

Checking and testing electrical products

Overview

This standard identifies the competences you need to carry out visual inspections and specific tests on electrical products, in accordance with approved procedures. You will be required to carry out checks and tests on electrical products such as rotating equipment, power equipment, control equipment, portable power tools, white or brown goods, communication equipment, process control and alarm equipment to establish that it is safe and functioning to specification. You will be required to use a range of electrical test instruments to measure and check that the equipment is to specification.

Your responsibilities will require you to comply with organisational policy and procedures for the checking and testing activities undertaken, and to report any problems with the electrical product you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will be expected to ensure that all tools and equipment used to check and test the product are returned to the correct location on completion of the activities. You will be expected to work to instructions, either alone or in conjunction with others, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will provide an informed approach to applying appropriate checking and test procedures to electrical products. You will understand the electrical product being checked, the test equipment being used, and the various test procedures, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the checking and testing activities, especially those for isolating the equipment and for taking the necessary safeguards to protect yourself and others against direct and indirect electric shock. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

Checking and testing electrical products

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the appropriate procedures for use of tools and equipment to carry out the required tests/inspections
3. set up and carry out the tests/inspections using the correct procedures and within agreed timescales
4. record the results of the tests in the appropriate format
5. review the results and carry out further tests if necessary

Checking and testing electrical products

Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken when checking and testing electrical products (such as specific legislation or regulations governing the activities or work area, safe working practices and procedures to be adopted, general workshop safety practice, displaying of warning notices)
2. the health and safety requirements of the work area where you are carrying out the testing activities, and the responsibility these requirements place on you
3. the hazards associated with checking and testing electrical products, and how they can be minimised
4. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the electrical checking and testing activities
5. what constitutes a hazardous voltage and how to recognise victims of electric shock
6. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber matting and isolating transformers)
7. how to obtain the necessary job instructions and other documents needed in the checking and testing activities
8. the preparations to be undertaken before the product is tested (such as visual examination for defects)
9. how to check that the test equipment is within current calibration dates, and is in a safe and usable condition
10. the types of test equipment to be used, and how it is to be connected to the product under test
11. the types of test used to verify the correct functioning of the electrical equipment
12. the importance of ensuring that test equipment is used only for its intended purpose, and within its specified range and limits
13. how to interpret the value and significance of the test readings
14. problems or errors that could occur and which may affect the test results, and how they can be avoided
15. recording the test results, and the documentation to be used
16. the typical defects and variations that can be found on the electrical products, and how to identify them
17. the procedure to be followed when inspected products are out of specification
- 18.

the extent of your own authority and to whom you should report if you have problems that you cannot resolve

Checking and testing electrical products

Scope/range related to performance criteria

1. Carry out **all** of the following during the testing activities:
 1. obtain all the necessary information to carry out the checking and testing activities (such as job instructions and testing documentation)
 2. obtain the appropriate test equipment, and check that it is within current calibration dates, and is in a safe and usable condition
 3. carry out the checking and testing activities, using the specified techniques and procedures
 4. identify and record the test results in the appropriate format
 5. place products (in and out of specification) in the correct location on completion of the checking and testing activities
 6. leave the work area in a safe and tidy condition on completion of the activities
2. Carry out tests on **one** of the following types of electrical equipment:
 1. rotating equipment (such as motors, alternators)
 2. electrical plant
 3. power equipment (such as transformers/inductors)
 4. alarm equipment
 5. control equipment (such as switchgear, distribution equipment, electrical panels)
 6. process control equipment
 7. communication equipment
 8. fans/blowers
 9. wire looms
 10. heating equipment
 11. vehicle control equipment
 12. portable tools/equipment
 13. aeronautical equipment
 14. white goods
 15. marine/yacht and boat equipment
 16. brown goods
 17. power supplies
 18. emergency power equipment
 19. other specific electrical equipment
3. Carry out **one** of the following inspection procedures:
 1. in-process/sample
 2. final inspection of the product

Checking and testing electrical products

4. Carry out visual inspection of electrical products, to include checking **all** of the following:
 1. all manufacturing/assembly procedures are complete
 2. all connections are mechanically secure
 3. products are free from damage or obvious defects
5. Carry out tests using **one** of following types of test equipment:
 1. oscilloscope
 2. insulation resistance tester
 3. specific product test equipment
 4. ohmmeter
 5. loop impedance tester
 6. current injection tester
 7. ammeter
 8. voltmeter (such as 2-pole voltage detector)
 9. portable appliance tester (PAT)
 10. flash tester
 11. residual current device (RCD) tester
 12. EMC meter
 13. multimeter
 14. computer-aided diagnostic equipment
6. Use the relevant test equipment to measure and check **two** of the following:
 1. function test
 2. voltage detection/levels
 3. inductance
 4. soak test
 5. power rating
 6. safety device trip speed
 7. continuity
 8. resistance
 9. protective resistance values
 10. polarity
 11. insulation resistance values
 12. capacitance
 13. current levels
 14. frequency values
 15. other product-specific tests
7. Check that equipment meets **one** of the following quality and accuracy standards:
 1. BS or ISO standards and procedures
 2. customer standards and requirements

Checking and testing electrical products

3. company standards and procedures
4. statutory regulations

8. Complete the relevant paperwork, using **one** of the following:

1. inspection report
2. customer specific documentation
- 3.

job card

Checking and testing electrical products

Developed by	Enginuity
Version Number	2
Date Approved	28 Feb 2015
Indicative Review Date	30 Mar 2018
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMTS2-10
Relevant Occupations	Engineering, Engineering and Manufacturing Technologies
Suite	Engineering Technical Support Suite 2
Keywords	Engineering; technical support; checking electrical products; testing electrical products; checks; tests; specification; equipment; inspection; instruments