

SPECIFIC SUPPLY CONDITIONS FOR TESTING

(March 17th, 2020)

1. Scope

These Specific Supply Conditions for carrying out tests are additional to the general conditions set out in the "General Supply Conditions" document and are intended to regulate the performance of the following services:

- "Vehicle mass / static load measurement per wheel";
- "Verification of the components for traction current. Harmonic current (0-1000 A)";
- "Technical interoperability and functionality of the ETCS";
- "Test for the acceptance of the running characteristics of railway vehicles - dynamic behavioural test";
- "Test for checking the braking performance of railway vehicles";
- "Test for the measurement of the Signal / Noise ratio on RSC equipment".

These conditions concern all the activities necessary to implement an effective process in order to satisfy the requests and requirements of the Parties involved.

The Applicant acknowledges and agrees that, in order to carry out the activities listed in the Offer, all the requirements set out in the "General Supply Conditions" document must be respected.

To this end, Italcertifer Laboratory requires that the Client undertakes to indicate one or more subjects, equipped with the appropriate skills¹, who can interface with the staff in charge of the Italcertifer Laboratories for mutual support and for exchange of documentation and information regarding the specific activity.

2. Sample Tested

2.1 Sampling

Unless otherwise specified, Italcertifer requests that the sampling have to be carried out by the Client that is also responsible for the conditions in which the sample to be tested reaches the Italcertifer Laboratory.

This condition must reflect the requirements set out in this document relating to the tests the sample will undergo.

If the customer be unable to ensure the requirements and conditions required of the sample for the performance of the tests, he is obliged - before the start of the tests - to provide a communication to the ITCF Laboratories indicating any deviation of the sample from the required conditions.

If the customer requests that the sample is in any case subjected to testing activities - despite the presence of a deviation from the specified conditions - the laboratory will include in the report a

¹ "Appropriate personnel" means competent personnel who have sufficient autonomy for decisions to be able to manage the service indicated in the offer / contract with Italcertifer S.p.A.

statement in which it declines any responsibility arising from this deviation, indicating the results that may be affected by the deviation itself.

2.2 Conditions required for the correct performance of the test activities

- **"Vehicle mass / static load measurement per wheel"**

The Client must provide the RTP (Technical Test Manager) with a formal declaration of the loading conditions of the sample, undertaking to guarantee the correspondence between the conditions of the sample sent to Italcertifier Laboratories for carrying out the weighing test under the conditions indicated in the reference standard.

- **"Technical interoperability and functionality of the ETCS"**

Italcertifier Laboratory require that the electrical connection of the target to the test bench must be made in the presence of the Client or a document of specific connections must be present.

Furthermore, with regards to sample preparation and initial checks, the following is required:

- a declaration of HW and SW configuration. The client must issue a specific declaration, supported by verification by the laboratory staff, that the delivered hardware is complete and correctly functioning. The Client must also issue a special declaration supported by verification by laboratory personnel that the SW loaded is correct (this verification must be carried out by means of software signatures and specific documentation supplied).
- a declaration of conformity of the HW and SW version. The Client must issue a specific declaration stating that the target under test (understood as HW and SW together) has completed the CENELEC safety cycle.

- **"Test for acceptance of the running characteristics of railway vehicles - dynamic behavioural test"**

The Client / applicant must deliver the documentation necessary for the performance of the tests according to agreements and procedures previously shared in a formal way (e.g. e-mail) between its Interface and Italcertifier's RTP.

In particular, the Client / applicant must provide the formal RTP with a declaration of:

1. vehicle serial number assigned by the Client to the vehicle under test;
2. identification of the vehicle elements tested (NEV);
3. vehicle operating parameters (uncompensated speed and acceleration / cant deficiency);
4. nominal mass of the bogies of the vehicle elements tested;
5. nominal axial load of the axles of the vehicle elements tested;
6. identification of the wheel profile of the elements tested;
7. failure conditions to be verified during the tests (pneumatic suspension if present / anti-snaking shock absorbers if present);
8. load conditions to be verified during tests according to EN 15663;
9. general data of the vehicle elements (length, wheelbase, inter-axle);
10. declaration of the representativeness of the sample with respect to the parameters that influence the dynamic behaviour, as required by paragraph 5.3.1 of the EN 14363 2016 + A1 standard.



Italcertifer declines any responsibility relating to the data provided by the Client that influence the choice of the test method (complete, simplified, simplified accelerometric) and related parameters that can be influenced by any choice (e.g. limit values).

