MIN Life (Nm)	Dynamic Torque at MAX Life (Nm)	Max Speed (RPM)	Max Lube-Free Speed (RPM)	Angular Accuracy (±ArcSec)	One-Way Repeatability (±ArcSec)	Angular Backlash (±ArcSec)	Max Dynamic Moment Load @ Max Life & Avg Torque (kNm) ⁽¹⁾	Max Dynamic Radial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Max Dynamic Axial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Moment of Inertia OUTER (kg/m²)	Moment of Inertia INNER (kg/m²)
967100	26	2.6 : 1	42	3.4	159	159	88	577	75	97	16.2	0	0.0	0.4	1.0	.004	.00002
967101	28	2.8 : 1	42	3.4	171	171	94	536	70	90	15.1	0	0.0	0.4	1.0	.005	.00002
967102	30	3.0 : 1	42	3.4	183	183	101	500	66	85	14.2	0	0.0	0.4	1.0	.006	.00002
967103	32	3.2 : 1	66	3.4	196	196	108	469	62	80	13.3	0	0.1	4.4	7.5	.009	.00015
967104	34	3.4 : 1	66	3.4	208	208	115	441	58	75	12.5	0	0.1	4.4	7.5	.011	.00015
967105	36	3.6 : 1	85	3.4	220	220	121	417	55	71	11.8	0	0.2	5.5	9.1	.016	.00039
967106	38	3.8 : 1	85	3.4	232	232	128	395	52	67	11.1	0	0.2	5.5	9.1	.018	.00039
967107	40	4.0 : 1	85	3.4	244	244	135	375	49	63	10.6	0	0.2	5.5	9.1	.021	.00039
967108	42	4.2 : 1	85	3.4	257	257	142	357	47	60	10.1	0	0.2	5.5	9.1	.024	.00039
967109	44	4.4 : 1	85	3.4	269	269	148	341	44	58	9.6	0	0.2	5.5	9.1	.027	.00040
967110	46	4.6 : 1	124	3.4	281	281	155	326	43	55	9.2	0	0.6	10.2	16.0	.043	.0028
967111	48	4.8 : 1	124	3.4	293	293	162	313	41	53	8.9	0	0.6	10.2	16.0	.047	.0028
967112	50	5.0 : 1	124	3.4	306	306	169	300	39	51	8.5	0	0.6	10.2	16.0	.052	.0028
967113	52	5.2 : 1	124	3.4	318	318	175	288	38	49	8.2	0	0.6	10.2	16.0	.058	.0028
967114	54	5.4 : 1	148	3.4	330	330	182	278	36	47	7.8	0	1.2	16.0	24.7	.095	.0063
967115	56	5.6 : 1	148	3.4	342	342	189	268	35	45	7.6	0	1.2	16.0	24.7	.10	.0063
967116	58	5.8 : 1	148	3.4	354	354	195	259	34	44	7.3	0	1.2	16.0	24.7	.11	.0063
967117	60	6.0 : 1	178	3.4	367	367	202	250	33	42	7.0	0	2.4	27.3	41.5	.15	.015
967118	62	6.2 : 1	178	3.4	379	379	209	242	32	41	6.9	0	2.4	27.3	41.5	.15	.015
967119	64	6.4 : 1	178	3.4	391	391	216	234	31	40	6.6	0	2.4	27.3	41.5	.16	.015
967120	66	6.6 : 1	178	3.4	403	403	222	227	30	39	6.4	0	2.4	27.3	41.5	.17	.015
967121	68	6.8 : 1	178	3.4	415	415	229	221	29	37	6.2	0	2.4	27.3	41.5	.19	.015
967122	70	7.0 : 1	178	3.4	428	428	236	214	28	36	6.0	0	2.4	27.3	41.5	.20	.015
967123	72	7.2 : 1	228	3.4	440	440	243	208	27	35	5.9	0	4.1	35.8	54.3	.29	.044
967124	74	7.4 : 1	228	3.4	452	452	249	203	26	34	5.7	0	4.1	35.8	54.3	.31	.044
967125	76	7.6 : 1	228	3.4	464	464	256	197	26	34	5.6	0	4.1	35.8	54.3	.32	.044
967126	78	7.8 : 1	228	3.4	477	477	263	192	25	33	5.4	0	4.1	35.8	54.3	.34	.044
967127	80	8.0 : 1	228	3.4	489	489	270	188	25	32	5.3	0	4.1	35.8	54.3	.36	.044
967128	82	8.2 : 1	228	3.4	501	501	276	183	24	31	5.2	0	4.1	35.8	54.3	.39	.044
967129	84	8.4 : 1	228	3.4	513	513	283	179	23	30	5.0	0	4.1	35.8	54.3	.41	.044

⁽¹⁾ Load types are mutually exclusive for comparison purposes. For combined loads and high loads, see Bearing Load Section.

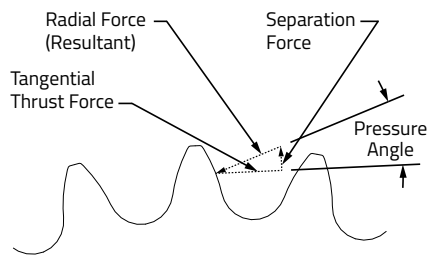
Geared Bearing Dimensions & Specifications by Product Number



Dimensions shown in mm unless otherwise noted.

- Basic gear dimensions shown for selection purposes only and subject to change.
- Visit www.nexengroup.com for detailed drawings and CAD models.
- Please contact Nexen Group for a design to meet your specification.

System Reaction Forces Under Maximum Torque Condition



Common Attributes for All Gears

Estimated Life	See System Life section
Operating Temperature Range (°C)	-5 to 40
Tooth Grease	Part Number 853901
Gear Finish	Black Oxide
Bearing Finish	Steel
External Ratings/Standards	CE, RoHS
Operational Noise (dB)	up to 80 (speed dependent)

RPS 16

Part ID.		Dimensions								System Reaction Forces (Under Max. Torque Condition)			
Product Number	Number of Teeth	Gear Tooth O.D. Size (mm)	Output Hole Bolt Circle Ø (mm)	Output Pilot I.D. (mm)	Mounting Hole Bolt Circle Ø (mm)	Mounting Pilot I.D. (mm)	Pinion Center Distance (mm)	Overall Height (mm)	Weight/Mass (kg)	Average Separation (N)	Max Separation (N)	Average Torque Induced Radial (N)	Max Torque Induced Radial (N)
967100	26	141	60	50	28	20	88	41	2.2	760	1,041	2,613	2,708
967101	28	151	60	50	28	20	93	41	2.4	771	1,050	2,613	2,708
967102	30	159	60	50	28	20	97	41	2.6	696	1,024	2,614	2,720
967103	32	169	85	75	45	35	102	42.5	3.2	710	1,033	2,614	2,720
967104	34	179	85	75	45	35	107	42.5	3.4	722	1,042	2,614	2,720
967105	36	189	107.5	95	65	55	112	42.5	4.1	733	1,049	2,614	2,720
967106	38	199	107.5	95	65	55	117	42.5	4.3	743	1,056	2,614	2,720
967107	40	209	107.5	95	65	55	122	42.5	4.6	751	1,062	2,614	2,720
967108	42	219	107.5	95	65	55	127	42.5	4.9	759	1,068	2,614	2,720
967109	44	229	107.5	95	65	55	132	42.5	5.2	767	1,073	2,614	2,720
967110	46	237	150	135	97	80	136	47	7.0	718	1,054	2,616	2,728
967111	48	247	150	135	97	80	141	47	7.3	727	1,060	2,616	2,728
967112	50	257	150	135	97	80	146	47	7.7	735	1,065	2,616	2,727
967113	52	267	150	135	97	80	151	47	8.0	742	1,070	2,616	2,727
967114	54	277	195	165	112	90	156	48.5	11.0	749	1,074	2,616	2,727
967115	56	287	195	165	112	90	161	48.5	11.0	755	1,078	2,616	2,727
967116	58	297	195	165	112	90	166	48.5	12.0	761	1,082	2,616	2,727
967117	60	307	220	195	139	115	171	50	14.0	767	1,085	2,616	2,726
967118	62	315	220	195	139	115	175	50	14.0	731	1,071	2,618	2,732
967119	64	325	220	195	139	115	180	50	14.0	737	1,075	2,618	2,732
967120	66	335	220	195	139	115	185	50	15.0	743	1,078	2,618	2,732
967121	68	345	220	195	139	115	190	50	15.0	748	1,081	2,618	2,731
967122	70	355	220	195	139	115	195	50	16.0	754	1,084	2,617	2,731
967123	72	365	275	250	184	160	200	54	20.0	759	1,087	2,617	2,731
967124	74	375	275	250	184	160	205	54	20.0	763	1,090	2,617	2,731
967125	76	383	275	250	184	160	209	54	21.0	734	1,078	2,619	2,736
967126	78	393	275	250	184	160	214	54	21.0	739	1,081	2,619	2,735
967127	80	403	275	250	184	160	219	54	22.0	744	1,084	2,619	2,735
967128	82	413	275	250	184	160	224	54	22.0	748	1,087	2,619	2,735
967129	84	423	275	250	184	160	229	54	23.0	753	1,089	2,619	2,734

