

STDP *Standard Procedure*

PROJECT	NON-DESTRUCTIVE TESTING PROCEDURE	DOC. NO. : JA-MT-810
	MAGNETIC PARTICLE TESTING	REV. NO. : 0 PAGE : 1 / 10

MAGNETIC PARTICAL TESTING

JAICO

PREPARED BY : _____ DATE : _____

REVIEWED BY : _____ DATE : _____

APPROVED BY : _____ DATE : _____

CUSTOMER

REVIEWED BY : _____ DATE : _____

APPROVED BY : _____ DATE : _____

REMARK :

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1.0 SCOPE AND PURPOSE

This procedure describes the requirements and techniques of nonfluorescent, continuous & yoke type magnetic particle examination of the ferrous materials and their welds.

2.0 APPLICABLE CODES AND STANDARDS

The following Codes and Standards are referred to herein.

- (a) ASME Code Sec.V (Latest Applicable Edition & Addenda)
- (b) ASME Code Sec.VIII,Div.1 (Latest Applicable Edition & Addenda)
- (c) SNT-TC-1A (Current Code Adopted Editions)

3.0 PERSONNEL QUALIFICATION

- 3.1 All personnel performing the MT shall be certified in accordance with the "JA-WR-1(Standard of NDE Personnel Qualification and Certification)" which complies with the requirements of SNT-TC-1A.
- 3.2 The results of Magnetic Particle Examination shall be evaluated by only by personnel certified to JAICO MT Level II or Level III.

4.0 SURFACE PREPARATION

- 4.1 Surface preparation by grinding or machining may be necessary where surface irregularities could mask indications due to discontinuities.
- 4.2 Prior to magnetic particle examination, the surface to be examined and all adjacent areas within at least 1 in.(25mm) shall be dry and free of all dirt, grease, lint, scale, welding flux and spatter, oil, or other extraneous matter that could interfere with the examination.
- 4.3 Cleaning may be accomplished using detergents, organic solvents, descaling solutions, paint removers, vapor degreasing, sand or grit blasting, or ultrasonic cleaning methods.

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5.0 EQUIPMENT AND MATERIALS

5.1 Equipments

Magnetizing is done by the use of portable yoke. Yokes may be of the fixed or articulated leg types, and when electromagnetic yokes are used to magnetize a local area, a longitudinal field is formed between the poles.

5.2 Wet Particles

5.2.1 The color of the particles shall provide adequate contrast with the surface being examined.

5.2.2 Wet magnetic particles are designed to be suspended in a vehicle such as water or oil to the test surface by flowing, spraying or pouring.

5.2.3 For the concentration of wet magnetic particle suspensions, the recommended settling volume is from 1.2 to 2.4 mL per 100 mL of vehicle for nonfluorescent particles. In cases the particles are premixed with the suspending vehicle by the supplier, the bath concentration is normally determined by supplier's certificate.

5.2.4 The temperature of the wet particle suspension and the surface of the part shall not exceed 135°F.

6.0 CALIBRATION OF EQUIPMENT

6.1 Frequency of Calibration

The magnetizing force of yoke shall be checked at least once per 6 months, or whenever a yoke has been damaged. If yoke has not been in use for a year or more, a check shall be done prior to first use.

6.2 Lifting Power of Yoke

6.2.1 Alternating Current Electromagnetic Yoke shall have a lifting power of at least 10 lb(4.5 Kg) at the maximum pole spacing that will be used.

6.2.2 Direct Current Electromagnetic Yoke shall have a lifting power of at least 40 lb(18.1 Kg) at the maximum pole spacing that will be used.

