SEMME3057

Loading and proving CNC fabrication machine tool programs

Overview

This standard identifies the competences you need to load and prove programs on computer numerically controlled (CNC) fabrication machine tools, in accordance with approved procedures. The CNC machines covered by this standard include shearing, punching, bending and forming, plasma, laser, water jet and gas cutting machines. You will be required to obtain the correct component program, which may be on storage media or downloaded from a remote computer. You will need to check the program for currency and to load it correctly into the machine controller, checking for fault/error messages and dealing with these, as appropriate to your level of responsibility. You will also be required to adjust the machine tool equipment and program, following proving/editing procedures to achieve component specification. You must ensure that any edited programs are saved safely and correctly.

Your responsibilities will require you to comply with organisational policy and procedures for obtaining, loading and proving the programs and to report any problems with these 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 own actions and for the quality and accuracy of the work that you carry out. **

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to loading and proving fabrication machine tool programs. You will understand the CNC machine tools used in the process, and its application, and you will know about the programming, editing and proving process, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the machine controller is set up to produce the components to the required specification.

You will understand the safety precautions required when working on the machine and with its 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.

Note: Setting workholding devices and tooling is the subject of other standards.

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. use the correct control program and ensure it is correctly loaded into the machine controller
3. follow the correct procedures for calling up the program and dealing with any error messages or faults
4. confirm program integrity
5. adjust the equipment and program operating parameters to optimise the outcomes to be achieved
6. load and correctly set-up all associated equipment
7. check that all safety mechanisms are in place and that the equipment is set correctly for the required operations
8. 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 loading and proving CNC fabrication machine tool operating programs
2. how to start and stop the machine, in normal and emergency situations
3. the importance of wearing the appropriate protective clothing and equipment (PPE) and of keeping the work area clean and tidy
4. how to handle and store program storage media, safely and correctly, away from contaminants and possible corruption
5. the methods and procedures used to minimise the chances of infecting a computer with a virus
6. the implications if the computer you are using does become infected with a virus and who to contact if it does occur
7. the computing/coding language used in the CNC programs
8. the function keys and operating system of the machine computer control system being operated
9. the operation of the various hand and automatic modes of machine control (such as program operating and control buttons)
10. how to load, execute, edit and exit programs correctly
11. how to set machine and plate datums for each machine axis being used
12. how to deal with error messages and faults on the program or computer controlled equipment
13. how to place the machine into the correct operating mode and how to access the program edit facility in order to enter or update tooling data (such as tool datums, positions, lengths, offsets and radius compensation)
14. the use of tool-posts, magazines and carousels and how to identify the tools in relationship to the operating program
15. how to conduct trial runs (using single block run, dry run, and feed and speed over-ride controls)
16. the items that you need to check before allowing the machine to operate in full program run mode
17. how to use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO

standards) in relation to work undertaken

18. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing

19. how to carry out currency/issue checks of the specifications you are working with

20. factors which will affect the feeds and speeds that can be used, and why they may need to be adjusted from the program setting (such as condition of material, workholding method, tooling used, tolerance and finish to be achieved)

21. typical problems that can occur with the loading and editing of the operating program, and what to do if they occur

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

Scope/range related to performance criteria

1.

Apply **all** of the following checks and practices during the program loading activities:

1.1 obtain the correct operating program and check it for currency and validity
1.2 ensure the machine controller is prepared ready to accept the operating program
1.3 ensure program media is stored safely and correctly away from contaminates or sources of corruption

2.

Load and prove programmes for **one** of the following types of CNC fabrication machine tool:

2.1 shearing machine
2.2 punching machine
2.3 forming machine
2.4 bending machine
2.5 plasma cutting
2.6 laser cutting
2.7 gas cutting
2.8 water jet cutting

3.

Obtain and load programmes stored on **one** of the following mediums:

3.1 storage media
3.2 remote computer system
3.3 other specific method

4.

Operate a CNC machine controller, using **six** of the following, as applicable to the machine type:

4.1 single block run
4.2 graphic displays
4.3 full dry run
4.4 search facilities
4.5 program save/store facilities
4.6 edit facilities
4.7 program override controls (speed, feed, tool data)
4.8 data input facilities

5.

Confirm that the machine and program operates safely and correctly, by checking **all** of the following:

5.1 datums for machine axis and plate are set in relation to all equipment and

tooling used
5.2 tool/cutting tool data is checked and, where applicable, updated in the machine controller
5.3 tool/cutting head paths are executed safely and correctly
5.4 tool change positions are safe and clear of the workpiece and machine equipment
5.5 the correct tools are selected at the appropriate points in the program (where applicable)
5.6 all operations are carried out to the program co-ordinates
5.7 any alterations to programs are communicated fully to the appropriate personnel

Behaviours

Behaviours:

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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