DCMA NSEO MANUFACTURING PROCESS SURVEILLANCE (MPS) CHECKLIST #03MT

MAGNETIC PARTICLE TESTING

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| **SUPPLIER & CAGE:**  |  |
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| **LOCATION:** |  |
|  |  |
| **PROCESS:** |  |
| **Program Type:**

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| --- | --- | --- | --- | --- | --- |
|  | Level I/SUSBAFE (LI/SS) |  | Navy Propulsion Program (NPP) |  | Deep Submergence Systems/Scope of Certification Program (DSS-SOC) |
|  | Nuclear Plant Material (NPM) |  | Naval Nuclear Propulsion Program (NNPP) |  | Aircraft Launch & Recovery Equipment (ALRE) |
|  | Fly By Wire Ships Control Systems (FBWSCS) |  | Ships Critical Safety Items (SCSIs) |  | Other: |

**Contractual Requirement(s) for this process:**

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**Supplier Procedure Number(s), Title(s) & Revision Level(s)/Date(s):**

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| --- | --- |
| Surveillance Performed By:  |  |
|  |  |
| Date(s) of Surveillance: |  |
| Contract Number(s): |  |
|  |  |
| Part Number(s)/Serial number(s)/NSN: |  |
|  |  |
| Part Nomenclature(s): |  |
|  |  |
| Supplier Personnel Contacted and Titles: |  |
|  |  |
| Drawing Number & Revision: |  |

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**Process Concerns and Guidance:**

* Improper Surface Preparation: It is critical that Magnetic Particle inspections be performed on surfaces that meet technical and procedural requirements. Improper surface conditions can mask defects or cause non-relevant or false indications.
* Inspection Coverage Problems: Insufficient coverage of the full area of interest, inspections beyond the specification’s allowable limits for coil, prod and yoke inspections, and insufficient magnetic field overlap to ensure full magnetic field coverage of inspection areas The inspection surface as offered in the final surface condition for acceptance has been inadequate.
* Acceptance Criteria: Acceptance criteria can vary depending on whether the product will be 100 percent volumetrically inspected using another NDT method. QAR must be cognizant of all NDT inspections to be performed that may affect acceptance criteria. Inspection procedure and Acceptance criteria should be available to inspector at workstation
* Inadequate Process Controls: In fluorescent magnetic particle testing, the particles in solution will gradually become depleted with use or may become contaminated with extraneous material. Suppliers must test the solution, normally daily when in use, to determine that there is an adequate level of particles in the solution and contamination level is not excessive.
* Inadequate Technique: There have been instances of poor technique observed which have resulted in invalid and questionable results due to inadequate pre-cleaning, inadequate visible or fluorescent lighting in the inspection area, inspecting beyond the limits of the coil, inspections performed on rough surfaces and inspections performed in only one direction or with inadequate magnetic field.
* Dry technique: Insufficient application of particles, excessive removal of particles and lighting on the test surface.
* Wet technique: Concentration and application of suspension of particles and the intensity of ultraviolet light at the test surface.
* Process Control testing not being performed as required
* Inaccessible areas on parts not adequately masked to preclude loss of cleanliness
* Amperage not within the procedure/specification range
* De-magnetization not being performed as required

**Governing Specifications**:

* NAVSEA 250-1500-1
* MIL-STD-2132
* T9074-AS-GIB-010/271

**Additional Oversight Checklists**

Addendums to this MPR checklist are available to use for a more in-depth process review. If used, the completed Addendum(s) are to be uploaded to the SAP Database in PDREP with the base checklist.

* 03 MPR-MPS - Addendum 1 – NDT Qualification, Certification and Oversight

**QARs should use the “BASIS OF DETERMINATION” column to document the objective quality evidence and/or clarify the rationale used to support their decision. (e.g. direct observation, documents verified etc.)**

S = Satisfactory U = Unsatisfactory

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| --- | --- | --- | --- |
| **SURVEILLANCE QUESTIONS** | **S** | **U** | **BASIS OF DETERMINATION** |
| 1. Are there any Corrective Actions previously issued for MT that will impact this inspection?
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| 1. Is the MT inspector certified in the method being performed? List inspector certification level and expiration dates for vision and NDT certifications.(NAV03-9/6a-b/7)
 |  |  |  |
| 1. Are procedures available to the personnel performing the task, with clear, correct inspection/acceptance requirement documentation and revisions? Have MT procedures been approved? Record procedures used and approval dates. (NAV03-2/8a-b)
 |  |  |  |
| 1. Does the procedure/technique used meet contract/inspection requirements? Are the MT procedures/techniques being used correctly for the tests being performed?
 |  |  |  |
| 1. Are the product and the materials used to perform the tests controlled and traceable throughout the process?
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| 1. Is inspection and testing equipment calibrated and of the required adequacy, accuracy, precision, and range to assure supplies produced comply with specifications and drawings? ***What Items were sampled and were they part of the supplier’s calibration program and within the calibration/check cycle?*** (NAV03-15)
 |  |  |  |
| 1. Is all non-conforming material segregated, controlled, traceable, and do procedures exist for disposition of the non-conforming material?
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| 1. Have the parts been properly pre-cleaned? Describe the process.
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| 1. Are the parts’ openings masked and plugged and removed after testing and inspection?
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| 1. Is the magnetic field induced in two opposing directions?
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| 1. Is there adequate/complete magnetic coverage of all inspection areas? (prod, yoke, coil etc… placements)
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| 1. Is there adequate coverage of powder (dry method) or suspension (wet method)?
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| 1. What are the actual amperages used for each inspection area and are they in compliance with the technique? (eachmagnetic direction) (NAV03-10)
 |  |  |  |
| 1. Is the lighting adequate on the test surface, visible or fluorescent, and verified with an appropriate light meter? (NAV03-11) ***Record readings obtained.***
 |  |  |  |
| 1. Is the material/product controlled and traceable throughout the process being audited?
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| 1. Are indications, both relevant and non-relevant, and non-conformities evaluated properly and in accordance with the acceptance criteria? Are non-relevant indications documented, if required?
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| 1. Is adequate or required magnetic field monitored and if so, how?
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| 1. If required, has residual magnetism been removed and if so what was the final gauss meter reading? (NAV03-16)
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| 1. Have parts been properly post cleaned? Describe process.
 |  |  |  |
| 1. Are correct acceptance criteria applied? Is the acceptance certification document correct, contain the minimum requirements, and show traceability? (NAV03-12)
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| 1. Are inspection records adequate to meet procedural requirements and include at least the following: (NAV03-14)
* Description and unique ID of item inspected.
* Approved procedure ID.
* Instrument manufacturer and model number, or unique equipment ID (excluding yokes).
* Acceptance standard used.
* Date of inspection.
* Signature(s) of inspector(s).
* Disposition (accept/reject) of the item inspected.
* Indicate heat off date and time for HY80/100 material.
* Other items as required.
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| 1. Are records maintained to confirm that all required inspection processes were performed?
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| Other observations: |  |  |  |
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| **Overall MPS Results:** | **SATISFACTORY** |  | **UNSATISFACTORY** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Corrective Action Generated?** | **No** |  |  | **Yes** |  |  | **CAR#** |  |

**FOLLOW-UP ACTION REQUIRED?**

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**SUMMARY/NOTES/COMMENTS/CONCERNS**:

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