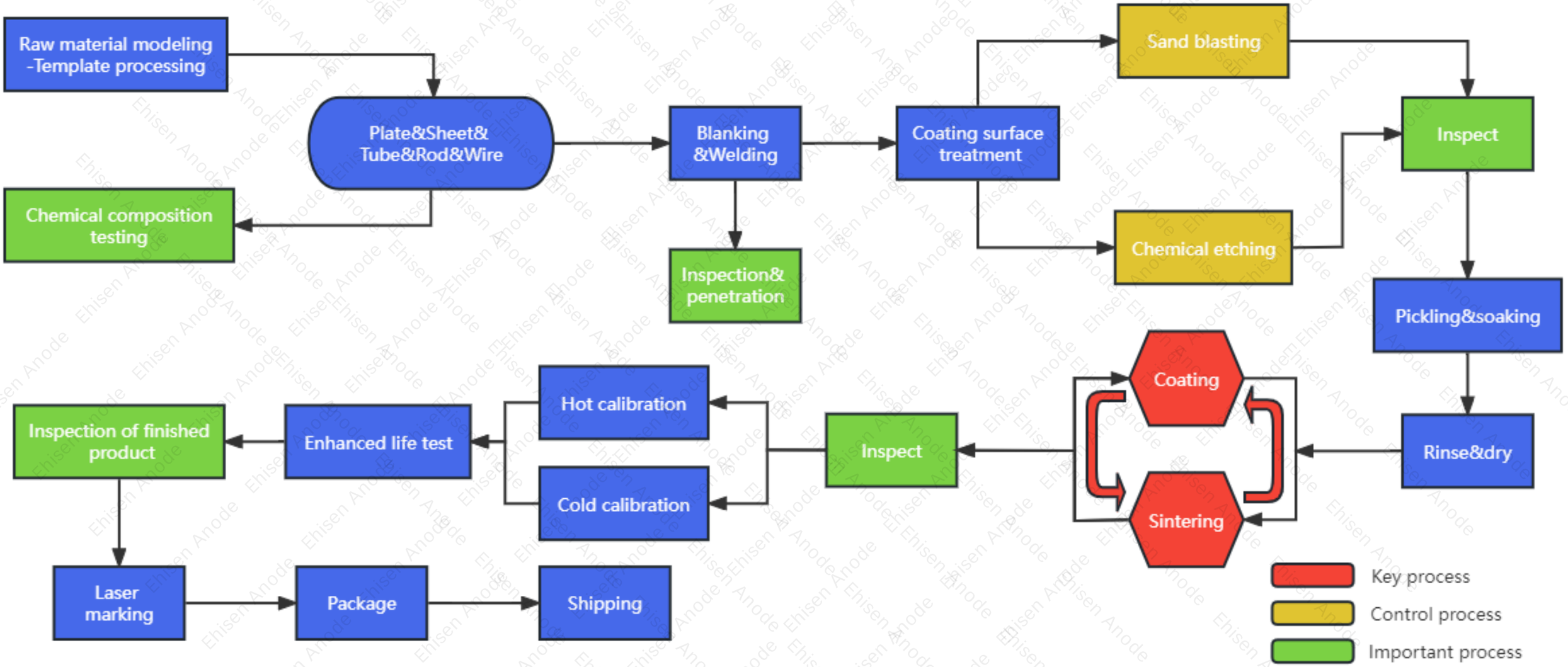
Raw material modeling -Template processing
Plate&Sheet& Tube&Rod&Wire
Chemical composition testing
Blanking &Welding
Inspection& penetration
Coating surface treatment
Sand blasting
Chemical etching
Inspect
Pickling&soaking
Rinse&dry
Coating
Sintering
Inspect
Hot calibration
Cold calibration
Enhanced life test
Inspection of finished product
Laser marking
Package
Shipping
Key process
Control process
Important process

YHX

Product Inspection Procedures

Baoji Ehisen Material Metal Co., Ltd.

C/YHX 12-2021

Controlled

Titanium anode products

2021—04—01 Publish 2021—04—01 Implement

Baoji Ehisen Material Metal Co., Ltd. Publish

Preface

This regulation is proposed by Baoji Ehisen Material Metal Co., Ltd.

This regulation was drafted by Baoji Ehisen Material Metal Co., Ltd.

The main drafter of this regulation：Miao Lei

Reviewed by：Xue Liang

Approved by：Xu Boshi

1 Range

This inspection procedure specifies the inspection requirements for raw materials, process products, and finished products during the manufacturing process of titanium anode products, and is applicable to the inspection of titanium anode products.

