Scheme of the proficiency test through interlaboratory comparison of radiated emission measurements in the 30 MHz to 6000 MHz frequency range
Proficiency test code PTC(RE-30-6000-VI)

Carlo Carobbi
Università degli Studi di Firenze, Dipartimento di Ingegneria dell'Informazione, Firenze, ITALY

Rev. 0 – April 8, 2021

1. Scope

1.a) This document describes the participation scheme to a proficiency test performed through an interlaboratory comparison of radiated emission measurements in the 30 MHz to 6000 MHz frequency range. The scheme includes:

- The description of the interlaboratory comparison;
- The selection criteria of the participants and the terms of admission to the proficiency test;
- The description of the technique adopted for the statistical analysis of the results of the interlaboratory comparison;
- The instructions to the participating laboratory (briefly, Laboratory) on how to perform measurements;
- The description of the method by which the results of the proficiency test are registered by the Laboratory and by the Coordinator of the proficiency test;
- The test report forms to be filled by the Laboratory and by the Coordinator;
- The registration forms (Doodle link for selecting the week for measurements, the purchase order regulating the agreements between the Laboratory and the Coordinator).

1.b) The last revision of the present document can be downloaded from the following URL:
https://www.dinfo.unifi.it/vp-436-schemi-delle-prove-valutative-schemes-of-the-proficiency-tests.html

2. Coordinator

2.a) The Coordinator of the proficiency test is Carlo Carobbi, from Università degli Studi di Firenze. The Coordinator relies on the technical and scientific support from:
- Alessio Bonci, ITT G. Ferraris (San Giovanni Valdarno, Firenze, ITALY);
- Marco Cati, Powersoft S.p.A. (Firenze, ITALY).

2.b) The contact details of the Coordinator are reported below:
Carlo Carobbi
Dipartimento di Ingegneria dell'Informazione
Università degli Studi di Firenze
Via S. Marta, 3 – 50139 Firenze, ITALY
Phone: +39 055 2758501
Mob. phone: +39 329 6509116
e-mail: carlo.carobbi@unifi.it
skype: live:carlo.carobbi
Telegram: https://t.me/carlo_carobbi

3. Type of interlaboratory comparison

3.a) The interlaboratory comparison consists in the comparison of the measurements of a travelling standard (Sample) provided by the Coordinator. Each Laboratory makes a quantitative examination (Measurement) of the Sample thus providing the Coordinator with a measurement result.

3.b) The Coordinator designed and assembled the Sample.

3.c) The Coordinator assigns to the Sample a reference value and the corresponding uncertainty. The reference value, x^*, and its standard uncertainty, s^*, are obtained by the Coordinator through the statistical analysis of the measurement results provided by the Laboratories during the proficiency test. The reference value x^* and the standard uncertainty s^* will be known at the end of the proficiency test, after that the last participating Laboratory has submitted its measurement results.

3.d) The scheme of participation in the proficiency test is sequential and it is illustrated in Fig. 1. The Coordinator passes the Sample to the 1st participating Laboratory. The 1st Laboratory performs the measurement thus obtaining the 1st measurement result. Then, the 1st Laboratory passes the Sample to the 2nd Laboratory which, in turns, performs the measurement and determines the 2nd measurement result. The 2nd Laboratory passes the Sample to the 3rd Laboratory which obtains the 3rd measurement result, and so on. The last Laboratory passes back the Sample to the Coordinator. The proficiency test is completed when the last participating Laboratory has submitted its measurement result to the Coordinator.

3.e) The measurement result provided by each Laboratory consists of a measured value x and its expanded uncertainty U_{lab}. The measurement result provided by each Laboratory shall be compared against the reference value assigned by the Coordinator.

3.f) The transmission of the test report from the Coordinator to the Laboratory will take place only after that the proficiency test is concluded. No communication of the results of the proficiency test shall be done by the Coordinator to the Laboratory in the period comprised between the beginning and the conclusion of the proficiency test.

3.g) The participation fee is specified in the purchase order (Annex A – Italian for Italian participants, or Annex B – English for non-Italian participants).

3.h) The Laboratory has one (1) week available to perform the measurement and one (1) week to communicate the measurement result to the Coordinator. Late results will not be accepted nor processed by the Coordinator.

3.i) In case that a Laboratory is willing to submit more than one set of measurement results (e.g., because the Laboratory wants to assess the performance of different facilities and instrumentations) then the Laboratory shall contact the Coordinator in order to determine the appropriate scheduling, participation fee and a correspondingly modified purchase order. In such case more than one test report shall be issued by the Laboratory, one for each submitted set of measurement results. Any request for more than one test report must be individually evaluated by the Coordinator (the Laboratory shall contact the Coordinator to this purpose), and it will imply, if viable, a higher cost (1000 Euro for any additional test report).

3.j) It is intended that the subscription of the purchase order reported in Annex A (Italian) or Annex B (English) allows for the submission of a single test report, both by the Laboratory and by the Coordinator.

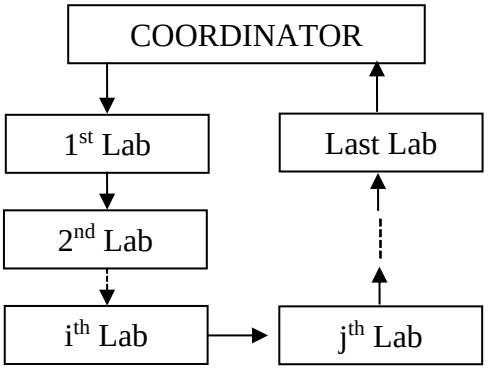

Fig. 1: Sequence by which the Sample is passed from the Coordinator to the Laboratories and from the Laboratories to the Coordinator.

