



IMQ S.p.A. - Società con Socio Unico  
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# TECHNICAL EVALUATION

## No. AE15S0359040-02

performed in accordance with

**“MEASUREMENT AND THE EVALUATION OF ELECTRIC AND  
MAGNETIC FIELDS WITH REFERENCE TO THE HUMAN EXPOSURE”**

|                 |                 |
|-----------------|-----------------|
| PRODUCT         | Digital printer |
| MODEL(s) TESTED | PRACTIKA MIG 64 |
| TRADE MARK(s)   | MuchColours     |

|           |   |
|-----------|---|
| APPLICANT | MUCHCOLOURS S.r.l. Via Fosso Foreste snc – 65015<br>Montesilvano (PE) - ITALY |
|-----------|---|

|             |                          |  |
|-------------|--------------------------|--|
| Tested by   | Ing. Francesco Spalletti |  |
| Approved by | Ing. Gianluca Trapè      |  |

### Revision Sheet

| Release No. | Date       | Revision Description |
|-------------|------------|----------------------|
| Rev. 0      | 2015-01-29 | First edition        |



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## 1. GENERAL DATA

| SAMPLE                            |   |                         |
|-----------------------------------|---|-------------------------|
| Samples received on               | 2015-01-14  | (sampling by applicant) |
| IMQ reference samples             | BEM   | 75817 (C00300901)       |
| Samples tested No.                | 1   |                         |
| Object under analysis recognition | <b>Not carried out</b><br>Except where stated, characteristics of products were taken from client description and were not verified by the laboratory |                         |
| TEST LOCATION                     |   |                         |
| Testing dates                     | 2015-01-14  |                         |
| Testing laboratory.               | IMQ S.p.A.  |                         |
| Testing site                      | Via C.Urbani, 9 – 62031 Belforte del Chienti (MC) - Italy   |                         |
| ENVIRONMENTAL CONDITIONING        |   |                         |
| <i>Parameter</i>                  | <i>Measured</i>   |                         |
| Ambient Temperature               | 20 °C   |                         |
| Relative Humidity                 | 40 %  |                         |
| Atmospheric Pressure              | 900 ÷ 1000 mbar   |                         |



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## 2. TEST SPECIFICATIONS, METHODS & PROCEDURES

The following relevant standards have been applied to the Equipment Under Test (EUT):

**CEI 211-6: GUIDE FOR THE MEASUREMENT AND THE EVALUATION OF ELECTRIC AND MAGNETIC FIELDS IN THE FREQUENCY RANGE 0 HZ - 10 KHZ, WITH REFERENCE TO THE HUMAN EXPOSURE.**

The procedures and methods of measurement and the instrumentation considered in the IEC 211-6 apply to electric and magnetic fields at low frequency, in a range between 0 Hz to 10 kHz, generated by sources in various environments such as industrial, household and research.

**CEI 211-7: GUIDE FOR THE MEASUREMENT AND THE EVALUATION OF ELECTRIC AND MAGNETIC FIELDS IN THE FREQUENCY RANGE 10 KHZ - 300 GHZ, WITH REFERENCE TO THE HUMAN EXPOSURE.**

The procedures and methods of measurement and the instrumentation considered in the IEC 211-7 apply to electric and magnetic fields at high frequency, in a range between 10 kHz to 300 GHz, generated by sources in various environments such as industrial, household, medical, broadcastings, telecommunication and research.



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### 3. UNIT UNDER TEST (EUT) DETAILS