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7.0 EXAMINATION PROCEDURE

7.1 Magnetizing Techniques

7.1.1 Sensitivity Measurement

- a) A Magnetic Field Indicator may be used as a convenient rough check of the adequacy and direction of part magnetization.
- b) A sufficient magnetic field must be generated in the part under examination to clearly develop the test pattern in the indicator.
- c) In using this indicator, a suitable flux or field strength is indicated when a clearly defined line of magnetic particles forms across the copper face of the indicator when the magnetic particles are applied simultaneously with the magnetizing force. When a clearly defined line of particles is not formed in the desired direction, the magnetizing technique shall be changed or adjusted.

7.1.2 Sequence of Operation

Examination shall be done by the continuous method ; that is, the magnetizing current remains on while the examination medium is being applied and while excess medium is being removed whenever possible. The operating sequence will be as follows:

- a) The surface to be tested will be thoroughly prepared and traces of grease, dirt, flux, spatter, etc. will be removed prior to the inspection.
- b) visual inspection will be made of the tested area for surface defects.
- c) White background paint may be applied to the surface being tested.
- d) The magnetic field will be applied to the area which is to be tested.
- e) Magnetic particles will be applied on the area which is to be tested.
- f) The magnetic field will be hold for min. 5 second to allow particle magnetization and than it will be withdrawn.
- g) All examinations will be conducted with sufficient overlap to ensure 100% coverage at the required sensitivity of the tested area under examination.

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h) A second examination shall be made with the lines of flux approximately perpendicular, those used during the first examination.

i) All indications shall be evaluated in accordance with Para. 8.0 & 9.0.

7.2 Application of Magnetic Particle

Wet magnetic particle shall be applied with spraying over the area to be examined.

7.3 Observation of Magnetic Particle Indication

7.3.1 The observation of magnetic particle indication shall, as a rule, be made immediately after the formation.

7.3.2 Since the magnetic particle indication include some nonrelevant indications caused by reasons other than defects, great care must be taken for the discrimination between nonrelevant and relevant indications.

8.0 EVALUATION OF INDICATIONS

8.1 Indications will be revealed by retention of magnetic particles. All such indications are not necessarily imperfections, however, since excessive surface roughness, magnetic permeability variations (such as at the edge of heat affected zones), etc., may produce similar indications.

8.2 An indication is the evidence of a mechanical imperfection. Only indications which have any dimension greater than 1/16 in. shall be considered relevant.

8.2.1 A linear indication is one having a length greater than three times the width.

8.2.2 A rounded indication is one of circular or elliptical shape with a length equal to or less than three times its width.

8.2.3 Any questionable or doubtful indications shall be reexamined to determine whether they are relevant or not.

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9.0 ACCEPTANCE STANDARDS

All surfaces to be examined shall be free of ;

- (a) relevant linear indications ;
- (b) relevant rounded indications greater than 3/16 in ;
- (c) four or more relevant rounded indications in a line separated by 1/16 in. or less, edge to edge.
- (d) an indication of an imperfection may be larger than the imperfection that causes it; however, the size of the indication is the basis for acceptance evaluation.

10.0 RE-EXAMINATION

10.1 Treatment of Indications Believed Nonrelevant

Any indication which is believed to be nonrelevant shall be regarded as an imperfection unless it is shown by reexamination by the same method or by the use of other nondestructive methods and/or by surface conditioning that no unacceptable imperfection is present.

10.2 Examination of Areas from Which Imperfections Have Been Removed

After a defect is thought to have been removed and prior to making weld repairs, the area shall be examined by suitable methods to ensure it has been removed or reduced to an acceptably sized imperfection.

10.3 Reexamination of Repair Areas

After repairs have been made, the repaired area shall be blended into the surrounding surface so as to avoid sharp notches, crevices, or corners and reexamined by the magnetic particle method and by all other methods of examination that were originally required for the affected area, except that, when the depth of repair is less than the radiographic sensitivity required, reradiography may be omitted.

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11.0 DEMAGNETIZATION

When residual magnetism in the part could interfere with subsequent processing or usage, the part shall be demagnetized any time after completion of the examination.

