ZYS

Luoyang Bearing Research Institute Co., Ltd.

ZYS BEARING CAGE

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Plentiful Achievements

1966

Developed missile-specific bearing cage

1990

Successfully developed satellite attitude control momentum wheel and bearing cage

2005

Successfully developed the special bearing cage for the Chang'e No. 1 satellite

2007

Successfully developed the special bearing cage for Shenzhou No.6

2010

Successfully developed the special bearing cage for Tiangong No.1

2016

Successfully developed the special bearing cage for Long March 5

Research and Development

1991

Won National Invention Third Prize

ZYS developed the Sintered Porous Polyimide Cage Material independently and produced in batches.

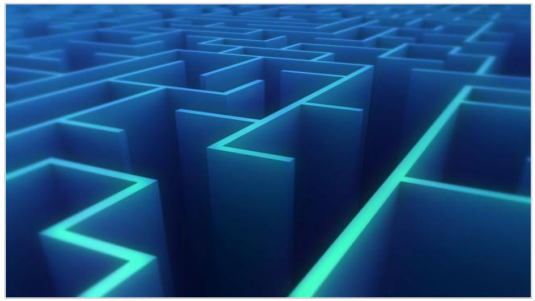
2006

Established special bearing cage material laboratory

The laboratory has undertaken the development of dozens of national key models of non-metallic cage materials for bearings, and has made important contributions to the realization of independent innovation in China's aerospace industry.

2012

Independently undertook Environmental Adaptability R&D of Porous Polyimide Cage for Bearings.



2013

Established bearing lubrication engineering technology research and development center

ZYS R&D center can customize personalized products and services according to customer needs.

ZYS

Technological breakthrough

Successfully developed glass cloth reinforced fluororesin cage.

2016

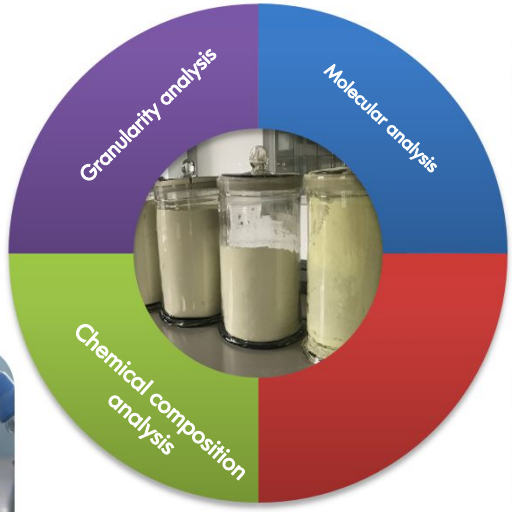
2018

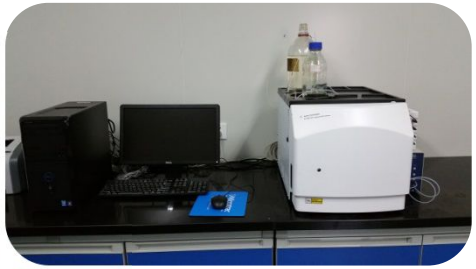
New Technology

The vacuum sintering products passed the process qualification and production baseline evaluation.

PRESENT

Quality Assurance: Raw Material Quality Control





Quality Assurance: Quality Control of Cage Blanks

Radial tensile strength

Q/ZYS J064-2013

Shore hardness

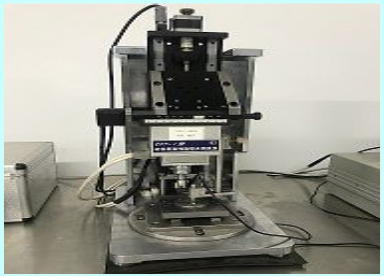
GB/T 2411-2008

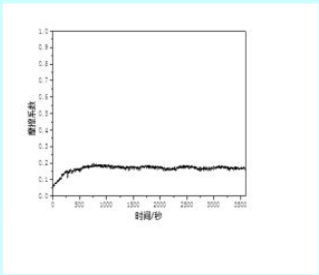
Density

GB/T 1033-2008

Appearance

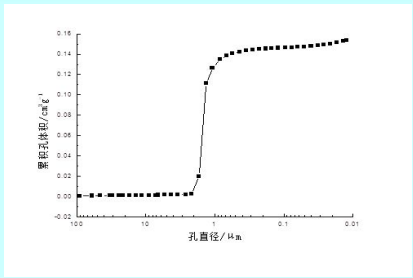
40x microscope





Friction coefficient, wear amount

ASTM G133-2005



Aperture, porosity

GB/T 21650-2008

Quality Assurance: Cage Size and Tolerance Quality Control

Appearance, inner and outer diameter

Inner diameter roundness

Outer diameter roundness

Parallelism, pocket coplanarity

Polyimide cage

Inner diameter size : Φ3mm～Φ270mm

Outer diameter size : Φ4mm～Φ300mm

Applicable speed : Low speed, swing or medium-high speed

Applicable temperature : －253～＋260℃

Test item	Test method	SLPI01	SLPI02	SLPI03
Density / g · cm-3	GB/T1033	1.55	1.40	1.39
Tensile Strength/MPa	Q/ZYS J063，-50℃	92	119.7	156
	23℃	80	87	140
	200℃	35	66	48
	260℃	-	56	-
Friction coefficient	ASTM G133	＜0.15	＜0.2	＜0.2
Shore hardness	GB/T 2411	82	92	85
Thermal deformation temperature/℃	GB/T 1634.2	249	336	253

