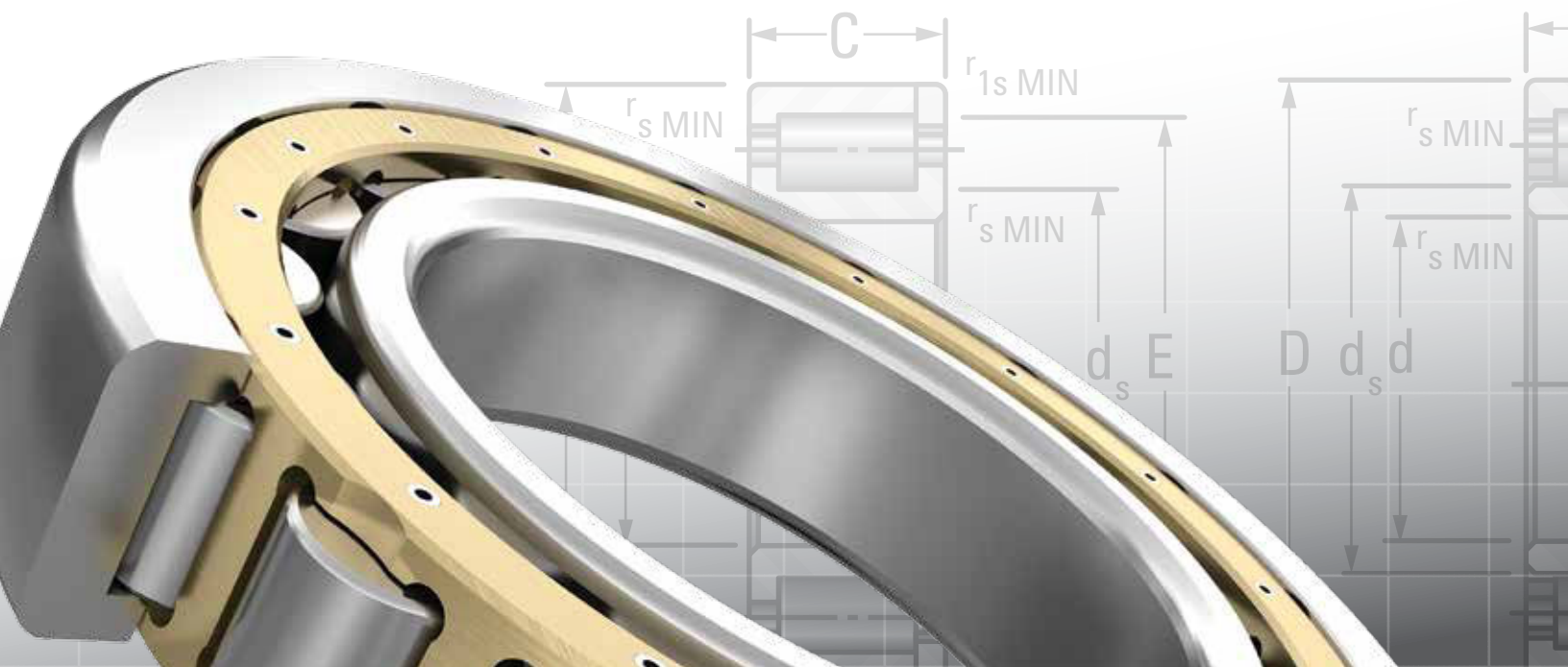


TIMKEN® CYLINDRICAL ROLLER BEARINGS



SINGLE-ROW EMA SERIES

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35

Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

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Киргизия +996(312)96-26-47

<https://timken.nt-rt.ru/> || tek@nt-rt.ru

HIGH PERFORMANCE

At Timken, our brand stands for outstanding quality in everything we do, from product design and manufacturing to engineering support and distribution. We believe in providing customers with the highest quality product solutions – and the greatest levels of service – for their application needs.

Our dedication to high quality solutions is the inspiration for our new line of cylindrical roller bearings. Timken's single-row EMA series features an increased capacity design with a machined brass cage. This premium design outperforms both the Timken published ratings and the industry's leading high-performance design to provide longer bearing life.



IS OUR STANDARD

Timken's cylindrical roller bearing line is one of the broadest in the industry, backed by everything you need to improve your equipment and business performance. Timken industry experts, a global distribution network and an unwavering commitment to quality all combine to help you improve uptime and achieve the most from your operations.

INDUSTRY EXPERTS

Timken engineers lead the industry in bearing design and application support. Every high-performance Timken® cylindrical roller bearing comes with our Timken team of experts, providing you with the industry's best design, application and 24/7 field engineering support from around the globe.

GLOBAL DISTRIBUTION NETWORK

Our technical centers and manufacturing plants are supported by our worldwide distribution operations, which provide customers everywhere with easy access to Timken products and services.

QUALITY YOU CAN TRUST

Timken is the only premium bearing manufacturer in the world that manufactures super-clean, high-alloy bearing steel, and we apply this knowledge of superior quality materials to every bearing we make. In addition, Timken Worldwide Quality Standards are implemented in every manufacturing facility, so each bearing meets the same performance standards – no matter where in the world it is manufactured.



THE TIMKEN DIFFERENCE

- **Timken standard designs are high performance** – in fact, our new single-row EMA series offers greater performance than the Timken-published ratings and the leading high-performance industry design.
- **Our material quality is second to none** – 90+ years of steelmaking expertise is integrated into the material selection of every bearing we make.
- **Timken experts are your experts** – customers worldwide leverage our technical experience to improve performance in their own operations.



PERFORMANCE THAT RAISES THE BAR

We've applied more than 80 years of cylindrical roller bearing design and manufacturing experience to achieve the highest levels of performance in the industry. In fact, Timken tests indicate that our new EMA series of cylindrical roller bearings offer greater performance than the Timken-published ratings and the leading high-performance industry design.

INNOVATIVE DESIGN

From a unique cage design to our proprietary internal geometries and special surface textures, Timken® single-row EMA series cylindrical roller bearings feature unique characteristics designed to increase load ratings – resulting in longer life, improved uptime and reduced maintenance costs.

PREMIUM CAGE

Our EMA series bearings include a one-piece brass cage with a full-milled pocket design. The first of its kind in the industry, this Timken innovation is a land-riding cage which, unlike traditional roller-riding cages, minimizes drag on the

roller elements. This helps reduce heat generation and improve bearing life.

Compared to a two-piece cage design, our one-piece open pocket cage also reduces heat and wear by enhancing lubrication flow. The high cage rigidity allows for more rollers than possible with other brass cage configurations.



UNIQUE INTERNAL GEOMETRIES

Proprietary profiles on the races and rollers increase load capacity over other competing designs.

ENHANCED SURFACE TEXTURES

Engineered process for rings and rollers enhance surface textures for smoother operation, reducing friction, lowering operating temperatures and promoting longer bearing life.

In fact, surface textures on Timken's EMA series bearings nearly double the operating contact lambda ratio, resulting in a 1.5 times increase in predicted bearing life under severe operating conditions.



COMPACT DESIGN

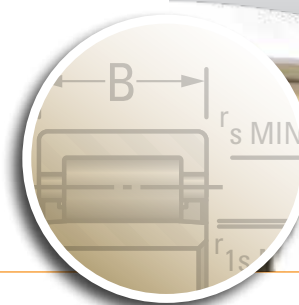
Just as with every other Timken bearing design, our EMA series bearings are engineered for the greatest performance in the smallest design envelope possible. This helps original equipment manufacturers reduce their capital investment costs by building smaller equipment. It also contributes to more lightweight equipment, which can help end users reduce energy consumption.



