SEMETS375

Preparing mechanical testing equipment

Overview

This standard identifies the competences you need to prepare manual, semi-automatic or fully automatic mechanical testing equipment, in readiness for the testing activities, in accordance with approved procedures. The correct outcome of testing demands great care in setting up the equipment, in order that the test indications may be confidently interpreted. The types of equipment that could require preparing are tensile, compression, bending, hardness and impact testing devices.

You will be required to check that the testing equipment is prepared as specified in the testing instructions. You will be required to check that the equipment is in a safe and usable condition, and that all electrical connections, cables and mechanical fittings are securely connected and fit for purpose. You will also be expected to check the basic operation of the equipment, and where necessary to check that its data recording system is functioning as specified.

Your responsibilities will require you to comply with organisational policy and procedures for the setting up of the testing equipment, and to report any problems with the equipment in use, or the setting up activities, that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, taking personal responsibility for your actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will show a good understanding of your work, and will provide an informed approach to the setting up of the testing equipment being used. You will have a good understanding of the principles of the testing methodology. You will have an understanding of how the properties of materials will affect the test results, and the response of different types tests on a range of materials. You will have a good knowledge of the different types testing equipment available, their application and calibration requirements. Your knowledge will include an appreciation of hazards and safe working practice, and you will understand the risks posed by testing activities.

You will understand the safety precautions required when setting up the testing equipment, and when using the associated tools and equipment. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

Glossary of Terms:

Discontinuity – Any imperfection in the material / component / structure

Flaw – A significant discontinuity to be recorded but within specified limits and tolerances

Defect – A flaw outside specified limits and tolerances causing the material / component / structure to be non-compliant and rejected

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety legislation and other relevant regulations, directives and guidelines
2. obtain all the required equipment and ensure that it is in safe and usable condition
3. carry out the necessary preparations to equipment (set up, check, adjust) in line with work requirements/techniques
4. make sure that required safety arrangements are in place to protect other workers from activities likely to disrupt normal working
5. report completion of preparations in line with organisational procedures
6. deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken when setting up testing equipment
2. the hazards associated with setting up the testing equipment (such as electrical contact, fast moving mechanical parts, stored pressures/forces, temperatures) and how they can be minimised
3. the type of personal protective equipment (PPE) to be used, and how to obtain it
4. how to obtain the necessary job instructions/techniques, equipment setting-up procedures and testing specifications, and how to interpret their information
5. the importance of testing product materials using testing methods
6. why products may need to be tested by a range of different testing methods (such as tensile, compression, hardness, impact and bending)
7. the basic principles of testing
8. the basic components of the testing equipment (such as display panel, safety devices, power sources, recording mechanisms)
9. the different types of testing methods (such as tensile, compression, hardness, impact and bending) and what material characteristics they are measuring
10. factors which will affect the selection of suitable testing methods
11. how the properties of the products to be tested will affect the way the equipment performs and the measurements recorded (such as tensile strength, compressibility, hardness)
12. how to set up, calibrate and check the testing equipment
13. the different types of test data recording methods (such as meters, paper charts, electronic displays, computer storage devices)
14. how to check the testing recording system will function correctly during the tests
15. care and control of the equipment (to include checking condition of insulation, all electrical cables and connections, equipment operating controls and displays, mechanical functions and safety devices)
16. the problems that can occur during the setting up of the equipment and how they can be overcome
17. who to inform when the testing equipment is ready for use
18. the extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve

Scope/range

1.

Carry out all of the following during the preparation of the testing equipment:

1.1 comply with job instructions/techniques, equipment setting up documentation, testing specifications, relevant regulations and risk assessment documentation
1.2 use appropriate personal protective equipment
1.3 follow the defined setting-up procedures/techniques, and apply safe working practices and procedures at all times
1.4 leave the work area in a safe and tidy condition on completion of the activities

2.

Prepare one of the following types testing equipment for use:

2.1 tensile
2.2 compression
2.3 impact
2.4 hardness
2.5 bending
2.6 other specific type of testing equipment

3.

Prepare one of the following types of testing equipment in readiness for use:

3.1 manual
3.2 semi-automatic
3.3 fully automatic

4.

Set up, check and adjust the equipment, to include carrying out all of the following:

4.1 obtaining all necessary cables and fittings
4.2 checking that all electrical connections, cables and fittings are secure and in a safe condition (as appropriate)
4.3 checking that all mechanical linkages and connections are secure and in a safe condition
4.4 obtaining appropriate sample mounting clamps or fixtures (as appropriate)
4.5 obtaining the necessary conversion documents
4.6 functionally operate the equipment

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