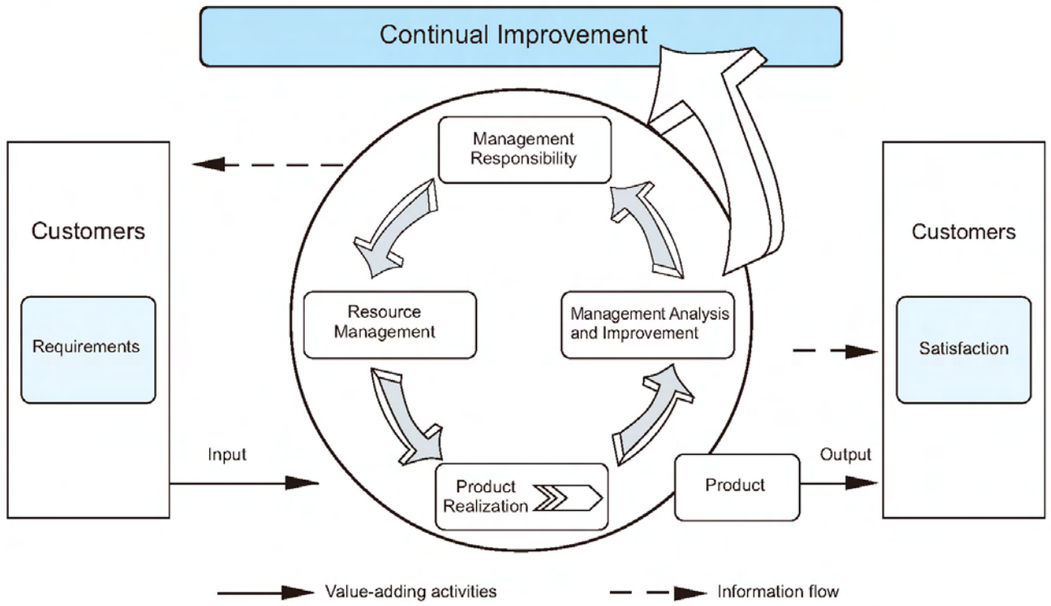
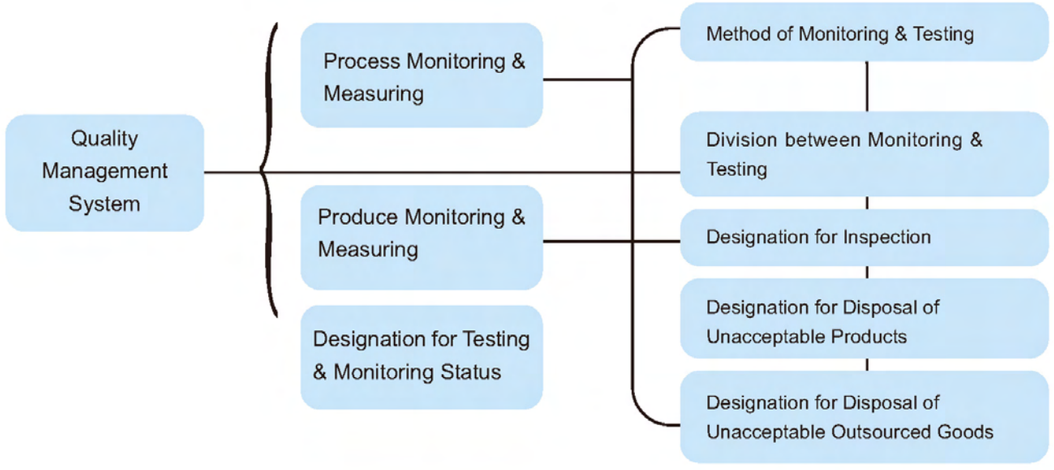
QUALITY MANAGEMENT SYSTEM

