

H-11 TEST INSTRUCTION

QUALIFICATION GUIDE FOR TESTING MEANS

This test instruction is limited to low-voltage domain and is based on the following COFRAC programs:

- Program No.13
- Program Nr. 58

Which it fully complies with and to which it provides additional information to improve test reproducibility between various ASEFA approved laboratories.

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The Chairman of the Certification Committee,
ASEFA



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1- Purpose

This instruction presents itself as a guide intended to define the influential parameters that must be mastered in the method for the qualification of testing means that will be used under ASEFA scope.

2- Definition of a qualification

The qualification, described in ASEFA's charter, is a voluntary initiative of the laboratory aiming to obtain quality recognition.

The qualification of a testing means is achieved by checking its suitability to the needs for the implementation of the tests and for ensuring the proper purpose of the test results.

The testing means include equipment, measuring instruments and skills of the staff concerned.

The check consists in ensuring that all parameters influencing the quality of the test results are controlled by the laboratory.

The results of the initial check and of developments are recorded in an internal report. During an audit, the laboratory can rely on ASEFA documents and its results to demonstrate its quality approach.

3- Classification of testing means

The test means are classified into two categories:

3.1 Major testing means

A main or fundamental characteristic of a device is checked with a major testing means.

A partial list of these means is provided in this instruction.

3.2- Minor testing means

Auxiliary characteristics of a device or sanctions of tests conducted with major testing means, can be performed with minor testing means.

4- Influential parameters

The influential parameters are electrical or mechanical physical values, behaviors or characteristics of the equipment, environmental conditions, the methodology implemented by the technology of the measuring instruments, and the expertise and experience of the managers and test operators.

The guide does not provide the level of results to be obtained, nor the tolerances allowed, nor the calculated uncertainties, which are included in other instructions.

5- Testing areas

The guide distinguishes the testing areas implementing specific equipment and skills.

Each area considered may include multiple test families, mobilizing means with identical or similar influential parameters.

Each area contains 5 chapters:

- Environment
- Characteristics
- Methodology
- Measuring instruments
- Skills

6- List of testing areas

6.1 Apparatus testing areas

- Current testing
- Power testing
- Voltage Testing
- Insulation testing
- Climatic testing
- Mechanical testing
- Protection & penetration testing
- Releases testing

6.2- Cable testing areas

- Dimensions
- Mechanical testing
- Voltage Testing
- Physical and chemical characteristics
- Fire behaviour

7- List of parameters for each area

The influential parameters are presented in the form of sheets for each area, with the following outline:

Testing area:	
Test family:	
Environment:	<i>List of environmental conditions of the testing instrument, which may affect the course of the test and the results</i>
Characteristics:	Parameters and performance results specific to the various components of the testing instrument.
Methodology:	<i>Techniques for implementing, conducting and interpreting the performance of the test.</i>
Measuring instruments:	<i>Means or specific performance results to be considered for the performance of the test.</i>
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP1 datasheet

Testing area:	CURRENT TESTING
Test family:	<ul style="list-style-type: none"> - TEMPERATURE-RISE TEST - OVERLOAD
Environment:	<ul style="list-style-type: none"> - FACILITY (Dimensions, Equipment) - TEMPERATURE OF THE AMBIENT AIR - AIR SPEED - RADIATION - HARMONICS - RESIDUAL-CURRENT DEVICES
Characteristics:	<ul style="list-style-type: none"> - CURRENT (Stability, waveform) - DISTRIBUTION (three-phase)
Methodology:	<ul style="list-style-type: none"> - CONNECTIONS - TEMPERATURE MEASUREMENT METHOD - See H06 guide
Measuring instruments:	- DETECTION OF TEMPERATURE STABILIZATION
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP2 datasheet

Testing area:	POWER TESTING
Test family:	<ul style="list-style-type: none"> - SHORT-CIRCUIT - MAKING and BREAKING CAPACITIES - ELECTRIC RELIABILITY - OVERLOAD
Environment:	/
Characteristics:	<ul style="list-style-type: none"> - POWER AND PERFORMANCE OF THE GENERATOR - CONTROL AND REPEATABILITY OF THE MAKING ANGLE - WAVEFORM - PHASE EQUILIBRIUM - PERFORMANCE OF THE NEUTRAL
Methodology:	<ul style="list-style-type: none"> - CURRENT RATIO AT 100% and 75% OF THE TESTING VOLTAGE FOR CALIBRATION
Measuring instruments:	- See D 001- 2 instruction
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP3 datasheet

Testing area:	VOLTAGE TESTING
Test family:	<ul style="list-style-type: none"> - DIELECTRIC 50Hz - IMPULSE WAVE 1.2/50
Environment:	<ul style="list-style-type: none"> - TEMPERATURE - RELATIVE HUMIDITY - ALTITUDE
Characteristics:	<ul style="list-style-type: none"> - VOLTAGE - WAVEFORM - SHORT-CIRCUIT CURRENT (50Hz) - TRIGGERING THRESHOLD AND DELAY (50Hz) - ENERGY (1,2/50)
Methodology:	<ul style="list-style-type: none"> - VOLTAGE RISE (50Hz) - APPLICATION TIME (50Hz)
Measuring instruments:	<ul style="list-style-type: none"> - BANDWIDTH OF THE PROBE and THE OSCILLOSCOPE (1.2/50) - MEASUREMENT METHOD FOR THE VOLTAGE (50Hz)
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP4 datasheet

