

INSPECTION Guideline for quality	Quality Standards	
Quality Specification	Doc ID:	2-01944916
	Doc. Rev.:	B

Quality Standards Unit no. x

INSPECTION Guideline for quality Quality Specification

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1 Scope

This standard defines the general guidelines for quality documentation and (witness) inspections of components purchased or produced (incl. installation and commissioning at site) by Voith Hydro.

Note: “Manufacturer” in this specification is a general definition and includes all specific descriptions such as “Founder” (Foundry Shop) / Forging Shop (see related Quality Sheets, definitions as per CCH 70-4).

2 Reference Standards

This procedure refers to following standard:

- EN 10204: “Metallic products - Types of inspection documents”
- ISO 10474 : “Steel and steel products - Inspection documents”
- ISO 9712: “Non-destructive testing – Qualification and certification of NDT personnel”
- ISO 17000: “Conformity assessment - Vocabulary and general principles”
- ASNT SNT-TC-1A: “Personnel Qualification and Certification in Nondestructive Testing”

3 Abbreviations

ASME = American Society of Mechanical Engineers	NDT = Non Destructive Testing
ASNT = American Society for Nondestructive Testing	OU = Operating Unit
BOM = Bill of Material	PO = Purchase Order
CCH = Cahier des Charges de Réception des Pièces en Acier Moulé pour Machines Hydrauliques	PT = Dye-penetrant Test
BT = Batch Test	PWHT = Post Weld Heat Treatment
Cat. = Category	QA = Quality Assurance
Doc. = Document	QS = Quality Sheet
EP = Examination Procedure	RI = Random Inspection
EXI = Examination Instruction	RT = Radiographic Test
GS = General Specification	ST = Sample Test
ICC = Inter Company Cooperation	TDS = Technical Delivery Specification
ID number = Identification Number	UT = Ultrasonic Test
ITP = Inspection and Test Plan	VT = Visual Test
MGS = Material Grade Specification	WBS = Work Breakdown Structure

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MT = Magnetic Particle Examination	Wit. = Witness
QASC = Quality Along the Supply Chain (Voith quality management tool)	

4 Background and ITP definitions

VOITH HYDRO maintains a modular quality assurance system. The ITP is the leading document. The ITP calls for general quality standards like MGS, QS and GS. These documents themselves may refer to examination procedures (EP, EXI).

The ITP is part of the contract between VOITH HYDRO and its customer. It specifies the mandatory quality assurance measures on the equipment during the value-added-process. Any deviation from these specifications as well as any inconsistencies among specifying documents and standards are subject to prior approval/release by VOITH HYDRO. VOITH HYDRO requirements are binding even though the manufacturer provides additional documentation (welding book, procedures, manufacturing and process plan,...). VOITH HYDRO's review of this additional documentation does not relieve the supplier from its duties. Any deviation from the specification requires a formal approval (change request) of VOITH HYDRO.

Within the column "Witness" ("Wit.") the following abbreviations are used:

S: Inspection to be carried out solely by the manufacturer

F: Inspection to be witnessed by VOITH HYDRO. VOITH HYDRO reserves the right to waive its participation.

G: Inspection with mandatory presence of VOITH HYDRO

X: Inspection with mandatory presence of VOITH HYDRO. Customer may opt to witness the inspection(s) based on, and without any impact, to the project schedule dates. Work process shall not stop in case of "no show".

H: Inspection with mandatory presence of VOITH HYDRO and VOITH HYDRO's customer. Work process shall stop, unless the customer explicitly waives his participation.

Announcement of F, X, H, G witness inspection dates (via QASC tool, inspection status "forecasted") > 30 days to VOITH HYDRO. Dates shall be confirmed (via QASC tool, inspection status "invited") by latest 10 working days prior to the planned inspection.

Within the column "Category" ("Cat.") the following abbreviations are used:

Q: Quality record for data book

- records expected
- records are part of the quality data book

R: Internal record – VOITH HYDRO internal requirements

- records expected
- records are NOT part of the quality data book

V: Internal verification, without records

- No record expected

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The inspection document type *such as 3.1, 3.2 or 2.2* according to EN 10204 / ISO 10474 is indicated in the column "Doc.". If this column is blank, a test protocol confirmed by the inspector is sufficient. Both standards are accepted.

5 Traceability of material

5.1 General rules

All components mentioned in the ITP shall be marked permanently. Permanently joint (welded, brazed,...) components shall only receive one stamp for the entire component. The traceability of the raw material will be ensured as per clause 6.3. The location of the marking is indicated on the respective manufacturing drawing. All inspection documents and test reports (MT, PT, VT, UT, dimensional, material) shall include a reference to this stamping/markings of the component. *If marking is removed by machining or similar, part shall be re-marked ensuring traceability.* In case marking is necessary on a machined area, the marking shall be ground flat (e.g. by using oil stone).