12.0 RECORDS

12.1 Magnetic Particle Examination records shall be filed for the period required by contract unless otherwise agree to by the interested parties.

12.2 Examination condition and interpretation & evaluation shall be recorded on the report form of Magnetic Particle Examination (Exhibit 1-1, 1-2) attached to this procedure.


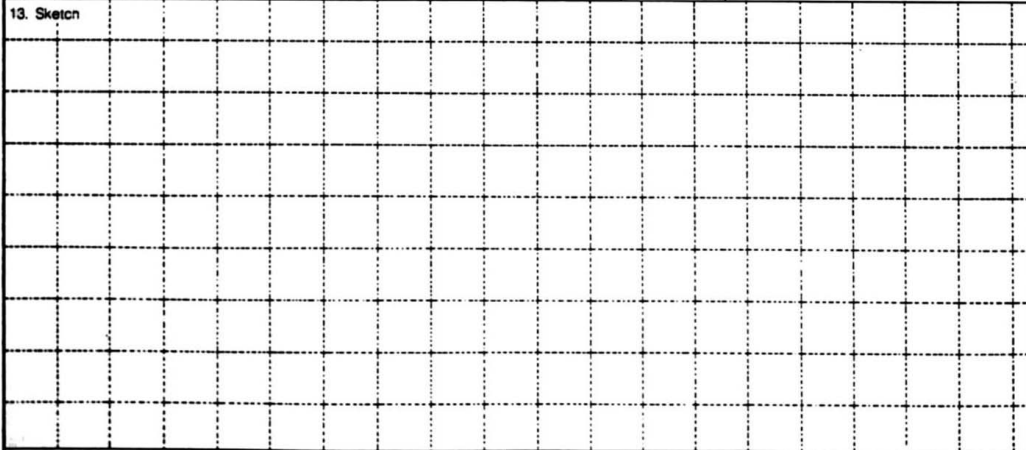
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EXHIBIT 1-1 : REPORT OF MAGNETIC PARTICLE EXAMINATION (A)

자 분 탐 상 보 고 서
REPORT OF MAGNETIC PARTICLE EXAMINATION

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 JAICO Joong Ang Inspection Co., LTD. <small>□ Daedo-Bldg. 1st FL. 78-8 Non Hyun-Dong Kang Nam-Ku, Seoul, Korea. □ TEL : (02)545-2961-3. FAX : (02)545-2964</small>		보고서 번호 (Report No.)
		발주자 (Customer)
1. 공사명 (Project Name)		2. 부품번호 (P/N)
3. 도면번호 (DWG. No)		
4. 검사물 (Object)	Material	
	Surface Condition	
	Surface Temp.	℃
	Surface Finish	
5. 자화방법 (Technique)		<input type="checkbox"/> Ford <input type="checkbox"/> Yoke <input type="checkbox"/> Head Shot
6. 자화장비 (Equipment)		<input type="checkbox"/> Central Conductor <input type="checkbox"/> Coil
7. 검사방법 (Method of Exam)	Method	<input type="checkbox"/> Continuous <input type="checkbox"/> Residual
	Current	<input type="checkbox"/> AC <input type="checkbox"/> DC <input type="checkbox"/> HWDC <small>Amps</small>
8. 자외선등 (Black Light)		<input type="checkbox"/> ft-cd <input type="checkbox"/> μW/cm²
9. 자 분 (Magnetic Particles)	Manufac.	
	Brand	
	Size	μ
10. 자극간격 (Spacing)		<input type="checkbox"/> inch <input type="checkbox"/> cm
11. 탈자 (Demagnet.)		<input type="checkbox"/> Yes <input type="checkbox"/> No.
12. 적용규격 (Applicable Document)		Spec. Procedure No.
13. Sketch 		
Examined by Level _____ Interpreted by Level _____ Approved by Level _____		<input type="checkbox"/> Witnessed by <input type="checkbox"/> Reviewed by 검사일자 (Date of Exam.)

