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TECHNICAL SPECIFICATION

Doc No: DSF-SPC-QAC-004

Rev. 1

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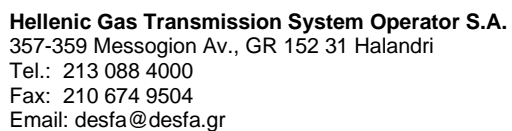
HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

POSITIVE MATERIAL IDENTIFICATION

JUNE 2021

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1	Second Issue	30-06-2021	KD	DK	TPI
0	First Issue	05-04-2011	PQ DPT.		V.G.
REV	DESCRIPTION	DATE	PRPD	CHKD	APVD



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SCOPE AND OBJECTIVES

This specification specifies all the requirements for positive material identification of alloy/stainless steel bulk materials to be employed by the Contractor, which include the supply, fabrication or erection of alloy/stainless steel materials.

PMI specifies identification, examination, marking, traceability and certification in according with Pressure Equipment Directive (PED) No. 214/68/EU throughout all the phases of material supply, fabrication, warehousing and erection to assure correct materials are installed.

Carbon steel materials are not subject to this specification. It is understood that this PMI, procedure does not substitute any other inspection and testing requirements and that all the above materials will continue to receive all the normal delivery checks for compliance with the Purchase Order and all the normal field inspection controls during prefabrication and erection to ensure that the quality of materials and workmanship meets project requirements.

1. REFERENCES

1.1 Reference Documents

Job Spec. No. DSF-SPC-QAC-002

[Material Colour Coding]

Job Spec. No. DSF-SPC-QAC-005

[Shop Inspection of Equipment and Materials for NGT Project]

Job Spec. No. DSF-SPC-QAC-006

[Inspection and Test Instructions]

1.2 Reference Codes and Standards

Pressure Equipment Directive (PED) No. 214/68/EU

2. ACRONYMS

PMI: Positive Material Identification


PED: Pressure Equipment Directive

XRF: X-Ray Fluorescence

3. RESPONSIBILITIES

The application of the PMI, procedure according to the present specification is at complete care and charge of Mill, Stockist, Shop Prefabricator or Fabricator, Field Erector and shall include:

- Supply of the required apparatus (portable analyzer) or chemical analysis performed by a recognized laboratory.

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- Supply of qualified analyzer operator.
- Application of controls and issue of PMI, reports.

The execution of controls at field site shall not be at shop Prefabricator or Fabricator charge except for assembling/erection works performed in field by the same shop Prefabricator/Fabricator.

4. LIMITS OF PMI INSPECTION

4.1 ITEMS TO BE PMI INSPECTED

All alloy/stainless steel bulk materials for piping systems including all components (i.e. pipes, fittings, pressure containing parts of valves, plugs, couplings, flanges, pressure containing parts of control valves, flow nozzles, flowmeter runs, thermowells, PSV's orifice plates, orifice flanges, etc.).

Tubular products used in equipment fabrication and internals (i.e. heat exchangers, heaters, boilers, furnace tubes, return bends, fittings, packaged units, tube hangers, tube supports, baffles and tubesheets).

Equipment and materials shall be in accordance with **Job Spec. No. : DSF-SPC-QAC-005** requirements.

4.2 MATERIALS TO BE PMI INSPECTED

Alloy/stainless steel materials

4.3 COLOR MARKING

Materials must be color marked by Supplier according to the Job Spec. No. DSF-SPC-QAC-002.

Materials without color marking will not be delivered to the job site and/or used for prefabrication/construction.

4.4 LOCATION OF INSPECTION

The PMI examination will be implemented in the following potential problem areas:

- Raw Material Supplier.
- Fabrication Shop.
- Gen. Site Warehouse.
- Field.



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5. EXTENT OF PMI INSPECTION

5.1 CHECKS TO BE PERFORMED AT SOURCE SUPPLIER (MILL – STOCKLIST)

The positive material identification will be performed on a representative sample taken out from each lot supplied.

As a lot it is intended that all the materials supplied are produced from the same heat.

A representative sample consists of one or more units (pieces) randomly selected from the lot to be inspected, which are to be examined to determine lot acceptability.

The sampling criteria will be in accordance with TABLE 1.

Size of the Lot	Size of the Representative Sample
5 units or less	100%
6 to 200 units	5 units or 5% of total, whichever is greater
Greater than 200 units	10 units or 3 % of total, whichever is greater.

TABLE 1.

If any piece from the representative sample is found to be unacceptable, the remaining lot quantities will be 100 % checked.

