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Ing. Marco Rognini
TESLAB S.r.l.
Via delle Cateratte, 84 (int.12)
57122 Livorno (LI)
Italy

Bristol, 13th March 2017

REFERENCE: FACILITY APPRAISAL

The facilities listed in the attached register entry have been appraised in accordance with VCA internal quality procedure PC-017 to indicate their acceptability for official witnessed tests and/or CoP purposes to VCA engineers. An entry in this register does not constitute any form of approval and recognition of this entry by third parties for any other purpose is entirely at their own risk.

The appraisal is valid for a maximum period of three years, but VCA reserves the right in the meantime, at its discretion and for any reason appearing to be appropriate, to remove the entry relating to the facility from the register without notice. Such removal may be permanent or temporary pending completion of a satisfactory reappraisal. In particular, but without prejudice to the forgoing, VCA reserves the right to reassess the entry if witnessed tests are not routinely undertaken.

The inclusion of the facility in the register is furthermore conditional upon the full implementation of any corrective actions identified as obligatory at the time of the appraisal. VCA must be informed of any substantial changes to equipment, personnel or procedures and an entry may be removed if such changes are made without informing VCA. Application must also be made if you wish to extend the use of the facility to cover additional or new Directives and Regulations.

All correspondence on this subject should be directed to the undersigned.

Yours sincerely,

D LAWLOR
Chief Technical and Statutory Operations Officer

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FACILITY APPRAISAL REGISTER

Bristol, 13th March 2017

Company: TESLAB S.r.l.

Test centre description: Test House

Address:
Via delle Cateratte, 84 int.12
57122 Livorno (LI)
Italy

Manager: Eng. Marco Rognini

Tel No: +39 0586 340230

Fax No: +39 0586 340227

Individual Facility Reference	Purpose of the Facility	Applicable Directive/ Regulation (or other)	Facility Use Witness/CoP Tests	Job No. / Date of Appraisal	Test Engineer
CISPR 25 room for Components	Radiated Emissions; Immunity (BCI and ALSE)	ECE-R10.04 [1]; ECE-R10.05 [1] 2009/64/EC [1]	Witness and CoP tests[1]	MSS381524	Francesco Barbierato
ISO Pulse area	ISO7637-2 Transient	ECE-R10.04 [1]; ECE-R10.05 [1] 2009/64/EC [1]	Witness and CoP tests[1]	MSS381524	Francesco Barbierato
Semi-anechoic chamber	Radiated Emissions; Immunity (ALSE)	ECE-R10.04 [2]; ECE-R10.05 [2]	Witness and CoP tests[1]	MSS381524	Francesco Barbierato
EMC Laboratory	Vibration; IP degree; salt mist test; climatic and performance test; ESD acc. ISO 10605; ISO 7637-3 pulse on signal cable	Directive 74/61/EEC as last Amend.95/56/EC[3]; ECE-R116[3]; ECE-R97[2]	Witness and CoP tests[3] on VAS & Immobilizer	MSS381524	Francesco Barbierato

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[1] Appraisal valid for Electrical/Electronic Sub Assembly (ESA)/Components.

[2] Appraisal valid for small Vehicles and Motorbikes, included "RESS charging mode coupled to the power grid". ALSE door dimensions are 145 (L) x 200 (h) cm. Particular, RESS 380V AC max. 32A on three-phases system. Another data about Power Supply on DC the max. current rate is 100A.

[3] Appraisal valid for VAS & Immobilizer as Components. Not available the dedicated instruments for testing on vehicles accordingly to the Paragraphs 6.4.2.11. and 7.4, see also Annex 8 and Regulation No. 116

The facilities listed in this register entry have been appraised in accordance with VCA internal quality procedure PC-017 to indicate their acceptability for official witnessed tests and/or COP purposes to VCA engineers. An entry in this register does not constitute any form of approval and recognition of this entry by third parties for any other purpose is entirely at their own risk. The appraisal is valid for a maximum period of three years, but VCA reserves the right to reassess the entry if witnessed tests are not routinely undertaken. The facility is obliged to inform VCA of any major changes to equipment, procedures or personnel, and at its discretion VCA may temporarily or permanently remove the facility from the register without notice until a satisfactory reappraisal has been completed. Application must also be made to extend the use of the facility to cover additional or new Directives and Regulations.