TIMKEN®

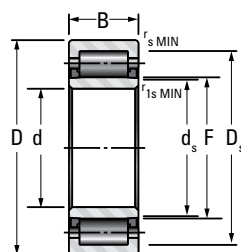
SINGLE-ROW EMA SERIES

CYLINDRICAL ROLLER BEARINGS



Timken's single-row EMA series of cylindrical roller bearings is available in a wide variety of size ranges and configurations to meet various application requirements.

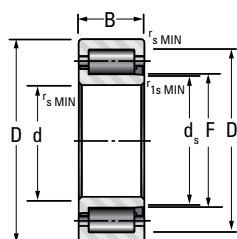
Size ranges: 80 mm ID - 400 mm OD | **Designs:** N, NU, NJ, NUP | **Common applications:** wind energy, metals, construction, mining, pumps, hoists, gear drives and other industrial equipment



TYPE NU

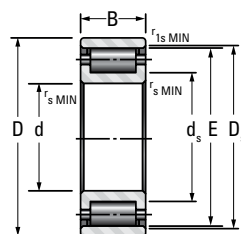
The most popular cylindrical roller bearing design, Type NU may be used in one or two positions for shaft support if other means of axial location are provided. The outer ring has two

integral ribs while the inner ring has a cylindrical outer diameter without ribs. This type is not designed for any thrust load.



TYPE NJ

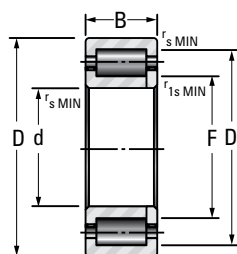
Type NJ has double-ribbed outer and single-ribbed inner rings and can support heavy radial loads, as well as light unidirectional thrust loads up to 30 percent of the radial load.



TYPE N

Type N bearings may be used in one or two positions for shaft support if other means of axial location are provided. The outer ring has a cylindrical bore without ribs and the inner ring

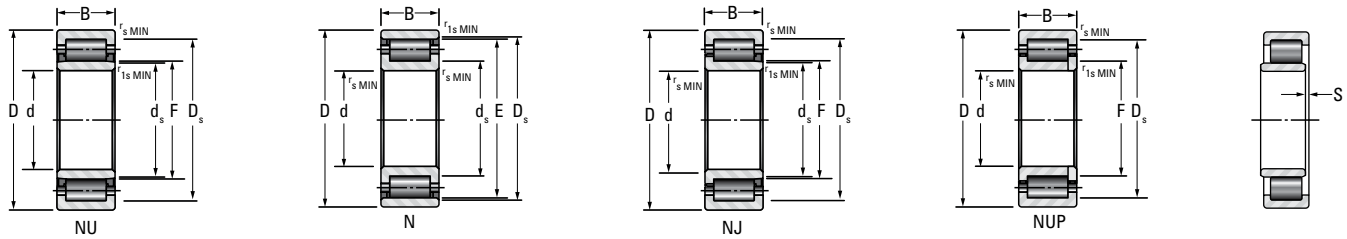
incorporates two ribs. This type is not designed for any thrust load.



TYPE NUP

Type NUP has a double-ribbed outer ring and a single-ribbed inner ring with an abutting loose rib, allowing the bearing to provide axial location and to carry light thrust loads in both directions.

TIMKEN® SINGLE-ROW EMA SERIES CYLINDRICAL ROLLER BEARINGS BY BORE SIZE

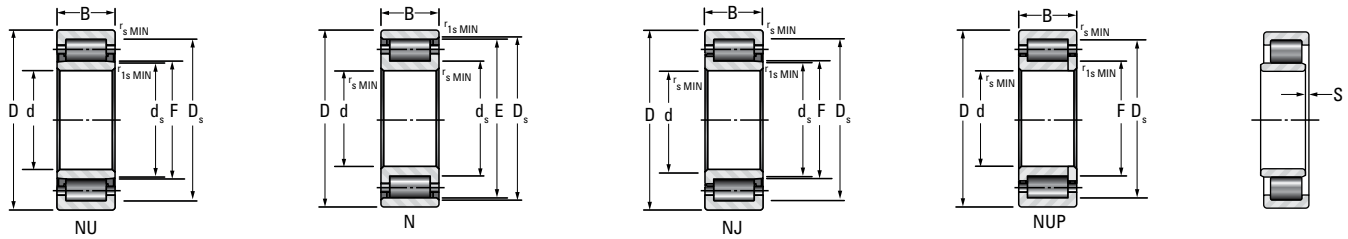


Bearing Dimensions				Load Ratings		Part Number		Mounting Data					Bearing Mass	Cg (3)	Thermal Speed Rating	
				Dynamic (1)	Static	Bearing (2)	Type			Backing Diameter						
d	D	B	F/E	C ₁	C ₀			r _s MIN	r _{1s} MIN	ds	Ds	s				
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing					
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch	kg. lb.		RPM	RPM
80.000	140.000	26.000	95.300	155	169	NU216EMA	NU	2.0	2.0	92.4	127.3	1.7	1.80	0.079	4300	3600
3.1496	5.5118	1.0236	3.7520	34900	38000			0.08	0.08	3.64	5.01	0.07	3.63			
80.000	140.000	33.000	95.300	208	245	NU2216EMA	NU	2.0	2.0	91.3	127.3	1.7	2.20	0.086	3400	2900
3.1496	5.5118	1.2992	3.7520	46800	55100			0.08	0.08	3.59	5.01	0.07	4.80			
80.000	140.000	33.000	95.300	208	245	NJ2216EMA	NJ	2.0	2.0	91.3	127.3	1.7	2.20	0.086	3400	2900
3.1496	5.5118	1.2992	3.7520	46800	55100			0.08	0.08	3.59	5.01	0.07	4.90			
80.000	140.000	33.000	95.300	208	245	NUP2216EMA	NUP	2.0	2.0	95.3	127.3	-	2.30	0.086	3400	2900
3.1496	5.5118	1.2992	3.7520	46800	55100			0.08	0.08	3.75	5.01	-	5.10			
80.000	170.000	39.000	101.000	290	289	NU316EMA	NU	2.1	2.1	96.5	151.0	2.4	4.60	0.088	4100	3500
3.1496	6.6929	1.5354	3.9764	65300	64900			0.08	0.08	3.80	5.94	0.09	10.12			
80.000	170.000	58.000	101.000	406	439	NU2316EMA	NU	2.1	2.1	95.4	151.0	5.0	6.00	0.097	3400	3000
3.1496	6.6929	2.2835	3.9764	91300	98700			0.08	0.08	3.76	5.94	0.20	12.50			
85.000	150.000	28.000	100.500	186	201	NU217EMA	NU	2.0	2.0	96.6	136.5	1.7	2.10	0.083	4000	3400
3.3465	5.9055	1.1024	3.9567	41900	45200			0.08	0.08	3.80	5.37	0.07	5.80			
85.000	150.000	36.000	100.500	244	282	NU2217EMA	NU	2.0	2.0	97.1	136.5	2.2	2.70	0.090	3300	2800
3.3465	5.9055	1.4173	3.9567	54900	63300			0.08	0.08	3.82	5.37	0.09	5.80			
85.000	180.000	41.000	108.000	313	314	NU317EMA	NU	3.0	3.0	103.6	160.0	3.5	5.10	0.092	3900	3400
3.3465	7.0866	1.6142	4.2520	70400	70600			0.12	0.12	4.08	6.30	0.14	5.80			
85.000	180.000	60.000	108.000	423	458	NU2317EMA	NU	3.0	3.0	101.8	160.0	5.5	7.50	0.100	3300	2800
3.3465	7.0866	2.3622	4.2520	95200	103000			0.12	0.12	4.01	6.30	0.22	5.80			
90.000	160.000	30.000	107.000	206	225	NU218EMA	NU	2.0	2.0	103.6	145.0	2.7	2.60	0.087	3900	3300
3.5433	6.2992	1.1811	4.2126	46400	50500			0.08	0.08	4.08	5.71	0.11	5.80			
90.000	160.000	30.000	107.000	206	225	NJ218EMA	NJ	2.0	2.0	103.6	145.0	2.7	2.70	0.087	3900	3300
3.5433	6.2992	1.1811	4.2126	46400	50500			0.08	0.08	4.08	5.71	0.11	5.90			
90.000	160.000	40.000	107.000	275	321	NUP2218EMA	NUP	2.0	2.0	102.9	145.0	-	3.60	0.094	3300	2800
3.5433	6.2992	1.5748	4.2126	61800	72200			0.08	0.08	4.05	5.71	-	8.00			
90.000	190.000	43.000	113.500	359	362	NU318EMA	NU	3.0	3.0	107.9	169.5	2.5	6.10	0.096	3700	3200
3.5433	7.4803	1.6929	4.4685	80700	81500			0.12	0.12	4.25	6.67	0.10	13.40			

