

**NSK**

**EXTRA-CAPACITY ECA SPHERICAL ROLLER BEARINGS**

A NEW STANDARD IN HIGH PERFORMANCE





## FIELD-PROVEN TO OUTPERFORM AND OUTLAST: NSKHPS

Extreme heavy and impact loads in steelmaking, mining and construction. Extreme speeds and high heat in papermaking. Extreme reliability where and when unexpected machine and equipment downtime is intolerable.

For the spherical roller bearings employed in industry's most challenging applications, the expectations are invariably demanding: to run harder, to run faster, to run longer. And to transcend being mere load bearing components to being performance enhancers - mitigating maintenance and operating costs, improving throughput and profitability.

Decisively.

That measure of differentiation is achieved by better manufacturing processes, better material technology, better design fundamentals.

That differentiation is NSKHPS Spherical Roller Bearings.

## A NEW STANDARD IN HIGH PERFORMANCE

NSKHPS Spherical Roller Bearings are the synthesis of NSK technologies, with material engineering, tribology, mechanical design and advanced manufacturing fully engaged to significantly outperform and outlast conventional designs.

With our new extra-capacity ECA spherical roller bearings, NSK has redefined our high-performance standards to deliver unrivalled machinery and equipment performance with:

- ➔ **Newly optimized internal design** and an advanced roller-guided cage that eliminates the need for a center guide ring
- ➔ **Higher load capacities** derived from a larger complement of larger-sized rollers
- ➔ **Higher limiting speeds** are achievable, even greater than comparable steel cage designs



# DESIGN FEATURES AND PERFORMANCE CHARACTERISTICS

Boasting a newly optimized internal design and advanced NSK technologies, ECA Spherical Roller Bearings deliver a new level of performance, capacity, speed and reliability across all applications.

## DESIGN FEATURES

- › Manufactured with high purity steel for superior fatigue strength
- › Next-generation, roller-guided machined brass cage eliminates the need for a center guide ring, reducing sliding friction and wear
- › Optimized internal design packs in more rollers of larger size for a significant increase in load capacity and bearing fatigue life
- › Advanced raceway surface finish for improved lubrication characteristics and wear resistance
- › With outer ring lubricating groove and holes
- › High-temperature dimensional stability in working temperatures as great as 200°C



### DYNAMIC LOAD RATINGS

increased by as much as

**47%**



### STATIC LOAD RATINGS

increased by as much as

**22%**

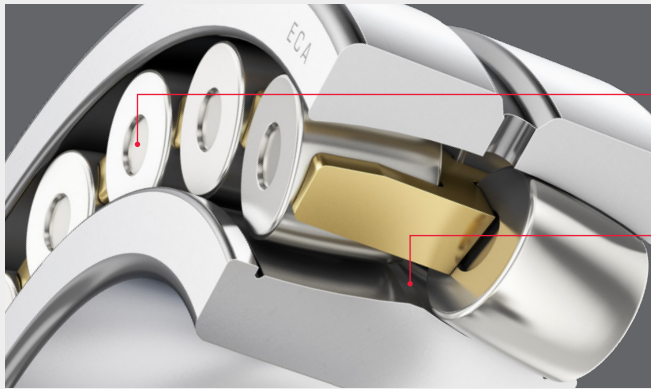


### LIMITING SPEEDS

increased by as much as

**20%\***

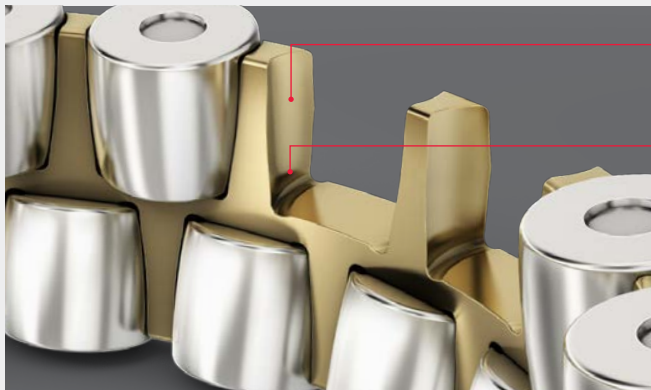
\* compared with NSK EA steel cage type



## DESIGN OPTIMIZATIONS / ADVANCEMENTS

➔ **Significantly higher load capacity**  
with increased size and quantity of rollers packed into each roller row