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APPRAISAL REPORT:
ELECTROMAGNETIC COMPATIBILITY – COMPONENT TEST INCLUDING RESS MODE COUPLED TO THE POWER GRID
Regulation 10.04

APPRAISAL/JOB NUMBER:	MSS381524

INSPECTION DETAILS	
Location of Inspection	Via delle Cateratte, 84 int. 12 57122 Livorno (LI) - Italy
Date of Inspection	24 January 2017
VCA Representative	Francesco Barbierato
Facility Representative	Giorgio Romano (QM); Marco Rognini (CEO)
Items Covered	Radiated Emissions BB/NB; Immunity (BCI and ALSE); ISO7637-2 Transients

FACILITY DETAILS	
Facility Name	TESLAB S.r.l.
Facility Address	Via delle Cateratte, 84 int.12 57122 Livorno (LI) - Italy

CONCLUSION	The above mentioned facility has been appraised in accordance with the above mentioned legislation was found to comply in all respects
Signature:	Francesco Barbierato
Name:	Francesco Barbierato
Position:	Type Approval Engineer
Date:	24 January 2017

LIST OF ANNEXES

ANNEX	No of PAGES	SUBJECT
1	4	Instrument list
2	1	ESA/Component test set-up identification

APPRAISAL REPORT:
ELECTROMAGNETIC COMPATIBILITY –
VEHICLE TEST EXCLUDING RESS MODE COUPLED TO THE POWER GRID
Regulation 10.04 & 10.05
Regulation 97, 116

Paragraph		*Complies*

APPRAISED VEHICLE and COMPONENT TESTS

- ❑ Narrowband radiated emissions
- ❑ Broadband radiated emissions
- ❑ Immunity (complete range in Free-Field for Vehicles)
- ❑ Immunity (mixed in the range between BCI and Free-Field for Components)
- ❑ ISO 7637-2 pulses
- ❑ ISO 7637-2 conducted emission (time domain)

REMARKS

Audit performed no contextually at the EMC tests on Vehicles or ESA/component for Cars, Motorbikes and Agricultural vehicles.

Checked the practice aspects and also the management quality object correlated to the activity.

Checked the present ISO 17025 Quality Manual and in particular the Procedure regarding the CISPR 12, CISPR 25, ISO 7637 series and ISO 11452 series, recalled from Automotive and Motomotive like Directives and Regulations.
Checked also the instruments and procedures necessary to perform tests accordingly with the Regulations for Homologate Alarm System and Immobilizer (e.g. ECE-R116, ECE-R97)

Reference of the ISO 17025:2005 & ISO 9001:2008 Quality Manual: MQ-00 Rev.2.3 issued on 30/09/2015.

Regarding the appropriate safety measures in the Working place, see Specific Folder with report D.Lgs.81 at the reference instance in the Quality Manual ref. MQ-00 Rev.2.3 issued on 30/09/2015.

ISO 7637-2 pulse instruments is available from another Lab in PISA, just know by VCA.

Not present training regarding Automotive/Motomotive during last year, for example ECE-R10 Rev.5.
On each request the technical manager check if it's available an upgrade of the standard.

Checking the update internal info for ECE-R10: based on 3/month checking on the UNECE website.

APPRAISAL REPORT:
ELECTROMAGNETIC COMPATIBILITY –
VEHICLE TEST EXCLUDING RESS MODE COUPLED TO THE POWER GRID
Regulation 10.04 & 10.05
Regulation 97, 116

Paragraph		*Complies*

TEST PROCEDURES

Copies of each relevant standard are available *Remarks: each test operator has access at the internal folder via PC to see the standards. No paper copy. On the Server is present a dedicated folder setting as Reader only.*	**Yes**
Facility has work instructions in place for each test procedure *Remarks: each test operator has access at the internal folder via PC to see Test Procedures. No paper copy. On the Server is present a dedicated folder setting as Reader only.*	**Yes**
Facility operates to with the appropriate safety measures in place	**Yes**

