



	A	B	C	D	E	F	G	H	I	J	K	L	M
1		SLEWING BEARING QUALITY CONTROL PLAN											
2		TZP-Q006 Version B											
3													
4	PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR MFG.	CHARACTERISTICS			SPECI-AL CHAR. CLASS	METHODS					REACTIO N PLAN
5				NO.	PRODUCT	PROCE-SS		PRODUCT/PROCES S SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE		CONTROL METHOD	
6										SIZE	FREQ.		
7	10	毛坯进厂检验 Rough material warehouse entry inspection	原材料 Parts	1	硬度 hardness		*	250HB~300HB	布氏硬度计brinell hardness tester	GB/T 2828.1	每批 each batch	来料质量验收规 范 FY/Z 07- 26-2013 Code for quality acceptance of raw materials FY/Z 07-26-2013	评审/退回 供应商 review/ returned to the suppliers
8				2	内圈尺寸 inner ring size			外圆 outer diameter φ759+3/+8	卷尺 tapeline	GB/T 2828.1	每批 each batch		
9								内孔 inner diameter φ667-3/-8					
10								高度 height 73+3/+6					
11				3	外圈尺寸 outer ring size			外圆 outer diameter φ858+3/+8					
12								内孔 inner diameter φ762-3/-8					
13								高度 height 85+3/+6					
14	20	密封条检验 seal inspection	外购原材料 outsourcing	1	硬度 hardness			70 (±5A)	邵氏硬度计 shore durometer	GB/T 2828.1	每批	来料质量验收规 范 FY/Z 07- 15-2013 Code for quality acceptance of raw materials	评审/退回 供应商 review/ returned to the suppliers
15				2	外观 appearance			外观平整, 无气泡、 飞边 no damage	目视 visual				
16	30	钢球检验 Steel ball inspection	外购原材料 outsourcing	1	压碎值 crush test			≥318500N	查验质保书 check the inspection report		100%	来料质量验收规 范 FY/Z 07- 21-2013 Code for quality acceptance of raw materials FY/Z 07-21-2013	评审/退回 供应商 review/ returned to the suppliers
17				2	化学成分 material			GCr15					
18				3	外观 appearance			不允许有裂纹、凹陷 、锈蚀 no damage	目视 visual				
19				4	硬度 hardness			HRC61-66	超声波硬度计 sclerometer ultrasound	GB/T 2828.1			
20				5	直径变动量 ball diameter variation			V _{DWS} ≤1μm	扭簧比较仪 microkator				
21	40	油嘴检验 grease nipple inspection	外购原材料 outsourcing	1	规格 size			1/8-27NPT	压力试验机 universal testing machine	GB/T 2828.1	每批 each batch	来料质量验收规 范 FY/Z 07- 23-2013 Code for quality acceptance of raw materials	评审/退回 供应商 review/ returned to the suppliers
22				2	外观 appearance			无飞边、气泡 no damage	目视 visual				
23	50	毛坯编号入库 Numbering the material	目视检查 visual inspection					供应商代码 Numbering cycle	目视 visual	100%	每批 each batch		
24	内圈 inner ring												
25	60	粗车 roughing	立车 vertical lathe	1	尺寸 size			外圆 outer diameter φ762±0.5	游标卡尺 Calipers (0-1000mm)	首件 frist piece	每批 each batch	员工自检 互检、 专检 工艺卡检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review
26				2	尺寸 size			内孔 inner diameter φ664±0.5		100% 其余 others			
27				3	尺寸 size			单圈高度 height 76-0.5/+0		10%			
28	70	超声波探伤 UT detection of defects	超声波探伤 仪ultrasonic fault detector	1	内部缺陷 internal defect		*	锻件内部符合 II 级标 准Forging internal defect levels≤ II level	超声波探伤仪 ultrasonic fault detector	10%	每批 each batch	QC 专检 《无损探伤规程》 inspector 《Non-destructive testing procedures》	评审/退回 供应商 review/ returned to the suppliers
