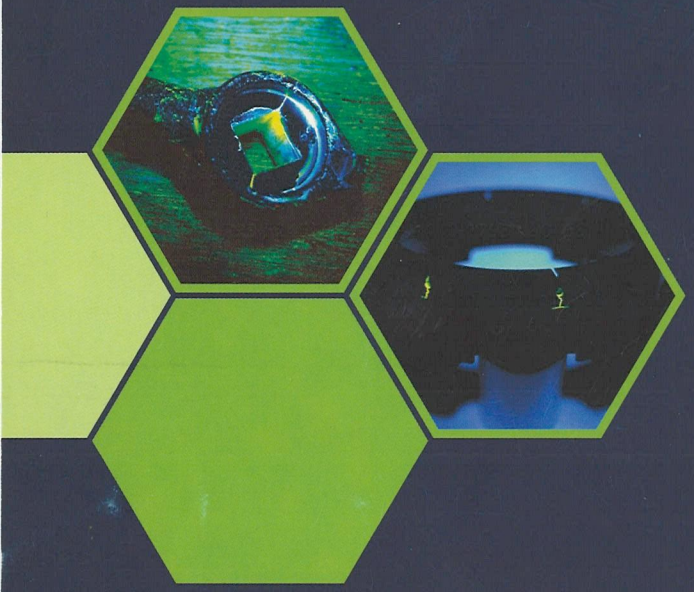

MAGNAFLUX®
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NON DESTRUCTIVE TESTING EQUIPMENT AND MATERIALS

MAGNAFLUX®
A Division of ITW Ltd

OUR MISSION

Magnaflux® is a Global manufacturer of Quality Control Inspection Equipment and Materials.

Our purpose is to provide world class value to our customers through superior product solutions and best-in-class customer service.

As an Industry Leader we will achieve operational excellence aimed at providing exceptional customer satisfaction.

Our core values will support this mission by creating a dynamic and motivating environment for our employees.

Magnaflux® non destructive testing equipment and materials enjoy a wide reputation for excellence, a reputation supported by customers of international renown – including British Airways, Boeing, Caterpillar, Cummins, McDonnell Douglas, Pratt & Whitney, and Rolls Royce.

The company carries the ISO9001 : 2008 accreditation for the design and manufacture of magnetic particle and dye penetrant equipment, and their associated consumables.

Established in the UK in 1963 by Magnaflux Corporation of Chicago, with whom a very close liaison is maintained, Magnaflux® maintains a constant awareness of the changes in manufacturing methods, developing new products and techniques for quality testing to meet the ongoing changes in technology within the market place.

HANDBOOK FOR MAGNAFLUX Y7 ELECTROMAGNETIC YOKE

PART NUMBER: 001Y018

CE

Certificate of Conformity

Y7 Yoke
Serial number: 11350

Certified that the above item conforms to and meets the requirements of the following:

EC Directives	Specifications
73/23/EEC	ASME V ART7
89/392/EEC	ASTM E-709
91/368/EEC	ASTM E-1444
89/336/EEC (Emissions)	EN-ISO 9934-3
92/31/EEC (Emissions)	MIL-STD-271F(SH)

Certificate is issued under the auspices of the Equipment Product Manager (2011):

Magnaflux (A Division of ITW Ltd),
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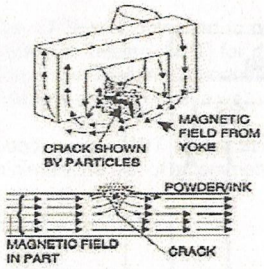
ACS REGISTRARS Quality Assurance ISO 9001 UKAS QUALITY MANAGEMENT 229

MAGNETIC FIELD RISK

Persons susceptible to strong magnetic fields, including those with pacemakers, are advised not to use or approach this equipment without seeking professional advice.

USING THE Y7 YOKE



Adjust the leg spacing to 125-175mm and place the Yoke firmly on the work piece (securing the best contact possible) with the suspected defect at right angles to the poles. With the selector switch in either the AC or DC position, depress the test switch to energise the Yoke and lightly dust (dry powder) or flow (wet method) inspection particles over the area of interest. For example, when testing for longitudinal surface cracks in a weld, the Yoke would be positioned so that the legs straddle the weld. If the direction of a possible defect is not known, two inspections of the area should be made, turning the Yoke approximately 90° for the second inspection. Using the powder blower bulb or spray, lightly dust with Magnaflux powder or spray with magnetic ink, the area between the Yoke legs and inspect closely for cracks or defects. The current should remain 'on' (continuous method). Repeat the process until the entire area of the part is inspected.