2 Referenced files

The relevant clauses in the following documents become the clauses of this regulation by reference. Any reference document with a date or revision shall not be applicable to this regulation in any subsequent modification list (excluding corrected content) or revised version. However, parties advocating the use of this regulation shall explore the possibility of using its latest version. For referenced documents without date or revision, the latest version applies to this regulation.

GB/T 2828.1-2012	Sampling inspection procedures by attributes part 1：Batch by batch inspection sampling plan indexed by acceptance quality limit (AQL)
GB/T 2965-2007	Titanium and titanium alloy bars
GB/T 3620.1-2007	Titanium and titanium alloy grades and chemical composition
GB/T 3620.2-2007	Permissible deviations in chemical composition of titanium and titanium alloy processed products
GB/T 3621-2007	Titanium and titanium alloy plates
GB/T 3622-2012	Titanium and titanium alloy strips and foils
GB/T 3624-2010	Titanium and titanium alloy seamless pipes
GB/T 26059-2010	Titanium and titanium alloy mesh plate
HG/T 2471-2011	Metal anode coating for electrolytic cells
J/YHX 41-2017	Specification for electrochemical performance inspection of titanium anodes

3 General principles

3. 1 The products to be inspected must come from qualified suppliers with product identification. For raw material inspection, necessary documents such as inspection notice, certificate/quality certificate, drawings, etc. must be attached. For process products and finished product inspection, necessary documents such as production process flow cards, drawings, etc. must be attached.

3.2 The process products must pass the inspection and be signed on the inspection card before they can be transferred to another process.

3.3 Before the required inspections and tests are completed or the necessary reports are received and verified, due to urgent production needs, emergency release of raw materials and exceptional transfer of process products, approval procedures must be handled according to the provisions of the quality system procedure documents before the transfer can be carried out, and the products must be marked and recorded according to regulations.

3.4 Finished products can only be stored and left factory after completing all specified inspections and tests and meeting the specified requirements. When the product has not completed all required verification activities and needs to be released exceptionally, approval procedures should be carried out according to regulations, customer consent should be obtained, and identification and records should be made to ensure that the product can be recovered and replaced.

3.5 Adequate lighting should be ensured during visual inspection.

4 Technical requirement

Implement according to product drawings, process cards, product enterprise standards, and relevant technical agreements.

5 Inspection items

5.1 Inspection of raw titanium materials

5.1.1 The material is pure titanium Gr1/Gr2 according to GB/T 3620.1-2007, its chemical composition should meet the requirements of Table 1, and the allowable deviation of its composition should comply with the provisions of GB/T 3620.2-2007.

Table 1

Grade	Chemical composition (Mass)，%													
	Main components							Impurities, not greater than						
	Ti	Al	Sn	Mo	Pd	Ni	Si	Fe	C	N	H	O	Other elements	
													Single	Sum
Gr1	margin	-	-	-	-	-	-	0.20	0.08	0.03	0.015	0.18	0.10	0.40
Gr2	margin	-	-	-	-	-	-	0.30	0.08	0.03	0.015	0.25	0.10	0.40

5.1.2 The appearance inspection shall be carried out according to the classification of plates, mesh materials, strips, pipes, and bars, in accordance with the corresponding national standards for "appearance quality" requirements.

5.1.3 The size inspection shall be carried out in accordance with the size specification requirements in the "Raw Material Inspection Notice": combined with the corresponding national standard "allowable size deviation".

5.1.4 Acceptance of raw titanium materials：

a) The warehouse keeper shall verify the specifications and quantity of the arrived boards according to the "Raw Material Inspection Notice".

b) The inspector shall verify the quality certificate/conformity certificate provided by the supplier, and the material and chemical composition shall comply with 5 1. 1 requirements; For customers who require self retesting, sample for component retesting.

c) The inspector visually inspects the appearance and should comply with 5 1.2.

d) The inspector shall use a tape measure, steel plate ruler, caliper, or micrometer to inspect the dimensions, which shall comply with 5 1.3 requirements.

e) Each batch is sampled at a rate of 10% and the number of samples is ≥ 1.

f) Qualified titanium materials shall undergo warehousing procedures; If the inspection fails, it shall be handled according to the "Nonconforming Product Control Procedure".