29	80	镗堵头孔Drilling plug hole	专用镗床 Special boring machine	1	尺寸 size			孔径 hole diameter φ36+0.04/0	游标卡尺Calipers (0-100mm)	首件 frist piece	每批 each batch	员工自检 互检、 专检 工艺卡检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review
30				2	尺寸 size			距大头定位面 distance to the mounting face 40±0.2		100% 其余 others			
31				3	粗糙度 roughness			堵塞孔粗糙度 plug hole roughness ≤6.3	对比块 contrast block	10%			
32		钻绞锥销孔 (带 堵塞,锥销) Drilling and fraise taper pin hole (with plug, taper pin)	摇臂钻床 φ10锥度绞刀 Beam drill machine φ10 taper reamer	4	锥度 taper			1:50	游标卡尺Calipers (0-100mm)	首件 frist piece	每批 each batch	员工自检 互检、 专检 工艺卡检验记录 Workers self- check/mutual check/QC inspector Operation card	隔离 评审 Separate, Review
33				5	尺寸 size			锥销孔中心位置 center position of taper pin φ 701.68±0.3	游标卡尺 Calipers (0-1000mm)	100% 其余 others			
34	90	半精车(滚道) Half finish turning (raceway)	数控立车 NC Vertical lathe	1	尺寸 size			大外圆尺寸 outer diameter 1 φ759±0.1	游标卡尺Calipers (0-1000mm)	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review
35				2	尺寸 size			小外圆尺寸 outer diameter 2 φ757-0.3/+0					
36				3	尺寸 size			滚道中心尺寸 raceway diameter φ759+1.2/+1.0					
37				4	尺寸 size			单圈高度 height 75.5±0.3	游标卡尺Calipers (0-100mm)				
38				5	尺寸 size			滚道至小头端面距离 raceway center to the nonmounting face distance 35.5± 0.2	深度尺 Depth Gauge (0- 200mm)				

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2		SLEWING BEARING QUALITY CONTROL PLAN											
3		TZP-Q006 Version B											
4		PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR MFG.	CHARACTERISTICS			SPECI-AL CHAR. CLASS	METHODS				
5	NO.				PRODUCT	PROCE-SS	PRODUCT/PROCES S SPECIFICATION/ TOLERANCE		EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE		CONTROL METHOD	
6										SIZE	FREQ.		
39	100	钻油眼 drilling grease hole	镗床 boring machine	1	位置 position			18.5 °±1 ° (Chord length 112.79± 1.62)	游标卡尺 Calipers (0- 200mm)	100%	每批 each batch	员工自检 互检、 专检 工艺卡检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review
40	110	滚道淬火 raceway quenching	专机 Special machine	1	硬度 hardness		*	HRC55-62	里氏硬度计 Leeb Hardness Tester	100%	每批 each batch	《滚道淬火检验 规范》《 rollaway surface hardness inspection standard》 (FY/Z-07-36-2013)	隔离 评审 Separate, Review
41				2	尺寸 size			滚道回火带宽度 raceway soft width ≤40	游标卡尺 Calipers (0-100mm)	100%	每批 each batch		
42				3	尺寸 size		*	滚道淬硬层深度 raceway hardening depth ≥3.0	金相显微硬度计 micro hardness tester	1件 1pieces	每2个月 2 month	工艺卡检验记录 Operation card inspection record	
43		回火 tempering	箱式回火炉 Box-type tempering furnace	4		时间time		180℃后保温3h Reach 180℃-draw a charge no less than 3h	查看温控仪	1次 1 time	每小时 each hour	设备点检表《回 火记录表》 Equipment checkup sheet 《tempering record sheet》	重新设定报 告班组长 Inform foreman Re-set
44				5		温度temper- ature		180~200℃					
45	120	精车 Finishing turning	数控立车NC Vertical lathe	1	尺寸 size			半圆高度 height 73.5- 0.8/-0.6	游标卡尺Calipers (0-100mm)	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review