Testing area:	- INSULATION TESTING
Test family:	- C.T.I. - GLOW-WIRE - FIRE BEHAVIOUR
Environment:	- CONTAINMENT - STILL AIR
Characteristics:	- See corresponding standards
Methodology:	- RATE OF SEPARATION OF THE CARRIAGE (glow-wire)
Measuring instruments:	- See corresponding standards
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP5 datasheet

Testing area:	CLIMATIC TESTING
Test family:	<ul style="list-style-type: none"> - DRY HEAT - DRY COLD - DAMP HEAT - CYCLES - FAST TEMPERATURE VARIATION - SALT MIST - CORROSIVE GAS
Environment:	<ul style="list-style-type: none"> - QUALITY OF THE WATER, THE SALT, THE GAS - TEMPERATURE OF THE SUPPLY WATER - TEMPERATURE OF THE FACILITY
Characteristics:	<ul style="list-style-type: none"> - DEFINITION OF USEFUL VOLUME - TEMPERATURE RANGES - HUMIDITY RANGES - TEMPERATURE AND HUMIDITY VARIATION SPEED - REGULATION - STABILITY - REPEATABILITY - MAXIMUM ACCEPTABLE POWER - MAXIMUM WEIGHT OF THE TEST PIECES
Methodology:	<ul style="list-style-type: none"> - SIZE AND QUALITY OF THE FEED APERTURES - SETUP OF THE TEST PIECES - LOCATION OF THE SENSORS
Measuring instruments:	- CHOICE OF THE METHOD FOR MEASURING HUMIDITY
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP6 datasheet

Testing area:	MECHANICAL TESTING
Test family:	<ul style="list-style-type: none"> - RELIABILITY - IMPACT - I.K. - TRACTION - PROPERTIES OF THE TERMINALS - BALL PRESSURE
Environment:	<ul style="list-style-type: none"> - NATURE OF THE SUPPORT
Characteristics:	<ul style="list-style-type: none"> - RATES RANGES - STRENGTH or TORQUE - RANGE and NATURE OF THE POWER SUPPLIES OF THE CONTROL DEVICE
Methodology:	<ul style="list-style-type: none"> - PREPARATION OF THE TEST PIECES - FAULT DETECTION DEVICE - SETUP OF THE TEST PIECES - LOCATION OF THE SENSORS
Measuring instruments:	<ul style="list-style-type: none"> - IMPACT MEASUREMENT - CALCULATION OF IMPACT ENERGY
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP7 datasheet

Testing area:	PROTECTION AND PENETRATION TESTING
Test family:	- I.P.
Environment:	- FACILITY (Temperature - Humidity)
Characteristics:	- USEFUL VOLUME
Methodology:	- AIR FLOW MEASUREMENT - AIR FLOW OR WATER PRESSURE MEASUREMENT
Measuring instruments:	- ASSESSMENT OF THE PENETRATION LEVEL
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP8 datasheet

Testing area:	TESTS OF RELEASES
Test family:	<ul style="list-style-type: none"> - OVERLOAD - RESIDUAL-CURRENT
Environment:	<ul style="list-style-type: none"> - FACILITY (Dimensions, Equipment) - TEMPERATURE OF THE AMBIENT AIR - AIR SPEED - RADIATION
Characteristics:	<ul style="list-style-type: none"> - CURRENT (Stability, waveform) - DISTRIBUTION (three-phase)
Methodology:	<ul style="list-style-type: none"> - CONNECTIONS
Measuring instruments:	/
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Apparatus: AP9 datasheet

Testing area:	IMPACT AND VIBRATIONS TESTING
Test family:	<ul style="list-style-type: none"> - SINE VIBRATIONS - SHOCKS
Environment:	<ul style="list-style-type: none"> - TEMPERATURE OF THE AIR IN THE FACILITY
Characteristics:	<ul style="list-style-type: none"> - MAXIMUM STRENGTH IN SINUSOIDAL REGIME - MAXIMUM STROKE - MAXIMUM SPEED - MAXIMUM ACCELERATION - RANGE OF RATED FREQUENCY (RESONANT FREQUENCY) - MOBILE EQUIPMENT WEIGHT - DIMENSIONS OF THE TABLE (HORIZONTAL) AND OF THE EXPANDER (VERTICAL) - ACCEPTABLE LOAD - RATED TOTAL HARMONIC DISTORTION - CROSS MOTION OF THE TABLE - UNIFORMITY OF THE TABLE MOTION - TOLERANCE ON FREQUENCY (ACQUISITION / MONITORING) - TOLERANCE ON SCANNING SPEED (ACQUISITION / MONITORING) - TOLERANCE ON THE STEERING SIGNAL (ACQUISITION / MONITORING) - LIST OF TESTING SUPPORTS AND INDICATION OF THE FIRST NO-LOAD RESONANCE FREQUENCY SPEED
Methodology:	<ul style="list-style-type: none"> - ASSEMBLY USED - FASTENING OF THE EQUIPMENT - POSITION OF SENSORS (REFERENCE POINTS, CHECK POINTS, MEASUREMENT POINTS) - MONITORING STRATEGY (1 POINT, SEVERAL POINTS) - TOLERANCE ON SPEED VARIATION (IMPACT TEST) - ACQUISITION BANDWIDTH (IMPACT TEST)
Measuring instruments:	<ul style="list-style-type: none"> - ACCELEROMETERS
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Cables: CA1 datasheet