5.2 Process product inspection

5.2.1 Processing and molding

5.2.1.1 After the titanium material is processed and formed according to the process card and drawings, it needs to undergo dimensional and visual inspection.

5.2.1.2 Dimensional inspection: The dimensions should meet the requirements of the drawing. After the first piece inspection of the product size for manual processing (including cutting, punching, welding, assembly, etc.) is qualified, a 10% sampling inspection shall be conducted; The dimensions of products processed by machine numerical control (laser cutting, wire cutting, water cutting, mold forming, etc.) are sampled and inspected in accordance with GB/T 2828 1. General inspection level I, one sampling plan for normal inspection, with AQL=2.5 for sampling. The specific sampling and judgment are shown in Table 2.

Table2

Total number of batches of products to be inspected	Sampling inspection quantity	Ac	Re
2~15	2	0	1
16~25	3	0	1
25~90	5	0	1
91~150	8	0	1
151~280	13	1	2
281~500	20	1	2
501~1200	32	2	3
1201~3200	50	3	4

5.2.1.3 Appearance inspection: inspect according to the relevant requirements of the "process control" appearance on the process card; Full inspection for less than 20 pieces, 10% sampling for 20 pieces and above.

5.2.1.4 The composite electrode plates directly formed by outsourcing shall be inspected according to GB/T 2828.1, special inspection level S-2, normal inspection once sampling plan, and AQL=2.5 for sampling.

5.2.2 Sand blast

After sandblasting, visually inspect the appearance, ensure that the sandblasted surface is uniform and consistent, and visually compare the roughness with the sandblasted sample; According to GB/T 2828 1. General inspection level I, one sampling plan for normal

inspection, with AQL=2.5 for sampling. The specific sampling and judgment are shown in Table 2.

5.2.3 Proofreading

5.2.3.1 After calibration, visually inspect the appearance and flatness, and perform thermal calibration according to GB/T 2828 1. General inspection level I, one sampling plan for normal inspection, with AQL=2.5 for sampling. The specific sampling and judgment are shown in Table 2. Cold calibration requires full inspection.

5.2.3.2 Appearance inspection: After thermal calibration, the surface color of the electrode plate is uniform and free of spots.

5.2.3.3 Flatness inspection: The electrode plate should be flat and meet the relevant indicator requirements of the process card.

5.2.4 Acidation

Visual inspection of appearance (composite electrode plate/small piece, electrode mesh according to GB/T 2828 1. General inspection level I, one sampling plan for normal inspection, with AQL=2.5 for sampling), the surface after acid treatment should present a uniform light gray pitted surface, without spots or untreated oxide skin.

5.2.5 Process product acceptance

5.2.5.1 After conducting the process inspection, the inspector records the inspection content on the quality inspection record form and signs for confirmation.

5.2.5.2 The process products that pass the inspection will flow into the next process for processing, and the non-conforming products will be handled according to the "Nonconforming Product Control Procedure".

5.3 Finished product inspection

5.3. 1 Finished product inspection requires visual inspection, coating adhesion inspection, and electrochemical performance testing.

5.3.2 Appearance inspection: Visual full inspection method shall be adopted, and the appearance shall meet the following requirements:

a) The coating area is consistent with the requirements of the drawings and process cards.

b) The coating surface should be uniform, free from stains, indentations, and impurities.

c) The surface of the anode coating shall be free from scratches, scratches, and slight scratches or scratches are allowed (the depth shall not expose the substrate); The number and length of scratches and scratches shall not exceed the requirements of the enterprise standard for such products. If customers have special requirements for scratches and scratches, the customer's requirements shall prevail.

d) The product is free from collision or deformation.

5.3.3 Coating adhesion test: Wipe the anode coating with white gloves, and ensure that the gloves do not lose any dust or color. For the attached sample, use 18mm wide 3M transparent tape to stick it to the anode coating of the sample, press it tightly with hand and quickly remove it. Use white paper as the base, and the tape will not leave obvious black marks; Sample 1 piece per batch.

5.3.4 Electrochemical performance testing

5.3.4.1 Electrochemical performance testing includes: enhanced lifespan, current efficiency (chlorine evolution anode), and specific operations and requirements can be found in J/YHX 41-2017 "Electrochemical Performance Inspection Regulations for Titanium Anodes".

5.3.4.2 Take 1 furnace sample (cut 2 pieces) from each batch for enhanced lifespan testing, and its indicators should meet the enhanced lifespan requirements in the enterprise standards for this type of product. If customers have special requirements for enhanced lifespan, the customer's requirements shall prevail.