Geared Bearing Specifications by Product Number

RPS 20

General Specs					Gear Torque			Speed		Precision			Load			Inertia	
Product Number	Number of Teeth	Gear Ratio	Bearing Number	Module of Gear Teeth (mm)	Static Torque (Nm)	Dynamic Torque at MIN Life (Nm)	Dynamic Torque at MAX Life (Nm)	Max Speed (RPM)	Max Lube-Free Speed (RPM)	Angular Accuracy (±ArcSec)	One-Way Repeatability (±ArcSec)	Angular Backlash (±ArcSec)	Max Dynamic Moment Load @ Max Life & Avg Torque (kNm) ⁽¹⁾	Max Dynamic Radial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Max Dynamic Axial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Moment of Inertia OUTER (kg/m ²)	Moment of Inertia INNER (kg/m ²)
967147	22	2.2 : 1	42	4.2	210	203	116	545	71	92	15.4	0	(2)	(2)	(2)	.006	.00002
967148	24	2.4 : 1	42	4.2	229	222	126	500	65	84	13.9	0	(2)	(2)	(2)	.008	.00002
967149	26	2.6 : 1	66	4.2	248	240	137	462	60	77	12.9	0	0.1	3.8	6.9	.012	.0002
967150	28	2.8 : 1	66	4.2	267	258	147	429	56	72	12.0	0	0.1	3.8	6.9	.014	.0002
967151	30	3.0 : 1	85	4.2	287	277	158	400	52	67	11.2	0	0.2	4.9	8.5	.021	.0004
967152	32	3.2 : 1	85	4.2	306	295	168	375	49	63	10.5	0	0.2	4.9	8.5	.025	.0004
967153	34	3.4 : 1	85	4.2	325	314	179	353	46	59	9.9	0	0.2	4.9	8.5	.03	.0004
967154	36	3.6 : 1	124	4.2	344	332	189	333	43	56	9.3	0	0.6	9.7	15.6	.05	.003
967155	38	3.8 : 1	124	4.2	363	351	200	316	41	53	8.8	0	0.6	9.7	15.6	.05	.003
967156	40	4.0 : 1	124	4.2	382	369	210	300	39	50	8.4	0	0.6	9.7	15.6	.06	.003
967157	42	4.2 : 1	124	4.2	401	388	221	286	37	48	8.0	0	0.6	9.7	15.6	.07	.003
967158	44	4.4 : 1	148	4.2	420	406	231	273	35	46	7.6	0	1.1	15.5	24.2	.11	.006
967159	46	4.6 : 1	148	4.2	439	425	242	261	34	44	7.3	0	1.1	15.5	24.2	.12	.006
967160	48	4.8 : 1	148	4.2	458	443	252	250	32	42	7.0	0	1.1	15.5	24.2	.14	.006
967161	50	5.0 : 1	178	4.2	478	462	263	240	31	40	6.7	0	2.4	26.8	41.1	.18	.015
967162	52	5.2 : 1	178	4.2	497	480	273	231	30	39	6.4	0	2.4	26.8	41.1	.20	.015
967163	54	5.4 : 1	178	4.2	516	498	284	222	29	37	6.2	0	2.4	26.8	41.1	.22	.015
967164	56	5.6 : 1	178	4.2	535	517	294	214	28	36	6.0	0	2.4	26.8	41.1	.24	.015
967165	58	5.8 : 1	228	4.2	554	535	305	207	27	35	5.8	0	4.0	35.4	53.9	.33	.044
967166	60	6.0 : 1	228	4.2	573	554	315	200	26	34	5.6	0	4.0	35.4	53.9	.36	.044
967167	62	6.2 : 1	228	4.2	592	572	326	194	25	32	5.4	0	4.0	35.4	53.9	.39	.044
967168	64	6.4 : 1	228	4.2	611	591	336	188	24	31	5.2	0	4.0	35.4	53.9	.43	.044
967169	66	6.6 : 1	228	4.2	630	609	347	182	24	30	5.1	0	4.0	35.4	53.9	.46	.044

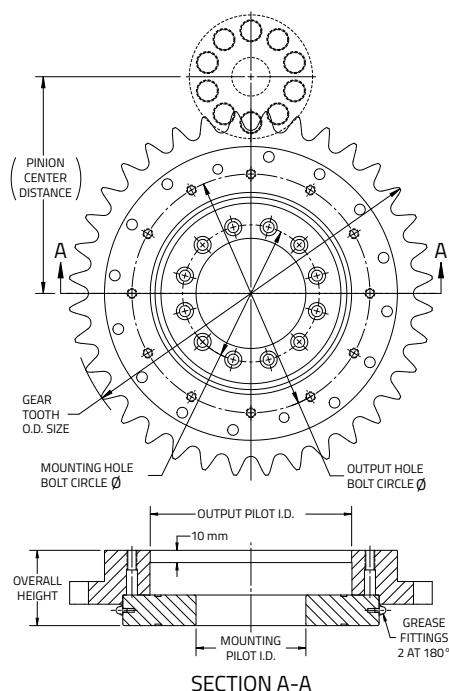
RPS 25

General Specs					Gear Torque			Speed		Precision			Load			Inertia	
Product Number	Number of Teeth	Gear Ratio	Bearing Number	Module of Gear Teeth (mm)	Static Torque (Nm)	Dynamic Torque at MIN Life (Nm)	Dynamic Torque at MAX Life (Nm)	Max Speed (RPM)	Max Lube-Free Speed (RPM)	Angular Accuracy (±ArcSec)	One-Way Repeatability (±ArcSec)	Angular Backlash (±ArcSec)	Max Dynamic Moment Load @ Max Life & Avg Torque (kNm) ⁽¹⁾	Max Dynamic Radial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Max Dynamic Axial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Moment of Inertia OUTER (kg/m ²) ⁽¹⁾	Moment of Inertia INNER (kg/m ²)
967130	20	2.0 : 1	42	5.4	352	318	179	455	62	81	13.5	0	(2)	(2)	(2)	.011	.000019
967131	22	2.2 : 1	66	5.4	387	350	197	414	57	73	12.2	0	0.1	2.8	5.9	.017	.00015
967132	24	2.4 : 1	85	5.4	422	382	215	379	52	67	11.1	0	0.2	4.0	7.6	.027	.00039
967133	26	2.6 : 1	85	5.4	458	414	233	350	48	62	10.4	0	0.2	4.0	7.6	.033	.00039
967134	28	2.8 : 1	85	5.4	493	446	251	325	44	58	9.6	0	0.2	4.0	7.6	.042	.00039
967135	30	3.0 : 1	124	5.4	528	478	269	303	41	54	8.9	0	0.5	8.8	14.7	.067	.0028
967136	32	3.2 : 1	124	5.4	563	509	286	284	39	50	8.4	0	0.5	8.8	14.7	.080	.0028
967137	34	3.4 : 1	124	5.4	598	541	304	268	37	47	7.9	0	0.5	8.8	14.7	.094	.0028
967138	36	3.6 : 1	148	5.4	634	573	322	253	34	45	7.4	0	1.1	14.7	23.4	.15	.0063
967139	38	3.8 : 1	148	5.4	669	605	340	239	33	42	7.0	0	1.1	14.7	23.4	.17	.0063
967140	40	4.0 : 1	178	5.4	704	637	358	228	31	40	6.7	0	2.3	26.0	40.3	.22	.015
967141	42	4.2 : 1	178	5.4	739	669	376	217	30	38	6.4	0	2.3	26.0	40.3	.25	.015
967142	44	4.4 : 1	178	5.4	774	700	394	207	28	37	6.1	0	2.3	26.0	40.3	.29	.015
967143	46	4.6 : 1	178	5.4	810	732	412	198	27	35	5.8	0	2.3	26.0	40.3	.32	.015
967144	48	4.8 : 1	228	5.4	845	764	430	190	26	34	5.6	0	3.9	34.6	53.1	.44	.044
967145	50	5.0 : 1	228	5.4	880	796	448	182	25	32	5.4	0	3.9	34.6	53.1	.50	.044
967146	52	5.2 : 1	228	5.4	915	828	465	175	24	31	5.2	0	3.9	34.6	53.1	.54	.044

⁽¹⁾ Load types are mutually exclusive for comparison purposes.
For combined loads and high loads, see Bearing Load Section.

⁽²⁾ Contact Nexen

Geared Bearing Dimensions & Specifications by Product Number



Dimensions shown in mm unless otherwise noted.

- Basic gear dimensions shown for selection purposes only and subject to change.
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- Please contact Nexen Group for a design to meet your specification.

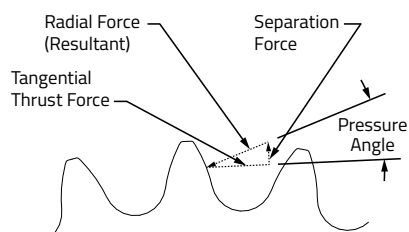
RPS 20

Part ID.		Dimensions								System Reaction Forces (Under Max. Torque Condition)			
Product Number	Number of Teeth	Gear Tooth O.D. Size (mm)	Output Hole Bolt Circle Ø (mm)	Output Pilot I.D. (mm)	Mounting Hole Bolt Circle Ø (mm)	Mounting Pilot I.D. (mm)	Pinion Center Distance (mm)	Overall Height (mm)	Weight/Mass (kg)	Average Separation (N)	Max Separation (N)	Average Torque Induced Radial (N)	Max Torque Induced Radial (N)
967147	22	152	60	50	28	20	98	42	2.6	824	1,202	3,125	3,245
967148	24	166	60	50	28	20	105	42	3.0	911	1,244	3,124	3,237
967149	26	178	85	75	45	35	111	43.5	3.6	896	1,244	3,125	3,242
967150	28	190	85	75	45	35	117	43.5	4.0	883	1,245	3,125	3,246
967151	30	202	107.5	95	65	55	123	43.5	4.7	872	1,246	3,126	3,250
967152	32	214	107.5	95	65	55	129	43.5	5.2	863	1,246	3,127	3,253
967153	34	226	107.5	95	65	55	135	43.5	5.7	854	1,247	3,127	3,256
967154	36	240	150	135	97	80	142	48	7.4	912	1,275	3,126	3,250
967155	38	252	150	135	97	80	148	48	8.0	903	1,274	3,127	3,253
967156	40	264	150	135	97	80	154	48	8.5	894	1,273	3,127	3,256
967157	42	276	150	135	97	80	160	48	9.1	886	1,273	3,128	3,259
967158	44	288	195	165	112	90	166	49.5	12.0	879	1,272	3,129	3,261
967159	46	300	195	165	112	90	172	49.5	12.0	873	1,272	3,129	3,263
967160	48	312	195	165	112	90	178	49.5	13.0	867	1,271	3,130	3,265
967161	50	326	220	195	139	115	185	51	15.0	909	1,291	3,128	3,260
967162	52	338	220	195	139	115	191	51	16.0	902	1,290	3,129	3,262
967163	54	350	220	195	139	115	197	51	17.0	896	1,289	3,130	3,264
967164	56	362	220	195	139	115	203	51	17.0	890	1,288	3,130	3,266
967165	58	374	275	250	184	160	209	55	21.0	885	1,287	3,131	3,267
967166	60	386	275	250	184	160	215	55	22.0	880	1,287	3,131	3,269
967167	62	400	275	250	184	160	222	55	23.0	914	1,303	3,130	3,265
967168	64	412	275	250	184	160	228	55	24.0	908	1,301	3,130	3,266
967169	66	424	275	250	184	160	234	55	25.0	903	1,300	3,131	3,268