Testing area:	DIMENSIONS
Test family:	<ul style="list-style-type: none">- THICKNESS- DIAMETERS
Environment:	<ul style="list-style-type: none">- TEMPERATURE- RELATIVE HUMIDITY
Characteristics:	<ul style="list-style-type: none">- RESOLUTION- MAGNIFICATION
Methodology:	<ul style="list-style-type: none">- See reference standard EN 60811-1-1
Measuring instruments:	<ul style="list-style-type: none">- PROFILE PROJECTOR:- MINIMUM MAGNIFICATION OF 20- RESOLUTION / 0.001 mm
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Cables: CA2 datasheet

Testing area:	MECHANICAL TESTING
Test family:	- TRACTION
Environment:	- TEMPERATURE OF THE FACILITY - RELATIVE HUMIDITY
Characteristics:	- TENSILE STRENGTH - ELONGATION AT BREAK Before and after various ageing processes
Methodology:	- TRACTION SPEED - CONSTITUTION OF TEST PIECES (tubular, barbell)
Measuring instruments:	- DYNAMOMETER (traction speed of 25 to 250 mm/min) - DRY HEAT AND NATURAL DRAW HEAT CHAMBER (renewal 8 to 20 volumes / hour)
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Cables: CA3 datasheet

Testing area:	VOLTAGE TESTING
Test family:	<ul style="list-style-type: none"> - DIELECTRIC 50Hz - IMPULSE WAVE 1.2/50
Environment:	<ul style="list-style-type: none"> - TEMPERATURE - HUMIDITY
Characteristics:	<ul style="list-style-type: none"> - VOLTAGE - WAVEFORM - SHORT-CIRCUIT CURRENT (50Hz) - TRIGGERING THRESHOLD AND DELAY (50Hz) - ENERGY (1,2/50)
Methodology:	<ul style="list-style-type: none"> - VOLTAGE RISE (50Hz) - APPLICATION TIME (50Hz) - NUMBER OF IMPACTS AND POLARITY
Measuring instruments:	<ul style="list-style-type: none"> - BANDWIDTH OF THE PROBE and THE OSCILLOSCOPE (1.2/50) - MEASUREMENT METHOD FOR THE VOLTAGE (50Hz) - CHRONOMETER
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Cables: CA4 datasheet

Testing area:	PHYSICAL AND CHEMICAL CHARACTERISTICS
Test family:	<ul style="list-style-type: none"> - LOSS IN MASS - HOT TEMPERATURE PRESSURE - CRACKING - HOT TEMPERATURE ELONGATION - LOW TEMPERATURE ELONGATION - WATER ABSORPTION - HOT TEMPERATURE RETRACTION
Environment:	<ul style="list-style-type: none"> - TEMPERATURE
Characteristics:	<ul style="list-style-type: none"> - TEMPERATURE REGULATION AND DISTRIBUTION IN THE HOT CHAMBERS - HOT CHAMBER AIR RENEWAL RATE
Methodology:	<p>See reference standards:</p> <ul style="list-style-type: none"> - EN 60811-1-3 - EN 60811-3-1 - EN 60811-3-2 - EN 60811-2-1 - EN 60811-1-4
Measuring instruments:	<ul style="list-style-type: none"> - PROFILE PROJECTOR: (magnification 20, resolution 0.001 mm) - BALANCE (resolution 0.1 mg) - DRY HEAT AND NATURAL DRAW HEAT CHAMBER (renewal 8 to 20 volumes / hour) - COLD CHAMBER (-25°C)
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.

Cables: CA5 datasheet

Testing area:	FIRE BEHAVIOUR
Test family:	<ul style="list-style-type: none">- NON PROPAGATION OF THE FLAME- NO SPREAD OF FIRE- OPACITY OF THE SMOKES- GAS CORROSIVENESS AND ACIDITY
Environment:	<ul style="list-style-type: none">- TEMPERATURE- RELATIVE HUMIDITY
Characteristics:	See specific standards: <ul style="list-style-type: none">- EN 60265-2-1- EN 60267-2-1- EN 50266-2-4- EN 50268
Methodology:	See specific standards
Measuring instruments:	See specific standards
Skills:	The required level of skill, training and experience of personnel working on the testing instrument, shall be specified.