(1) Based on 1 X 10⁶ L₁₀ life for the ISO life calculation method.

(2) N, NF, NP, NJF designs are available by request. Minimum volumes may apply.

(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.



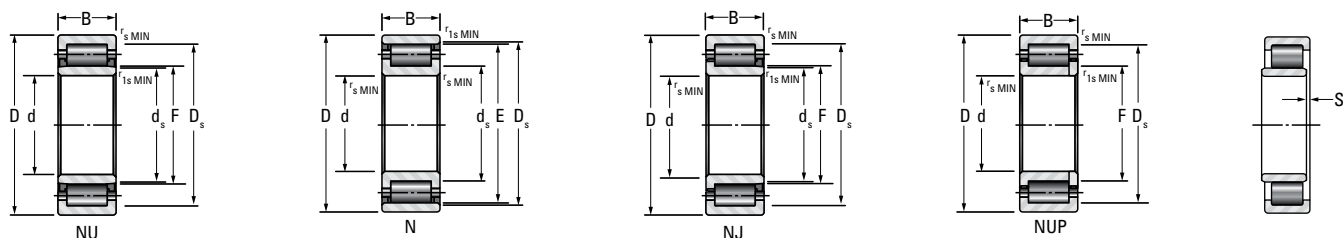
Bearing Dimensions				Load Ratings		Part Number		Mounting Data					Bearing Mass	Cg (3)	Thermal Speed Rating		
				Dynamic (1)	Static					Backing Diameter							
d	D	B	F/E	C ₁	C ₀	Bearing (2)	Type	r _s MIN	r _{1s} MIN	ds	Ds	s					
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing						
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch	kg. lb.				
90.000	190.000	43.000	113.500	359	362	NJ318EMA	NJ	3.0	3.0	107.9	169.5	2.5	6.20	0.096	3700	3200	
3.5433	7.4803	1.6929	4.4685	80700	81500			0.12	0.12	4.25	6.67	0.10	13.60				
90.000	190.000	64.000	113.500	497	544	NU2318EMA	NU	3.0	3.0	106.8	169.5	5.0	9.10	0.106	3000	2600	
3.5433	7.4803	2.5197	4.4685	112000	122000			0.12	0.12	4.20	6.67	0.20	20.00				
90.000	190.000	64.000	113.500	497	544	NJ2318EMA	NJ	3.0	3.0	106.8	169.5	5.0	9.30	0.106	3000	2600	
3.5433	7.4803	2.5197	4.4685	112000	122000			0.12	0.12	4.20	6.67	0.20	20.40				
95.000	170.000	32.000	112.500	248	271	NU219EMA	NU	2.1	2.1	109.1	154.5	1.8	3.10	0.092	3600	3100	
3.7402	6.6929	1.2598	4.4291	55800	60900			0.08	0.08	4.30	6.08	0.07	6.90				
95.000	170.000	32.000	112.500	248	271	NJ219EMA	NJ	2.1	2.1	109.1	154.5	1.8	3.20	0.092	3600	3100	
3.7402	6.6929	1.2598	4.4291	55800	60900			0.08	0.08	4.30	6.08	0.07	7.00				
95.000	170.000	43.000	112.500	324	378	NU2219EMA	NU	2.1	2.1	108.1	154.5	3.5	4.20	0.099	3100	2700	
3.7402	6.6929	1.6929	4.4291	72800	84900			0.08	0.08	4.26	6.08	0.14	9.30				
95.000	170.000	43.000	112.500	324	378	NJ2219EMA	NJ	2.1	2.1	108.1	154.5	3.5	4.30	0.099	3100	2700	
3.7402	6.6929	1.6929	4.4291	72800	84900			0.08	0.08	4.26	6.08	0.14	9.50				
95.000	200.000	45.000	121.500	379	395	NU319EMA	NU	3.0	3.0	115.3	177.5	3.0	7.10	0.101	3500	3100	
3.7402	7.8740	1.7717	4.7835	85300	88900			0.12	0.12	4.54	6.99	0.12	15.70				
95.000	200.000	45.000	121.500	379	395	NJ319EMA	NJ	3.0	3.0	115.3	177.5	3.0	7.30	0.101	3500	3100	
3.7402	7.8740	1.7717	4.7835	85300	88900			0.12	0.12	4.54	6.99	0.12	16.00				
95.000	200.000	67.000	121.500	525	593	NU2319EMA	NU	3.0	3.0	115.5	177.5	7.1	10.40	0.111	2800	2500	
3.7402	7.8740	2.6378	4.7835	118000	133000			0.12	0.12	4.55	6.99	0.28	22.80				
95.000	200.000	67.000	121.500	525	593	NJ2319EMA	NJ	3.0	3.0	115.5	177.5	7.1	10.60	0.111	2800	2500	
3.7402	7.8740	2.6378	4.7835	118000	133000			0.12	0.12	4.55	6.99	0.28	23.30				
100.000	180.000	34.000	119.000	280	311	NU220EMA	NU	2.1	2.1	115.0	163.0	2.3	3.80	0.097	3500	3000	
3.9370	7.0866	1.3386	4.6850	63000	70000			0.08	0.08	4.53	6.42	0.09	8.40				
100.000	180.000	34.000	119.000	280	311	NJ220EMA	NJ	2.1	2.1	115.0	163.0	2.3	3.90	0.097	3500	3000	
3.9370	7.0866	1.3386	4.6850	63000	70000			0.08	0.08	4.53	6.42	0.09	8.60				
100.000	180.000	46.000	119.000	377	451	NU2220EMA	NU	2.1	2.1	115.0	163.0	3.3	5.20	0.105	2900	2500	
3.9370	7.0866	1.8110	4.6850	84800	101000			0.08	0.08	4.53	6.42	0.13	11.40				

(1) Based on 1 X 10⁶ L₁₀ life for the ISO life calculation method.