46				2	尺寸 size			滚道至大头端面距离 raceway center to the mounting face distance 39-0.4/+0	深度尺 Depth Gauge (0- 200mm)				
47				3	尺寸 size			大头内孔尺寸 inner diameter φ667±0.7	游标卡尺Calipers (0-1000mm)				
48				4	粗糙度 roughness			表面粗糙度 surface roughness ≤3.2	对比块 contrast block				
49	130	钻安装孔Drilling mounting hole	数控钻床 NC Drilling machine	1	尺寸 size			安装孔方度圆 Installing holepitch circle φ701.68±0.5	游标卡尺 Calipers 1000mm	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector	隔离 评审 Separate, Review
50				2	孔参数hole parameter			30-5/8-11UNC-2B	螺纹规 Thread gauge				
51	140	车磨滚道Milling raceway	数控立车NC vertical lathe	1	尺寸 size			滚道测量尺寸 raceway PCD φ787.58-0.04/-0.08	滚道量杆 raceway measuring rods	100%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review
52				2	尺寸 size			密封槽尺寸 Seal slot size φ747±0.3	游标卡尺Calipers (0-1000mm)				
53				3	尺寸 size			密封槽宽度 Seal slot width 2.5+0.1/+0	塞规 plug guage				
54				4	尺寸 size			单圆高度 height 73+0/- 0.8	游标卡尺Calipers (0-100mm)				
55				5	尺寸 size		*	滚道至大头端面距离 raceway center to the mounting face distance 38.5+0.25/-0.65	深度尺 Depth Gauge (0- 200mm)				
56				6	角度 angle			滚道接触角 Contact angle °±3	接触角样板Contact Angle sample plate				
57				7	外观 appearance			软带“S”钢印 soft zone "S" Steel seal	目视 visual				
58				8	粗糙度 roughness			滚道粗糙 raceway roughness ≤1.6	对比块 contrast block				
59	150	磁粉探伤 MT Detection of defects	磁粉探伤机 Magnetic powder detector	1	淬火缺陷 quenching defect		*	滚道内不允许存在淬 火裂纹Don't allow existence quenching cracks in raceway	磁粉探伤机Magnetic powder detector	100%	每批 each batch	QC专检 《磁粉探伤作业 指导书》 QC inspector 《Magnetic powder detection work instructions》	隔离 评审 Separate, Review
60	外圈 outer ring												
61	160	粗车 roughing	立车 vertical lathe	1	尺寸 size			半圆高度 height 88- 0.5/-0.6	游标卡尺Calipers (0-100mm)	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review
62				2	尺寸 size			外圆1 outer diameter 1 φ860±0.5					
63				3	尺寸 size			外圆2 outer diameter 2 φ830±0.5*9	游标卡尺Calipers (0-1000mm)				
64				4	尺寸 size			内孔 inner diameter φ759±0.5					
65	170	超声波探伤 UT detection of defects	超声波探伤 仪ultrasonic fault detector	1	内部缺陷 internal defect		*	锻件内部符合II级标 准Forging internal defect levels≤II level	超声波探伤仪 ultrasonic fault detector	10%	每批 each batch	QC专检 《无损探伤规程 》QC inspector 《Non-destructive testing procedures》	评审/退回 供应商 review/ returned to the suppliers
66				1	尺寸 size			大内孔尺寸 inner diameter 1 φ761.67+0.8/+0.6					

A		B	C	D	E	F	G	H	I	J	K	L	M
TenSun		SLEWING BEARING QUALITY CONTROL PLAN											
T2P-Q006												Version B	
PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR MFG.	CHARACTERISTICS			SPECI-AL CHAR. CLASS	METHODS					REACTIO N PLAN	
			NO.	PRODUCT	PROCE-SS		PRODUCT/PROCES S SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE		CONTROL METHOD		
										SIZE	FREQ.		