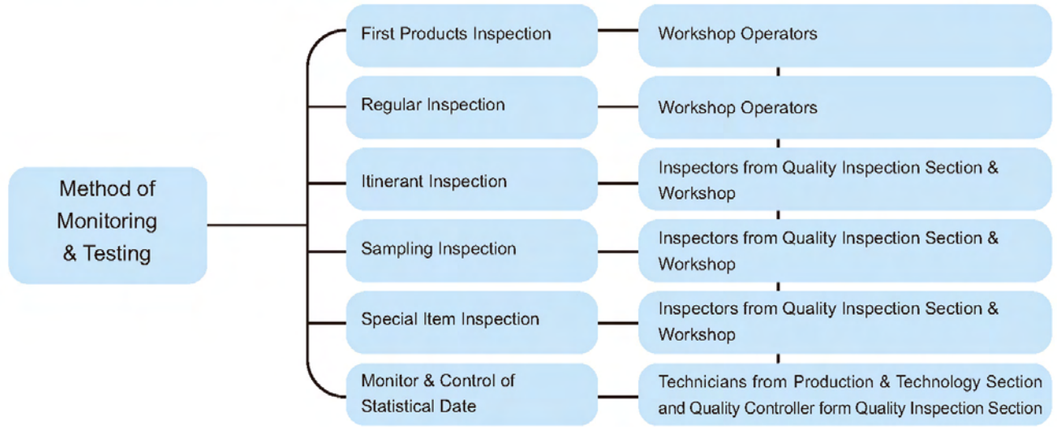
The adoption of HCH quality management system is a strategic decision of HCH organization structure. It is specially designed for HCH particular products-bearings and the relative processes employed. The chart below shows HCH basic model of a process-based quality management system. HCH quality management system illustration below shows customers play a significant role in defining requirements as inputs. Monitoring customer satisfaction requires the evaluation of information to related with customer perception as whether the organization has met the customer's requirements.

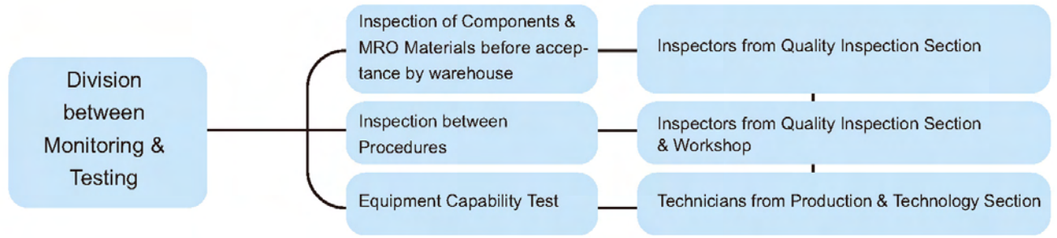
● Model of a process-based quality management system