RPS 25

Part ID.		Dimensions								System Reaction Forces (Under Max. Torque Condition)			
Product Number	Number of Teeth	Gear Tooth O.D. Size (mm)	Output Hole Bolt Circle Ø (mm)	Output Pilot I.D. (mm)	Mounting Hole Bolt Circle Ø (mm)	Mounting Pilot I.D. (mm)	Pinion Center Distance (mm)	Overall Height (mm)	Weight/Mass (kg)	Average Separation (N)	Max Separation (N)	Average Torque Induced Radial (N)	Max Torque Induced Radial (N)
967130	20	174	60	50	28	20	115	54	4.0	1,156	1,662	4,311	4,473
967131	22	190	85	75	65	35	123	55.5	5.0	1,197	1,691	4,311	4,474
967132	24	206	107.5	95	65	55	131	55.5	6.0	1,232	1,715	4,312	4,474
967133	26	220	107.5	95	65	55	138	55.5	6.7	1,165	1,698	4,313	4,487
967134	28	236	107.5	95	65	55	146	55.5	7.4	1,199	1,720	4,314	4,486
967135	30	252	150	135	97	80	154	60	9.6	1,228	1,739	4,314	4,486
967136	32	268	150	135	97	80	162	60	11.0	1,254	1,756	4,314	4,485
967137	34	282	150	135	97	80	169	60	11.0	1,202	1,740	4,316	4,495
967138	36	298	195	165	112	90	177	61.5	15.0	1,227	1,755	4,316	4,494
967139	38	314	195	165	112	90	185	61.5	16.0	1,250	1,769	4,315	4,494
967140	40	328	220	195	139	115	192	63	18.0	1,206	1,755	4,318	4,502
967141	42	344	220	195	139	115	200	63	19.0	1,228	1,768	4,318	4,501
967142	44	360	220	195	139	115	208	63	20.0	1,247	1,780	4,317	4,500
967143	46	374	220	195	139	115	215	63	22.0	1,210	1,767	4,319	4,507
967144	48	390	275	250	184	160	223	67	26.0	1,229	1,778	4,319	4,506
967145	50	406	275	250	184	160	231	67	27.0	1,246	1,788	4,319	4,505
967146	52	420	275	250	184	160	238	67	28.0	1,213	1,776	4,321	4,512

System Reaction Forces Under Maximum Torque Condition



Common Attributes for All Gears	
Estimated Life	See System Life section
Operating Temperature Range (°C)	-5 to 40
Tooth Grease	Part Number 853901
Gear Finish	Black Oxide
Bearing Finish	Steel
External Ratings/Standards	CE, RoHS
Operational Noise (dB)	up to 80 (speed dependent)

Geared Bearing Specifications by Product Number

RPS 32

General Specs					Gear Torque			Speed		Precision			Load			Inertia	
Product Number	Number of Teeth	Gear Ratio	Bearing Number	Module of Gear Teeth (mm)	Static Torque (Nm)	Dynamic Torque at MIN Life (Nm)	Dynamic Torque at MAX Life (Nm)	Max Speed (RPM)	Max Lube-Free Speed (RPM)	Angular Accuracy (±ArcSec)	One-Way Repeatability (±ArcSec)	Angular Backlash (±ArcSec)	Max Dynamic Moment Load @ Max Life & Avg Torque (kNm) ⁽¹⁾	Max Dynamic Radial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Max Dynamic Axial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Moment of Inertia OUTER (kg/m ²)	Moment of Inertia INNER (kg/m ²)
9671170	24	2.0 : 1	124	5.0	1,917	1,283	733	313	41	53	8.9	0	0.2	3.3	9.2	.08	.003
9671171	26	2.16 : 1	124	5.0	1,917	1,390	794	289	38	49	8.2	0	0.2	3.3	9.2	.11	.003
9671172	28	2.3 : 1	124	5.0	1,917	1,497	855	268	35	45	7.6	0	0.2	3.3	9.2	.14	.003
9671173	30	2.5 : 1	148	5.0	2,875	1,604	917	250	33	42	7.0	0	0.7	9.4	18.1	.21	.006
9671174	32	2.6 : 1	178	5.0	3,067	1,711	978	235	31	40	6.6	0	1.9	20.9	35.2	.27	.015
9671175	34	2.83 : 1	178	5.0	3,258	1,818	1,039	221	29	37	6.2	0	1.9	20.9	35.2	.32	.015
9671176	36	3.0 : 1	178	5.0	3,450	1,925	1,100	208	27	35	5.9	0	1.9	20.9	35.2	.39	.015
9671177	38	3.16 : 1	228	5.0	3,642	2,031	1,161	197	26	33	5.6	0	3.4	29.7	48.2	.53	.044
9671178	40	3.3 : 1	228	5.0	3,833	2,138	1,222	188	25	32	5.3	0	3.4	29.7	48.2	.61	.044

RPS 40

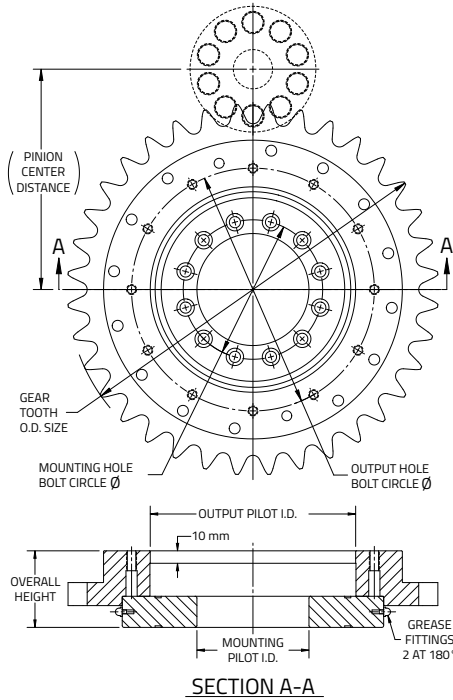
General Specs					Gear Torque			Speed		Precision			Load			Inertia	
Product Number	Number of Teeth	Gear Ratio	Bearing Number	Module of Gear Teeth (mm)	Static Torque (Nm)	Dynamic Torque at MIN Life (Nm)	Dynamic Torque at MAX Life (Nm)	Max Speed (RPM)	Max Lube-Free Speed (RPM)	Angular Accuracy (±ArcSec)	One-Way Repeatability (±ArcSec)	Angular Backlash (±ArcSec)	Max Dynamic Moment Load @ Max Life & Avg Torque (kNm) ⁽¹⁾	Max Dynamic Radial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Max Dynamic Axial Load @ Max Life & Avg Torque (kN) ⁽¹⁾	Moment of Inertia OUTER (kg/m ²)	Moment of Inertia INNER (kg/m ²)
9671179	24	2.0 : 1	148	6.8	3,953	2,750	2,292	250	32	42	7.0	0	(2)	(2)	(2)	.28	.006
9671180	26	2.16 : 1	178	6.8	4,282	2,980	2,483	231	30	39	6.4	0	0.7	8.4	22.7	.38	.015
9671181	28	2.3 : 1	178	6.8	4,612	3,209	2,674	214	28	36	6.0	0	0.7	8.4	22.7	.47	.015
9671182	30	2.5 : 1	178	6.8	4,754	3,438	2,865	200	26	34	5.6	0	0.7	8.4	22.7	.58	.015

(1) Load types are mutually exclusive for comparison purposes.

For combined loads and high loads, see Bearing Load Section.

(2) Contact Nexen

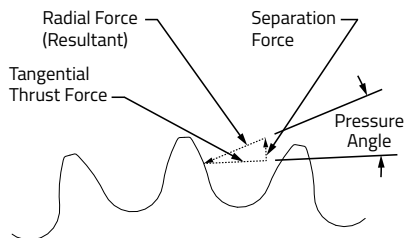
Geared Bearing Dimensions and Specifications by Product Number



Dimensions shown in mm unless otherwise noted.

- Basic gear dimensions shown for selection purposes only and subject to change.
- Visit www.nexengroup.com for detailed drawings and CAD models.
- Please contact Nexen Group for a design to meet your specification.