67	180	半精车(滚道) Half finish turning (raceway)	数控立车 NC Vertical lathe	2	尺寸 size		小内孔尺寸 inner diameter 2 φ763+0.8/+0.6	游标卡尺 Calipers (0-100mm)	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review	
68				3	尺寸 size		滚道中心尺寸 raceway PCD φ759+0/-0.2						
69				4	尺寸 size		滚道至端面距离 raceway center to the mounting surface distance 35.5±0.2	深度尺 (0- 200mm)					
70				5	尺寸 size		单圈高度 height 87.5±0.3	游标卡尺 Calipers (0-100mm)					
71	190	滚道淬火 raceway quenching	专机 Special machine	1	硬度 hardness	*	HRC55-62	里氏硬度计 Leeb Hardness Tester	100%	每批 each batch	《滚道淬火检验 规范》 《 rollaway surface hardness inspection standard》 (FY/Z-07-36-2013) 工艺卡检验记录 Operation card inspection record	隔离 评审 Separate, Review	
72				2	尺寸 size		滚道回火带宽度 raceway soft width ≤40	游标卡尺 Calipers (0-100mm)	100%	每批 each batch			
73				3	尺寸 size	*	滚道淬硬层深度 raceway hardening depth ≥3.0	金相显微硬度计 micro hardness tester	1件 1pieces	每2个月 2 month			
74		回火 tempering	箱式回火炉 Box-type tempering furnace	4			180℃后保温3h Reach 180℃-draw a charge no less than 3h	查看温控仪	1次 1 time	每小时 each hour	设备点检表《回 火记录表》 Equipment checkup sheet 《tempering record sheet》	重新设定报 告班组长 Inform foreman Re-set	
75				5		温度 temperature	180~200℃						
76	200	精车 turning	数控立车 NC Vertical lathe	1	尺寸 size		单圈高度 height 85.5+0/-0.8	游标卡尺 Calipers (0-100mm)	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review	
77				2	尺寸 size		齿顶圆直径 tip diameter φ857.25+0/-0.4	游标卡尺 Calipers (0-1000mm)					
78				3	尺寸 size		大头外圆司必克 outer diameter φ827±0.5						
79				4	粗糙度 roughness		表面粗糙度 surface roughness ≤3.2	对比块 contrast block					
80	210	齿加工 gear hobbing	滚齿机 gear hobbing machine	1	尺寸 size		公法线 tooth span 283.65-0.18/-0.33	游标卡尺Calipers (0-500mm)	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review	
81				2	粗糙度 roughness		齿面粗糙度 tooth roughness ≤6.3	对比块 contrast block					
82	220	钻安装孔Drilling mounting hole	数控钻床 NC Drilling machine	1	尺寸 size		安装孔分度圆 Installing holepitch circle φ706.02±0.5	游标卡尺 Calipers (0- 1000mm)	首件 frist piece 100% 其余 others 10%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review	
83				2	孔参数hole parameter		30-5/8-11UNC-2B	螺纹规 Thread gauge					
84	230	车磨滚道 Grinding raceway	数控立车NC vertical lathe	1	尺寸 size		滚道测量尺寸 raceway PCD φ730.43+0.04/+0	滚道量杆 raceway measuring rods	100%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review	
85				2	尺寸 size		密封槽尺寸 Seal slot size φ773.7±0.5	游标卡尺Calipers (0-1000mm)					
86				3	尺寸 size		密封槽宽度 Seal slot width 2.5+0.1/+0	塞规 plug guage					
87				4	尺寸 size		单圈高度 height 85+0/- 0.8	游标卡尺 Calipers (0-100mm)					
88	230	车磨滚道 Grinding raceway	数控立车NC vertical lathe	5	尺寸 size	*	滚道至大头端面距离 raceway center to the mounting face distance 50.5+0.25/-0.65	深度尺 Depth Gauge (0- 200mm)	100%	每批 each batch	员工自检 互检、 专检 工艺卡 检验记录 Workers self- check/mutual check/QC inspector Operation card check record	隔离 评审 Separate, Review	