4. Admission requirements

4.a) The present scheme applies to Electromagnetic Compatibility (EMC) test Laboratories that:

- Can make radiated emission measurements in accordance with the methods described in the following clauses of the standard EN 55016-2-3:2017/A1:2019
    - §7.3 (30 MHz – 1000 MHz, semi-anechoic room or open area test site, at 3 m or 10 m distance) or in §7.4 (30 MHz – 1000 MHz, fully-anechoic room or absorber-lined semi-anechoic room or absorber-lined open area test site, at 3 m distance) and,
    - §7.6 (1 GHz – 18 GHz, fully-anechoic room or absorber-lined semi-anechoic room or absorber-lined open area test site, at 3 m distance) in the frequency range between 1GHz and 6 GHz.

- Have evaluated the measurement uncertainty U_{lab} of the measurement method mentioned in the previous clause - and U_{lab} is less than or equal to the corresponding U_{cispr} value reported in EN 55016-4-2:2011/A1:2014/A2:2018, i.e. $U_{lab} \leq 6{,}3$ dB in the frequency range between 30 MHz and 1000 MHz in a semi-anechoic room or open area test site, $U_{lab} \leq 5{,}3$ dB in the frequency range between 30 MHz and 1000 MHz in a fully-anechoic room or absorber-lined semi-anechoic room or absorber-lined open area test site, $U_{lab} \leq 5{,}2$ dB in the frequency range between 1 GHz and 6 GHz in a fully-anechoic room or absorber-lined semi-anechoic room or absorber-lined open area test site.

4.b) Accreditation to ISO/IEC 17025 is not required for admission to the proficiency test. The Coordinator designed the present scheme assuming participation of both accredited and non-accredited Laboratories.

4.c) The Coordinator starts the proficiency test if there are at least five participating Laboratories. The maximum number of participating laboratories is twenty-five (25) which corresponds to a total duration of the proficiency test of less than one year.

4.d) The Coordinator assigns a code to the Laboratory for anonymous identification. The same code will be used to identify the Laboratory in e-mail correspondence and in the test reports. The code is as follows:

PTC(RE-30-6000-VI)LAB(#)

The code is the combination of a general part – PTC(RE-30-6000-VI) – that identifies the measurement method, and therefore a homogenous set of measurement results, and a specific part – LAB(#) – that identifies a particular Laboratory.

4.e) The Laboratory that is willing to participate in the proficiency test shall:

- Fill, print, sign, scan and send by certified e-mail to the certified e-mail address dinfo@pec.unifi.it the purchase order in Annex A (Italian) **or** Annex B (English). It is generally intended that Italian laboratories use Annex A, foreign laboratories use Annex B.

- Designate a Technical Responsible. The Technical Responsible shall sign the test report submitted by the Laboratory to the Coordinator (Annex C), in addition he/she will be the reference person for correspondence with the Coordinator.

- Select the week during which the measurement will be performed by using the Doodle link https://doodle.com/poll/qzucm44ht939zafv.Use the Laboratory name when making the selection, do not use the code assigned by the Coordinator.

4.f) The Laboratory shall observe the following shipping rules:
- Shipping of the Sample from the Coordinator to the Laboratory is in charge of the Coordinator;
- Shipping of the Sample from Laboratory X to the next Laboratory Y or to the Coordinator is in charge of Laboratory X;
- Shipments shall be done by means of an express courier;
- The same packaging used by the Coordinator shall be used by the Laboratory.

Address and contact details of each Laboratory are provided through the same Doodle link. Be accurate when inserting the address and contact details requested by the Doodle.

Handle with care the travelling Sample. A damage to the Sample will cause a delay and eventually the interruption of the proficiency test. Each Laboratory shall verify by inspection the mechanical integrity of the Sample. Possible defects or damages, proven or suspected, shall be immediately notified to the Coordinator. A verification of the electrical performance of the Sample is also envisaged (see §7).

5. Statistical analysis of the measurement results

5.a) The statistical analysis is based on the zeta-scores (symbol ζ) performance statistics (see §9.6 of ISO 13528:2015). The measurement result x_i, in dB(μV), provided by the i-th Laboratory ($i = 1, 2, ..., p$, where p is the number of participating Laboratories) is compared with the value X, in dB(μV/m), assigned by the Coordinator. The standard uncertainty of x_i is $u_{xi} = (U_{lab})_i / 2$ where $(U_{lab})_i$, in dB, is the expanded uncertainty stated by the i-th Laboratory

(see §3). The standard uncertainty of X is $u_X = U/2$, where U, in dB, is the expanded uncertainty obtained multiplying the standard uncertainty by a coverage factor $k = 2$ (which corresponds to a coverage probability of about 95 %, assuming a normal distribution) that the Coordinator assigned to the reference value X. The Coordinator calculates the following measure ζ_i of relative deviation between x_i and X:

$$\zeta_i = \frac{x_i - X}{\sqrt{u_{xi}^2 + u_X^2}}. \tag{1}$$

The value of ζ_i is calculated for each Laboratory and for each investigated frequency. Therefore, as many values of ζ_i will be calculated as the number of investigated frequencies (ten frequencies investigated, ten values of ζ_i for the i-th Laboratory). The measurement result provided by the i-th Laboratory will produce a warning signal if, at least at one frequency, we have ζ_i less than −2 or greater than +2. The measurement result provided by the i-th Laboratory will produce an action signal if, at least at one frequency, we have ζ_i less than −3 or greater than +3. If at all frequencies, we have ζ_i greater than −2 and less than +2 then the measurement result provided by the i-th Laboratory will not give evidence of any anomaly.