#### GENERAL DATA

| MODEL (basic)      | Description  |
|--------------------|--|
| PRACTIKA MIG 64    | The Practika Mig 64 is a flat printer for digital prints able to decorate all surfaces up to a maximum thickness of 300 mm |
| VARIANTS (derived) | Description  |
| /                  | /  |

|                             |  |
|-----------------------------|--|
| <b>EUT Category</b>         | Digital printer  |
| <b>EUT use</b>              | <input checked="" type="checkbox"/> Fixed <input type="checkbox"/> Vehicular <input type="checkbox"/> Portable |
| <b>EUT single or system</b> | <input checked="" type="checkbox"/> Single <input type="checkbox"/> System                                     |
| <b>EUT standing</b>         | Floor  |
| <b>Supply voltage</b>       | 3 x 400 V ac $\pm 10\%$ - 50 Hz  |
| <b>Rated current</b>        | 15 Ampere  |
| <b>Power</b>                | 10 kVA   |
| <b>Dimensions</b>           | 1600 x 3000 x 1100mm   |
| <b>Weight</b>               | 1350 Kg.   |



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## 4. GENERAL CONDITION

Unless special conditions specified in the present test report, EUT configuration and general measurement conditions used are described on next table.

### OPERATION OF THE EQUIPMENT (EUT)

The operational conditions of the EUT were determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission.

These operational modes are described in the following table:

| Ref. | Description                     |
|------|---------------------------------|
| #1   | Continues work on the two axes. |
| /    | /                               |

## 5. EXPOSITION LIMITS ACCORDING TO 2013/35/UE DIRECTIVE (2013/06/26)

Directive 2013/35/UE on the minimum health and safety requirements regarding the exposures of workers to the risks arising from physical agents (electromagnetic fields)

### Article 3 of Directive 2013/35/UE

#### Exposure limit values (ELVs) and action levels (ALs)

**For the purpose of this Directive, where it is demonstrated that the relevant ALs set out in Annex II (NON-THERMAL EFFECTS) and III (THERMAL EFFECTS) are not exceeded, the employer shall be deemed to be in compliance with the health effects ELVs and sensory effects ELVs. Where the exposure exceeds the ALs, the employer shall act in accordance with Article 5(2), unless the assessment carried out in accordance with Article 4(1), (2) and (3) demonstrates that the relevant ELVs are not exceeded and that safety risks can be excluded.**

### NON-THERMAL EFFECTS

#### ALs (ACTION LEVELS) FOR MAGNETIC FLUX DENSITY OF STATIC MAGNETIC FIELDS

| Hazard  | ALs ( $B_0$ ) |
|---|---------------|
| Interference with active implanted devices, e.g. cardiac pacemakers                         | 0,5 mT        |
| Attraction and projectile risk in the fringe field of high field strength sources (> 100mT) | 3 mT          |

#### ALs (ACTION LEVELS) FOR CONTACT CURRENT $I_c$

| Frequency                   | ALs ( $I_c$ ) steady state current (mA) (RMS) |
|-----------------------------|---|
| Up to 2,5 kHz               | 1,0   |
| $2,5 \leq f < 100$ kHz      | $0,4 f$                                       |
| $100 \leq f \leq 10000$ kHz | 40  |

## ALs (ACTION LEVELs) FOR EXPOSURE TO ELECTRIC FIELD FROM 1Hz to 10 MHz

| Frequency Range                           | Electric field strength Low ALs (E) ( $\text{Vm}^{-1}$ ) (RMS) | Electric field strength High ALs (E) ( $\text{Vm}^{-1}$ ) (RMS) |
|---|--|---|
| $1 \leq f < 25 \text{ Hz}$                | $2,0 \times 10^4$  | $2,0 \times 10^4$   |
| $25 \leq f < 50 \text{ Hz}$               | $5,0 \times 10^5/f$  | $2,0 \times 10^4$   |
| $50 \leq f < 1,64 \text{ kHz}$            | $5,0 \times 10^5/f$  | $1,0 \times 10^6/f$   |
| $1,64 \text{ kHz} \leq f < 3 \text{ kHz}$ | $5,0 \times 10^5/f$  | $6,1 \times 10^2$   |
| $3 \text{ kHz} \leq f < 10 \text{ MHz}$   | $1,7 \times 10^2$  | $6,1 \times 10^2$   |