(2) N, NF, NP, NJF designs are available by request. Minimum volumes may apply.

(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.

TIMKEN® SINGLE-ROW EMA SERIES CYLINDRICAL ROLLER BEARINGS BY BORE SIZE *cont.*

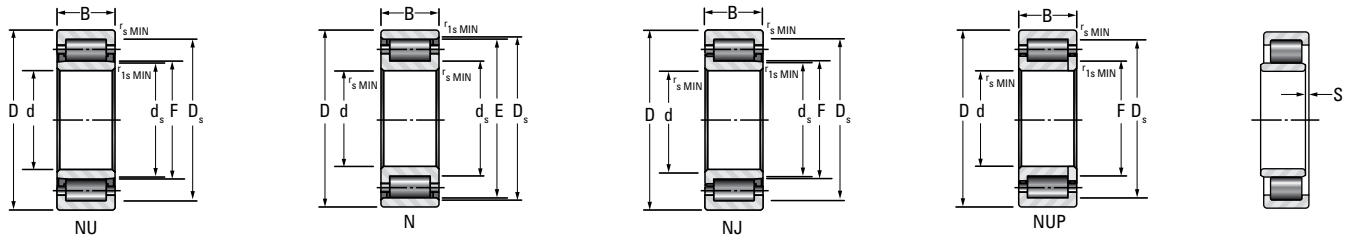


Bearing Dimensions				Load Ratings		Part Number		Mounting Data					Bearing Mass	Cg (3)	Thermal Speed Rating	
				Dynamic (1)	Static					Backing Diameter						
d	D	B	F/E	C ₁	C ₀	Bearing (2)	Type	r _s MIN	r _{1s} MIN	ds	Ds	s			Oil	Grease
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing					
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch	kg. lb.	RPM		
100.000	180.000	46.000	119.000	377	451	NJ2220EMA	NJ	2.1	2.1	115.0	163.0	3.3	5.30	0.105	2900	2500
3.9370	7.0866	1.8110	4.6850	84800	101000			0.08	0.08	4.53	6.42	0.13	11.60			
100.000	215.000	47.000	127.500	437	442	NU320EMA	NU	3.0	3.0	120.7	191.5	3.0	8.60	0.104	3300	2900
3.9370	8.4646	1.8504	5.0197	98200	99400			0.12	0.12	4.75	7.54	0.12	19.00			
100.000	215.000	47.000	127.500	437	442	NJ320EMA	NJ	3.0	3.0	120.7	191.5	3.0	8.80	0.104	3300	2900
3.9370	8.4646	1.8504	5.0197	98200	99400			0.12	0.12	4.75	7.54	0.12	19.40			
100.000	215.000	73.000	127.500	658	737	NU2320EMA	NU	3.0	3.0	120.4	191.5	5.2	13.40	0.117	2500	2200
3.9370	8.4646	2.8740	5.0197	148000	166000			0.12	0.12	4.74	7.54	0.20	29.50			
100.000	215.000	73.000	127.500	658	737	NJ2320EMA	NJ	3.0	3.0	120.4	191.5	5.2	13.70	0.117	2500	2200
3.9370	8.4646	2.8740	5.0197	148000	166000			0.12	0.12	4.74	7.54	0.20	30.10			
110.000	200.000	38.000	132.500	331	374	NU222EMA	NU	2.1	2.1	128.5	180.5	2.5	5.40	0.104	3300	2800
4.3307	7.8740	1.4961	5.2165	74400	84000			0.08	0.08	5.06	7.11	0.10	11.90			
110.000	200.000	38.000	132.500	331	374	NJ222EMA	NJ	2.1	2.1	128.5	180.5	2.5	5.50	0.104	3300	2800
4.3307	7.8740	1.4961	5.2165	74400	84000			0.08	0.08	5.06	7.11	0.10	12.10			
110.000	200.000	53.000	132.500	436	527	NU2222EMA	NU	2.1	2.1	126.8	180.5	4.1	7.50	0.113	2800	2400
4.3307	7.8740	2.0866	5.2165	98000	118000			0.08	0.08	4.99	7.11	0.16	16.50			
110.000	200.000	53.000	132.500	436	527	NJ2222EMA	NJ	2.1	2.1	126.8	180.5	4.1	7.60	0.113	2800	2400
4.3307	7.8740	2.0866	5.2165	98000	118000			0.08	0.08	4.99	7.11	0.16	16.80			
110.000	240.000	50.000	143.000	519	546	NU322EMA	NU	3.0	3.0	136.2	211.0	3.0	11.60	0.114	2900	2500
4.3307	9.4488	1.9685	5.6299	11700	123000			0.12	0.12	5.36	8.31	0.12	25.40			
110.000	240.000	50.000	143.000	519	546	NJ322EMA	NJ	3.0	3.0	136.2	211.0	3.0	11.80	0.114	2900	2500
4.3307	9.4488	1.9685	5.6299	11700	123000			0.12	0.12	5.36	8.31	0.12	25.90			
110.000	240.000	80.000	143.000	768	891	NU2322EMA	NU	3.0	3.0	134.6	211.0	6.4	18.80	0.128	2200	1900
4.3307	9.4488	3.1496	5.6299	173000	200000			0.12	0.12	5.30	8.31	0.25	41.30			
110.000	240.000	80.000	143.000	768	891	NJ2322EMA	NJ	3.0	3.0	134.6	211.0	6.4	19.20	0.128	2200	1900
4.3307	9.4488	3.1496	5.6299	173000	200000			0.12	0.12	5.30	8.31	0.25	42.10			
120.000	180.000	28.000	135.000	158	202	NU1024MA	NU	2.0	1.1	131.2	165.0	3.8	2.60	0.096	3600	2900
4.7244	7.0866	1.1024	5.3150	35600	45300			0.08	0.04	5.17	6.50	0.15	5.60			

(1) Based on 1 X 10⁶ L₁₀ life for the ISO life calculation method.

(2) N, NF, NP, NJF designs are available by request. Minimum volumes may apply.

(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.