System Reaction Forces Under Maximum Torque Condition



RPS 32

Part ID.		Dimensions								System Reaction Forces (Under Max. Torque Condition)			
Product Number	Number of Teeth	Gear Tooth O.D. Size (mm)	Output Hole Bolt Circle Ø (mm)	Output Pilot I.D. (mm)	Mounting Hole Bolt Circle Ø (mm)	Mounting Pilot I.D. (mm)	Pinion Center Distance (mm)	Overall Height (mm)	Weight/Mass (kg)	Average Separation (N)	Max Separation (N)	Average Torque Induced Radial (N)	Max Torque Induced Radial (N)
967170	24	260	150	135	97	80	175	65.5	11.0	2,950	4,037	11,386	11,715
967171	26	280	150	135	97	80	185	65.5	13.0	3,014	4,089	11,387	11,717
967172	28	300	150	135	97	80	195	65.5	14.0	3,070	4,136	11,388	11,720
967173	30	320	195	165	112	90	205	67	18.0	3,120	4,176	11,388	11,722
967174	32	338	220	195	139	115	214	68.5	21.0	3,007	4,173	11,395	11,744
967175	34	358	220	195	139	115	224	68.5	23.0	3,056	4,175	11,395	11,745
967176	36	378	220	195	139	115	234	68.5	25.0	3,100	4,209	11,396	11,746
967177	38	398	275	250	184	160	244	72.5	29.0	3,140	4,240	11,396	11,746
967178	40	416	275	250	184	160	253	72.5	31.0	3,048	4,204	11,402	11,764

RPS 40

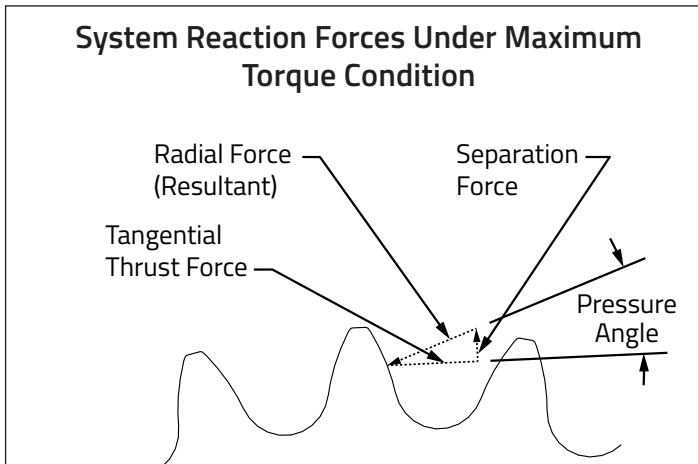
Part ID.		Dimensions								System Reaction Forces (Under Max. Torque Condition)			
Product Number	Number of Teeth	Gear Tooth O.D. Size (mm)	Output Hole Bolt Circle Ø (mm)	Output Pilot I.D. (mm)	Mounting Hole Bolt Circle Ø (mm)	Mounting Pilot I.D. (mm)	Pinion Center Distance (mm)	Overall Height (mm)	Weight/Mass (kg)	Average Separation (N)	Max Separation (N)	Average Torque Induced Radial (N)	Max Torque Induced Radial (N)
967179	24	331	195	165	112	90	222	84.5	23.0	5,314	7,114	19,329	19,899
967180	26	355	220	195	139	115	234	86	27.0	5,250	7,118	19,337	19,925
967181	28	379	220	195	139	115	246	86	30.0	5,196	7,124	19,345	19,949
967182	30	403	220	195	139	115	258	86	33.0	5,149	7,128	19,353	19,971

Common Attributes for All Gears

Estimated Life	See System Life section.
Operating Temperature Range (°C)	-5 to 40
Tooth Grease	Part Number 853901
Gear Finish	Black Oxide
Bearing Finish	Steel
External Ratings/Standards	CE, RoHS
Operational Noise (dB)	up to 80 (speed dependent)

Reaction Loading Calculations

The calculations in the following section will allow you to calculate the Reaction Loading of the Geared Bearing and Pinion. These calculations will be necessary to calculate the System Life on the following pages.



Due to the unique rolling technology in the RPS system, the pressure angle changes throughout the motion. Therefore, Nexen has provided both the average and maximum separation force and radial load force for each gear system. To calculate the values in your system simply multiply the catalog force by the ratio of your application torque/maximum torque. After the reaction forces are calculated, other application forces can be added to calculate bearing life and load. (See Bearing Loading Section)

Step 1: Gather the System Reaction Forces Under Maximum Torque Condition data from the Specifications section.

Data from Specification Section	Customer Data	Sample Data*
Average Separation Force Under Max Torque	N	908 N
Max Separation Force Under Max Torque	N	1,301 N
Average Torque Induced Radial Force Under Max Torque	N	3,130 N
Max Torque Induced Radial Force Under Max Torque	N	3,266 N

*Sample Data is from Specifications section: RPS Size 20, 64 Tooth Geared Bearing, Part# 967168

Step 2: Enter the amount of pinion/input torque needed for the application (up to, but not more than the maximum torque).

Application Data	Customer Data	Sample Data*
Amount of Torque Required for Application	Nm of Nm Max.	54 Nm of 92.3 Nm Max.

*Sample Data is from Specifications section: RPS Size 20, 64 Tooth Geared Bearing, Part# 967168

**Some geared bearings may be limited by output torque of geared bearing and not input torque of pinion

Step 3: Calculate Resultant Forces.

Sample Application Data	Sample Data*	Sample Resultant Forces
Average Separation Force Under Max Torque	• 908 (N) 54 (Nm) / 92.3 (Nm) =	531 N
Max Separation Force Under Max Torque	• 1,301 (N) 54 (Nm) / 92.3 (Nm) =	761 N
Average Torque Induced Radial Force Under Max Torque	• 3,130 (N) 54 (Nm) / 92.3 (Nm) =	1,831 N
Max Torque Induced Radial Force Under Max Torque	• 3,266 (N) 54 (Nm) / 92.3 (Nm) =	1,911 N

*Sample Data is from Specifications section: RPS Size 20, 64 Tooth Geared Bearing, Part# 967168

Application Data	Customer Data	Actual Resultant Forces
Average Separation Force Under Max Torque	• (N) (Nm) / (Nm) =	N
Max Separation Force Under Max Torque	• (N) (Nm) / (Nm) =	N
Average Torque Induced Radial Force Under Max Torque	• (N) (Nm) / (Nm) =	N
Max Torque Induced Radial Force Under Max Torque	• (N) (Nm) / (Nm) =	N

Static Bearing Load Capacity Calculations

Step 1: Gather Application Data

Before you begin calculations, there are several key measurements that you will need from your application in order to calculate static safety factor. Collect the data and record it in the space provided.

Measurements for Bearing Calculations	Customer Data (record your values below)	Sample Data
Maximum Static Gear Torque of Application ($T_{staticApp}$)	Nm	200 Nm
Dynamic Gear Torque at Min Life (T_{accel}) (from Specifications Section)	Nm	306 Nm
Maximum Static Radial Load (F_{RO})	N	0 N
Maximum Static Axial Load (F_{AO})	N	5,000 N
Maximum Static Moment Load (M_0)	Nm	1,000 Nm

*Sample Data is from specification section: RPS Size 16,50 Tooth Geared Bearing, Part# 967112

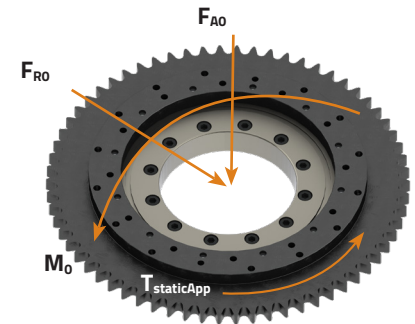


Table 1 Bearing Race Specific Data

Bearing Size		GB42	GB66	GB85	GB124	GB148	GB178	GB228
Basic Dynamic Load Rating (C)	N	7,350	17,500	20,300	33,100	49,100	80,300	104,000
Basic Static Load Rating (C_0)	N	8,350	22,300	29,500	50,900	76,800	135,000	173,000
Rolling Diameter of Cross Roller (dp)	m	0.0415	0.066	0.085	0.124	0.1475	0.178	0.2275
RPS Generated Load on Cross Roller Bearing (f_{rps})	RPS10	N	380	345	332	316	311	307
	RPS12	N	748	679	653	622	612	603
	RPS16	N	4,022	3,544	3,364	3,210	3,135	3,007
	RPS20	N	5,120	4,433	4,173	3,941	3,737	3,650
	RPS25	N	7,393	6,324	5,919	5,549	5,234	5,097
	RPS32	N				15,038	14,516	13,600
	RPS40	N				25,590	24,627	

Step 2: Calculate The Static Equivalent Radial Load

Perform the following calculations using data from Table 1 and your application data from Step 1.

Maximum Static Equivalent Radial Load

$$P_0 = F_{RO} + \frac{2 \cdot M_0}{dp} + \frac{T_{staticApp}}{T_{accel}} \cdot f_{rps} + 0.44 \cdot F_{AO}$$

$$P_0 = (\text{N}) + \frac{2 \cdot (\text{Nm})}{(\text{m})} + \frac{(\text{Nm})}{(\text{Nm})} \cdot (\text{N}) + 0.44 \cdot (\text{N})$$

Maximum Static Equivalent Radial Load

$P_0 =$ N

Sample: $P_0 = (0N) + \frac{2 \cdot (1000Nm)}{(0.124m)} + \frac{(200Nm)}{(306Nm)} \cdot (3210N) + 0.44 \cdot (5000N) = 20,427N$

Step 3: Apply Safety Factor

The basic static load rating refers to the static load C_0 with constant direction and magnitude, under which the calculated contact stress in the center of the contact area between the roller and the raceway where the maximum load applied is 4,000 MPa (if the deformation exceeds this level, it will affect rotation). When a load is statically or dynamically applied, it is necessary to consider the static safety factor.

Static Safety Factor

Use Table 1 along with the above calculated Maximum Static Equivalent Radial Load to calculate the Safety Factor.

$$f_s = \frac{C_0}{P_0}$$

$$f_s = \frac{(\text{N})}{(\text{N})}$$

Static Safety Factor

$f_s =$

Sample:

$$f_s = \frac{(50,900N)}{(20,427N)} = 2.49$$

Table 2 Static Safety Factor

Service Condition	f_s
Normal Load	1.5 to 2
Impact Load	2 to 3

Sample: $f_s = 2.49$

Sufficient safety factor for impact loads.