5.3.4.3 The current efficiency of the chlorine anode is tested on one sample per batch, and its indicators should meet the requirements of the enterprise standard for chlorine anode products. If customers have special requirements, the customer's requirements shall prevail.

5.3.5 Finished product acceptance

5.3.5.1 After the completion of the finished product, the inspector shall conduct inspections in accordance with this regulation, product enterprise standards, and customer requirements, and fill in corresponding inspection records.

5.3.5.2 The finished products can only be put into storage after passing the inspection, and the unqualified products shall be handled according to the "Nonconforming Product Control Procedure".

5.4 For products with special requirements, a separate product control plan can be prepared and inspected according to its requirements.

6 File

The data and records formed during each inspection process should be promptly organized and archived, and executed in accordance with the "Record Control Procedure".

7 Grant

This document is distributed to the Quality Department.

Baoji Ehisen Metal Materials Co., Ltd		Raw Material Incoming Inspection Control Procedure	Version number	C
			Modification number	0
			Implementation Date	2020/9/1
Number	YHX8403		Document pages	5

Directory

Release / Modify Record

Modification order No.	Revision clause	Version Status	Artificial person	Reviewed by	Approver	Effective date
——	New release	0/A	Miao Lei	Lin Jing	Xu Boshi	2018/4/1
YHX190225-1	Refer to the modification form	0/B	Miao Lei	Lin Jing	Xu Boshi	2019/4/1
YHX200819-1	Refer to the modification form	0/C	Miao Lei	Lin Jing	Xu Boshi	2020/9/1

1 Objective

This procedure specifies the implementation steps, requirements, and responsibilities of relevant departments for activities such as inspection preparation, appearance inspection, sample collection and delivery, testing, summary and judgment, and incoming material re inspection during raw material procurement inspection, to ensure that raw materials meet the specified requirements.

2 Range

This procedure is applicable to the inspection of raw materials required for company production.

3 Responsibility

3.1 Production Comprehensive Department

a) Responsible for receiving raw material purchases and printing the "Raw Material Inspection Notice" to be sent to the Quality Department for inspection. After passing the inspection, the warehouse entry procedures will be processed and recorded.
b) Identify raw materials in accordance with the provisions of YHX 8502 "Identification and Traceability Control Procedure".

3.2 Equipment factory

Responsible for receiving and notifying the arrival of raw materials for equipment procurement, and handling the warehousing procedures after passing the inspection by the quality department.

3.3 Quality department

a) Responsible for centralized management of raw material incoming inspection;
b) Responsible for the specific inspection of raw materials: verifying incoming material identification, visual inspection, if necessary, preparing samples for inspection, and implementing inspection status identification;
c) Organize verification at the supplier when necessary;
d) Comprehensively determine whether the raw materials meet the procurement requirements;
e) Approve the "emergency release" of raw materials and supervise the implementation.

3.4 Manufacturer

Responsible for handling emergency release procedures for production raw materials.

4 Procedural requirement

4.1 General principles

4.1.1 Raw materials should be verified and labeled in accordance with the procurement technical conditions and the requirements of this procedure.

4.1.2 Raw materials that have not been inspected are generally not allowed to be put into use. If they are urgently needed for production and are released without verification, emergency release procedures should be handled.

4.1.3 When necessary, verification can be carried out at the supplier's location in accordance with the procurement documents specified in YHX8401 "Procurement Control Procedure"

4.1.4 Raw material inspection shall be carried out in accordance with corresponding standards, procedures, and technical agreements. The inspection process can be found in Appendix 1.

4.2 Inspection preparation

4.2.1 Document review

After receiving the raw material quality certificate and other quality certification documents from the supplier, the quality department will have the inspector compare and review them with the supplier's quality certification documents according to the content on the "Raw Material Inspection Notice", and prepare for inspection.

4.2.2 Equipment inspection
Before inspection, sampling instruments and measuring instruments used for inspection should be checked for compliance with requirements, and the inspection equipment should be checked for normal operation. Only when they meet the requirements can they be used.

4.3 Inspection implementation

4.3.1 For precious metal raw materials, inspectors should not only review the supplier's quality certificate and inspect the appearance, but also take samples according to the relevant inspection regulations for precious metal raw materials for composition re inspection, and record them in the "Raw Material Inspection Ledger".