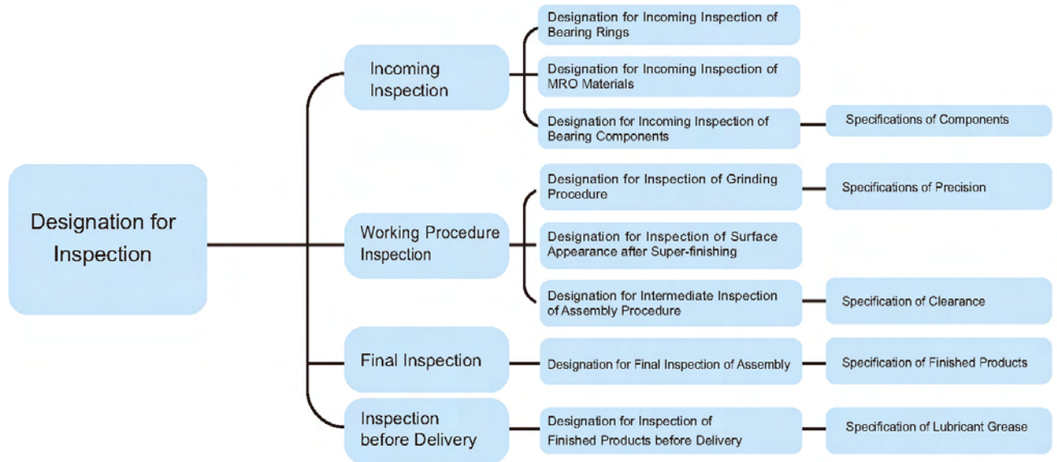


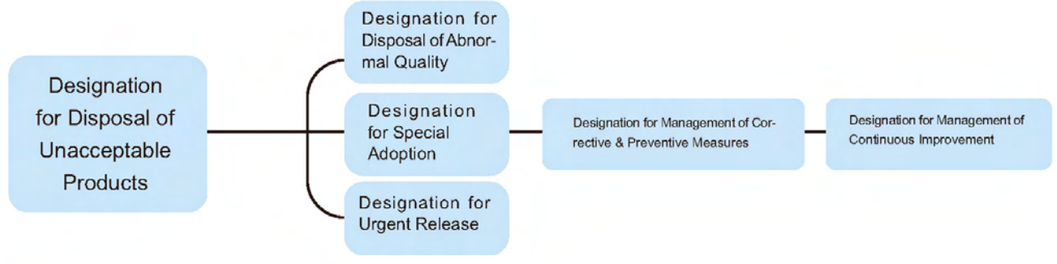
The Quality Management System also serves the employees of HCH in applying its quality policy and pursuing the consistent achievement of quality and strategic goals. From order entry to design, manufacturing and servicing, activities are controlled in accordance with the commitments of the QMS.











Performance Test Results:

Dimensional Results: HCH will submit dimensional results for parts produced from the production trial run. Actual results shall be recorded against all dimensions, characteristics and specifications as required / specified in the approved M&M part drawings.

Noise & Vibration Level: Factors that attempt to disrupt intended function of the system/subsystem/component (ie: piece-to-piece variation, changes over time, customer usage and duty cycle, environment, system interaction, etc.)

Appearance Results:

TESTING CERTIFICATE													
TYPE: 6205ZZ EMQV2+				GRADE: ABEC-1						DIMENSION: ø25xø52x15			
COMPANY: HUANCHI BEARING GROUP CO.,LTD.										QUANTITY: 10PCS			
ITEM				STAN DARD	1	2	3	4	5	6	7	8	9	10
					TESTING VALUE um									
A	B	DIMENSION PRECISION	Δds	HIGH										
				LOW										
			Δdmp		0~-10	-6	-4	-3	-5	-4	-6	-5	-5	-4	-5
			Vdp		8	2	1	2	2	1	2	2	1	2	1
			Vdmp		8	1	1	0	1	1	0	0	1	1	0
			ΔDs	HIGH											
				LOW											
			ΔDmp		0~-13	-4	-5	-4	-5	-4	-4	-6	-5	-5	-4
			VDp		20	2	2	1	3	1	1	3	3	1	1
			VDmp		10	0	1	0	1	0	0	1	1	0	1
			Sd												
			Kia		13	2	3	5	2	4	2	3	4	3	3
			Sia												
			SD												
			Kea		25	3	3	3	5	3	3	2	5	4	5
			Sea												
		RUNNING ACCURACY													
		Radial Clearance			5~20	17	17	13	17	14	16	13	17	14	16
		S0910(Noise level)													
		BVT (Vibration) V2+		LOW	130	30	49	43	46	56	40	50	51	30	33
				MID	100	20	20	16	20	14	14	18	16	18	14
				HIGH	75	14	14	14	14	16	18	16	18	18	18
		HARDNESS													
	C	ΔBs			0~-120	-40	-25	-25	-30	-40	-25	-35	-25	-25	-35
		VBs			20	1	0	2	3	2	2	2	0	3	1
		ΔCs			0~-120	-35	-35	-25	-30	-25	-25	-40	-30	-40	-30
		VCs			20	2	2	1	2	1	3	2	1	1	1
		RESIDUAL													
		REMARKS													
GREASE		BRAND				ORIGIN				FILLING					
TESTING METHOD		ALL TESTED			INSPECTOR		Zhangyanfei			DATE		2013.1.17			

Note: 1. All tests required / conducted and related specifications should be listed along with quantity tested and the actual results of each test.