- "Test for checking the braking performance of railway vehicles"

The Client / Applicant must deliver the documentation necessary for the performance of the tests according to agreements and procedures previously shared in a formal way (for example by e-mail) between its Interface and Italcertifer's RTP.

In particular, the Client / applicant must provide the formal RTP with a declaration of:

1. serial number / serial number of the vehicle under test;
2. identification of the vehicle elements tested;
3. clear and unambiguous indication of the regulatory references to be respected (Rule Reference List or similar document);
4. technical characteristics of the brake system:
 - to. pneumatic diagram;
 - b. brake calculation;
 - c. vehicle commissioning report, if any
 - d. estimated weight of the vehicle under test;
 - is. data sheet of the main components of the brake system (manipulator, distributor, self-continuous device or other device for changing the pressure of the brake cylinders according to the load, brake cylinders, brake discs);
 - f. all types of brake linings or blocks with which you intend to carry out tests on the vehicle under test;
 - g. all software releases installed on the vehicle that are relevant in relation to the component under test (if any).

The Client undertakes to provide the latest version of the documentation listed above

If, during the approval process and for any reason, the intervention of the vehicle Client or the supplier of the brake system is necessary to make changes on the vehicle under test (HW and / or SW), it will be necessary to evaluate the impact of these interventions in order to decide whether to repeat all or part of the static and / or dynamic tests carried out up to that moment.

Italcertifer declines all responsibility for the data provided by the Client which have an impact on the test results.

- "Verification of the components of the traction current. Harmonic current (0-1000 A) "

The Client is required to declare:

- description of the vehicle
- sample name
- sample identification code (type and serial number)
- maximum test speed
- description of the traction circuit

- maximum power
- maximum current absorption
- number of auxiliary converters
- auxiliary converters power
- modulation frequency of the power converters
- frequency of the voltage generated by the auxiliary converters
- AT electrical diagrams
- figure / drawing of the internal and external vehicle
- sketch / drawing of the imperial
- composition of the train under test
- position of the rolling stock in question with respect to the train
- list of possible degraded traction and auxiliary configurations declared as compatible with the normal operational service of the vehicle.
- description of the line filter and sizing.
- diagrams relating to the electrical power architecture.
- description of the power converters and related nominal data, in particular the switching frequencies of choppers and / or inverters.
- traction curves for continuous and temporary service.
- nominal data relating to traction motors and to those dedicated to auxiliary services.
- installed pantograph (Client and identification code) and relative thrust.

At the beginning of tests, the Client shall provide the SW revision and the list of SWs that have an impact on the test results.

The start of the tests is subject to the Client's declaration of fine tuning.

Italcertifer Laboratories inform the Client that the test in question is carried out with TA developed in association with the technical specification ST370582 and has a transfer function similar to that required by the specification.

This instrument was used without interruption for the tests performed by the former Trenitalia S.p.A. laboratory. before and from that of Italcertifer S.p.A. until the issue of the Reference Specification.

The measurement uncertainty requirements of the AC current are those expressed by the new standard CEI 9-173.

- "Test for the measurement of the Signal / Noise ratio on RSC equipment"

The Client is required to declare:

- architecture of the STB;
- vehicle name;
- identification code (type and serial number);



- maximum test speed;
- maximum current absorption;
- maximum operating speed;
- maximum wheel power;
- maximum power in electric braking;
- maximum power in rheostatic braking;
- traction force at start;
- maximum force in electric braking;
- number of engines;
- ratio between the motor supply frequency (output frequency of the traction inverters) and vehicle speed;
- software of the signaling system installed on the vehicle;
- identification code of the traction software installed on the rolling stock;

At the beginning of tests, the Client shall provide the SW revision and the list of SWs that have an impact on the test results.

For all the aforementioned test activities, Italcertifer Laboratories inform that:

- ✓ **the Client is also responsible for the conditions in which the sample to be tested reaches the Italcertifer Laboratories**
- ✓ **Italcertifer is relieved of all responsibility in the event that the condition of the sample provided does not correspond to when declared by the Client.**
- ✓ **Italcertifer reiterates that the test and the consequent Report concern only the samples subjected to testing in the conditions declared by the Client.**
- ✓ **Italcertifer declines all responsibility for the data provided by the Client which have an impact on the test results.**

2.3 Storage time of the sample tested

For the specific tests, a minimum retention time of the sample downstream of the test is not identified as it is expected to be returned in the manner indicated in the following paragraph.

The timing and methods of collection of the vehicle under test are managed by RTP which, for this purpose, agrees the logistics with the contact person of the Client / Applicant.

2.4 Further information to the Client

All documents and declarations must be provided in Italian or English.