## ALs (ACTION LEVELs) FOR EXPOSURE TO MAGNETIC FIELD FROM 1Hz to 10 MHz

| Frequency Range                         | Magnetic flux density low ALs (B) ( $\mu\text{T}$ ) (RMS) | Magnetic flux density high ALs (B) ( $\mu\text{T}$ ) (RMS) | Magnetic flux density ALs for exposure of limbs to a localised magnetic field ( $\mu\text{T}$ ) (RMS) |
|---|---|--|---|
| $1 \leq f < 8 \text{ Hz}$               | $2,0 \times 10^5/f^2$                                     | $3,0 \times 10^5/f$  | $9,0 \times 10^5/f$   |
| $8 \leq f < 25 \text{ Hz}$              | $2,0 \times 10^4/f$                                       | $3,0 \times 10^5/f$  | $9,0 \times 10^5/f$   |
| $25 \leq f < 300 \text{ Hz}$            | $1,0 \times 10^3$   | $3,0 \times 10^5/f$  | $9,0 \times 10^5/f$   |
| $300 \text{ Hz} \leq f < 3 \text{ kHz}$ | $3,0 \times 10^5/f$                                       | $3,0 \times 10^5/f$  | $9,0 \times 10^5/f$   |
| $3 \text{ kHz} \leq f < 10 \text{ MHz}$ | $1,0 \times 10^2$   | $1,0 \times 10^2$  | $3,0 \times 10^2$   |

### NOTE

f is the frequency expressed in hertz (Hz)

For electric field, "Low ALs" and "High ALs" means levels which relate to the specific protection or prevention measures specified in the Directive.

For magnetic field, "Low ALs" means levels which relate to the sensory effects ELVs and "High ALs" to the health effects ELVs.



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## THERMAL EFFECTS

### ALs (ACTION LEVELs) FOR EXPOSURE TO ELECTRIC AND MAGNETIC FIELD FROM 100kHz to 300 GHz

| Frequency Range     | Electric field strength (E)<br>(Vm <sup>-1</sup> ) (RMS) | Magnetic flux density<br>ALs (B) (μT) (RMS) | Power density ALs (S)<br>(Wm <sup>-2</sup> ) |
|---------------------|--|---|--|
| 100 kHz ≤ f < 1 MHz | 6,1 x 10 <sup>2</sup>                                    | 2,0 x 10 <sup>6</sup> /f                    | -----  |
| 1 ≤ f < 10 MHz      | 6,1 x 10 <sup>8</sup> /f                                 | 2,0 x 10 <sup>6</sup> /f                    | -----  |
| 10 ≤ f < 400 MHz    | 61   | 0,2   | -----  |
| 400 MHz ≤ f < 2 GHz | 3,0 x 10 <sup>-3</sup> f <sup>1/2</sup>                  | 1,0 x 10 <sup>-5</sup> f <sup>1/2</sup>     | -----  |
| 2 ≤ f < 6 GHz       | 1,4 x 10 <sup>2</sup>                                    | 4,5 x 10 <sup>-1</sup>                      | -----  |
| 6 ≤ f < 300 GHz     | 1,4 x 10 <sup>2</sup>                                    | 4,5 x 10 <sup>-1</sup>                      | 50   |

### ALs (ACTION LEVELs) FOR STEADY STATE CONTACT CURRENTS AND INDUCED LIMB CURRENTS

| Frequency            | Steady state contact current, ALs<br>(I <sub>c</sub> ) (mA) (RMS) | Induced limb current in any limb,<br>ALs (I <sub>L</sub> ) (mA) (RMS) |
|----------------------|---|---|
| 100 kHz ≤ f < 10 MHz | 40  | -----   |
| 10 ≤ f ≤ 110 MHz     | 40  | 100   |

Note: f is the frequency expressed in hertz (Hz)





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## 6. SUMMARY OF TEST RESULTS

| POSSIBLE TEST CASE VERDICTS:                 |                     |
|--|---------------------|
| Test object does meet the requirement        | Under Action Levels |
| Test object does not meet the requirement    | Over Action Levels  |
| Evaluation of test result submit to customer | C.E.                |

| ENVIRONMENTAL PHENOMENON   | PORT      | RESULT              |
|--|-----------|---------------------|
| Measurement and evaluation of electric and magnetic fields in the frequency range 0 Hz - 3 GHz, with reference to the human exposure | Enclosure | Under Action Levels |