5.b) The reference values X and U that the Coordinator uses to evaluate the performance of a Laboratory are the robust mean x^* and the robust expanded uncertainty U^*, respectively. The standard uncertainty of the reference value $X = x^*$ is $u_X = U^*/2 = 1,25 \cdot s^*/\sqrt{p}$.

5.c) The values of the robust mean x^* and the robust standard deviation s^* are obtained by the Coordinator by using the robust analysis (Algorithm A) described in Annex C of ISO 13528:2015, §C.3.1. The robust analysis is based on an iterative calculation. At the first step of iteration

$$x^* = \text{median of } x_i \quad (i = 1,2,...,p) \tag{2}$$

and

$$s^* = 1,483 \cdot \{\text{median of } |x_i - x^*|\} \quad (i = 1,2,...,p). \tag{3}$$

NOTE : The factor 1,483 which appears in (3) represents the ratio between the standard deviation σ and the median of the absolute deviations from the median, *MAD*, assuming normal distribution. It is indeed possible to show that in the case of symmetric distribution, $MAD/\sigma = \Phi^{-1}(3/4)$, where Φ is the cumulative distribution function. In the case of normal distribution $\Phi^{-1}(3/4) = 0,6745$ and therefore $\sigma = 1,4826 \cdot MAD$.

NOTE 2: The factor 1,25 that appears in the formula $U^*/2 = 1,25 \cdot s^*/\sqrt{p}$ represents the ratio between the standard deviation of the median and the standard deviation of the mean (see the note 2 in §7.7.3 of ISO 13528:2015). Therefore x^* and $1,25 \cdot s^*/\sqrt{p}$ are interpreted as the mean and the standard deviation of the mean of the measurement results, respectively.

6. Characteristics of the Sample

6.a) The Sample is an electromagnetic field source made of the combination of a battery-operated comb generator and an antenna, see Fig. 2. The comb generator and the battery are embedded in the antenna. The shape of the Sample is cylindrical with approximate sizes 10 cm (base diameter) x 12 cm (height).

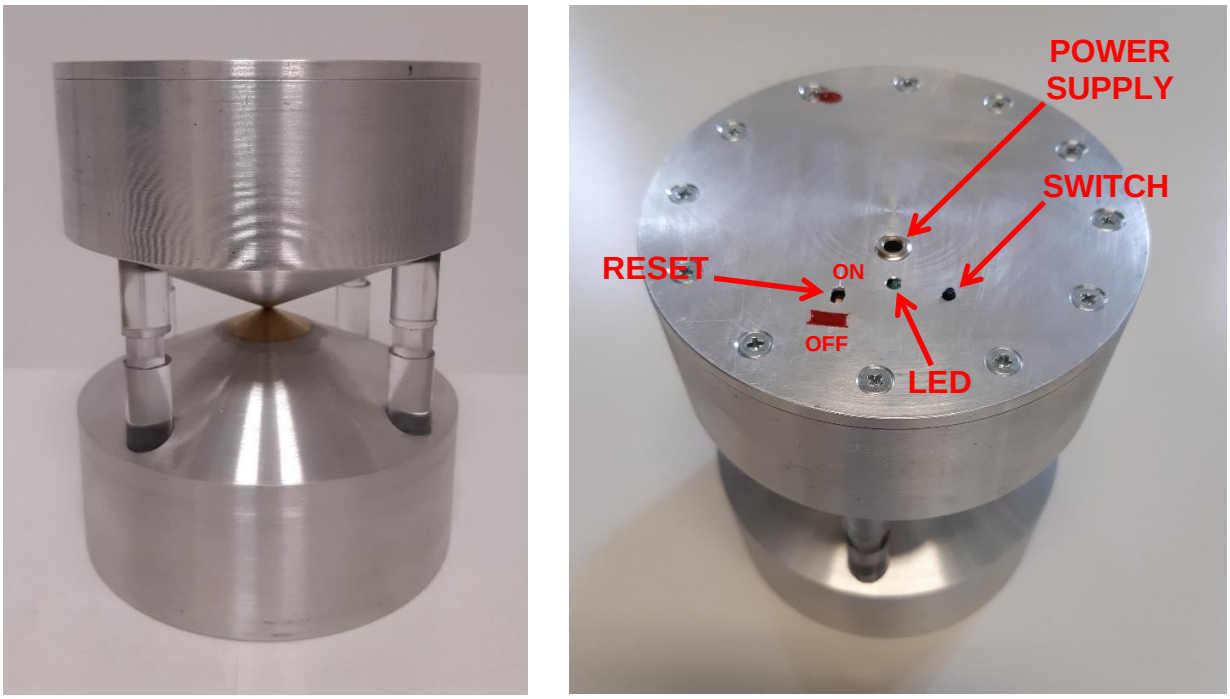

Fig. 2: Picture of the Sample.

6.b) The Sample is equipped with a SWITCH (Fig. 2, right) through which the comb generator can be turned on and off. To turn on/off the comb generator press the SWITCH for at least five seconds. The (green) LED flashes when the comb generator is on.

6.c) When the comb generator is turned on the LED flashes at regular time intervals. If the SWITCH is pushed again for at least five seconds, then the comb generator is turned off.

6.d) Three hours of continuous and reliable operation of the comb generator are permitted by the fully charged battery. The comb generator automatically turns off when the charge level drops below the limit for reliable operation.

6.e) The Sample is equipped with a jack connector for battery recharge. The power supply is provided by the Coordinator. Three hours are needed to fully recharge the battery. During battery recharge the led intermittently flashes. If the LED is continuously on, then the battery is fully charged.

6.f) A RESET switch is provided to disconnect the battery from the comb generator. The red flag indicates the OFF position of the switch (battery disconnected). Keep the switch at the ON position for normal operation. Use the provided tool to set the switch position.