Following data shall be included in the marking:

- manufacturer's reference that can clearly be found on each certificate of the quality data book (unique ID number; e.g. heat and batch no.)
- Voith material number; optional for quantity > 5
- Sales order no. + unit no.; optional for quantity > 5
- serial number for quantity > 1
- Further marking according to drawing, if specified



Figure 1: Example for marking (example without serial number)

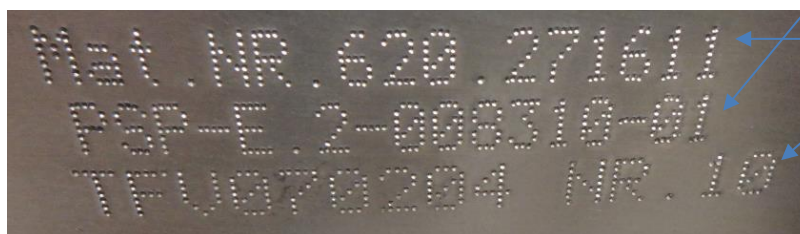
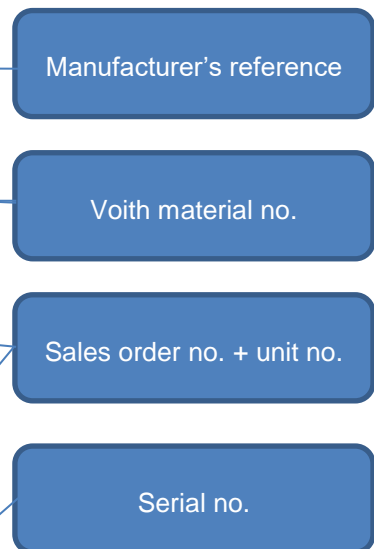


Figure 2: Marking incl. serial no.



5.2 Welded components

(if required in the purchase order or ITP or other projects specific documents; otherwise proceeding as per 5.1)

The manufacturer shall assure that all welded components and used raw materials (plates, castings, forgings, etc.) are permanently marked so that traceability of each material is possible at any time. The

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stamp shall correspond to the traceability list (see 6.3) and shall give traceability to the raw material. The marking of the plates shall sustain until inspection welding and PWHT (if applicable).

5.3 Remarks

If not elsewhere specified the test scope is 100% for the manufacturer *or as indicated in the respective standard or specification*. The test scope during witness inspections depends on several parameters such as manufacturer's rating and criticality of the component.

The ITP shall not be considered as a test and inspection sequence plan. All inspection documents and recordings shall be submitted in English language if not otherwise specified. If the ITP requires a 3.1/3.2 certificate according to EN 10204 / ISO 10474, VOITH HYDRO considers following deviation from these standards as acceptable: (re-)test or (re-)qualifications without manufacturer's confirmation such as Z35 or UT on plates. Confirmation by an inspection representative is mandatory.

A 3.2 certificate is fulfilled if a VOITH HYDRO representative witnesses and confirms the results on the respective certificate. If the ITP requires a 3.2 certificate and the part is manufactured at VOITH HYDRO, a 3.1 certificate confirmed by VOITH HYDRO is considered as sufficient. *Witness inspections may be performed by remotely.*

6 Inspection, quality data book and shipment release

6.1 General rules

The quality data book shall be available before inspection reflecting the manufacturing progress of the tested component. If certificates need to be reworked, the certificates shall be sent to VOITH HYDRO within one week. In any case the quality data book is a precondition for shipment release. Any deviation from the specification shall be reported to VOITH HYDRO immediately after detection. Anything that affects the specified capabilities of the component at the point of shipment is considered to be a deviation (e.g. final dimensions, material, heat treatment, not specified overlay welding to meet dimensions, specified performance data). In case of a deviation an NCR shall be submitted to the responsible Sourcing Manager in the purchasing department. Any NCR shall be added to the quality data book. The quality data book shall be uploaded to the VOITH HYDRO QASC planning tool.

6.2 General data on quality documents

The quality data book issued by the manufacturer shall be identifiable by following data (in order to find data, see enclosure – *clause 7*):

- Project name (code word)
- Test step number ("item") according to inspection and test plan (ITP)
- PO no. and PO item no.
- WBS element number
- Voith Material number
- Drawing number incl. revision
- Part name/component

The data above shall appear at least on a cover sheet or similar of the quality data book. A clear reference between the cover sheet and the individual protocol shall be created (e.g. part ID, production order no.). The quality data book shall provide a clear link between protocol and line item of ITP ("operation code").

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7 Annex



Figure 4: Relevant numbers in PO

impulse turbine, vertical
Inspection and Test Plan
Applicable for use in the Planning Tool

Description: Raw Material Test - Forging
 Project: XYZ
 Sales order: 20012345
 Hydro Structure: TIV020111: Shaft
 Test plan: TIV020111-02-005-RAW
 Test Plan Revision: 1
 Test Plan Derived From ITP: 2-10001122

Mod. Rev.	Code	Designation	Cat.	Wit.	Doc	Quality-Class	Test Scope (%)	Procedures / Specifications	Comment
	TIV020111-02	Shaft							
1	TIV020111-02-005-RAW	Raw Material: Raw Material Test - Forging							
	TIV020111-02-005-RAW-001	Chemical Analysis	Q	S	3.1			MGS 2-10136202	
	TIV020111-02-005-RAW-002	Heat Treatment	Q	S	3.1			MGS 2-10136202	
	TIV020111-02-005-RAW-003	Test Coupons Stamped and Identified	Q	F	3.1				test coupon positioning acc. QS 2-10136203; incl. photos
	TIV020111-02-005-RAW-004	Tensile Test	Q	F	3.2			MGS 2-10136202	
	TIV020111-02-005-RAW-005	Impact Test	Q	F	3.2			MGS 2-10136202	
	TIV020111-02-005-RAW-006	Hardness Test	Q	F	3.1			MGS 2-10136202	

Figure 5: Example for inspection and test plan