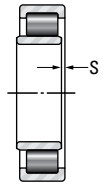
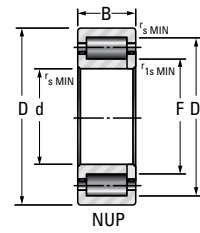
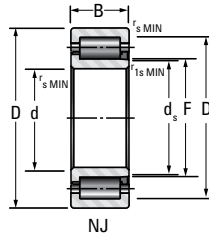
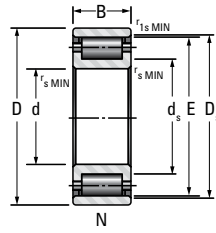
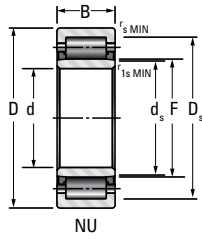
Bearing Dimensions				Load Ratings		Part Number		Mounting Data					Bearing Mass	Cg (3)	Thermal Speed Rating		
				Dynamic (1)	Static					Backing Diameter							
d	D	B	F/E	C ₁	C ₀	Bearing (2)	Type	r _s MIN	r _{1s} MIN	ds	Ds	s				Oil	Grease
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing						
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch	kg. lb.				
120.000	215.000	40.000	143.500	379	431	NU224EMA	NU	2.1	2.1	138.0	195.5	2.1	6.50	0.111	3000	2600	
4.7244	8.4646	1.5748	5.6496	85300	97000			0.08	0.08	5.43	7.70	0.08	14.30				
120.000	215.000	40.000	143.500	379	431	NJ224EMA	NJ	2.1	2.1	138.0	195.5	2.1	6.60	0.111	3000	2600	
4.7244	8.4646	1.5748	5.6496	85300	97000			0.08	0.08	5.43	7.70	0.08	14.50				
120.000	215.000	58.000	143.500	514	630	NU2224EMA	NU	2.1	2.1	137.4	195.5	4.6	9.40	0.121	2500	2200	
4.7244	8.4646	2.2835	5.6496	116000	142000			0.08	0.08	5.41	7.70	0.18	20.80				
120.000	215.000	58.000	143.500	514	630	NJ2224EMA	NJ	2.1	2.1	137.4	195.5	4.6	9.60	0.121	2500	2200	
4.7244	8.4646	2.2835	5.6496	116000	142000			0.08	0.08	5.41	7.70	0.18	21.20				
120.000	260.000	55.000	154.000	594	614	NU324EMA	NU	3.0	3.0	147.0	230.0	3.8	14.70	0.120	2700	2300	
4.7244	10.2362	2.1654	6.0630	134000	138000			0.12	0.12	5.79	9.06	0.15	32.30				
120.000	260.000	55.000	154.000	594	614	NJ324EMA	NJ	3.0	3.0	147.0	230.0	3.8	15.00	0.120	2700	2300	
4.7244	10.2362	2.1654	6.0630	134000	138000			0.12	0.12	5.79	9.06	0.15	32.90				
120.000	260.000	86.000	154.000	902	1040	NU2324EMA	NU	3.0	3.0	145.9	230.0	6.3	23.20	0.136	2000	1700	
4.7244	10.2362	3.3858	6.0630	203000	233000			0.12	0.12	5.74	9.06	0.25	51.10				
120.000	260.000	86.000	154.000	902	1040	NJ2324EMA	NJ	3.0	3.0	145.9	230.0	6.3	23.60	0.136	2000	1700	
4.7244	10.2362	3.3858	6.0630	203000	233000			0.12	0.12	5.74	9.06	0.25	52.00				
130.000	230.000	40.000	153.500	411	464	NU226EMA	NU	3.0	3.0	148.0	209.5	2.2	7.20	0.115	2800	2400	
5.1181	9.0551	1.5748	6.0433	92300	104000			0.12	0.12	5.83	8.25	0.09	15.80				
130.000	230.000	40.000	153.500	411	464	NJ226EMA	NJ	3.0	3.0	148.0	209.5	2.2	7.30	0.115	2800	2400	
5.1181	9.0551	1.5748	6.0433	92300	104000			0.12	0.12	5.83	8.25	0.09	16.10				
130.000	230.000	64.000	153.500	603	750	NU2226EMA	NU	3.0	3.0	146.8	209.5	5.0	11.50	0.129	2300	2000	
5.1181	9.0551	2.5197	6.0433	135000	169000			0.12	0.12	5.78	8.25	0.20	25.40				
130.000	230.000	64.000	153.500	603	750	NJ2226EMA	NJ	3.0	3.0	146.8	209.5	5.0	11.80	0.129	2300	2000	
5.1181	9.0551	2.5197	6.0433	135000	169000			0.12	0.12	5.78	8.25	0.20	25.90				
130.000	280.000	58.000	167.000	701	753	NU326EMA	NU	4.0	4.0	159.7	247.0	3.7	18.20	0.108	2300	2000	
5.1181	11.0236	2.2835	6.5748	158000	169000			0.16	0.16	6.29	9.72	0.14	40.00				
130.000	280.000	58.000	167.000	701	753	NJ326EMA	NJ	4.0	4.0	159.7	247.0	3.7	18.50	0.108	2300	2000	
5.1181	11.0236	2.2835	6.5748	158000	169000			0.16	0.16	6.29	9.72	0.14	40.70				

(1) Based on 1 X 10⁶ L₁₀ life for the ISO life calculation method.

(2) N, NF, NP, NJF designs are available by request. Minimum volumes may apply.

(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.