89				6	角度 angle		滚道接触角 Contact angle 45°	接触角样板 Contact Angle sample plate					
90				7	外观 appearance		软带“S”钢印 soft zone “S” Steel seal	目视 visual					
91				8	粗糙度 roughness		滚道粗糙 raceway roughness ≤1.6	对比块 contrast block					
92	240	磁粉探伤 MT Detection of defects	磁粉探伤机 Magnetic powder detector	1	淬火缺陷 quenching defect	*	滚道内不允许存在淬 火裂纹Don't allow existence quenching cracks in raceway	磁粉探伤机 Magnetic powder detector	100%	每批 each batch	QC专检 《磁粉探伤作业 指导书》 QC inspector 《Magnetic powder detection work instructions》	隔离 评审 Separate, Review	
装配Assemble													
94				1	数量 number		钢球、隔离块数量各 72粒 numbers of ball & spacer, 72 each	目视 visual	100%				

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2	SLEWING BEARING QUALITY CONTROL PLAN												
3	TSP-Q006											Version B	
4	PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR MFG.	CHARACTERISTICS			SPECI-AL CHAR. CLASS	METHODS					REACTIO N PLAN
5				NO.	PRODUCT	PROCE-SS		PRODUCT/PROCES S SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE		CONTROL METHOD	
6										SIZE	FREQ.		
95	250	装配/检验 Assemble /inspection	装配台 assembling table	2	尺寸 size			总高 Total high 89+0.5/-1.3	深度尺 Gauge (0-100mm)	100%	每批 each batch	QC 专检 工艺卡检验记录 《成品检验规范》 FY/Z 07-45-2013 QC inspector Operation card check record 《finished product inspection specification》 FY/Z 07-45-2013	隔离 评审 Separate, Review
96				3	尺寸 size		*	轴向跳动 axial runout ≤0.15	百分表 dialgag	100%			
97				4	尺寸 size		*	径向跳动 radial runout ≤0.30	百分表 dialgag	100%			
98				5	尺寸 size		*	轴向间隙 axial clearance 0.04-0.12	百分表 dialgag	100%			
99				6	尺寸 size		*	径向间隙 raidal clearance 0.04-0.12	百分表 dialgag	100%			
				7	尺寸 size		*	齿轮径向跳动 gear radial runout ≤0.40	百分表 dialgag	100%			
100													
101	250	装配/检验 Assemble /inspection	装配台 assembling table	8	标记 mark		*	齿跳取尚点用蓝漆标 识三齿顶 marking blue marks on the highest of gear three teeth	目视 visual	100%	每批 each batch	QC 专检 工艺卡检验记录 《成品检验规范》 FY/Z 07-45-2013 QC inspector Operation card check record	隔离 评审 Separate, Review
102				9	功能function		*	转动灵活, 无异响 Flexible rotation, no abnormal noise	/	100%			
103	260	安装油嘴 grease nipple		1	材质 Material			不锈钢 stainless steel	目视 visual	100%	每批 each batch	《装配、收尾作 业指导书》《 assembling and tail-in work instruction》	返工.rework
104				2	数量 number			2					
105	270	注油 greasing		1	润滑油品牌 Greasing			EP2润滑脂 EP2 Grease	目视 visual	100%	每批 each batch	隔离 评审 Separate, Review	
106	280	密封封条 embed seal		1	密封条规格 seal types			MT12	目视 visual	100%	每批 each batch		
107	290	标序列号 stamp searial number		1	标序列号 stamp searial number			50035	目视 visual	100%	每批 each batch	合格证核对 Check with certification	返工.rework
108	300	包装 Packing		1	储存 Store				/	/	/	《装配、收尾作 业指导书》《 assembling and tail-in work instruction》	/
109													
110	Documented: <u>Xinling</u>												
111	Approved: <u>Tianxiang Wang</u>												
	Date: <u>9th Sep 2014</u>												