6.g) The comb generator does not require warm up prior to measurement.

6.h) The harmonics' spacing is 50 MHz and the first available harmonic in the frequency range from 30 MHz to 6000 MHz is at 50 MHz.

6.i) The Coordinator identifies the harmonics to be measured through their ordinal number and the approximate frequency value. For example: the 5th harmonic at approximately 250 MHz.

6.j) What identifies the harmonic is its order not its frequency. Frequencies are given only for guidance.

6.k) The combination of the lock is 183. Input the combination from top to bottom (see Fig. 3).

Fig. 3: Picture of the lock.

7. Measurement procedure

7.a) Radiated electromagnetic field measurement must be preceded by a preliminary verification of the correct operation of the Sample by using the magnetic field loop probe provided by the Coordinator, a short section of coaxial cable (length less than 1 m, not provided by the coordinator) and a receiver (spectrum analyzer or EMI receiver). The verification shall be as follows:

- Connect the probe to the input of the receiver through the short section of coaxial cable.
- Put the Sample on the same table used for radiated emission testing of table-top equipment.
- Turn on the Sample. The Sample shall be fed by its internal battery (the Sample shall not be connected to the power supply).
- Place the probe in the position sketched in Fig. 4. The probe shall be positioned so that its cable is perpendicular to the axis of the Sample and at half height of the Sample. The plane of the loop shall be the one containing the probe cable and the axis of the Sample. The probe shall touch the cones of the Sample.
- Use your hand to support the probe. No special care is required.
- Measure the power P_m that the probe delivers to the input of the receiver at the frequency of the 4th harmonic (about 200 MHz). Register the values of P_m (in dBm, rounded to the integer) in Table 1. Calculate and annotate the deviation $\Delta = P_m - P_{ref}$ (in dB, rounded to the integer).

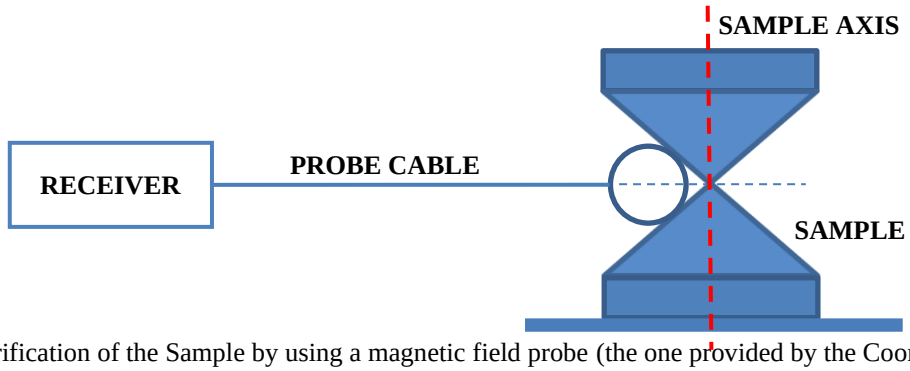

Fig. 4: Verification of the Sample by using a magnetic field probe (the one provided by the Coordinator).

- Verify that:
  - The measured power P_m decreases by at least 20 dB rotating the probe by 90°;
  - $-3\text{dB} \leq \Delta \leq 3\text{dB}$.

Table 1: Verification of the power that the probe delivers to the receiver.

Harmonic #	**Frequency MHz**	P_{ref} **dBm**	P_m **dBm**	**Δ dB**
4	200	−41		

7.b) If the preliminary Sample verification is successful then the Laboratory can pass to the next step, i.e., the radiated emission measurement, otherwise the Coordinator is informed and the radiated emission measurement is temporarily delayed.

7.c) Measurements performed above a reflective ground plane in the frequency range comprised between 30 MHz and 1000 MHz (§7.3 of EN 55016-2-3:2017/A1:2019) at 3 m or 10 m distance.

The scope of the measurement is to obtain the best estimate and measurement uncertainty of the maximum electric field strength, in dB(μV/m), emitted by the Sample in vertical polarization at the specified horizontal distance from the Sample (3 m or 10 m) at a height between 1 m and 4 m above the reflecting ground plane, see Fig. 5. The reference of the Sample for distance measurement is the exterior surface of the Sample facing the antenna. The use of the same measuring instrumentation as that used for radiated emission tests in the corresponding frequency range is recommended. Measurement frequencies are reported in Table 2.