Bearing Drag Torque Calculations

Step 1: Gather Application Data

Before you begin calculations, there are several key measurements that you will need from your application in order to calculate drag torque. Collect the data and record it in the space provided.

Measurements for Bearing Calculations	Customer Data (Record your values below)	Sample Data
Maximum Dynamic Gear Torque of Application (T_{maxApp})	Nm	501 Nm
Dynamic Gear Torque at Min Life (T_{accel}) (from Specifications Section)	Nm	501 Nm
Maximum Dynamic Radial Load (F_{Rmax})	N	0 N
Maximum Dynamic Axial Load (F_{Amax})	N	54,300 N
Maximum Dynamic Moment Load (M_{max})	Nm	0 Nm

*Sample Data is from specification section: RPS Size 16, 82 Tooth Geared Bearing, Part# 967128

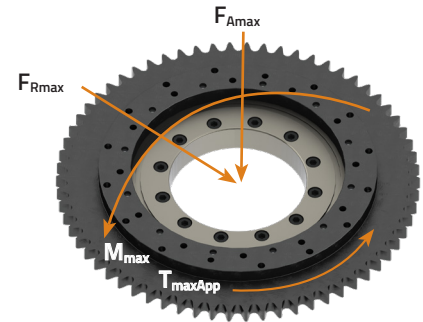


Table 3 Bearing Race Specific Data

Bearing Size		GB42	GB66	GB85	GB124	GB148	GB178	GB228
Basic Dynamic Load Rating (C)	N	7,350	17,500	20,300	33,100	49,100	80,300	104,000
Basic Static Load Rating (C_0)	N	8,350	22,300	29,500	50,900	76,800	135,000	173,000
Rolling Diameter of Cross Roller (dp)	m	0.0415	0.066	0.085	0.124	0.1475	0.178	0.2275
RPS Generated Load on Cross Roller Bearing (f_{rps})	RPS10	N	380	345	332	322	316	307
	RPS12	N	748	679	653	633	622	612
	RPS16	N	4,022	3,544	3,364	3,210	3,135	3,066
	RPS20	N	5,120	4,433	4,173	3,941	3,834	3,737
	RPS25	N	7,393	6,324	5,919	5,549	5,384	5,234
	RPS32	N				15,038	14,516	14,045
	RPS40	N					25,590	24,627

Step 2: Calculate The Maximum Dynamic Equivalent Radial Load

Perform the following calculations using the data from Table 3 and your application data from Step 1.

Loading Distribution	IF:	THEN:	
		X	Y
$\frac{F_{Amax}}{F_{Rmax} + \frac{2 \cdot M_{max}}{dp} + \frac{T_{maxApp}}{T_{accel}} \cdot f_{rps}}$	≤ 1.5	1	0.45
$\frac{F_{Amax}}{F_{Rmax} + \frac{2 \cdot M_{max}}{dp} + \frac{T_{maxApp}}{T_{accel}} \cdot f_{rps}}$	> 1.5	0.67	0.67

Maximum Dynamic Equivalent Radial Load

$$P_{Cmax} = X \cdot \left(F_{Rmax} + \frac{2 \cdot M_{max}}{dp} + \frac{T_{maxApp}}{T_{accel}} \cdot f_{rps} + Y \cdot F_{Amax} \right)$$

$$P_{Cmax} = () \cdot \left(() \text{ N} + \frac{2() \text{ Nm}}{() \text{ m}} + \frac{() \text{ Nm}}{() \text{ Nm}} \cdot () \text{ N} \right) + () \cdot () \text{ N}$$

Maximum Dynamic Equivalent Radial Load

$P_{Cmax} =$ N

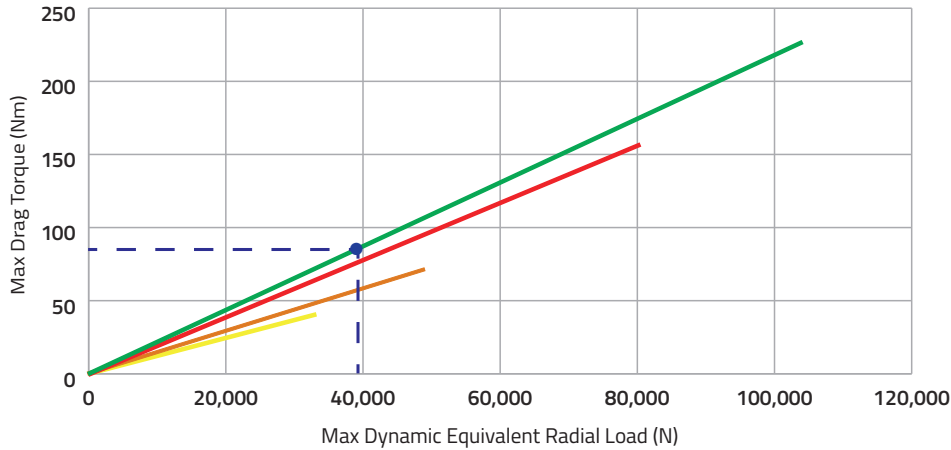
Sample: $P_{Cmax} = (0.67) \cdot \left((0) + \frac{2(0 \text{ Nm})}{(0.2275 \text{ m})} + \frac{(501 \text{ Nm})}{(501 \text{ Nm})} \cdot (3007 \text{ N}) \right) + (0.67) \cdot (54,300 \text{ N}) = 38,395 \text{ N}$

Bearing Drag Torque Calculations

Step 3: Determine Bearing Drag Torque

The bearing drag torque can be estimated based on the dynamic equivalent radial load. Use the following charts to determine your approximate bearing drag torque. Add bearing drag torque to the application required gear torque to determine the total torque requirement. Verify your chosen geared bearing is still capable for the application.

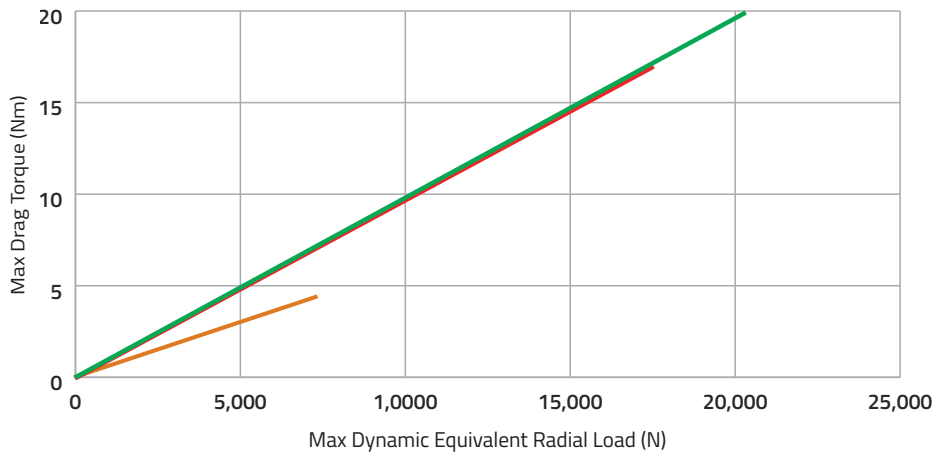
Maximum Dynamic Equivalent Radial Load vs. Drag Torque (T_{BD})



GB228	GB178	GB148	GB124	Sample
—	—	—	—	---

Bearing Drag Torque	
$T_{BD} =$	Nm

Sample: With $P_{Cmax} = 38,395$ N then $T_{BD} = \sim 84$ Nm



GB85	GB66	GB42
—	—	—

Total Required Gear Torque

Use your Application Gear Torque (T_{maxApp}) and Bearing Drag Torque (T_{BD}) calculated above to determine the Total Required Gear Torque.

$$T_{Tgear} = (T_{maxApp}) + (T_{BD})$$

$$T_{Tgear} = (\quad \text{Nm}) + (\quad \text{Nm})$$

Total Required Gear Torque	
T_{Tgear}	Nm

Sample: $T_{Tgear} = (501\text{Nm}) + (84\text{ Nm}) = 585\text{ Nm}$

Geared Bearing System Life Calculations

The calculations in the following section will allow you to calculate the expected life of the Geared Bearing and Pinion. These calculations will result in the same values as the charts on the following pages.

Step 1: Gather Application Data

Before you begin calculations, there are three key measurements that you will need from your application. Collect the data and record it in space provided to the right.

Measurements Required for Pinion Calculations	Customer Data (record your values below)	Sample Data
Average Pinion Torque (T_{avg})	Nm	85 Nm
Pinion Revolutions Per Cycle (L)	rev	1.3 rev
Average Pinion Speed (V_{avg})	RPM	2 RPM

Table 4 RPS Pinion Life Values

		RPS10	RPS12	RPS16		RPS20		RPS25		RPS32	RPS40
				Premium	Value	Premium	Value	Premium	Value		
Max Torque (T_{max})	Nm	4.0	9.5	61.1	12.8	92.3	23.9	159.2	43.8	641.5	1375.2
Torque at Max Life ($T_{final, pinion}$)	Nm	4.0	9.5	33.7	12.8	52.5	23.9	89.5	43.8	366.6	1146
Transition Point ($E_{T, pinion}$)	million contacts	60	60	8	2	8.2	2	8.5	2	9.4	32
Max Life ($N_{max contacts, pinion}$)	million contacts	60	60	60	2	60	2	60	2	60	60
Constant (C)		NA	NA	115.30	NA	179.43	NA	305.91	NA	1255.14	3916.09

Table 5 RPS Gear Life Values

		RPS10	RPS12	RPS16	RPS20	RPS25	RPS32	RPS40
Torque at Max Life ($T_{final, pinion}$)	Nm	4.0	9.5	33.7	52.5	89.5	366.6	1146
Transition Point ($E_{T, gear}$)	million contacts	30	30	5	5	5	5	5
Max Life ($N_{max contacts, gear}$)	million contacts	30						
Slope (m)		NA	NA	-1.10	-1.59	-2.79	-11.00	-9.17
Intercept (b)		NA	NA	68.2	101.2	173.5	696.5	1421.0

Step 2: Calculate the Total Number of Pinion Contacts ($N_{contacts}$)

Perform the following calculations using the data collected from your application data in Step 1.