2. The report should be on letterhead of the laboratory. The date should be indicated on which the testing took place.

Initial Process Studies / Process Capability Plan:

Significant & Critical Features are part characteristics that significantly affect performance, fit, function or workability on the completed units, and therefore require application of statistical measures for capability assessment and control. The purpose of such studies is to gain confidence in the production process withpotential to produce products that will meet the customer requirements and result in customer satisfaction.

	Short Term CPK	Long Term PPK
Sample Size	100 (30 minimum)	≥50 or as required to determinevariability source
Expectation Variable Data	≥1.67, Stable	≥1.33, Stable
If expectation is not met	1. Process control method is required (ie: increased audit, SPC,100% inspection, etc.) 2. Inspect 100% since the last in-control point and implement corrective action. 3. Notify if parts escaped and begin containment activity.	

The Ppk study should be based on 100 (minimum 30) consecutively. For all Significant and Critical characteristics, the concerned processes should be stable and under statistical control with preliminary process capability index (PPK) above 1.67 in production trial run & on-going process capability index (CPk) above 1.33 in regular production.

CPK of Inner Bore Diameter Ellipse for HCH P/N: **6205**

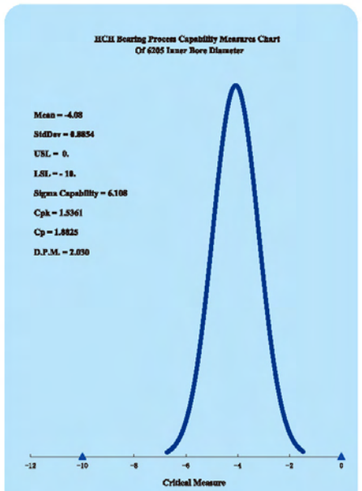
Inspected: **125 Pcs** STD Size: **ø25xø52x15**

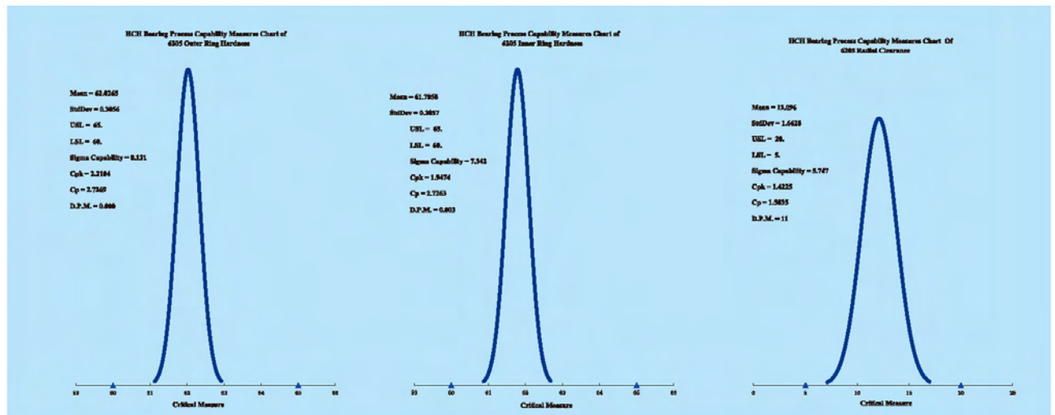
ISO Grade: **ABEC-1 (0~-10um)** Insp. Sub: **Inner Bore Diameter Ellipse**