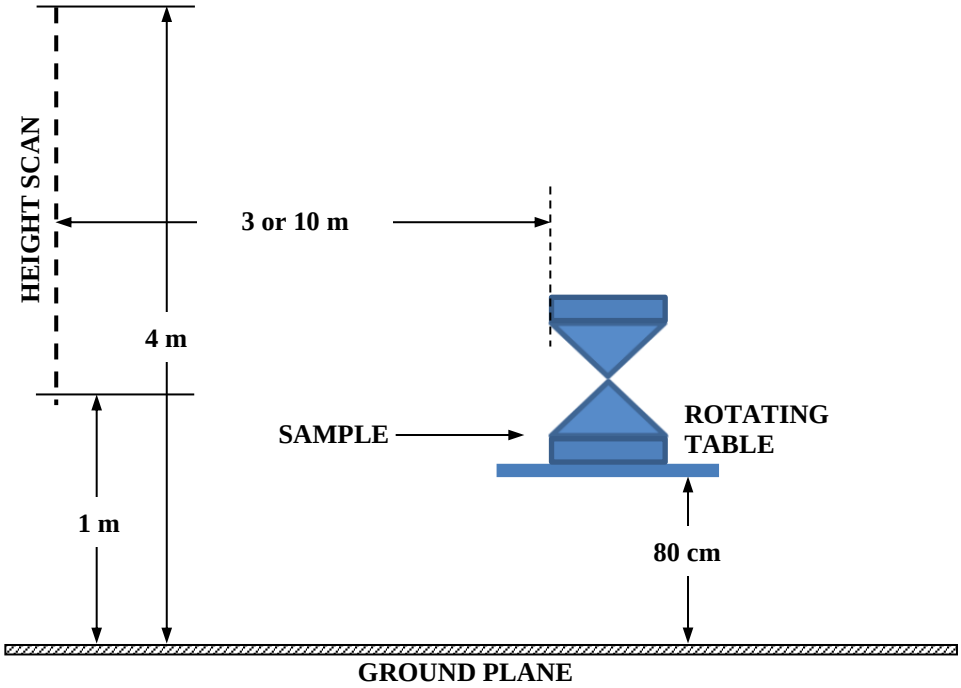

Fig. 5: Measurement layout for the 30 MHz to 1000 MHz frequency range, semi-anechoic room (3 or 10 m).

7.d) Measurements performed in a free-space environment in the frequency range comprised between 30 MHz and 1000 MHz (§7.4 of EN 55016-2-3:2017/A1:2019) and between 1 GHz and 6 GHz (§7.6 of EN 55016-2-3:2017/A1:2019) at 3 m distance.
The scope of the measurement is to obtain the best estimate and measurement uncertainty of the electric field strength, in dB(μV/m), emitted by the Sample at 3 m distance from the Sample in the boresight direction, see Fig. 6. The reference of the Sample for distance measurements is the exterior surface of the Sample facing the receiving antenna. The use of the same measuring instrumentation as that used for radiated emission tests in the corresponding frequency range is recommended. Measurement frequencies are reported in Table 2.

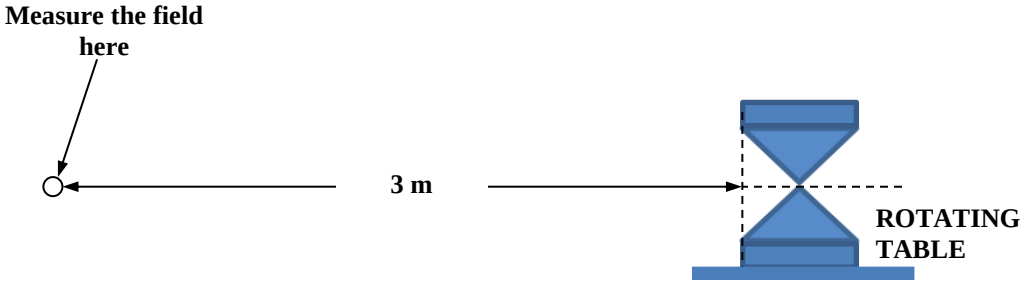

Fig. 6: Measurement layout for the 30 MHz to 1000 MHz and for the 1 GHz to 6 GHz frequency ranges in a fully anechoic room.

7.e) It is up to the Laboratory to charge the battery before preliminary verification and measurement. Handle the Sample with care.

7.f) The EMI receiver's detector shall be set to average.

7.g) The measurement result provided by the Laboratory shall be:

- The estimate x, expressed in dB(μV/m), of the amplitude of the selected harmonics;

- The expanded uncertainty of the estimate x, U_{lab}, expressed in dB and obtained multiplying the combined standard uncertainty by the coverage factor $k = 2$ (which corresponds to a coverage probability of about 95 % assuming normal distribution).

7.h) The Laboratory may assign a different value of U_{lab} to each measured frequency.

8. Recording electromagnetic field measurement results

8.a) The measured disturbance voltage x, in dB(μV/m), shall be rounded to 3 significant figures (e.g., 68,5 dB(μV/m)). Measurement uncertainty U_{lab}, in dB, shall be rounded to 2 significant figures (e.g., 3,2 dB).

8.b) The values of x and U_{lab} shall be recorded in the sixth and seventh column of Table 2, respectively. The Coordinator will complete the rest of Table 2.

Table 2: Table to be used for recording the electromagnetic field measurement result x and its expanded uncertainty U_{lab}. Columns six and seven shall be filled up by the Laboratory, the other columns will be filled up by the Coordinator.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Band	**Harmonic #**	**Frequency** MHz	***X*** dB(μV/m)	***U*** dB	***x*** dB(μV/m)	U_{lab} dB	ζ
C	1	50	-	-			-
C	3	150	-	-			-
D	7	350	-	-			-
D	11	550	-	-			-
D	16	800	-	-			-
D	19	950	-	-			-
E	50	2500	-	-			-
E	70	3500	-	-			-
E	90	4500	-	-			-
E	120	6000	-	-			-

8.c) The Laboratory fills columns six and seven and sends a copy of Table 2 to the Coordinator. The Coordinator completes the rest of Table 2 and sends a copy to the Laboratory. The proficiency test result does not give evidence of any anomaly if, at all frequencies, $-2 \le \zeta \le 2$. Otherwise anomalies shall be described in terms of warning and action signals as discussed in §5.

NOTE: Warning signals do not add up to give an action signal.

9. Test reports

9.a) The test report issued by the Laboratory to the Coordinator shall conform to Annex C and it shall be signed by the Technical Responsible. The test report issued by the Coordinator to the Laboratory will conform to Annex D. Annexes C and D, once completed by the Laboratory and by the Coordinator, will be integral part of the present document and they will provide evidence

to any interested part (e.g. the Accreditation Body) of the participation of the Laboratory to the proficiency test.

10. Remarks and complaints

10.a) The Coordinator issued and made freely available this document in order to prevent remarks and complaints from the Laboratories during the progress of the proficiency test.