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## 7. TEST RESULTS

### 7.1 “Measurement and evaluation of electric and magnetic fields in the frequency range 0 Hz - 300 GHz, with reference to the human exposure”

| TEST REQUIREMENT               |   |
|--------------------------------|---|
| Test procedure                 | According to CEI 211-6 and CEI 211-7  |
| Test set-up                    | -----   |
| Distance of measure            | 50 cm.  |
| Time of measure for each point | 6 min.  |
| Frequency Range                | 5 Hz – 3 GHz  |
| Detector                       | RMS   |
| Type of field                  | <input checked="" type="checkbox"/> Near Field<br><input type="checkbox"/> Far Field      |
| Magnetic / Electric field      | <input checked="" type="checkbox"/> Magnetic <input checked="" type="checkbox"/> Electric |
| Type of measure                | <input checked="" type="checkbox"/> Broadband<br><input type="checkbox"/> Narrowband      |

#### NOTE:

|   |   |
|---|---|
| 1 | Action Levels (ALs) specified in the following tables refer to the most restrictive action level at different frequencies indicated at par. 5 of this Technical Evaluation. |
| 2 | Steady state contact currents and induced limb currents: not applicable for this machine  |

## MEASUREMENT RESULTS

Operating condition #1: Continues work on the two axes.

| POINT OF TEST         | Magnetic B-field ( $\mu\text{T}$ )<br>Range 5Hz+100kHz<br>(detector RMS) | Action Levels ALs ( $\mu\text{T}$ ) |
|-----------------------|--|-------------------------------------|
| Main display          | 0,02<br>(at 622 Hz)  | 482                                 |
| Storage inck          | 0,03<br>(at 620 Hz)  | 484                                 |
| Control panel         | 0,03<br>(at 850Hz)   | 353                                 |
| Display near the axis | 0,05<br>(at 50Hz)  | 1000                                |

| POINT OF TEST         | Electric field ( $\text{Vm}^{-1}$ )<br>Range 5Hz+100kHz<br>(detector RMS) | Action Levels ALs ( $\text{Vm}^{-1}$ ) |
|-----------------------|---|--|
| Main display          | 0,29<br>(at 152 Hz)   | 10000                                  |
| Storage inck          | 0,39<br>(at 50 Hz)  | 10000                                  |
| Control panel         | 0,41<br>(at 50Hz)   | 10000                                  |
| Display near the axis | 0,75<br>(at 50Hz)   | 10000                                  |

| <b>POINT OF TEST</b>         | <b>Electric field (<math>Vm^{-1}</math>)<br/>Range 100kHz÷3GHz<br/>(detector RMS)</b> | <b>Action Levels ALs (<math>Vm^{-1}</math>)</b> |
|------------------------------|---|---|
| <b>Main display</b>          | 0,01<br>(MAX 0,25)  | 61  |
| <b>Storage inck</b>          | 0,04<br>(MAX 0,65)  | 61  |
| <b>Control panel</b>         | 0,04<br>(MAX 0,31)  | 61  |
| <b>Display near the axis</b> | 0,01<br>(MAX 0,34)  | 61  |
| <b>Above the floor</b>       | 0,70<br>(MAX 1,10)  | 61  |