Analyst: **RongGuoXiang** Approved by: **LuGuoCan**

Unit: um

1	-3.0	-3.0	-4.0	-3.0	-4.0	-3.0	-3.0	-4.0	-3.0	-3.0
2	-3.0	-3.0	-4.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
3	-3.0	-3.0	-3.0	-3.0	-3.0	-4.0	-3.0	-3.0	-3.0	-3.0
4	-4.0	-4.0	-5.0	-4.0	-5.0	-4.0	-4.0	-5.0	-4.0	-4.0
5	-4.0	-4.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
6	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
7	-4.0	-4.0	-3.0	-4.0	-3.0	-4.0	-3.0	-4.0	-3.0	-4.0
8	-4.0	-4.0	-4.0	-5.0	-4.0	-4.0	-6.0	-4.0	-6.0	-4.0
9	-5.0	-5.0	-4.0	-4.0	-4.0	-5.0	-5.0	-4.0	-4.0	-6.0
10	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-5.0
11	-4.0	-5.0	-5.0	-4.0	-5.0	-4.0	-5.0	-5.0	-5.0	-5.0
12	-5.0	-5.0	-4.0	-4.0	-5.0	-4.0	-5.0	-4.0	-5.0	-5.0
13	-6.0	-6.0	-6.0	-5.0	-6.0					





Reliability Test Results:

For ongoing production, reliability checks are to be conducted on a defined frequency.

The common measurement is "L_{10}" life, defined as the number of revolutions before metal fatigue first appears on 10% of a large group of like bearings. This is referred as basic rating life of fatigue life.The relationship between the basic rating life, the basic dynamic load rating and the bearing load is given in following formula:

$$L_{10}=\left(\frac{C_r}{P}\right)^p$$

where,
p = 3 for ball bearings
p = 10/3 for roller bearings
L_{10}: Basic rating life (at 90% reliability), millions of revolutions
C_r: Basic dynamic load rating, N or kgf
P: Equivalent dynamic load, N or kgf

$$L_{10h}=\frac{10^6}{60n}\left(\frac{C_r}{P}\right)^p$$

where,
n: Rotational speed, rpm

Report No.: HCH121125-001

Test Report of Product Quality

Test Report of Product Quality

Product Name:**Deep groove ball bearing**

Product Type:**6205 ZZ**

Client:Huanchi Bearing Group Co.,Ltd

Rolling Bearing Fatigue Life Test Report							
Report No.	HCH 121125-001	Inspection Type		Product Name	Deep Groove Ball Bearing	Product Type	6205ZZ
Client	Huanchi Bearing Group Co.,Ltd			Source of Sample	Sample	Trademark	HCH
Sample Base		Sample Number	8	Sample No.	1#~8#	Grade of Tolerance	(ABEC-1)
Dimensions	25x52x15		Sample Arrival Date	12.09.24	Test Date	12.09.24	
Testing Place	Life Lab. of Huanchi Bearing Group Co.,Ltd						
Testing Basis	JB/T50013-2000《Rolling Bearings Test Rules of Litf and Reliability》						
Judgment Basis	GB/T 24607-2009《Rolling bearings Test Evaluation of Life and Reliability》						
Testing Conclusion	Reliability= 99.41% Date: (Y) (M) (D)						

Rolling Bearing Fatigue Life Test Report			
Testing Purpose And Method	To test fatigue life of deep groove ball bearing 6205 ZZ entrusted by Huanchi Bearing Group Co.,Ltd. The bearing dynamic load rating Cr=14KN. Apply pure radial load. Adopt number suspend test method.		
Product Type: 6205 ZZ Test Conditions	Tester Type		ABLT-1
	Rating Life		L10=100h
	Test Bearing Speed		4000rpm
	Load	Radial Load	Fr= 4.85KN
		Axial Load	Fa=0 KN
	Lubrication and cooling		Grease Lubrication
Test Beginning Date		Test Ending Date	

Test Result				
Number	Sample No.	Test Time (h)	Failure Part (s)	Remark
1	1#	347	INNER RING FAILURE	
2	2#	292	OUTER RING FAILURE	
3	3#	325	INNER RING FAILURE	
4	4#	325	OUTER RING FAILURE	
5	5#	331	OUTER RING FAILURE	
6	6#	360	NO FAILURE	
7	7#	304	INNER RING FAILURE	
8	8#	360	NO FAILURE	
Remark				
Approver		Examinant		Compiler

(Notice)

1. This report is invalid without "special inspection seal" and "testing organization common seal"
2. This report is not allowed to make copies without approver's written approval. copy will be invalid without permission.
3. This report is invalid without signatures of approver,verifier and organizer.
4. This report is invalid if it is changing and incomplete.
5. Please propose your views within 15 days from the received date if you have some disagreement about it.There is no acceptance if exceed the limit time.
6. The report is responsible for the sample.