10.b) Remarks and complaints will be considered by the Coordinator only if they are related to management or technical aspects actually relevant to the proficiency test but not considered in the present document. Subscription of the purchase order in Annex A (Italian) or B (English) implies formal acceptance of the terms and conditions of participation in the proficiency test described in this document.

10.c) Laboratories are allowed to verbally contact (e.g. by phone) the Coordinator to represent possible remarks and complaints about management and technical problems related to the proficiency test that appear during the progress of the proficiency test itself. If possible, and depending on the importance of the problem originating the remark or complaint, the Coordinator will give advice to the Laboratories in order to resolve the problem.

10.d) If the Coordinator judges that the problem cannot be verbally solved through an advice to the Laboratory then he will ask the Laboratory a written communication of the remarks and complaints. The Coordinator will discuss the remarks and complaints with his technical and scientific collaborators (see §2) and collectively take a decision about their management.

10.e) Possible technical problems related to the management of the Sample (including shipment), delay in the progress of the proficiency test caused by a Laboratory or by the Coordinator himself, can be solved by the Coordinator without involving the scientific and technical collaborators.

11. Confidentiality and impartiality

11.a) The Coordinator and his technical and scientific collaborators shall keep confidential any information pertaining the performance of the Laboratories involved in the proficiency test during its progress and after its completion. The Coordinator warrants that the results originated from the participation of the Laboratories in the proficiency test shall be kept confidential through:

- Keeping anonymous the result associated with each Laboratory. The individual result produced by each Laboratory may be released only in such a way that the anonymity of the Laboratory is preserved.

- Keeping anonymous aggregate results (i.e., statistical average, dispersion, …). The aggregate proficiency test results may be released only in such a way that the anonymity of the Laboratories that generated the results is preserved.

- Informing accredited Laboratories about a possible request of the Accreditation Body to reveal their proficiency test result. The proficiency test result shall be revealed to the Accreditation Body under written permission of the accredited test Laboratory.

11.b) The Coordinator and his scientific and technical collaborators will avoid any conduct that could cause some Laboratories to take advantage with respect to the others in the successful participation in the proficiency test.

11.c) Laboratories shall avoid raising issues that could generate a situation of disparity in the successful completion in the proficiency test.

Annex A

Compilare inserendo i dati richiesti oppure impiegare modello di buono di acquisto equivalente avendo cura, in particolare, di specificare le informazioni evidenziate in giallo. Verificare di aver inserito i dati richiesti e spedire il buono di acquisto a dinfo@pec.unifi.it

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ORDINE DI ACQUISTO PER PRESTAZIONI A TARIFFA

(in conformità all'art.3 c. del Regolamento sullo svolgimento di attività di ricerca o didattica commissionate da soggetti pubblici e privati emanato con D.R. 451/2018, Prot. 63016 del 16/04/2018)

N° Documento: **Data:** **Data di consegna del rapporto di prova:** entro 1 anno dalla data di emissione del presente ordine di acquisto *(altre info richieste dal Committente)*	**Indirizzo del Dipartimento:** Università degli Studi di Firenze Dipartimento di Ingegneria dell'Informazione, Via Santa Marta, 3 – 50139 Firenze, Italia	**Indirizzo di fatturazione:**	**Indirizzo di consegna del campione itinerante:**

Con riferimento al tariffario del Dipartimento di Ingegneria dell'Informazione approvato in data 30 gennaio 2019, il Committente affida l'incarico per le prestazioni di seguito descritte:

Descrizione	Quantità	Prezzo unitario	Importo Netto
Partecipazione a circuito interlaboratorio tipo G, codice PTC(RE-30-6000-VI)	**1**	**2000 Euro**	**2000 Euro**

Valore netto	**2000 Euro**
IVA	**440 Euro***
Importo totale	**2440 Euro**

*** Specificare l'eventuale titolo di inapplicabilità dell'IVA**

Firma digitale del Committente

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CONDIZIONI GENERALI DI ACQUISTO

1. Ambito di applicazione

Le presenti "Condizioni generali di acquisto" si applicano a tutte le prestazioni su tariffario effettuate dal Dipartimento a favore di Committente. Le presenti condizioni prevarranno su eventuali condizioni generali o particolari di vendita del Dipartimento. Qualsiasi modifica o aggiunta alle presenti Condizioni sarà valida soltanto nel caso di specifica accettazione scritta del Committente. Le modifiche e le integrazioni alle Condizioni saranno limitate alla particolare prestazione per la quale vengono pattuite.

2. Responsabile dell'attività

Responsabile dello svolgimento della prestazione è il Prof. Carlo Carobbi

3. Emissione degli Ordini di Acquisto

L'Ordine di Acquisto si intende accettato dal Dipartimento e quindi perfezionato, all'atto della ricezione da parte del Committente della Conferma d'Ordine sottoscritta per accettazione dal Dipartimento, purché detta ricezione avvenga entro il termine di 15 giorni dalla data di emissione dell'Ordine.

4. Termini e modalità di esecuzione della prestazione

a. La prestazione richiesta dovrà essere svolta dal Dipartimento entro e non oltre 1 anno dalla data di emissione dell'ordine di acquisto.

b. La prestazione richiesta dovrà essere svolta dal Dipartimento secondo le modalità descritte dal documento tecnico **"Scheme of the proficiency test through interlaboratory comparison of radiated emission measurements in the 30 MHz to 6000 MHz frequency range – Proficiency test code PTC(RE-30-6000-VI)"**, la cui ultima revisione è disponibile presso la pagina web https://www.dinfo.unifi.it/vp-436-schemes-of-the-proficiency-tests.html, e che il Committente integralmente accetta.
c. Il Dipartimento deve puntualmente rispettare i termini e le modalità di invio del campione itinerante. La consegna del campione itinerante dovrà avvenire presso la sede indicata nella voce "Indirizzo di Consegna" riportata nell'Ordine di Acquisto.
d. In caso di ritardo nelle consegne di quanto pattuito, il Committente avrà il diritto di fissare al Dipartimento un termine ulteriore per la consegna.