TIMKEN® SINGLE-ROW EMA SERIES CYLINDRICAL ROLLER BEARINGS BY BORE SIZE *cont.*

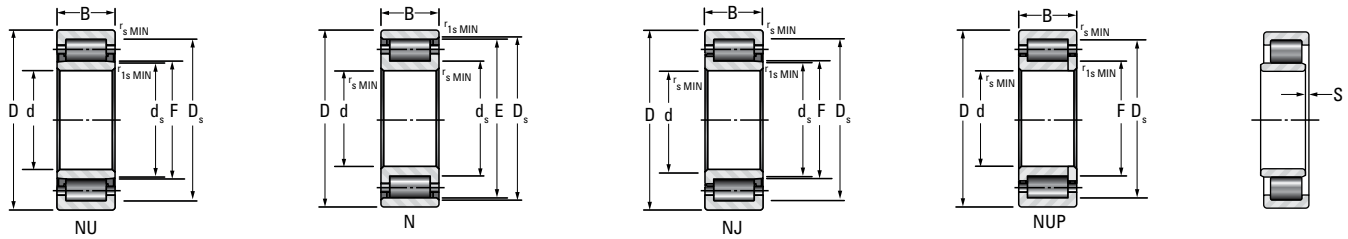


Bearing Dimensions				Load Ratings		Part Number		Mounting Data						Bearing Mass	Cg (3)	Thermal Speed Rating		
				Dynamic (1)	Static					Backing Diameter								
d	D	B	F/E	C ₁	C ₀	Bearing (2)	Type	r _s MIN	r _{1s} MIN	ds	Ds	s					Oil	Grease
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing							
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch		kg. lb.				
140.000	250.000	42.000	169.000	443	526	NU228EMA	NU	3.0	3.0	162.4	225.0	2.1	9.20	0.124	2600	2200		
5.5118	9.8425	1.6535	6.6535	99500	118000			0.12	0.12	6.39	8.86	0.08	20.30					
140.000	250.000	42.000	169.000	443	526	NJ228EMA	NJ	3.0	3.0	162.4	225.0	2.1	9.40	0.124	2600	2200		
5.5118	9.8425	1.6535	6.6535	99500	118000			0.12	0.12	6.39	8.86	0.08	20.70					
140.000	250.000	68.000	169.000	650	850	NU2228EMA	NU	3.0	3.0	160.1	225.0	5.0	14.80	0.138	2100	1800		
5.5118	9.8425	2.6772	6.6535	146000	191000			0.12	0.12	6.30	8.86	0.20	32.50					
140.000	250.000	68.000	169.000	650	850	NJ2228EMA	NJ	3.0	3.0	160.1	225.0	5.0	15.10	0.138	2100	1800		
5.5118	9.8425	2.6772	6.6535	146000	191000			0.12	0.12	6.30	8.86	0.20	33.20					
140.000	300.000	62.000	180.000	771	837	NU328EMA	NU	4.0	4.0	174.2	264.0	5.2	22.10	0.114	2100	1900		
5.5118	11.8110	2.4409	7.0866	173000	188000			0.16	0.16	6.86	10.39	0.20	48.50					
140.000	300.000	62.000	180.000	771	837	NJ328EMA	NJ	4.0	4.0	174.2	264.0	5.2	22.50	0.114	2100	1900		
5.5118	11.8110	2.4409	7.0866	173000	188000			0.16	0.16	6.86	10.39	0.20	49.50					
140.000	300.000	102.000	180.000	1180	1420	NU2328EMA	NU	4.0	4.0	171.3	264.0	9.7	36.10	0.129	1600	1400		
5.5118	11.8110	4.0157	7.0866	265000	319000			0.16	0.16	6.74	10.39	0.38	79.40					
140.000	300.000	102.000	180.000	1180	1420	NJ2328EMA	NJ	4.0	4.0	171.3	264.0	9.7	36.80	0.129	1600	1400		
5.5118	11.8110	4.0157	7.0866	265000	319000			0.16	0.16	6.74	10.39	0.38	81.00					
150.000	225.000	35.000	169.500	231	309	NU1030MA	NU	2.1	1.5	164.6	205.5	4.9	4.90	0.115	3100	2500		
5.9055	8.8583	1.3780	6.6732	51900	69500			0.08	0.06	6.48	8.09	0.19	10.80					
150.000	270.000	45.000	182.000	506	607	NU230EMA	NU	3.0	3.0	176.9	242.0	4.0	11.60	0.109	2400	2000		
5.9055	10.6299	1.7717	7.1654	114000	137000			0.12	0.12	6.96	9.53	0.16	25.60					
150.000	270.000	45.000	182.000	506	607	NJ230EMA	NJ	3.0	3.0	176.9	242.0	4.0	12.00	0.109	2400	2000		
5.9055	10.6299	1.7717	7.1654	114000	137000			0.12	0.12	6.96	9.53	0.16	26.30					
150.000	270.000	45.000	182.000	506	607	NUP230EMA	NUP	3.0	3.0	176.9	242.0	-	12.10	0.109	2400	2000		
5.9055	10.6299	1.7717	7.1654	114000	137000			0.12	0.12	6.96	9.53	-	26.60					
150.000	270.000	73.000	182.000	752	998	NU2230EMA	NU	3.0	3.0	176.0	242.0	4.0	18.50	0.123	1800	1600		
5.9055	10.6299	2.8740	7.1654	169000	224000			0.12	0.12	6.93	9.53	0.16	40.70					
150.000	270.000	73.000	182.000	752	998	NJ2230EMA	NJ	3.0	3.0	176.0	242.0	4.0	18.80	0.123	1800	1600		
5.9055	10.6299	2.8740	7.1654	169000	224000			0.12	0.12	6.93	9.53	0.16	41.36					

(1) Based on 1 X 10⁶ L₁₀ life for the ISO life calculation method.

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(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.



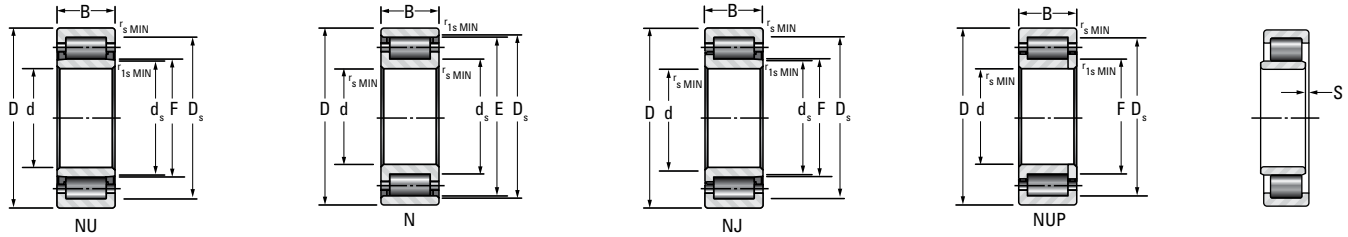
Bearing Dimensions				Load Ratings		Part Number		Mounting Data					Bearing Mass	Cg (3)	Thermal Speed Rating		
				Dynamic (1)	Static					Backing Diameter							
d	D	B	F/E	C ₁	C ₀	Bearing (2)	Type	r _s MIN	r _{1s} MIN	ds	Ds	s					
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing						
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch	kg. lb.				
150.000	320.000	65.000	193.000	870	951	NU330EMA	NU	4.0	4.0	186.0	283.0	4.0	27.50	0.120	1900	1700	
5.9055	12.5984	2.5591	7.5984	196000	214000			0.16	0.16	7.32	11.14	0.16	60.50				
150.000	320.000	65.000	193.000	870	951	NJ330EMA	NJ	4.0	4.0	186.0	283.0	4.0	27.80	0.120	1900	1700	
5.9055	12.5984	2.5591	7.5984	196000	214000			0.16	0.16	7.32	11.14	0.16	61.16				
150.000	320.000	108.000	193.000	1330	1620	NU2330EMA	NU	4.0	4.0	186.0	283.0	9.0	45.50	0.136	1500	1300	
5.9055	12.5984	4.2520	7.5984	299000	364000			0.16	0.16	7.32	11.14	0.35	100.10				
150.000	320.000	108.000	193.000	1330	1620	NJ2330EMA	NJ	4.0	4.0	186.0	283.0	9.0	46.00	0.136	1500	1300	
5.9055	12.5984	4.2520	7.5984	299000	364000			0.16	0.16	7.32	11.14	0.35	101.20				
160.000	240.000	38.000	180.000	276	367	NU1032MA	NU	2.1	1.5	173.9	220.0	4.4	5.90	0.121	3000	2400	
6.2992	9.4488	1.4961	7.0866	62000	82500			0.08	0.06	6.85	8.66	0.17	13.00				
160.000	290.000	48.000	195.000	572	695	NU232EMA	NU	3.0	3.0	189.6	259.0	4.2	14.50	0.115	2200	1900	
6.2992	11.4173	1.8898	7.6772	129000	156000			0.12	0.12	7.46	10.20	0.17	31.80				
160.000	290.000	48.000	195.000	572	695	NJ232EMA	NJ	3.0	3.0	189.6	259.0	4.2	14.70	0.115	2200	1900	
6.2992	11.4173	1.8898	7.6772	129000	156000			0.12	0.12	7.46	10.20	0.17	32.40				
160.000	290.000	48.000	195.000	572	695	NUP232EMA	NUP	3.0	3.0	189.6	259.0	-	15.00	0.115	2200	1900	
6.2992	11.4173	1.8898	7.6772	129000	156000			0.12	0.12	7.46	10.20	-	33.00				
160.000	290.000	80.000	193.000	919	1210	NU2232EMA	NU	3.0	3.0	183.6	261.0	4.5	23.80	0.130	1600	1500	
6.2992	11.4173	3.1496	7.5984	207000	271000			0.12	0.12	7.23	10.28	0.18	52.40				
160.000	290.000	80.000	193.000	919	1210	NJ2232EMA	NJ	3.0	3.0	183.6	261.0	4.5	24.10	0.130	1600	1500	
6.2992	11.4173	3.1496	7.5984	207000	271000			0.12	0.12	7.23	10.28	0.18	53.02				
160.000	340.000	68.000	204.000	984	1090	NU332EMA	NU	4.0	4.0	195.0	300.0	4.0	32.00	0.126	1800	1600	
6.2992	13.3858	2.6772	8.0315	221000	244000			0.16	0.16	7.68	11.81	0.16	70.40				
160.000	340.000	68.000	204.000	984	1090	NJ332EMA	NJ	4.0	4.0	195.0	300.0	4.0	32.20	0.126	1800	1600	
6.2992	13.3858	2.6772	8.0315	221000	244000			0.16	0.16	7.68	11.81	0.16	70.84				
160.000	340.000	114.000	204.000	1500	1840	NU2332EMA	NU	4.0	4.0	195.0	300.0	9.0	53.00	0.143	1300	1200	
6.2992	13.3858	4.4882	8.0315	337000	413000			0.16	0.16	7.68	11.81	0.35	116.60				
160.000	340.000	114.000	204.000	1500	1840	NJ2332EMA	NJ	4.0	4.0	195.0	300.0	9.0	53.50	0.143	1300	1200	
6.2992	13.3858	4.4882	8.0315	337000	413000			0.16	0.16	7.68	11.81	0.35	117.70				

(1) Based on 1×10^6 L₁₀ life for the ISO life calculation method.