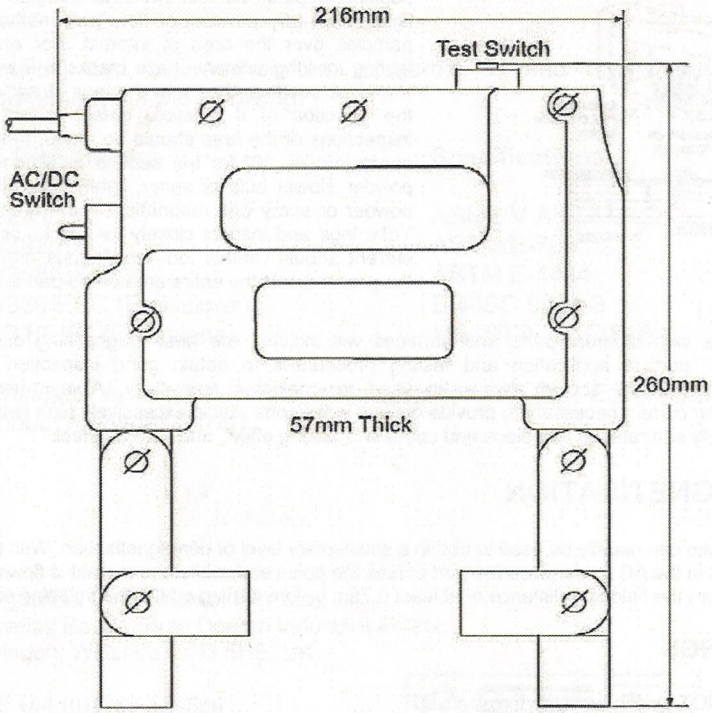
Experience with different parts and surfaces will indicate the best magnetising current, current magnitude, particle application and testing procedures to obtain good inspection results. The 'continuous method' should always be used for maximum sensitivity. Always use the lowest magnetising current necessary to provide distinct indications. Avoid excessively high fields which may magnetically saturate the test piece and cause a 'masking effect' and hide a defect.

DEMAGNETISATION

The Y7 Yoke can usually be used to obtain a satisfactory level of demagnetisation. With the instrument in the AC mode place the part across the poles and, whilst the current is flowing, withdraw the part from the field to a distance of at least 0.75m before turning off the magnetising current.

WARNINGS

- DO NOT smoke while performing NDT
- DO NOT operate the Y7 Yoke for longer than 2 minutes ON followed by 2 minutes OFF
- If the Yoke is too hot to hold in the bare hand it is a sign that the duty cycle has been exceeded. Wait for the Yoke to cool before continuing.
- DO NOT use any means to permanently operate the Yoke switch
- DO NOT use the supply cable to pull, lift or carry the equipment
- When the Yoke is switched OFF the magnetic attraction to the tested component will be weakened and either the part or the Yoke could fall and cause injury
- DO NOT change the AC/DC selector switch with the unit ON
- DO NOT operate from a DC power source



WARNING

DO NOT REPLACE ANY PARTS WITH OTHER THAN THOSE RECOMMENDED BY MAGNAFLUX.

SAFETY DATA

FLAMMABILITY

The Y7 Yoke is intended to be used in conjunction with appropriate chemicals as a Non Destructive means of Testing (NDT) for defects, such as cracks, on a wide range of manufactured components. Some chemicals may produce a flammable atmosphere at the point of use and it is important that the testing is carried out in a well ventilated place and that all sources of ignition are excluded.

Good quality NDT chemicals such as Magnaflux magnetic inks and powders are formulated to minimise the risk of a flammable atmosphere when correctly used.

ELECTRICAL

Ensure that the protective conductor (earth) is continuous from the Y7 laminations through suitable connections to the electrical supply.