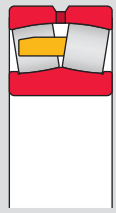
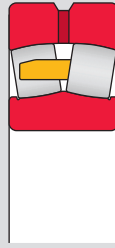
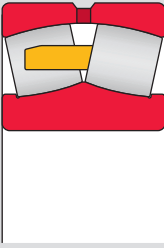
➔ **Optimized cage geometry**  
eliminates the need for a center guide ring and reduces sliding friction and wear



➔ **Controlled roller motion**  
with precision "roller hugging" cage pocket contour

➔ **Reduced cage stress**  
with a design that balances form fitting shape with uncompromised cage bar strength in maximum stress zones

### Range Of availability: dimension series, diameters and design features

			<b>Bore diameter range</b>	ranging from 40 to 130 mm; refer to pages 8/9
			<b>Bore types</b>	cylindrical bore; 1:12 tapered bore
			<b>Clearances</b>	all standard clearance types: C2, C-normal, C3, C4, C5
			<b>Vibrating equipment specification (series 223)</b>	special internal clearance - set at upper 2/3 relative to standard; special dimensional tolerances - set at 1/2 relative to normal
222	213	223		



## UNSHAKABLE PERFORMANCE IN VIBRATING SCREENS

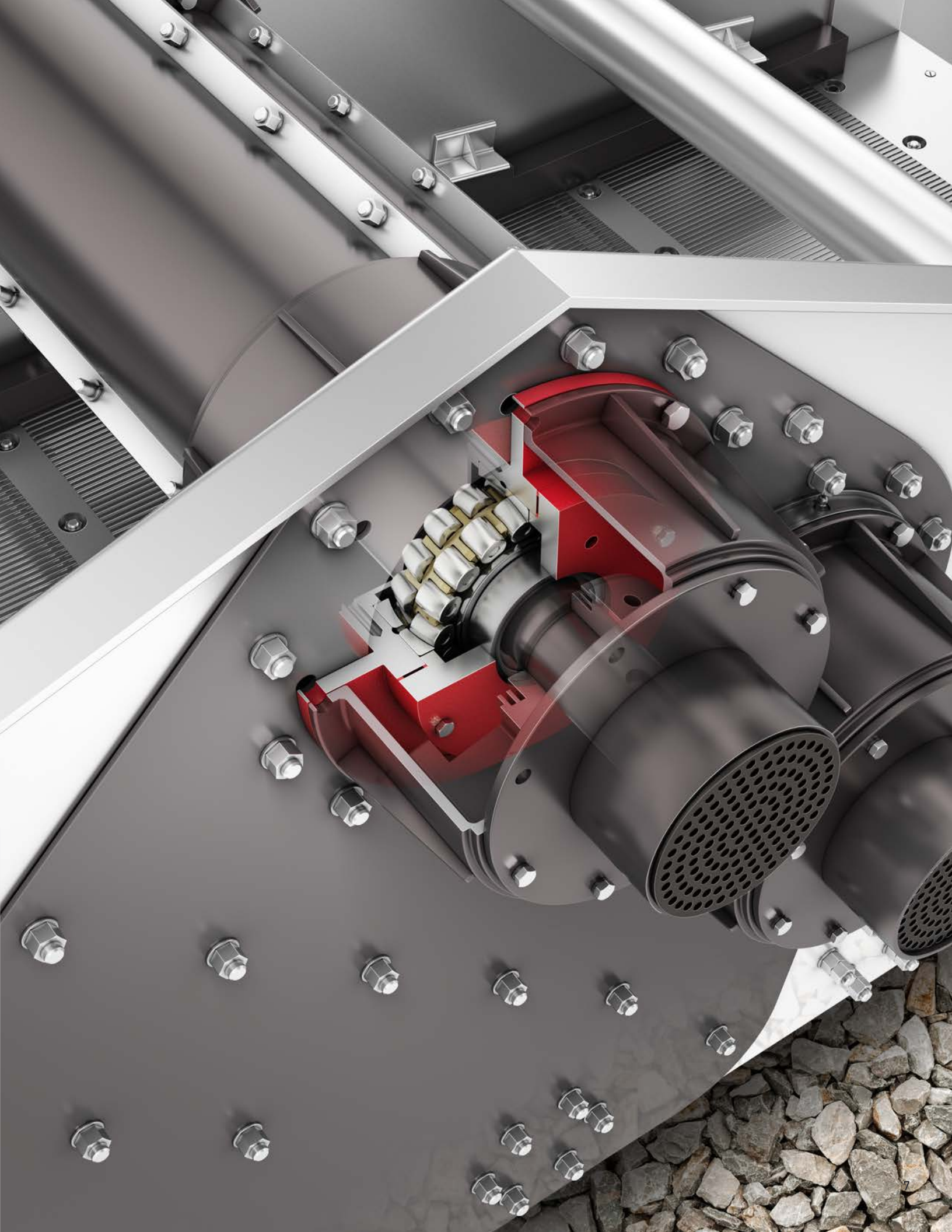
Punishing loads. Radial acceleration. Relentless vibration and mechanical shock. NSK's ECA-VS spherical roller bearings are engineered specifically - and ideally - to contend with the severity of vibrating machinery and equipment applications with stabilized load distribution and robust performance to deliver long-life operating benefits including:

