

Overview

This standard identifies the competences you need to carry out machining operations on an electro-discharge machine, in accordance with approved procedures. You will confirm with the machine setter that the machine is ready for the operations to be performed and that all the required components/materials and consumables are available. You will be expected to produce a range of component shapes, such as internal and external profiles that have flat, square, parallel and tapered faces, square /rectangular forms, concave and convex forms, holes, slots, radii/arcs, cavities and special forms.

You will be required to operate the machine in line with safe working practices and approved procedures, to continuously monitor the machining operations and, where necessary, make minor adjustments or seek the help of the setter to make the required adjustments, in order to ensure that the work output is to the required quality and accuracy. Meeting production targets will be an important issue, and your production records must show consistent and satisfactory performance.

Your responsibilities will require you to comply with organisational policy and procedures for the machining activities undertaken, and to report any problems with the machining activities that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for your actions and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will enable you to adopt an informed approach to applying procedures for electro-discharge machining. You will have an understanding of the electro-discharge process and its application, and will know about the equipment, materials and consumables in adequate depth to provide a sound background for carrying out the activities to the required specification.

You will understand the safety precautions required when working with the machine, 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.

Setting up of the machine, its tooling and associated workholding devices, is the

subject of another standard and is the responsibility of the machine-tool setter.

Performance criteria

You must be able to:

- P1 work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
- P2 confirm that the machine is set up and ready for the machining activities to be carried out
- P3 operate the machine controls in accordance with safe working practices and operational procedures
- P4 produce machined components to the required specification and within the specified dimensional accuracy
- P5 carry out quality sampling checks with the appropriate gauges/instruments for accuracy at suitable intervals
- P6 deal with problems within your control and report those that cannot be solved
- P7 complete and store all relevant documentation in accordance with organisational requirements
- P8 shut down the equipment to a safe condition on conclusion of the machining activities

Knowledge and understanding

You need to know and understand:

- K1 how to work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
- K2 the safety mechanisms on the machine, and the procedure for checking that they function correctly
- K3 operation of the machine controls in both hand and power modes
- K4 how to stop the machine in both normal and emergency situations, and the procedure for restarting after an emergency
- K5 the importance of wearing the appropriate personal protective equipment (PPE), and of keeping the work area clean and tidy
- K6 where to obtain the component drawings, specifications and/or job instructions required for the components to be machined
- K7 how to extract and use information from engineering drawings and related specifications in relation to work undertaken
- K8 how to use imperial and metric systems of measurement
- K9 the main features of the electro-discharge machine being used, and the accessories that can be used
- K10 the various erosion operations that can be performed, and the methods and equipment used
- K11 how to handle and store electrodes and wires safely and correctly
- K12 the application of roughing and finishing cuts, and the effect on electrode life, surface finish and dimensional accuracy
- K13 the application of dielectric fluid with regard to a range of different materials
- K14 the effects of clamping the workpiece in a chuck/workholding device, and how this can cause distortion in the finished components
- K15 how to recognise machining faults, and how to identify when electrodes need changing
- K16 the quality control procedures used, inspection checks to be carried out, and the equipment that will need to be used
- K17 the issues that can occur with the electro-discharge machining activities, and how these can be overcome
- K18 the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve

Scope/range related to performance criteria

1. Apply all of the following during the machining activities:
 - 1.1 obtain and use the appropriate documentation (such as job instructions, drawings, quality control documentation)
 - 1.2 adhere to procedures or systems in place for risk assessment, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
 - 1.3 confirm with the machine setter that the machine is ready for production
 - 1.4 where appropriate, seek any necessary instruction/training on the operation of the machine
 - 1.5 ensure that machine guards are in place and are correctly adjusted
 - 1.6 hold components securely, without distortion
 - 1.7 follow the defined operating procedures and apply safe working practices and procedures at all times
 - 1.8 ensure that machine settings are adjusted as and when required (either by yourself or the setter) to maintain the required accuracy
 - 1.9 ensure that the components produced meet the required specification for quality and accuracy
 - 1.10 leave the work area and machine in a safe and appropriate condition on completion of the activities

2. Operate one of the following types of electro-discharge machine:
 - 2.1 spark erosion
 - 2.2 wire erosion

3. Produce machined components which include four of the following features:
 - 3.1 flat faces
 - 3.2 concave forms
 - 3.3 profile forms
 - 3.4 square/rectangular forms
 - 3.5 square faces
 - 3.6 convex forms
 - 3.7 cavities
 - 3.8 angular faces
 - 3.9 parallel faces
 - 3.10 holes

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- 3.11 radii/arcs
 - 3.12 threads
 - 3.13 engraving
 - 3.14 slots
 - 3.15 other special features
4. Machine components made from one of the following types of material:
- 4.1 ferrous
 - 4.2 non-ferrous
5. Use appropriate gauges or instruments to carry out the necessary checks, during production, for accuracy of three of the following:
- 5.1 dimensions
 - 5.2 surface texture
 - 5.3 parallelism
 - 5.4 profile
 - 5.5 angle/taper
 - 5.6 squareness
6. Produce components with dimensional accuracy, form and surface texture within all the relevant quality and accuracy standards as is applicable to the operations performed:
- 6.1 components to be free from false starts and sharp edges
 - 6.2 tolerance to relevant standard
 - 6.3 surface texture 32 μ in or 0.8 μ m or 18VDI

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Developed by Enginuity

Version Number 3

Date Approved 31 Mar 2026

Indicative Review Date 01 Apr 2029

Validity Current

Status Original

Originating Organisation Enginuity

Original URN SEMMME2-13

Relevant Occupations Engineering, Engineering and Manufacturing Technologies,
Engineering Technicians

Suite Mechanical Manufacturing Engineering Suite 2

Keywords engineering; manufacturing; mechanical; machining; operating;
electro-discharge machine; spark erosion; wire erosion;
convex forms; concave forms