EMISSIONS TEST REQUIREMENTS

R10.05 Appendix 1	Test procedures comply with CISPR 12 (Fifth edition 2001 and Amd1:2005)	**Yes**
R10.05, par.6 and 7	Emission limits and measuring location comply with requirements	**Yes**
CISPR 16 series	Open-test site (O.A.T.S) complies with the requirements of CISPR 16 series	**N/A**
	OR	
R10 Annex 4, par.3	Absorber-lined shielded enclosure correlates to results obtained at an O.A.T.S	**Yes**

EMISSIONS EQUIPMENT

CISPR12, 5.1.1.1	Complies with CISPR 16-1	**Yes**
	All equipment calibrations able to be uniquely identified and traced to calibration records	**Yes**
R10 Annex 4, 4	Emissions equipment has the capacity to measure in the full frequency range	**Yes**
	Antennas calibrated to national standards	**Yes**
	Calibration of connecting equipment such as cable, attenuators, amplifiers, etc. traceable to national standards *Remarks: all cable, attenuator, amplifiers etc. is checked with internal calibration and for all is available a report.*	**Yes**

APPRAISAL REPORT:
ELECTROMAGNETIC COMPATIBILITY –
VEHICLE TEST EXCLUDING RESS MODE COUPLED TO THE POWER GRID
Regulation 10.04 & 10.05
Regulation 97, 116

Paragraph		*Complies*
	BROADBAND TEST REQUIREMENTS	
R10, Annex 4, 4.2	Peak or Quasi-Peak detector used	**Yes**
CISPR12, 5.3.2	For electric motor functions, only peak detector is used	**Yes**
CISPR 25, 5.1.1.3	Bandwidth as recommended (120 kHz)	**Yes**
	NARROWBAND TEST REQUIREMENTS	
R10, Annex 5, 3.2	Average detector used	**Yes**
CISPR 5, 5.1.1.3	Bandwidth as recommended (120 kHz)	**Yes**
	IMMUNITY TEST REQUIREMENTS	
R10, Annex 6 1.3	Facility complies with legal requirements regarding the emission of electromagnetic fields	**Yes**
R10, Annex 6 1.2	Test method according to ISO 11451-2:2004 and ISO 11452-4:1995	**Yes**
R10, Annex 6 5.1.2	Calibration method complies with applicable standards	**Yes**
	Test and calibration data show all necessary information for testing	**Yes**
	TEST EQUIPMENT REQUIREMENTS	
	All equipment can be uniquely identified and calibration records traceable to national standards *Remarks: checked certificate of calibration method ARP958 with distance 1 m*	**Yes**
R10, Annex 6 4.1	Equipment is capable of producing the correctly modulated signals in the appropriate frequency bands	**Yes**
	Field generating equipment and its layout employed during the test phase is the same as that used during calibration	**Yes**
10.04 Annex 6 2.1.1.1	Facility equipped with appropriately loaded dynamometer or insulated jack stands if no dynamometer is available	**Yes**
ISO11451-1 4.2	Atmospheric conditions comply with requirements	**Yes**

Paragraph		*Complies*
R10, Annex 6, 4.1	Field generating device is an antenna generating a vertically polarized field	**Yes**
R10, Annex 6, 2	Monitoring equipment is able to verify vehicle state during testing and is non-perturbing	**Yes**
ISO11451-2, 9.4.1	Forward power used to define test field	**Yes**
ISO11451-2, 9.4.1	Field strength contour complies with the requirements	**Yes**
ISO11451-1 4.5	Test signal dwell time sufficient	**Yes**
	BRAKE CYCLE TEST	
	Appropriate test method is employed to demonstrate ABS functionality *Remarks: in case appropriate system for check the ABS system was and will be supply from the manufacturer of the motorbike, for example through a dedicated Rooler-bench.*	**N/A**
	OR Alternative component test methods employed	**N/A**
	TRANSMITTER DECLARATION	
R10 3.1.8	Facility has the capability to test and provide the necessary declarations with regards to RF transmitters *Remarks:* *The Laboratory has demonstrated competence in Radio matter and in its application for Automotive/Motomotive field too.* *The Laboratory however has GSM test set simulator R&S model CMD 60 M.*	**Yes**

Paragraph		*Complies*

Other remarks:

Semi-anechoic chamber used for Vehicle & Component
Dimension 8,5 x 5,5 m
Max. weight on turn-table 1 tonn.
Access door 2,00 m x 2,43 cm

Another small CISPR 25 chamber compliance and used only for Components.