(2) N, NF, NP, NJF designs are available by request. Minimum volumes may apply.

(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.

TIMKEN® SINGLE-ROW EMA SERIES CYLINDRICAL ROLLER BEARINGS BY BORE SIZE *cont.*

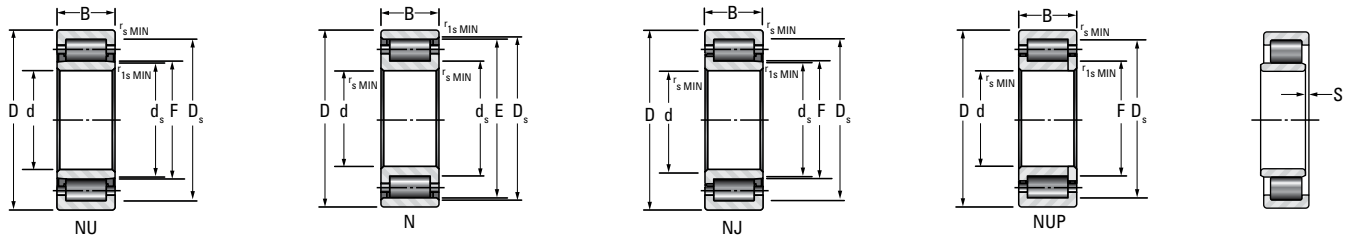


Bearing Dimensions				Load Ratings		Part Number		Mounting Data					Bearing Mass	Cg (3)	Thermal Speed Rating		
				Dynamic (1)	Static					Backing Diameter							
d	D	B	F/E	C ₁	C ₀	Bearing (2)	Type	r _s MIN	r _{1s} MIN	ds	Ds	s				Oil	Grease
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing						
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch	kg. lb.	RPM			
170.000	260.000	42.000	193.000	321	425	NU1034MA	NU	2.1	2.1	186.3	237.0	4.9	8.00	0.107	2800	2300	
6.6929	10.2362	1.6535	7.5984	72200	95600			0.08	0.08	7.33	9.33	0.19	17.70				
170.000	310.000	52.000	207.000	685	822	NU234EMA	NU	4.0	4.0	201.6	279.0	4.4	19.00	0.122	2000	1700	
6.6929	12.2047	2.0472	8.1496	154000	185000			0.16	0.16	7.94	10.98	0.17	41.80				
170.000	310.000	52.000	207.000	685	822	NJ234EMA	NJ	4.0	4.0	201.6	279.0	4.4	19.40	0.122	2000	1700	
6.6929	12.2047	2.0472	8.1496	154000	185000			0.16	0.16	7.94	10.98	0.17	42.68				
170.000	310.000	86.000	205.000	1100	1420	NU2234EMA	NU	4.0	4.0	196.9	281.0	4.5	29.50	0.138	1500	1300	
6.6929	12.2047	3.3858	8.0709	246000	320000			0.16	0.16	7.75	11.06	0.18	64.90				
170.000	360.000	72.000	218.000	1050	1160	NU334EMA	NU	4.0	4.0	210.0	318.0	6.4	37.50	0.131	1700	1500	
6.6929	14.1732	2.8346	8.5827	236000	261000			0.16	0.16	8.27	12.52	0.25	82.50				
170.000	360.000	120.000	216.000	1710	2110	NU2334EMA	NU	4.0	4.0	205.7	320.0	10.3	61.90	0.150	1200	1100	
6.6929	14.1732	4.7244	8.5039	385000	474000			0.16	0.16	8.10	12.60	0.41	136.20				
170.000	360.000	120.000	216.000	1710	2110	NJ2334EMA	NJ	4.0	4.0	205.7	320.0	10.3	63.00	0.150	1200	1100	
6.6929	14.1732	4.7244	8.5039	385000	474000			0.16	0.16	8.10	12.60	0.41	138.50				
180.000	280.000	46.000	205.000	386	500	NU1036MA	NU	2.1	2.1	198.9	255.0	6.1	10.30	0.112	2600	2100	
7.0866	11.0236	1.8110	8.0709	86800	112000			0.08	0.08	7.83	10.04	0.24	22.80				
180.000	320.000	52.000	217.000	711	874	NU236EMA	NU	4.0	4.0	211.6	289.0	4.4	19.50	0.126	1800	1600	
7.0866	12.5984	2.0472	8.5433	160000	196000			0.16	0.16	8.33	11.38	0.17	42.90				
180.000	320.000	52.000	217.000	711	874	NJ236EMA	NJ	4.0	4.0	211.6	289.0	4.4	19.90	0.126	1800	1600	
7.0866	12.5984	2.0472	8.5433	160000	196000			0.16	0.16	8.33	11.38	0.17	43.80				
180.000	320.000	86.000	215.000	1140	1520	NU2236EMA	NU	4.0	4.0	206.0	291.0	5.5	30.60	0.143	1400	1200	
7.0866	12.5984	3.3858	8.4646	256000	342000			0.16	0.16	8.11	11.46	0.22	67.32				
180.000	380.000	75.000	231.000	1130	1260	NU336EMA	NU	4.0	4.0	223.3	335.0	6.5	45.00	0.137	1600	1400	
7.0866	14.9606	2.9528	9.0945	254000	284000			0.16	0.16	8.79	13.19	0.26	99.00				
180.000	380.000	126.000	227.000	1860	2250	NU2336EMA	NU	4.0	4.0	215.0	339.0	8.7	71.50	0.154	1200	1000	
7.0866	14.9606	4.9606	8.9370	419000	506000			0.16	0.16	8.46	13.35	0.34	157.30				
190.000	290.000	46.000	215.000	396	525	NU1038MA	NU	2.1	2.1	207.9	265.0	6.1	10.70	0.116	2400	2000	
7.4803	11.4173	1.8110	8.4646	89100	118000			0.08	0.08	8.19	10.43	0.24	23.50				

(1) Based on 1 X 10⁶ L₁₀ life for the ISO life calculation method.

(2) N, NF, NP, NJF designs are available by request. Minimum volumes may apply.

(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.