Pinion Roller Contacts ($N_{contacts, pinion}$)

The total number of roller contacts ($N_{contacts, pinion}$) that a RPS Pinion can sustain before needing replacement is based on the average torque of your application. Determine which equivalency or inequality statement below is true for the average torque (T_{avg}) of your application. Then complete the corresponding pinion roller contact equation and record your value below.

IF T_{avg} is:	THEN $N_{contacts, pinion}$:
$\leq T_{final, pinion}$	$= N_{max contacts, pinion}$
$> T_{final, pinion}$ and $< T_{max}$	$= (C \div T_{avg})^{3.333} = \left(\frac{\quad}{\quad} \text{Nm} \right)^{3.333}$
$= T_{max}$	$= E_{T, pinion}$

Pinion Life in Roller Contacts	
$N_{contacts, pinion} =$	million contacts

Sample: (Evaluating RPS20 size) $N_{contacts, pinion} = (179.43 \div 85 \text{ Nm})^{3.333} = 12.07$ million contacts

Geared Bearing System Life Calculations

Step 3: Calculate The Total Number of Tooth Contacts

Perform the following calculations using the data collected from your application and the values from Tables 4 and 5.

Gear Tooth Contacts ($N_{\text{contacts, gear}}$)

The total number of tooth contacts ($N_{\text{contacts, gear}}$) that a RPS Gear can sustain before needing replacement may be calculated with average pinion torque. Use Table 5 to determine which equivalency or inequality statement below is true for the average torque (T_{avg}) of your application. Then complete the corresponding gear tooth contact formula and record your value below.

IF T_{avg} is:	THEN $N_{\text{contacts, gear}}$:
$\leq T_{\text{final, pinion}}$	$= N_{\text{max contacts, gear}}$
$> T_{\text{final, pinion}}$ AND $< T_{\text{max}}$	$= (T_{\text{avg}} - b) \div m = \left(\text{Nm} - \text{Nm} \right) \div$
$= T_{\text{max}}$	$= E_{\text{r, gear}}$

Gear Life in Tooth Contacts	
$N_{\text{contacts, gear}} =$	million contacts

Sample: (Evaluating RPS20 size) $N_{\text{contacts, gear}} = (85 \text{ Nm} - 101.2) \div -1.78 = 9.10$ million contacts

Step 4: Convert Roller Contacts to Hours, Meters or Revolutions

There are two options for converting contacts to other units: exact and estimated. Exact should be used whenever possible. The estimation is available for customers who do not have a well-defined distance per cycle.

Exact Option: Pinion Life In Hours (N_{hours})

Use the application data collected in Step 1 and the Pinion Life in Roller Contacts ($N_{\text{contacts, pinion}}$) calculated in Step 2 to calculate the total number of service hours your pinion can provide before needing replacement. First calculate E_1 to use in the N_{hours} equation.

$E_1 =$ Round up L to the nearest whole integer	$E_1 = \text{round up} \left(\text{rev} \right) =$ rev
---	---

Sample: $E_1 = \text{Round up} (1.3 \text{ rev}) = 2 \text{ rev}$

$N_{\text{hours}} = (N_{\text{contacts, pinion}} \cdot 10^6 \cdot L) \div (60 \cdot E_1 \cdot V_{\text{avg}})$ $N_{\text{hours}} = \left(\text{million contacts} \cdot 10^6 \cdot \text{rev} \right) \div \left(60 \cdot \text{rev} \cdot \text{rpm} \right)$	<table> <tr> <th colspan="2">Pinion Life in Hours</th></tr> <tr> <td>$N_{\text{hours}} =$</td><td>hrs</td></tr> </table>	Pinion Life in Hours		$N_{\text{hours}} =$	hrs
Pinion Life in Hours					
$N_{\text{hours}} =$	hrs				

Sample: $N_{\text{hours}} = (12.07 \text{ million contacts} \cdot 10^6 \cdot 1.3 \text{ revs}) \div (60 \cdot 2 \text{ revs} \cdot 2 \text{ RPM}) = 65,379 \text{ hrs}$

Estimation Option: Pinion Life in Revolutions N_{rev}

These calculations assume the pinion travels nonstop in one direction throughout its whole life.

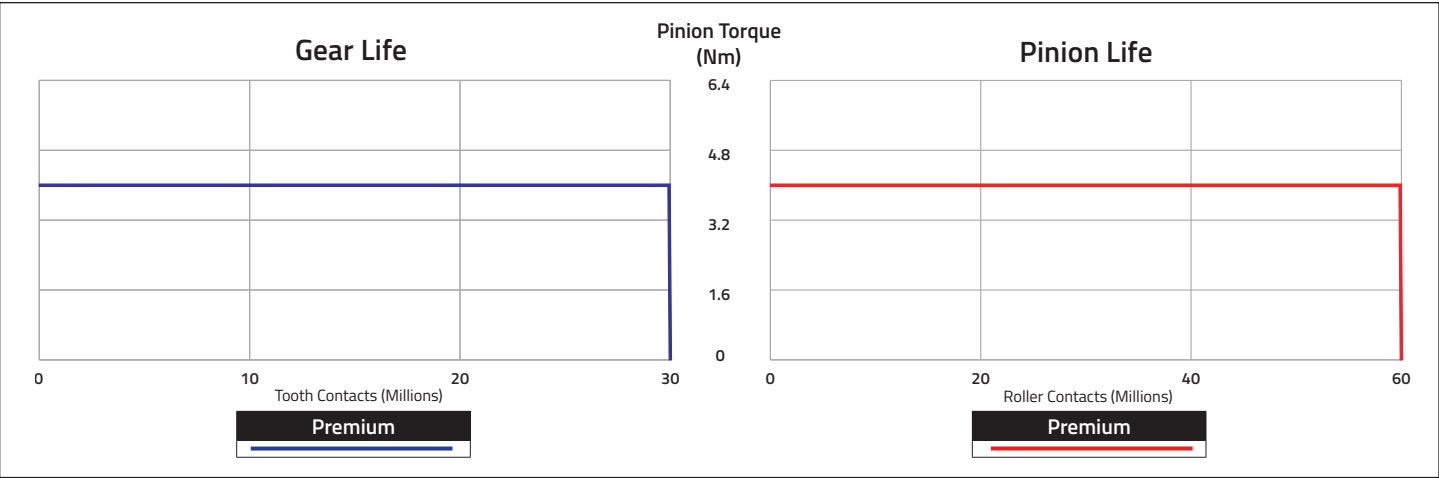
Pinion Life In Pinion Revolutions (N_{rev}) $N_{\text{rev}} = N_{\text{contacts, pinion}}$	<table> <tr> <th colspan="2">Pinion Life in Revolutions</th></tr> <tr> <td>$N_{\text{rev}} =$</td><td>million revolutions</td></tr> </table>	Pinion Life in Revolutions		$N_{\text{rev}} =$	million revolutions
Pinion Life in Revolutions					
$N_{\text{rev}} =$	million revolutions				

Sample: $N_{\text{rev}} = 12.07$ million revolutions

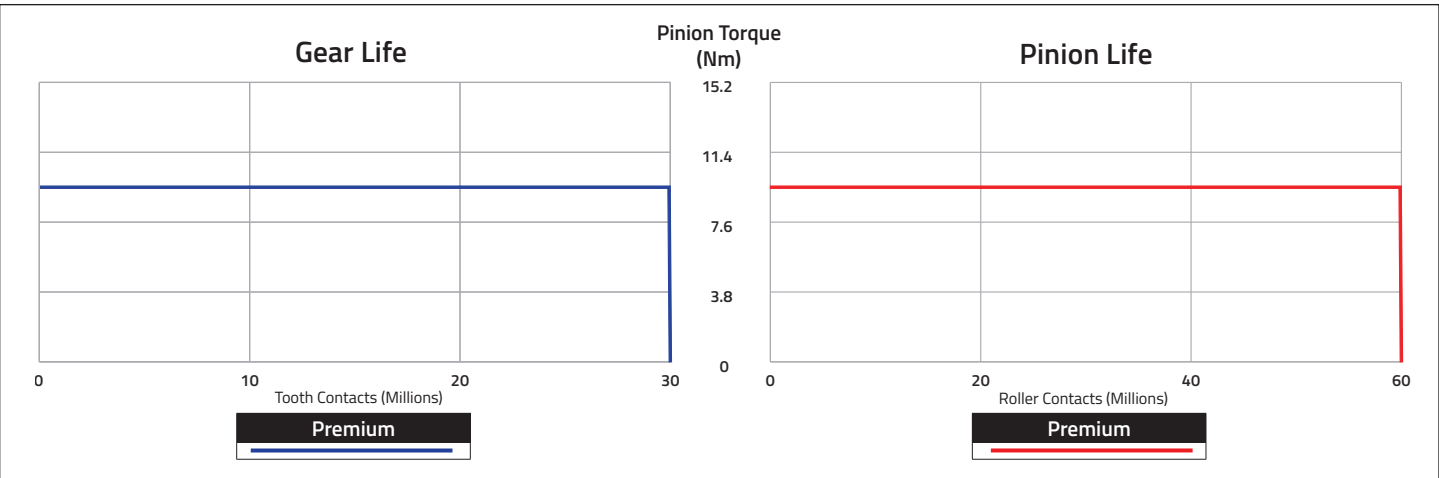
Geared Bearing System Life Graphs (RPS10, 12 and 16)

Refer to the following charts for a quick comparison of Life vs. Load for each RPS system. Exact calculations for the expected life of the Geared Bearing and Pinion are available on the previous pages.