- ➔ **Superior resistance to heavy loads and shock loads**
- ➔ **Smooth running** with superior roller guidance and controlled roller skew
- ➔ **High-speed performance** with low operating temperature rise
- ➔ **Reduced bearing damage** from slippage, surface fatigue and flaking
- ➔ **Higher operational reliability** with reduced incidents and maintenance costs

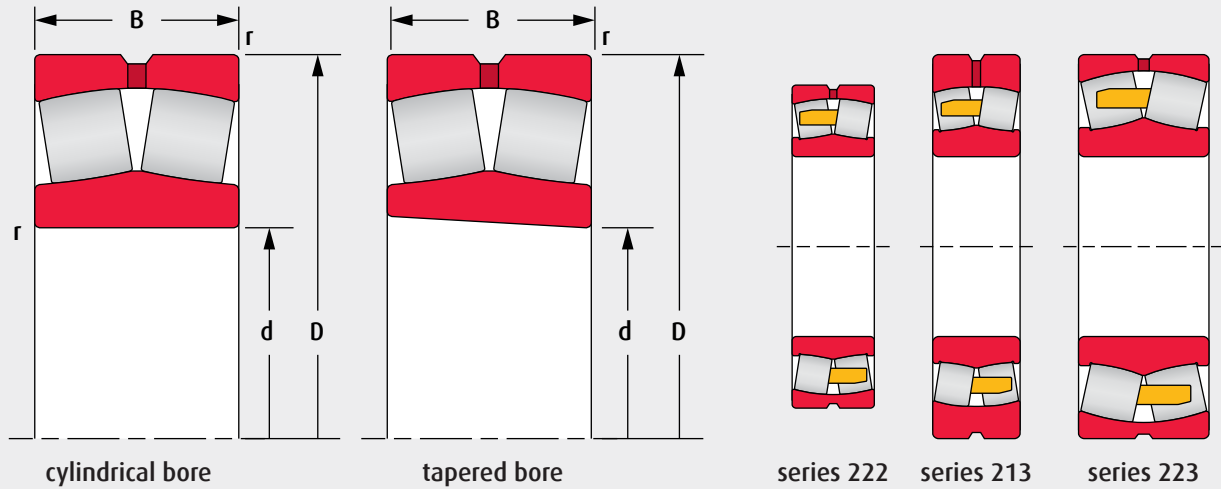


### Higher dynamic and static load ratings:

From left - the spherical roller of NSK's new extra-capacity 22320ECA spherical roller bearing versus NSK's previous design



# BEARING DIMENSIONS AND OPERATING VALUES

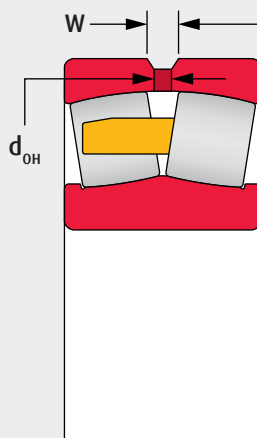


BASIC BEARING NO.		BEARING DIMENSIONS				BASIC LOAD RATINGS	
		mm				kN	
Cylindrical Bore	Tapered Bore	d	D	B	r (min)	Dynamic	Static
22208ECAME4	22208ECAMKE4	40	80	23	1.1	108	93
22308ECAME4	22308ECAMKE4		90	33	1.5	161	142
22209ECAME4	22209ECAMKE4	45	85	23	1.1	113	105
22309ECAME4	22309ECAMKE4		100	36	1.5	197	182
22210ECAME4	22210ECAMKE4	50	90	23	1.1	119	113
22310ECAME4	22310ECAMKE4		110	40	2.0	233	219
22211ECAME4	22211ECAMKE4	55	100	25	1.5	143	136
22311ECAME4	22311ECAMKE4		120	43	2.0	278	274
22212ECAME4	22212ECAMKE4	60	110	28	1.5	171	165
22312ECAME4	22312ECAMKE4		130	46	2.1	320	320
22213ECAME4	22213ECAMKE4	65	120	31	1.5	212	219
22313ECAME4	22313ECAMKE4		140	48	2.1	375	380
22214ECAME4	22214ECAMKE4	70	125	31	1.5	216	220
22314ECAME4	22314ECAMKE4		150	51	2.1	425	435
22215ECAME4	22215ECAMKE4	75	130	31	1.5	229	232
22315ECAME4	22315ECAMKE4		160	55	2.1	485	505
22216ECAME4	22216ECAMKE4	80	140	33	2.0	264	275
21316ECAME4	21316ECAMKE4		170	39	2.1	355	375
22316ECAME4	22316ECAMKE4		170	58	2.1	540	565