Bearing Dimensions				Load Ratings		Part Number		Mounting Data					Bearing Mass	Cg (3)	Thermal Speed Rating			
				Dynamic (1)	Static					Backing Diameter								
d	D	B	F/E	C ₁	C ₀	Bearing (2)	Type	r _s MIN	r _{1s} MIN	ds	Ds	s					Oil	Grease
Bore	OD	Width	DUR/DOR					Chamfer	Chamfer	Shaft	Housing							
mm inch	mm inch	mm inch	mm inch	kN lbf.	kN lbf.			mm inch	mm inch	mm inch	mm inch	mm inch	kg. lb.					
190.000	340.000	55.000	230.000	777	960	NU238EMA	NU	4.0	4.0	224.3	306.0	4.5	23.50	0.132	1700	1500		
7.4803	13.3858	2.1654	9.0551	175000	216000			0.16	0.16	8.83	12.05	0.18	51.70					
190.000	340.000	55.000	230.000	777	960	NJ238EMA	NJ	4.0	4.0	224.3	306.0	4.5	24.00	0.132	1700	1500		
7.4803	13.3858	2.1654	9.0551	175000	216000			0.16	0.16	8.83	12.05	0.18	52.80					
190.000	340.000	92.000	228.000	1250	1680	NU2238EMA	NU	4.0	4.0	218.0	308.0	6.1	39.00	0.149	1300	1200		
7.4803	13.3858	3.6220	8.9764	281000	377000			0.16	0.16	8.58	12.13	0.24	85.80					
190.000	400.000	78.000	245.000	1280	1470	NU338EMA	NU	5.0	5.0	237.0	353.0	6.0	50.00	0.145	1400	1300		
7.4803	15.7480	3.0709	9.6457	287000	331000			0.20	0.20	9.33	13.90	0.24	110.00					
190.000	400.000	132.000	240.000	2060	2500	NU2338EMA	NU	5.0	5.0	227.6	360.0	9.8	82.50	0.161	1100	960		
7.4803	15.7480	5.1969	9.4488	464000	561000			0.20	0.20	8.96	14.17	0.39	181.50					
200.000	310.000	51.000	229.000	445	606	NU1040MA	NU	2.1	2.1	223.0	281.0	8.6	14.60	0.122	2300	1900		
7.8740	12.2047	2.0079	9.0157	100000	136000			0.08	0.08	8.78	11.06	0.34	23.50					
200.000	360.000	58.000	243.000	870	1090	NU240EMA	NU	4.0	4.0	236.8	323.0	4.7	27.40	0.137	1600	1400		
7.8740	14.1732	2.2835	9.5669	196000	245000			0.16	0.16	9.32	12.72	0.19	60.28					
200.000	360.000	98.000	241.000	1410	1900	NU2240EMA	NU	4.0	4.0	231.5	325.0	7.0	44.90	0.156	1200	1100		
7.8740	14.1732	3.8583	9.4882	316000	428000			0.16	0.16	9.11	12.80	0.28	98.90					
200.000	420.000	80.000	258.000	1360	1580	NU340EMA	NU	5.0	5.0	249.9	370.0	7.0	57.50	0.150	1300	1200		
7.8740	16.5354	3.1496	10.1575	306000	354000			0.20	0.20	9.84	14.57	0.28	126.50					
200.000	420.000	138.000	253.000	2230	2730	NU2340EMA	NU	5.0	5.0	240.2	377.0	10.0	96.50	0.167	1000	900		
7.8740	16.5354	5.4331	9.9606	501000	613000			0.20	0.20	9.46	14.84	0.39	212.30					
220.000	340.000	56.000	250.000	565	765	NU1044MA	NU	3.0	3.0	243.8	310.0	8.4	18.50	0.132	2000	1700		
8.6614	13.3858	2.2047	9.8425	127000	172000			0.12	0.12	9.60	12.20	0.33	40.70					
220.000	340.000	56.000	250.000	565	765	NJ1044MA	NJ	3.0	3.0	243.8	310.0	8.4	19.10	0.132	2000	1700		
8.6614	13.3858	2.2047	9.8425	127000	172000			0.12	0.12	9.60	12.20	0.33	42.02					
220.000	400.000	65.000	268.000	1040	1290	NU244EMA	NU	4.0	4.0	260.0	358.0	4.0	38.00	0.148	1400	1200		
8.6614	15.7480	2.5591	10.5512	233000	290000			0.16	0.16	10.24	14.09	0.16	83.60					
220.000	400.000	65.000	268.000	1040	1290	NJ244EMA	NJ	4.0	4.0	260.0	358.0	4.0	38.30	0.148	1400	1200		
8.6614	15.7480	2.5591	10.5512	233000	290000			0.16	0.16	10.24	14.09	0.16	84.26					
220.000	400.000	108.000	259.000	1820	2370	NU2244EMA	NU	4.0	4.0	250.0	363.0	7.4	62.60	0.165	1000	920		
8.6614	15.7480	4.2520	10.1969	409000	533000			0.16	0.16	9.84	14.29	0.29	138.00					

(1) Based on $1 \times 10^6 L_{10}$ life for the ISO life calculation method.

(2) N, NF, NP, NJF designs are available by request. Minimum volumes may apply.

(3) Geometry constant for lubrication life adjustment factor a3l. For more information, contact your Timken representative.

RADIAL INTERNAL CLEARANCE CODES

Timken cylindrical roller bearings are available with the radial internal clearance (RIC) designations specified below. When placing an order, the desired RIC code (C2, C3, C4, C5) must be added to the part number following all other suffixes.

Bore (mm)		Radial Internal Clearance (Straight Bore)									
Over	Inclusive	C2		Normal		C3		C4		C5	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
		mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.	mm in.
80	100	0.050	0.015	0.085	0.050	0.110	0.075	0.140	0.105	0.190	0.155
		0.0020	0.0006	0.0033	0.0020	0.0043	0.0030	0.0055	0.0041	0.0075	0.0061
100	120	0.055	0.015	0.090	0.050	0.125	0.085	0.165	0.125	0.220	0.180
		0.0022	0.0006	0.0035	0.0020	0.0049	0.0033	0.0065	0.0049	0.0087	0.0071
120	140	0.060	0.015	0.105	0.060	0.145	0.100	0.190	0.145	0.245	0.200
		0.0024	0.0006	0.0041	0.0024	0.0057	0.0039	0.0075	0.0057	0.0096	0.0079
140	160	0.070	0.020	0.120	0.070	0.165	0.115	0.215	0.165	0.275	0.225
		0.0028	0.0008	0.0047	0.0028	0.0065	0.0045	0.0085	0.0065	0.0108	0.0089
160	180	0.075	0.025	0.125	0.075	0.170	0.120	0.220	0.170	0.300	0.250
		0.0030	0.0010	0.0049	0.0030	0.0067	0.0047	0.0087	0.0067	0.0118	0.0098
180	200	0.090	0.035	0.145	0.090	0.195	0.140	0.250	0.195	0.330	0.275
		0.0035	0.0014	0.0057	0.0035	0.0077	0.0055	0.0098	0.0077	0.0130	0.0108
200	225	0.105	0.045	0.165	0.105	0.220	0.160	0.280	0.220	0.365	0.305
		0.0041	0.0018	0.0065	0.0041	0.0087	0.0063	0.0110	0.0087	0.0144	0.0120
225	250	0.110	0.045	0.175	0.110	0.235	0.170	0.300	0.235	0.395	0.330
		0.0043	0.0018	0.0069	0.0043	0.0093	0.0067	0.0118	0.0093	0.0156	0.0130
250	280	0.125	0.055	0.195	0.125	0.260	0.190	0.330	0.260	0.440	0.370
		0.0049	0.0022	0.0077	0.0049	0.0102	0.0075	0.0130	0.0102	0.0173	0.0146
280	315	0.130	0.055	0.205	0.130	0.275	0.200	0.350	0.275	0.485	0.410
		0.0051	0.0022	0.0081	0.0051	0.0108	0.0079	0.0138	0.0108	0.0191	0.0161
315	355	0.145	0.065	0.225	0.145	0.305	0.225	0.385	0.305	0.535	0.455
		0.0057	0.0026	0.0089	0.0057	0.0120	0.0089	0.0152	0.0120	0.0211	0.0179

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