Internal Audits

HCH is strengthening its group audit functions as a mean of reinforcing its manufacturing. To guarantee the quality management is effectively implemented and maintained, HCH conducts internal audits at planned intervals to determine whether the quality management system conforms to the planned arrangements, the requirements of International standard and what established by HCH. The Scope of Internal Audit:

1. Review of requirements related to the product: Product requirements are defined. Reviewing the order and contract requirements and resolving the detailed problem to ensure HCH bearings meet specific requirements.

2. Quality management system audit: HCH Internal Audit department audits its quality management system to verify compliance with technical specification and any additional quality management system requirements, also audit each manufacturing to determine its effectiveness.

3. The department should audit products at appropriate stages of production and delivery to verify conformity to all specified requirements, such as product dimensions, functionality, packaging and labeling, at a defined frequency.

4. Continuous Improvement: Evidence demonstrates the use of data (ie: First Pass Yield, Final Test, In-process Cpk, etc.), past experience, and lessons learned may be requested to show continuous improvement of quality management system.

SHOPFLOOR AUDIT Receiving Inspection, Manufacturing Operation, Post-Process (as applicable), Packaging, Shipping		
PREPARATION FOR AUDIT (Documents Required)	Available (Yes/No)	Dates and Revisions of Documents
1) Are receiving inspection instructions available and accurate, as appropriate?		
2) As defined in the Control Plan, is appropriate sample size and frequency maintained at receiving inspection?		
3) Are control plan inspections and process steps covered in the manufacturing/work instructions?		
4) Are manufacturing instructions approved according to the plant's procedures?		
5) Are manufacturing instructions readily available to the operators?		
6) Do the operators follow the manufacturing instructions for the station they are running?		
7) Do manufacturing instructions tell the operator what to do when they find a non-conforming part?		
8) Is non-conforming product properly controlled?		
9) Is there an approved rework instruction for any rework/ repair being performed?		
10) Do operators follow written rework instructions? Are parts re-inspected after rework.		
11) Are Process or Quality Alerts, as appropriate, being followed? Are the Alerts readily available to the operator?		
12) Are in process and/or Lot Acceptance Tests being conducted at their specified frequencies?		

Mistake Proofing and Gages		
PREPARATION FOR AUDIT (Documents Required)	Available (Yes/No)	Dates and Revisions of Documents
1) Are inspection results documented and retrievable ?		
2) Is mistake proofing verified at the start of every shift?		
3) Is mistake proofing verified at the start of every shift?		
4) Are all gages updated to the corresponding approved product release level? Do all gages comply with the approved Gage Control Drawing/Specification?		
5) Are gages being used according to instructions?		
6) Are all gage calibrations current?		
Statistical Process Control		
1) Are statistical controls used as required in the control plan? Is their evidence to show that someone is reviewing and reacting to the data?		
2) When an out-of-control or out-of-spec condition is found, is there documentation indicating the actions taken to correct the situation or contain the issue?		
3) Is process stability at or above Cpk targets for critical and significant characteristics or are plans documented to reduce variation?		
4) Are continuous improvement action plans available and being implemented?		
Identification, Traceability, Packaging, Maintenance, Training, Cleanliness, Safety		
1) Are product builds traceable as identified in the Control Plan?		
2) Does packaging and labeling meet customer specifications?		
3) Is preventive maintenance / PM for the line being performed to schedule?		
4) Are operators trained prior to operating a station, and is documented evidence readily available?		
5) Is tagging of material required? If so, is material tagged per the plant procedures?		
6) Are the premises maintained in a state of order, cleanliness, and repair? Are 5Sprinciples adopted? Is Personal Protective Equipment available and worn according to Factory rules?		
Non-Conforming Product, Corrective Action and Lessons Learned		
1) For past corrective actions; are the improvement actions still required, effective,and maintained?		
2) Are the findings from DOCK AUDITS resolved in a timely manner?		