When a lot is found to contain unacceptable pieces, the next two lots (from the same supplier) shall be checked 100 %. If both lots are acceptable the sampling procedure per section 5 above may be resumed.

5.2 CHECKS TO BE PERFORMED AT FABRICATOR'S SHOP


The positive material identification at this stage will consist of a visual check to ensure that Mill certificates are in agreement with marking and stamping on materials previously PMI checked.

Lots of materials not previously PMI checked will be tested according to section 5.1 of the present specification.

Each piece of material from a lot previously PMI checked and found without color marks will be identified and marked and rejected to the supplier if not in accordance with the material specification.

Materials previously PMI identified and color marked but not stamped will be spot-checked to assure that material control procedures are functioning properly.

If color mark/stamp of any component could be destroyed during work process or will be no longer clearly visible, identifying symbols shall be transferred/reapplied at Contractor's care and responsibility.

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All alloy materials already validated shall be stored in segregated areas to prevent material mix-ups during fabrication and/or assembling.

Repetitive problems will be discussed with Contractor management to strongly reinforce the need for improved Quality Control.

5.3 CHECKS TO BE PERFORMED AT SITE (FIELD WAREHOUSE)

On their arrival at field warehouse, the bulk or shop fabricated materials will be submitted to a visual examination to ensure that Purchase Order specification is in agreement with the material color stamping and marking.

Materials part of PMI identified lots, found without color marks, will be 100 % tested and accepted only if strictly in accordance with the relevant material specification. Otherwise they will be rejected to the supplier for substitution.

Spot-checking of color marked materials will be performed. The pieces to be inspected will be selected by Owner surveyor.

After all alloy materials have been validated, they shall be stored in segregated areas, to prevent material mix-ups during erection.

If color marks/stamps of any component are no longer clearly visible, identifying symbols shall be affixed again, on it.

Repetitive problems will be discussed with Contractor Management to strongly reinforce the need for improved Quality Control.

5.4 CHECKS TO BE PERFORMED AT SITE (FIELD WAREHOUSE)

On their arrival at field warehouse, the bulk or shop fabricated materials will be submitted to a visual examination to ensure that Purchase Order specification is in agreement with the material color stamping and marking. Materials part of PMI identified lots, found without color marks, will be 100 % tested and accepted only if strictly in accordance with the relevant material specification. Otherwise they will be rejected to the supplier for substitution.

Spot-checking of color marked materials will be performed. The pieces to be inspected will be selected by Owner surveyor.

After all alloy materials have been validated, they shall be stored in segregated areas, to prevent material mix-ups during erection.

If color marks/stamps of any component are no longer clearly visible, identifying symbols shall be affixed again, on it.

Repetitive problems will be discussed with Contractor Management to strongly reinforce the need for improved Quality Control.



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5.5 CHECKS TO BE PERFORMED AT SITE (FIELD PREFABRICATION AREA)

The criteria to be followed shall be in accordance with section 5.2 of the present specification.

5.6 CHECKS TO BE PERFORMED AT SITE (DURING CONSTRUCTION PROGRAM)

During erection and before starting with painting/insulating operations, all items will be visually checked to identify marks and stamps and check correct installation.

Pieces found without color marks will be 100 % tested and accepted only if strictly in accordance with the relevant material specification; otherwise they will be rejected and cut out immediately.

All alloy materials already validated shall be stored in segregated areas, to prevent material mix-ups during construction.

Repetitive problems will be discussed with Mechanical Erection Management to strongly reinforce the need for improved Quality Control.

If color mark/stamp of any component could be destroyed during work process or were no longer clearly visible, identifying symbols shall be transferred/affixed again at Mechanical Erector's care and responsibility.

6. EXAMINATION METHODS

6.1 ACCEPTABLE METHODS

The portable analyzers used shall be of XRF technology, with calibration certificates and reference specimens for verifying the equipment operation and measurements.

For laboratory testing the following methods are acceptable provided the laboratory is accredited:

- X-ray emission spectrometry
- Optical emission spectroscopy
- Wet chemical analysis

Portable analyzer operators shall be trained and have on-job experience with the equipment used.

When a portable analyzer is used and identification element coverage is not sufficient to identify the material, then that material shall be checked by an accredited analytical laboratory.

All laboratory chemical analysis shall be carried out according to the relevant Standards included in the laboratory accreditation.

Portable x-ray emission analyzers must be used at temperatures greater than 0°C to avoid erroneous observations.