PTFE cage

Inner diameter size : Φ2mm～Φ140mm

Outer diameter size : Φ3.2mm～Φ200mm

Applicable speed : 20000?～60000r/min

Applicable temperature : －253～＋150℃

Test item	Test method	PTFE01	PTFE02	PTFE03	PTFE04	PTFE05	PTFE06	PTFE07
Density/ g · cm-3	GB/T1033	2.28	2.74	3.22	2.01	1.93	2.17	2.23
Tensile Strength/MPa	GB/T 1040	≥20	≥14	≥12	≥14	≥14	≥14	≥12
Shore hardness	GB/T 2411	66	66	65	64	64	69	71
Linear expansion coefficient /×10-5℃	GB/T 1036	3.75	1.02	1.02	-	-	-	-

Microporous oily polyimide cage

Inner diameter size : Φ3mm～Φ260mm

Outer diameter size : Φ6mm～Φ285mm

Applicable speed : 1000～10000r/min

Applicable temperature : －80～＋150℃

Material grade	Ring tensile strength/ MPa	Porosity/%	Hole radius/ μm	Applicable situation
MPPI01	≥10	25	0.8～1.25	Medium and low speed
MPPI02	≥14	15～25	0.8～1.25	Medium and low speed
MPPI03	≥20	18～24	1.0～1.22	High speed
MPPI04	≥14	15～20	0.8～1.25	Medium and high speed
MPPI05	≥8	28～40	0.8～1.25	Medium and high speed
MPPI06	≥8	15～25	0.8～1.25	Medium and low speed
DRPI01	≥45	15～25	0.8~1.25	Cage
DRPI01	≥40	12～25	0.8~1.25	Oil reservoir
DRPI01	≥40	12～25	0.8~1.25	Medium and low speed and oil storage ring
DRPI01	≥45	3～16	≤0.8	Delay ring
DRPI02	≥27	≤10	≤0.3	Core valve

Microporous bakelite cage

Inner diameter size : Φ25mm～Φ90mm

Outer diameter size : Φ35mm～Φ100mm

Applicable speed : 1000～60000r/min

Applicable temperature : －50～＋120℃

Application: aerospace long-life bearings

Material grade	Ring tensile strength/ MPa	Porosity/%	Hole radius/ μm	Applicable situation
Microporous bakelite	≥45	10%~20a%	1.0~3.0	Medium and high speed

Ball screw bearing plastic cage

Material: BASF Nylon PA66-GF25 Application: It is widely used in ball screw.

Features:

Ball screw bearing plastic cage adopts glass fiber modified PA66 and can bear the temperature from -40 to 120 ℃. The material PA66 has the advantages of excellent wear resistance, good self-lubricating property, high mechanical strength, high production efficiency and low cost. Ball screw bearing plastic cage is the most commonly used transmission elements on tool machinery and precision machinery.

Model	Central diameter	Ball diameter	Number of balls
760202	25.00	4.763	14
760203	28.67	5.556	14
760204	34.00	6.350	15
760205	39.00	6.350	17
760206	46.50	7.144	18

Cylindrical Roller Bearing Plastic Cage

Material: PEEK-GF/CF, PPS-GF.

Application: Precision grinder spindle bearing, motor spindle bearing.

The features of PEEK material: resistant to high temperature 260℃, excellent mechanical properties, good self-lubrication, chemical corrosion resistance, anti-flaming, peel resistance, high wear resistance, radiation resistance.

The features of PPS material: resistant to high temperature 220℃, excellent corrosion resistance,high mechanical properties and dimensional stability under the action of long-term working load and thermal load.

Model	Center diameter	Roller diameter	Number of rollers	Roller length
NU207	54.00	10	14	11
NU208	60.50	11	14	11
NU308	66.00	14	12	15
NN3011	73.00	8	22	8
NN3014	91.00	9	25	9
NN3016	103.00	10	25	10
NN3018	116.00	11	26	11
NN3024	151.00	14	28	14

Angular contact ball bearing plastic cage

Material: DSM nylon PA46-GF25

Application:

Machine tool spindle (including spindle of CNC lathe, spindle of grinding machine and spindle of machining center), steam turbine, high frequency motor, centrifugal separator and so on. It can bear axial load and radial load at the same time and can work at higher speed.

Model	Central diameter	Ball diameter	Number of balls
7012C/AC	77.46	10.319	19
7013C/AC	82.50	10.319	21
7014C/AC	90.00	11.906	20
7015C/AC	95.00	11.906	21
7016C/AC	102.50	13.494	20
7017C/AC	107.50	13.494	21
7018C/AC	115.00	15.081	20
7019C/AC	120.00	14.288	22
7020C/AC	125.00	15.081	22