5. Corrispettivi e pagamenti

a. Salvo diversi accordi scritti, i prezzi indicati nell'Ordine di Acquisto si intendono fissi e non soggetti ad alcuna revisione.
b. Inoltre, ai sensi dell'articolo 1260 del C.C., il credito derivante dall'esecuzione del presente ordine non potrà essere oggetto di cessione o di delegazione, sotto qualsiasi forma.
c. Per la liquidazione delle fatture, le stesse dovranno obbligatoriamente riportare il numero dell'Ordine di Acquisto e gli altri eventuali riferimenti in esso riportati.
d. Il pagamento dell'importo totale indicato (indicare l'eventuale titolo di inapplicabilità dell'IVA) verrà effettuato dal Committente entro 30 giorni dal ricevimento di fattura elettronica – codice SDI destinatario …….. e indirizzo PEC …… in conformità a quanto previsto dal Decreto Semplificazioni (DL n. 76 del 16/07/2020) esclusivamente attraverso l'utilizzo del Sistema pagoPA. Ogni pagamento sarà identificato univocamente dal codice IUV (Identificativo Univoco di Versamento), generato in sede di creazione della fattura e notificato al Committente tramite un Avviso di Pagamento contenente anche il Codice Avviso di Pagamento, il Codice QR e il Codice Interbancario (circuito CBILL: AAB1Y) che consentono di effettuare il pagamento.
e. Il Dipartimento terrà in ogni caso il Committente indenne e manlevato da ogni e qualsivoglia danno, perdita, costo o spesa (ivi incluse eventuali sanzioni comminate ai sensi di legge) che possano ad esso derivare da eventuali violazioni e/o inadempimenti del Dipartimento agli obblighi previsti dal presente articolo. In tutti i casi di inadempimento del Dipartimento, il Committente avrà il diritto di sospendere i pagamenti dovuti al Dipartimento, senza che ciò determini la maturazione di alcun interesse o penalità, finché il Dipartimento avrà rimediato all'inadempimento.

6. Trattamento dei dati

I dati forniti dalle Parti saranno trattati per le finalità del presente Ordine di acquisto, nel rispetto dei principi di liceità, correttezza, trasparenza, adeguatezza, pertinenza e necessità di cui all'art. 5, paragrafo 1 del Regolamento Generale sulla Protezione dei Dati (GDPR). Il conferimento di tali dati tra le Parti è obbligatorio al fine di adempiere a tutti gli obblighi di contratto comunque connessi all'esecuzione del rapporto instaurato con il presente atto.
I medesimi dati potranno essere comunicati unicamente all'interno della struttura del Committente e del Dipartimento per la gestione del rapporto instaurato dal presente atto.
I dati forniti dalle Parti saranno raccolti e trattati, con modalità manuale, cartacea e informatizzata, mediante il loro inserimento in archivi cartacei e/o informatici.
L'informativa completa dell'Università di Firenze sulla protezione dei dati personali degli operatori economici relativi al presente contratto è disponibile al seguente link
https://www.unifi.it/upload/sub/protezionedati/Informativa_TERZI.pdf
L'informativa completa del Committente sulla protezione dei dati personali degli operatori economici relativi al presente contratto è disponibile al seguente link ……., ovvero allegata al presente ordine.
Titolari del trattamento sono l'Università degli Studi di Firenze e il Committente e, Referenti per la protezione dei dati sono il Direttore del Dipartimento per l'Università e …… per il Committente.

CONFERMA D'ORDINE

VI CONFERMIAMO IL PRESENTE ORDINE ALLE CONDIZIONI SOPRA INDICATE CHE DICHIARIAMO DI ACCETTARE SENZA RISERVE

Firma per accettazione
Il Direttore del Dipartimento di Ingegneria dell'Informazione

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Annex B

Fill the required fields or use a similar purchase order providing equivalent information. Please specify an email address for administrative correspondence (see the text highlighted in yellow). Check that the required information has been inserted then send the purchase order to carlo.carobbi@unifi.it

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PURCHASE ORDER FOR FEE-BASED SERVICES

(in accordance with art.3 c. of the Regulation on the performance of research or teaching activities commissioned by public and private entities issued by Regional Decree 451/ 2,018, Prot. 63016 of 16/04/2018)

Document **N°: Date:** **Delivery date of the test report:** by 1 year from the date of issue of this purchase order ***(other information requested by the Client)***	**Department address** University of Florence Department of Information Engineering, Via Santa Marta, 3 – 50139 Firenze, Italia	**Invoicing address:**	**Delivery address of the travelling sample:**
With reference to the price list of the Department of Information Engineering approved on the 30th of January 2019, the Client hereby commissions the services described below:			
Description	**Quantity**	**Unitary price**	**Net amount**
Participation in interlaboratory comparison type G, code PTC(RE-30-6000-VI)	**1**	**2000 Euro**	**2000 Euro**
		Total amount	**2000 Euro**

Digital signature of the Client

_____

****

GENERAL CONDITIONS OF PURCHASE

1. Scope of application

These "General Conditions of Purchase" shall apply to all services on a fee basis performed by the Department in favor of the Client. These Conditions shall prevail over any general or special conditions of sale of the Department. Any amendments or additions to these Conditions shall be valid only if specifically accepted in writing by the Client. Amendments and additions to the Conditions shall be limited to the specific service for which they are agreed.