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## 8. MEASUREMENT EQUIPMENT AND INSTRUMENTATION

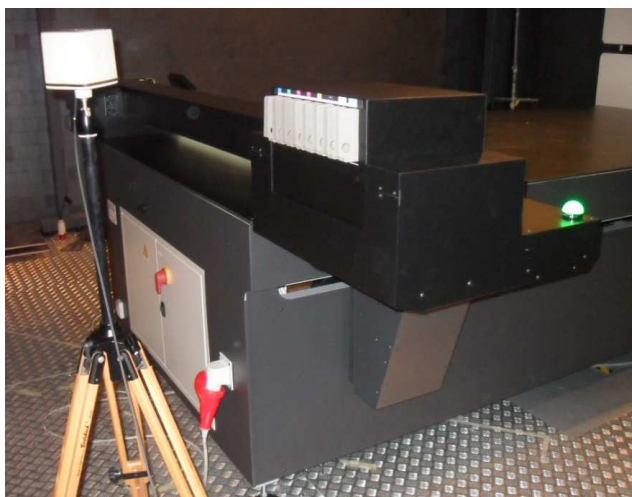
| Measurement and evaluation of electric and magnetic fields in the frequency range 0 Hz - 300 GHz, with reference to the human exposure (§ 7.1) |              |         |            |
|--|--------------|---------|------------|
| Instrument   | Manufacturer | Model   | s/n        |
| EM Field Analyzer  | PMM          | 8053    | 0220J10322 |
| Isotropic Electric and magnetic field  | PMM          | EHP-50A | 1311L10219 |
| Isotropic Electric Field Probe   | PMM          | EP 330  | 1010J10139 |

## 9. PHOTOGRAPHIC DOCUMENTATION

### EUT IDENTIFICATION

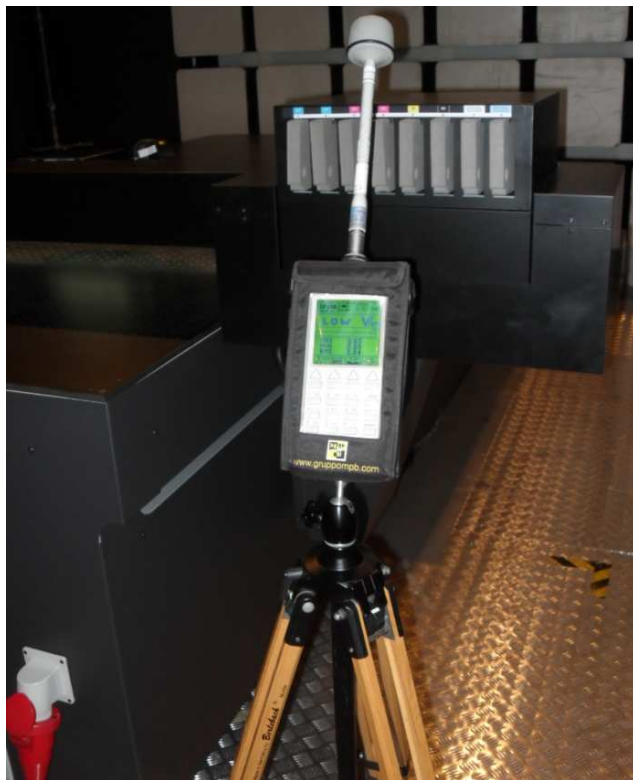
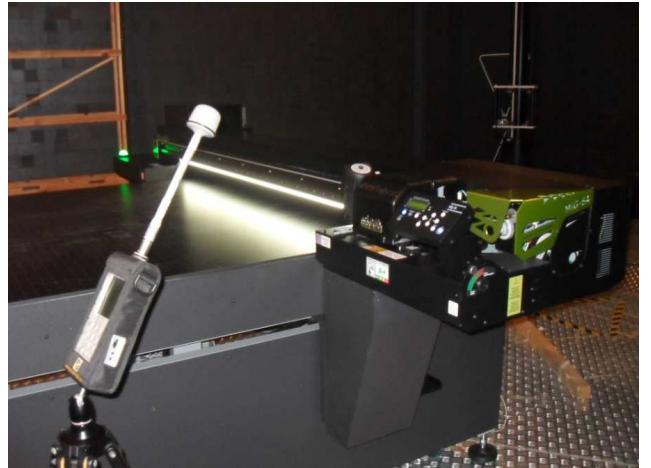


## SET-UP TEST – SOME TEST POINTS





## SET-UP TEST – SOME TEST POINTS



## END TECHNICAL EVALUATION