ISO Pulse instruments and Capacitive Clamp with construction acc. ISO 7637-3, available in partnership with GSD S.r.l. laboratory in Pisa just Appraised by VCA from year 2013.

Laboratory has Vibration system and climatic chamber able to perform tests accordingly with the ECE-R116, see Instrument list.

Annex 1

Job Number ref.	MSS381524
Location of Inspection	Via delle Cateratte, 84 int. 12 57122 Livorno (LI) - Italy
Date of Inspection	24 January 2017
VCA Representative	Mr. F. Barbierato
Facility Representative	Ing. M. Rognini (CEO); Ing. G. Romano (QM)

INSTRUMENTS LIST

[RADIATED EMISSION test]
Component and/or Vehicle

Equipment	Serial / Certificate No.	Calibration due*
Anechoic Room	ST078F01	NA
Anechoic Room	ST078F02	NA
EMI Receiver	ST249F1 / TESI 2797_2016/E	19/08/2017
EMI Receiver	ST249F2 / Keysight N° 1-7736356884-1	18/04/2017
AMN (positive)	ST203F01 / Internal calibration	03/05/2017
AMN (negative)	ST203F02 / Internal calibration	03/05/2017
Biconical Antenna	ST163A / Teseo 12C229	13/12/2017
Log-periodic Antenna	ST250A / Nemko 05351/16	23/08/2021

[RADIATED IMMUNITY – Free Field test method]

Equipment	Serial / Certificate No.	Calibration due*
Anechoic Room	ST078F01	NA
Anechoic Room	ST078F02	NA
AMN (positive)	ST203F01/ Internal calibration	03/05/2017
AMN (negative)	ST203F02/ Internal calibration	03/05/2017
Log-periodic Antenna	ST250A	NA
Log-periodic Antenna	ST161A	NA
Biconical Antenna	ST022A	NA
Horn Antenna	ST185A	NA
Parallele element antenna	ST020A	NA
RF signal generator	ST186A / TESI 2793_2016/E	18/08/2017
RF signal generator	ST094F05 / TESI 2957_2015/E	17/08/2017
Power meter	ST132S01 / Tesi 2787_2016/E	18/08/2017
Power meter	ST132S010 / Tesi 0080_2016	18/08/2017
Arb. Signal generator	ST133F03 / Tesi 0409_2016	18/03/2018
Arb. Signal generator	ST133F01 / Tesi 2788_2016	18/08/2018
Field Probe	ST148A / Nemko 01205/16	19/05/2018
Field Probe	ST262A / Nemko 05288/16	23/08/2020
RF Amplifier 0.001-200 MHz	ST228A/ Internal calibration	22/08/2017
RF Amplifier 80-1000 MHz	ST260A/ Internal calibration	20/08/2018
RF Amplifier 1000-2000 MHz	ST264A/ Internal calibration	20/08/2018

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Facility Representative	Ing. M. Rognini (CEO); Ing. G. Romano (QM)

INSTRUMENTS LIST

[RADIATED IMMUNITY – BULK CURRENT INJECTION test method]

Equipment	**Serial / Certificate No.**	**Calibration due***
AMN (positive)	ST203F01/ Internal calibration	03/05/2017
AMN (negative)	ST203F02/ Internal calibration	03/05/2017
RF signal generator	ST094F3 / TESI 2956_2015/E	17/08/2017
BCI probe	ST026F01/ Internal calibration	01/03/2017
BCI probe	ST026F02/ Internal calibration	01/03/2017
BCI probe	ST093F07/ Internal calibration	04/03/2017
BCI probe	ST093F08/ Internal calibration	04/03/2017
RF amplifier	ST228A/ Internal calibration	22/08/2017
RF amplifier	ST016F02A/ Internal calibration	20/08/2017
RF analyzer	ST230A / TESI 2796_2016/E	19/08/2017