2. Person in charge of the activity

The person responsible for the performance of the service is Prof. Carlo Carobbi

3. Issue of Purchase Orders

The Purchase Order shall be deemed as accepted by the Department, and therefore completed, upon receipt by the Client of the Order Confirmation signed for acceptance by the Department, provided said receipt occurs within 15 days from the date of issue of the Order.

4. Terms and conditions of the service

a. The requested service must be provided by the Department by and no later than 1 year from the date of issue of this purchase order.
b. The requested service shall be carried out by the Department as described in the technical document **"Scheme**

of the proficiency test through interlaboratory comparison of radiated emission measurements in the 30 MHz to 6000 MHz frequency range – Proficiency test code PTC(RE-30-6000-VI)", whose latest revision is available on the web page https://www.dinfo.unifi.it/vp-436-schemes-of-the-proficiency-tests.html, and that the Customer fully accepts**.**

c. The Department must comply with the terms and methods of shipment of the travelling sample. Delivery of the travelling sample shall be made to the location indicated in the "Delivery Address" section of the Purchase Order.

d. In the event of delay in the delivery terms agreed upon, the Client shall have the right to fix another term for the delivery with the Department.

5. Fees and payments

a. Unless otherwise agreed in writing, the prices set forth in the Purchase Order are fixed and not subject to revision.

b. Furthermore, pursuant to article 1260 of the Italian Civil Code, the credit deriving from the execution of this Purchase Order shall not be subject to assignment or delegation in any form whatsoever.

c. In order to be paid, invoices must include the number of the Purchase Order and any other references indicated therein.

d. Payment shall be made by the Client within 30 days from receipt of billing notice which will be followed by regular invoice – sent to the email address ..... – by payment to IBAN code IT88A0200802837000041126939, BIC/SWIFT: UNCRITM1F86, care of the UNICREDIT Banca S.p.A. in favor of the University of Florence - Department of Information Engineering (U.A. code 58507).

e. In any case, the Department will hold the Client harmless and indemnified from any and all damages, losses, costs or expenses (including any penalties imposed by law) that may be incurred as a result of the Department's breach and/or non-fulfilment of its obligations under this article. In all cases of default by the Department, the Client shall have the right to suspend payments due to the former, without the accrual of any interest or penalty, until such time as the Department has remedied the non-fulfilment.

6. Data processing

The data provided by the Parties shall be processed for the purposes of this Purchase Order, in accordance with the principles of lawfulness, fairness, transparency, adequacy, relevance and necessity set forth in Article 5, paragraph 1 of the General Data Protection Regulation (GDPR). The provision of such data between the Parties is compulsory in order to fulfil all contractual obligations in any case connected to the execution of the relationship established by this deed.

The same data may only be communicated within the structure of the Client and the Department for the management of the relationship established by this deed.

The data provided by the Parties shall be collected and processed manually, on paper and by computer, via their inclusion in hard-copy and/or computer files.

ORDER CONFIRMATION

WE CONFIRM THIS ORDER AT THE ABOVE CONDITIONS WHICH WE DECLARE TO ACCEPT WITHOUT RESERVATION

Signature for acceptance
The Director of the Department of Information Engineering

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Annex C

Test report issued by the participating Laboratory

Laboratory: Name of the Laboratory
Laboratory Code: PTC(RE-30-6000-VI)LAB(#)
Address: Address of the Laboratory
Technical Responsible: First name and last name of the Technical Responsible
E-mail: E-mail address of the Technical Responsible
Phone: Phone number of the Technical Responsible
Date of issue: Date of issue of this test report

Date of Sample receipt: .....
Date of measurements: .....
Data of Sample shipment: .....

Test result

Fill in the empty cells of columns six and seven with the measured value *x* and the measurement uncertainty U_{lab}.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Band	**Harmonic #**	**Frequency** MHz	***X*** dB(μV/m)	***U*** dB	***x*** dB(μV/m)	U_{lab} dB	***ζ***
C	1	50	-	-			-
C	3	150	-	-			-
D	7	350	-	-			-
D	11	550	-	-			-
D	16	800	-	-			-
D	19	950	-	-			-
E	50	2500	-	-			-
E	70	3500	-	-			-
E	90	4500	-	-			-
E	120	6000	-	-			-

Comments: Comments may be inserted here (optional)

Photos: At least one photo shall be inserted here (mandatory).

Signature of the Technical Responsible

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Annex D

Test report no. XYZ
Issued by the Coordinator of the proficiency test code PTC(RE-30-6000-VI)

Carlo Carobbi
Dipartimento di Ingegneria dell'Informazione
Università degli Studi di Firenze
Via S. Marta, 3 – 50139 Firenze
Phone: +39 055 2758501
Mob. phone: +39 329 6509116
e-mail: carlo.carobbi@unifi.it

to the participating Laboratory

Laboratory: Name of the Laboratory
Laboratory Code: PTC(RE-30-6000-VI)LAB(#)
Address: Address of the Laboratory

Start and stop dates of the proficiency test:
Number of participants:
Date of measurements of the participating Laboratory:
Data of issue of this report:

Test result

The cells of columns six and seven are filled in by the Laboratory, the other ones are filled by the Coordinator.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Band	**Harmonic #**	**Frequency** MHz	X dB(μV/m)	U dB	x dB(μV/m)	U_{lab} dB	ζ
C	1	50	-	-			-
C	3	150	-	-			-
D	7	350	-	-			-
D	11	550	-	-			-
D	16	800	-	-			-
D	19	950	-	-			-
E	50	2500	-	-			-
E	70	3500	-	-			-
E	90	4500	-	-			-
E	120	6000	-	-			-

Outcome

Here the Coordinator inserts the applicable outcomes:
- No anomaly is detected
- Warning signal(s) is (are) detected
- Action signal(s) is (are) detected

Signature of the Coordinator

….....