## Dimensions of Oil Grooves and Holes (mm)

NOMINAL BEARING WIDTH		OIL GROOVE WIDTH	OIL HOLE DIAMETER
B			
Over	Incl.	W	$d_{OH}$
18	30	5	2.5
30	40	6	3
40	50	7	4
50	65	8	5
65	80	10	6
80	100	12	8



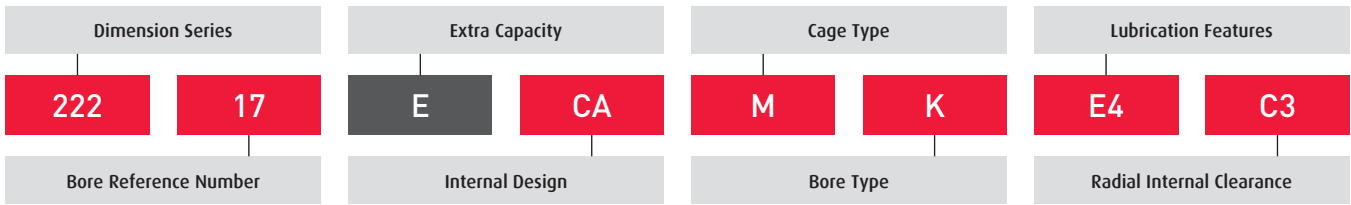
## Number of Oil Holes

NOMINAL BEARING O.D.		NUMBER OF HOLES
D		
Over	Incl.	
—	180	4
180	250	6
250	315	6

BASIC BEARING NO.		BEARING DIMENSIONS				BASIC LOAD RATINGS	
		mm				kN	
Cylindrical Bore	Tapered Bore	d	D	B	r (min)	Dynamic	Static
22217ECAME4	22217ECAMKE4	85	150	36	2.0	310	325
22317ECAME4	22317ECAMKE4		180	60	3.0	600	630
22218ECAME4	22218ECAMKE4	90	160	40	2.0	360	395
21318ECAME4	21318ECAMKE4		190	43	3.0	415	450
22318ECAME4	22318ECAMKE4		190	64	3.0	665	705
22219ECAME4	22219ECAMKE4	95	170	43	2.1	415	450
22319ECAME4	22319ECAMKE4		200	67	3.0	735	780
22220ECAME4	22220ECAMKE4	100	180	46	2.1	455	490
22320ECAME4	22320ECAMKE4		215	73	3.0	860	930
22222ECAME4	22222ECAMKE4	110	200	53	2.1	605	645
22322ECAME4	22322ECAMKE4		240	80	3.0	1 030	1 120
22224ECAME4	22224ECAMKE4	120	215	58	2.1	685	765
22324ECAME4	22324ECAMKE4		260	86	3.0	1 190	1 320
22226ECAME4	22226ECAMKE4	130	230	64	3.0	820	940

# DESIGNATION SYSTEM

## EXTRA-CAPACITY ECA SPHERICAL ROLLER BEARINGS



DESIGNATION	ATTRIBUTE	
Dimensional series	213	extra-heavy duty type
	222	medium duty type
	223	heavy duty type
Bore reference number		multiply x 5 for bore diameter in mm
Extra capacity	E	optimized cage and rollers
Internal design	CA	high capacity design
Cage type	M	machined brass cage
Bore type	blank	cylindrical bore
	K	1:12 tapered bore
Lubrication features	E4	lubrication groove and holes in the outer ring

DESIGNATION	ATTRIBUTE	
Radial internal clearance	C2	tight clearance
	blank	normal clearance (CN)
	C3	greater than normal clearance
	C4	greater than C3 clearance
	C5	greater than C4 clearance
	-VS3	special C3 clearance range and special accuracy for vibrating equipment
	-VS4	special C4 clearance range and special accuracy for vibrating equipment

**NSK**



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