Recommendations:

- A Residual Current Circuit Breaker (RCCB) or Earth Leakage Circuit Breaker (ELCB) should be used
- If the switch area of the Yoke becomes wet with kerosene or water it should be disconnected from its supply until the area has dried
- In damp conditions a 110V Yoke should be used and operated from a supply that is centre tapped to earth (55V-0-55V)
- If the Y7 shows signs of malfunctioning or if cracks appear in the casing, the Yoke should be removed from service immediately and examined by a qualified electrician. Cracking is usually caused by dropping the Yoke or by twisting the articulated legs.
- Do not change the AC/DC selector switch with the unit on
- Do not operate from a DC power source
- Repairs should not be attempted on these units. Units are sealed and should be returned to the factory.
- Wire colours (115/230V) – Brown-Live, Blue-Neutral and Green/Yellow-Earth

MAINTENANCE

Before using the Yoke:

- Ensure it is physically undamaged
- Ensure the cable is free from cuts which expose the wiring
- Tighten the articulated joints if they are excessively loose

It is a legal requirement in many countries that the electrical safety of equipment is checked periodically, commensurate with use, but at least once a year. The basic tests required are to check the condition and effectiveness of the electrical insulation and the continuity of the protective conductor (earth). These tests can be performed using as Portable Appliance Tester (PAT) or Portable Appliance Checker (PAC).

TECHNICAL SPECIFICATION

Part number	001Y019	001Y018
AC voltage ± 10% (V)	115	230
Frequency (Hz)	50/60	50/60
Supply current (A) (Intermittent)* in air	5	2
Recommended supply fuse (A)	3	3
Weight (Kg) lifted at 100mm pole spacing	AC – 4.5 DC – 13.5	AC – 4.5 DC – 13.5
Operating environment Temperature Relative humidity	0 – 40℃ 10 – 95% non condensing	

*Maximum continuous duty – 2 minutes ON and two minutes OFF

PRINCIPLE OF OPERATION

With the instrument connected to a proper power source, depressing the 'Push to test' switch creates an intense magnetic field between the legs. The resultant field can best be described as a multiplicity of invisible lines of force extending across the gap between the legs. As the Yoke is applied to a steel plate, the magnetic circuit is closed, and the magnetic field enters the plate making its passage between the legs of the Yoke at and very near the surface. A surface crack across this field cuts the magnetic circuit, the two sides of the crack become opposite poles of a magnet and a leakage field occurs in the air above the crack. Magnetic particles are attracted by this leakage field and mark its location.

MAGNETISING FIELD SELECTION

AC MAGNETISATION – This induced field is a surface field which only detects surface cracks. It is particularly useful for inspecting thick and irregular sections for surface defects. Best results are usually obtained using the dry method.

PULSED DC MAGNETISATION – This induced field penetrates the work piece and detects both surface and (slightly) subsurface cracks. Best results are usually obtained using the wet method.

PREPARED INKS

	Flash point (℃ min) (PMCC)	Viscosity @ 21℃ (cS)	Specific gravity	Particle size (µm)	Settlement volume (%V/V) (as supplied)
Magnaglo 410HF* A prepared ink consisting of Magnaglo MG410 in a high flash kerosene of low odour	93	3.45	0.81	7 to 25	0.12
Magnaglo 14HF* A prepared ink consisting of Magnaglo 14A in a high flash kerosene of low odour	93	3.45	0.81	2 to 25	0.25
Magnavis 7HF* A prepared ink consisting of Magnaflux 7C in a high flash kerosene of low odour	93	3.45	0.81	0.6 to 2.5	2.5

*Available in both aerosol and bulk format

DRY POWDERS

1 Grey Maximum working temperature 315℃	Magnaflux dry powders offer a range of colour to give good contrast on as wide a variety of finishes as possible. In the event of contrast not being ideal for inspection, a thin layer of Magnaflux WCP-2 White Contrast Paint can be applied prior to testing. All powders are of closely controlled particle size and shape and have desirable magnetic properties. For best results application should be as a cloud applied near the surface while the current is flowing. Excess powder settling out can be blown off.
3A Black Maximum working temperature 230℃	
8A Red Maximum working temperature 175℃	

WCP-2 White Contrast Paint	Magnaflux WCP-2 is a quick-drying white contrast paint which can be applied as a thin coating prior to testing where enhanced contrast is required.

SPECIFICATIONS

Magnaflux, Magnaglo and Magnavis concentrates, prepared inks and dry powders meet the requirements of ASTM E-1444 with oil suspended inks and concentrates meeting AMS specifications, plus appropriate industrial and Government specifications. Certifications are available on request.

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