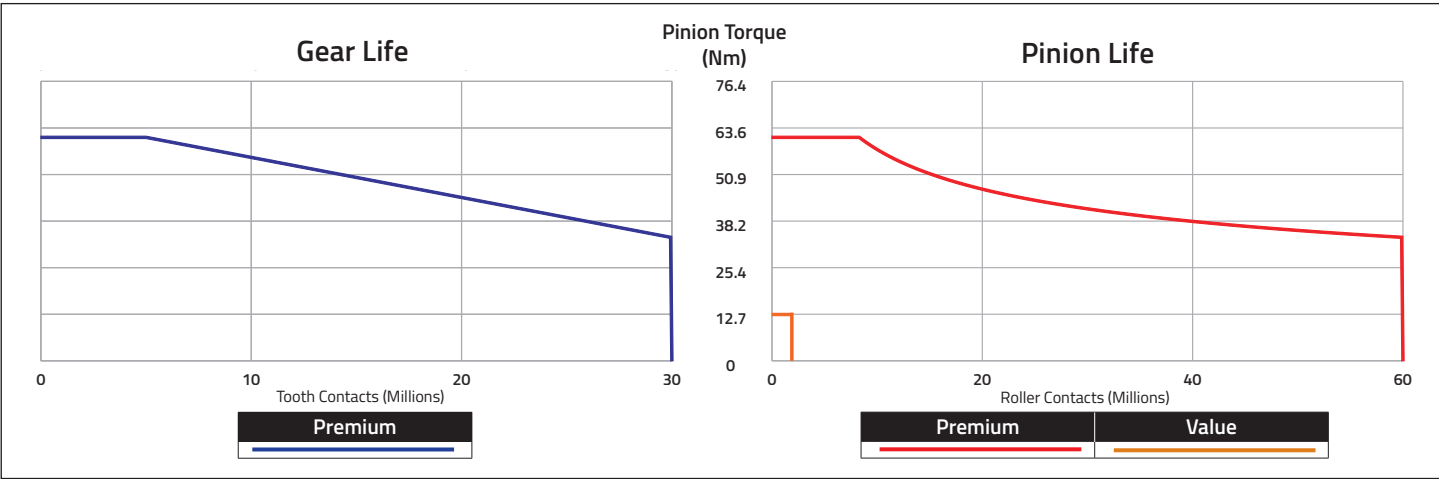
RPS 10 Geared Bearing



RPS 12 Geared Bearing

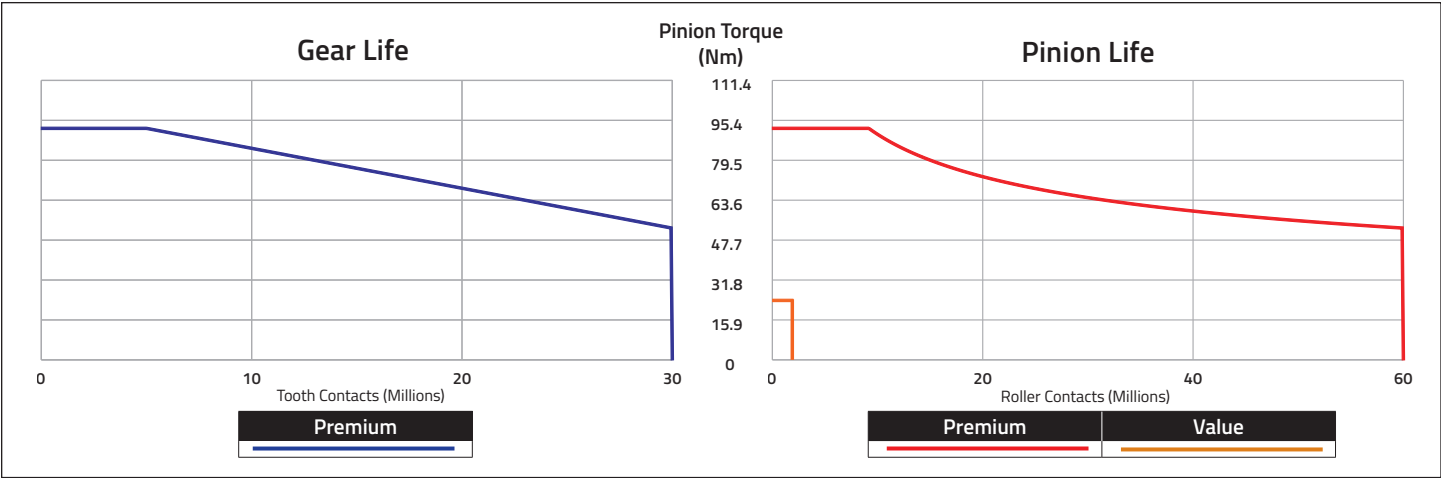


RPS 16 Geared Bearing

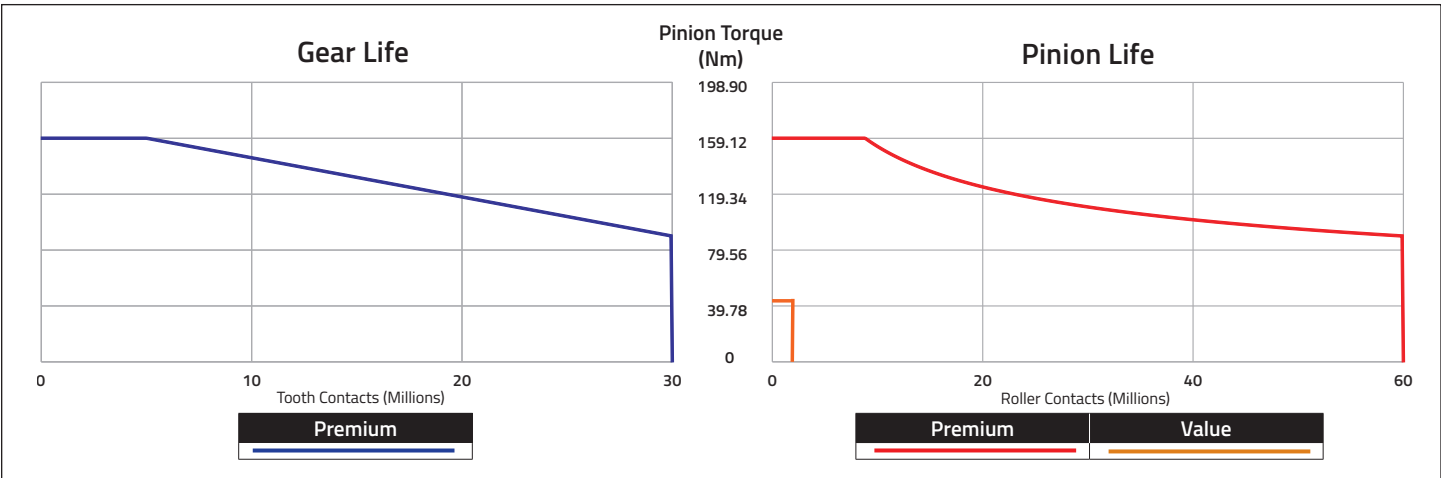


Geared Bearing System Life Graphs (RPS20, 25 and 32)