4.3.2 For the following situations, the inspector shall verify the supplier's quality certificate documents, check the conformity of their quality certificate documents, and conduct appearance and dimensional inspections. After passing the inspection, record the relevant content in the Raw Material Inspection Ledger.

a) Titanium and titanium alloy raw materials;
b) Other metal oxide (including precious metals) materials;
c) The raw materials provided by the supplier are produced by the system unit or tested by the system testing center. The supplier can provide a report or a copy stamped with the supplier's "quality special seal";
d) For temporary raw materials with a weight of ≤ 100Kg, they shall be provided by qualified suppliers with long-term supply, and the quality of the supplied raw materials shall be stable and reliable.

4.3.3 The raw materials of the equipment shall be inspected in accordance with the requirements of J/YHX 51-2020 "Equipment Inspection Regulations".

4.3.4 For titanium raw materials that require our company's re inspection as requested by customers, the quality department will take samples for component re inspection; Other titanium raw materials provided by qualified suppliers for a long time with stable and reliable quality shall be randomly inspected when necessary (if there are quality fluctuations or quality hazards).

4.3.5 The filling of inspection records requires neat and clear handwriting, without errors, omissions, or arbitrary alterations. In special circumstances where changes are necessary, the "scratch method" shall be used and the person making the changes shall sign and confirm the content.

4.3.6 Raw materials that are deemed unqualified shall be reviewed and handled in accordance with the provisions of YHX8701 "Nonconforming Product Control Procedure".

4.4 Emergency release of raw materials

4.4.1 General principles

4.4.1.1 Emergency release of raw materials can only be considered when there is an urgent need for scientific research and production, and failure to adopt emergency release will have serious consequences.

4.4.1.2 Raw materials that require emergency release can only be put into production after completing the approval procedures according to the provisions of this procedure, and the circulation shall be stopped before the specified process, waiting for the inspection results.

4.4.2 Procedures for examination and approval of projects

4.4.2.1 When the emergency release of raw materials is required in accordance with clause 4.4.1.1 of this procedure, the user department shall fill out the "Approval Form for Release of Raw and Auxiliary Materials to be Inspected", which shall be reviewed by the department head and submitted to the quality department for approval.

4.4.2.2 The quality department supervisor shall approve the raw material quality certificate, past usage, and supplier performance as the basis for emergency release according to corresponding standards and process requirements.

4.4.2.3 After receiving the "Approval Form for Release of Raw and Auxiliary Materials to be Inspected" and verifying that it is correct, the Production Comprehensive Department will mark it as "Emergency Release" before issuing the materials.

4.4.2.4 The approval form should clearly specify the name, batch number, specifications, quantity of the released raw materials, as well as the contract used, and indicate at what stage the circulation will stop and wait for the inspection results.

4.4.3 Inspection and usage requirements

4.4.3.1 When using materials that have been approved for emergency release, the using department should immediately stop production once problems are found, record the situation, and promptly report the specific situation to the quality department.

4.4.3.2 The quality department should still inspect the approved emergency release raw materials according to the specified inspection items and requirements.

4.4.4 Recovery Procedure

4.4.4.1 When it is found through inspection that the emergency release of raw materials does not meet the specified requirements, the quality department should immediately notify the user department to stop using them and issue a "Notice on Stopping the Use of Unqualified Raw Materials".

4.4.4.2 After receiving the "Notice on Stopping the Use of Unqualified Raw Materials", the user department should isolate all raw materials and products that have been produced according to the detailed situation of the material requisition, and indicate the words "Unqualified Stopped" in the process card and production records.

4.4.4.3 Unqualified raw materials and products already produced shall be reviewed and handled in accordance with the provisions of Y H X 8701 "Nonconforming Product Control Procedure".

4.5 Inspection status identification

When inspecting raw materials, the inspector should mark their inspection status in accordance with YHX8502 "Identification and Traceability Control Procedure" to indicate their inspection status.

5 Relevant documents

5.1 YHX8401《Procurement Control Procedure》
5.2 YHX8701《Nonconforming Product Control Procedure》
5.3 YHX8502《Identification and Traceability Control Procedure》
5.4 J/YHX 51-2020《Equipment Inspection Procedures》

6 Record

6.1 YHX8403K01A《Raw Material Inspection Ledger》
6.2 YHX8403K02A《Approval Form for Release of Raw and Auxiliary Materials to be Inspected》
6.3 YHX8403K03A《Notice on Stopping the Use of Unqualified Raw Materials》

Attachment 1：

Flow Chart of Raw Material Incoming Inspection