[ISO 7637-2 IMMUNITY test]

Equipment	**Serial / Certificate No.**	**Calibration due***
Pulse generator type 1, 2a		Jan.2017 (1 year)
Pulse generator type 3a, 3b		Jan.2017 (1 year)
Pulse generator type 2b, 4		Jan.2017 (1 year)
Software	EM TEST ISO	Jan.2017 (1 year)

Regarding REESS tests accordance with the ECE-R10.05

Burst

Equipment	**Serial / Certificate No.**	**Calibration due***
Capacitive Coupling Clamp	ST010S02/ Internal calibration	25/08/2017
4 kV combined wave generator	ST240A/ Internal calibration	25/08/2017

Surge

Equipment	**Serial / Certificate No.**	**Calibration due***
4 kV combined wave generator	ST240A/ Internal calibration	25/08/2017

Job Number ref.	MSS381524
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INSTRUMENTS LIST

Hamonics and Flicker

Equipment	Serial / Certificate No.	Calibration due*
Power Analyser	ST254A/ Internal calibration	19/05/2018

Conducted emission

Equipment	Serial / Certificate No.	Calibration due*
EMI Receiver	ST249F1 / TESI 2797_2016/E	19/08/2017
EMI Receiver	ST249F2 / Keysight N° 1-7736356884-1	18/04/2017
AMN (positive)	ST203F01 / Internal calibration	03/05/2017
AMN (negative)	ST203F02 / Internal calibration	03/05/2017
3 phase L.i.s.n.	ST239A / Internal calibration	14/11/2017
Capacitive Voltage Probe	ST274S/ Internal calibration	18/08/2017
ISN T8	ST275A / Internal calibration	04/09/2017

Regarding performance test accordance with the ECE-R116

Vibration

Equipment	Serial / Certificate No.	Calibration due*
Vibration table	ST055S01 / B&K N° CAS-103610-P4R7T6/B	03/05/2017
Amplifier	ST055S02 / B&K N° CAS-103610-P4R7T6/B	03/05/2017
Accelerometers monoaxial	ST067F02 / Metrolab S041/16	15/04/2017
Accelerometers monoaxial	ST067F03/ Metrolab S141/16	19/07/2017
Accelerometers monoaxial	ST067F06 / Metrolab S142/16	19/07/2017
Accelerometers monoaxial	ST067F09 / Metrolab S025/16	14/03/2017
Accelerometers monoaxial	ST067F10 / Metrolab S042/16	15/04/2017
Accelerometers triaxial	ST067F07/ Metrolab S026/16	14/03/2017
Digitasl controller	ST247A / B&K N° CAS-103610-P4R7T6/A	03/05/2017

Job Number ref.	MSS381524
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INSTRUMENTS LIST

Climatic

Equipment	**Serial / Certificate No.**	**Calibration due***
Climatic chamber	ST052A/ Internal calibration	15/10/2017
Climatic chamber	ST238A/ Internal calibration	15/10/2017
Corrosion test chamber	ST255A/Internal calibration	15/01/2018

Other remarks:

Semi-anechoic chamber used for Vehicle & Component
Dimension 8,5 x 5,5 m
Max. weight on turn-table 1 tonn.
Access door 2,00 m x 2,43 cm

Another CISPR 25 chamber compliance and used only for Component.

ISO Pulse instruments and Capacitive Clamp with construction acc. ISO 7637-3, available in partnership with GSD S.r.l. laboratory in Pisa just Appraised by VCA from year 2013.

Annex 2

Job Number ref.	MSS381524
Location of Inspection	Via delle Cateratte, 84 int. 12 57122 Livorno (LI) - Italy
Date of Inspection	24 January 2017
VCA Representative	Mr. F. Barbierato
Facility Representative	Ing. M. Rognini (CEO); Ing. G. Romano (QM)

Photos of TEST SET-UP

Views of the radiated emission test set-up with Biconical antenna