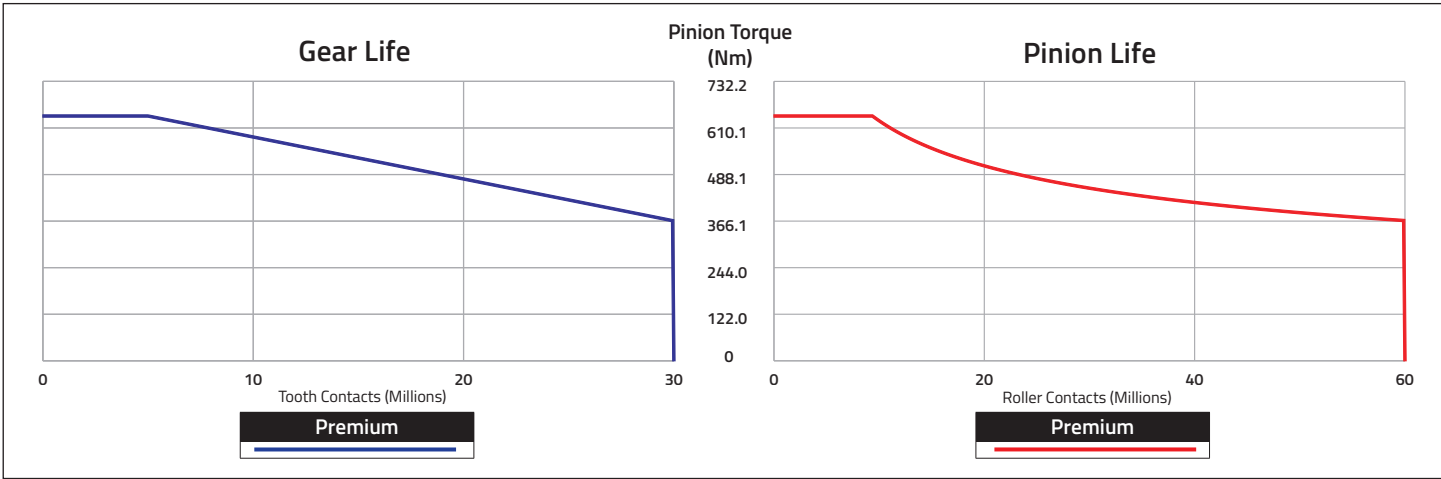
RPS 20 Geared Bearing



RPS 25 Geared Bearing

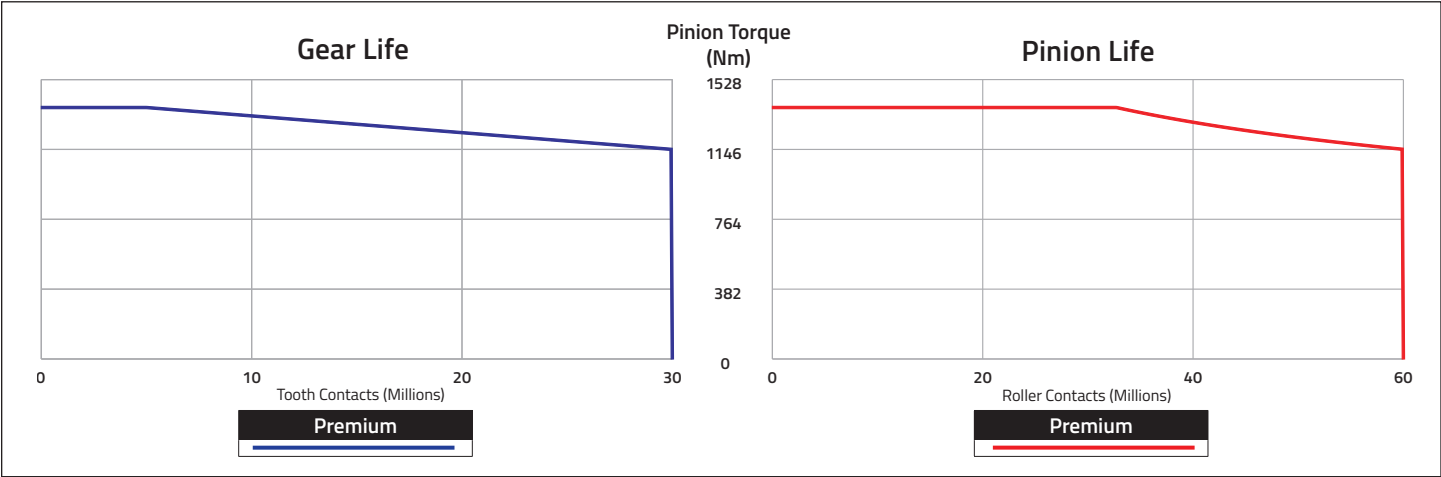


RPS 32 Geared Bearing



Geared Bearing System Life Graphs (RPS40)

RPS 40 Geared Bearing

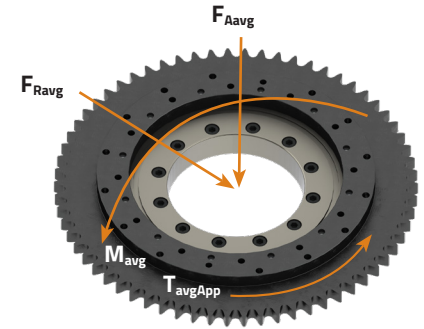


Bearing Life Calculations

Step 1: Gather Application Data

Before you begin calculations, there are several key measurements that you will need from your application in order to calculate bearing life. Collect the data and record it in the space provided.

Measurements for Bearing Calculations	Customer Data (Record your values below)	Sample Data
Average Dynamic Gear Torque of Application (T_{avgApp})	Nm	276 Nm
Dynamic Gear Torque at Min Life (T_{accel}) (from Specifications Section)	Nm	501 Nm
Maximum Dynamic Radial Load (F_{Ravg})	N	12,000 N
Maximum Dynamic Axial Load (F_{Aavg})	N	0 N
Maximum Dynamic Moment Load (M_{avg})	Nm	3,000 Nm
Average Gear Speed (V_{avg})	RPM	20 RPM



*Sample Data is from specification section: RPS Size 16, 82 Tooth Geared Bearing, Part# 967128

Table 6 Bearing Race Specific Data

Bearing Size		GB42	GB66	GB85	GB124	GB148	GB178	GB228
Basic Dynamic Load Rating (C)	N	7,350	17,500	20,300	33,100	49,100	80,300	104,000
Basic Static Load Rating (C_0)	N	8,350	22,300	29,500	50,900	76,800	135,000	173,000
Rolling Diameter of Cross Roller (dp)	m	0.0415	0.066	0.085	0.124	0.1475	0.178	0.2275
RPS Generated Load on Cross Roller Bearing (f_{rps})	RPS10	N	380	345	332	316	311	307
	RPS12	N	748	679	653	622	612	603
	RPS16	N	4,022	3,544	3,364	3,210	3,135	3,066
	RPS20	N	5,120	4,433	4,173	3,941	3,834	3,737
	RPS25	N	7,393	6,324	5,919	5,549	5,384	5,234
	RPS32	N				15,038	14,516	14,045
	RPS40	N					25,590	24,627

Step 2: Calculate The Average Dynamic Equivalent Radial Load

Perform the following calculations using the data from Table 6 and your application data from Step 1.

Loading Distribution	IF:	THEN:	
		X	Y
$F_{Ravg} + \frac{2 \cdot M_{avg} + \frac{T_{avgApp}}{T_{accel}} \cdot f_{rps}}{dp}$	≤ 1.5	1.0	0.45
$F_{Ravg} + \frac{2 \cdot M_{avg} + \frac{T_{avgApp}}{T_{accel}} \cdot f_{rps}}{dp}$	> 1.5	0.67	0.67

Average Dynamic Equivalent Radial Load

$P_{Cavg} = X \cdot \left(F_{Ravg} + \frac{2 \cdot M_{avg} + \frac{T_{avgApp}}{T_{accel}} \cdot f_{rps}}{dp} \right) + Y \cdot F_{Aavg}$	Average Dynamic Equivalent Radial Load $P_{Cavg} =$ N
$P_{Cavg} = (\quad) \cdot \left((\quad N) + \frac{2 \cdot (\quad Nm)}{(\quad m)} + \frac{(\quad Nm)}{(\quad Nm)} \cdot (\quad N) \right) + (\quad) \cdot (\quad N)$	

Sample: $P_{Cavg} = (1.0) \cdot \left((12,000 \text{ N}) + \frac{2 \cdot (3,000 \text{ Nm})}{(0.2275 \text{ m})} + \frac{(276 \text{ Nm})}{(501 \text{ Nm})} \cdot (3007 \text{ N}) \right) + (0.45) \cdot (0 \text{ N}) = 40,030 \text{ N}$

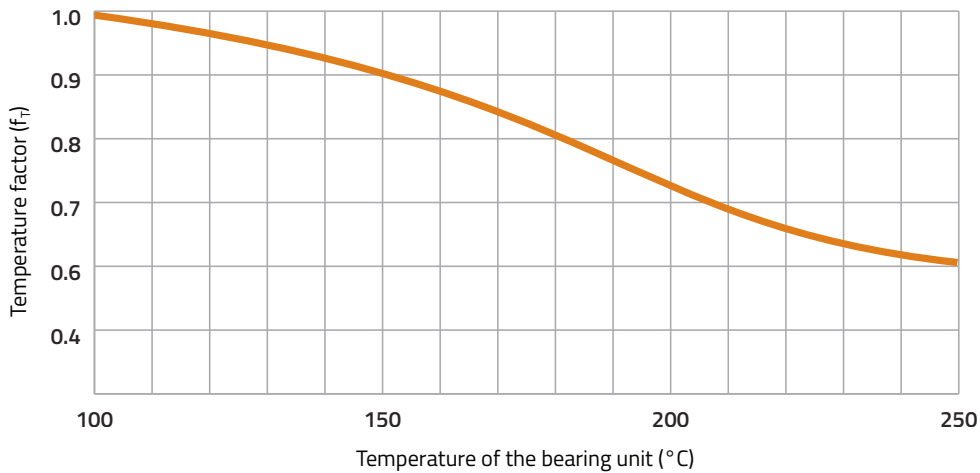
Bearing Life Calculations

Step 3: Calculate The Bearing Race Life

The bearing race life is the total number of revolutions or hours that 90% of a group of identical geared bearings independently operating under the same conditions can achieve without showing flaking from rolling fatigue on the cross roller raceways.

Service Condition, IF:	THEN: f_w
Smooth motion without impact	1 to 1.2
Normal motion	1.2 to 1.5
Motion with severe impact	1.5 to 3

Bearing Operating Temperature Graph



Note: The normal service temperature is 80°C or below. If the product is to be used at a higher temperature, contact Nexen.

Bearing Race Life In Revolutions

Use Table 6 along with the data you collected above to calculate the Bearing Race Life in Revolutions.

$$N_{rev} = \left(\frac{f_t \cdot C}{f_w \cdot P_{avg}} \right)^{3.333}$$

$$N_{rev} = \left(\frac{(\text{ }) \cdot (\text{ } N)}{(\text{ }) \cdot (\text{ } N)} \right)^{3.333}$$

Bearing Race Life in Revolutions

$N_{rev} =$ million revolutions

Sample Data assumes normal motion and 100°C Bearing Temperature.

Sample: $N_{rev} = \left(\frac{(1.0) \cdot (104,000 N)}{(1.2) \cdot (40,030 N)} \right)^{3.333} = 13.1 \text{ million revolutions}$

Bearing Race Life In Hours

Use the data you collected above and your application data from Step 1 calculate the Bearing Race Life in Hours.

$$N_{hours} = N_{rev} \cdot 10^6 / (60 \cdot V_{avg})$$

$$N_{hours} = (\text{ } \text{million revs}) \cdot 10^6 / (60 \cdot (\text{ } \text{RPM}))$$

Bearing Race Life in Hours

$N_{hours} =$ hrs

Sample: $N_{hours} = (13.1 \text{ million revs}) \cdot 10^6 / (60 \cdot (20 \text{ RPM})) = 10,917 \text{ hrs}$

Notes

[illegible]

Notes

[illegible]

Notes

[illegible]

Engineering Support

Nexen Group engineers and manufactures precision motion control for OEM machine designers, system integrators, and maintenance personnel, keeping equipment running trouble-free in the harshest environments.

Contact Nexen Group to see how our engineers can help design the must-have motion control products for your next project.



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