

## Producing aircraft components by acrylic moulding

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### Overview

This standard identifies the competences you need to produce aircraft components by using acrylic moulding techniques, in accordance with approved procedures. You will be required to follow the appropriate instructions, drawings, specifications and documentation to produce the various types of acrylic components, using the specified moulding process and techniques. This will involve using equipment such as air circulating ovens, presses, trimming and automated cutting equipment. The components produced will include deep drawn, double curvature, convex and concave shapes.

Your responsibilities will require you to comply with organisational policy and procedures for the acrylic moulding activities undertaken, and to report any problems with the moulding activities, equipment or materials that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will need to ensure that all tools, equipment and materials used in the moulding process are correctly accounted for on completion of the activities, and you must complete all necessary job/task documentation accurately and legibly.

You will be expected to work either with a high level of supervision or as a member of a team, and you will take personal responsibility for your own actions and for the quality and accuracy of the work that you carry out. Where team working is involved, you must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of this standard, and you must demonstrate competence in all the areas required by the standard.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will provide an informed approach to applying the appropriate acrylic moulding techniques and procedures. You will understand the production procedures and techniques used, and will know about the tools and techniques, 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 acrylic moulding activities, and when using the associated tools and equipment. You will be required to demonstrate safe working practices throughout. You will also understand your responsibilities for safety, and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

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### Performance criteria

#### You must be able to:

1. work safely at all times, complying with health and safety legislation, regulations, directives and other relevant guidelines
2. follow the correct component drawing or any other related specifications for the component to be produced
3. determine what has to be done and how this will be achieved
4. obtain and prepare the appropriate tools, equipment and materials
5. carry out the moulding activities using the correct methods and techniques
6. produce components to the required specification
7. check that all the required operations have been completed to specification
8. deal promptly and effectively with problems within your control and report those that cannot be solved

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### Knowledge and understanding

#### You need to know and understand:

1. the specific safety practices and procedures that you need to observe when working with acrylics (including any specific legislation, regulations/codes of practice for the activities, equipment or materials used)
2. the health and safety requirements of the work area where you are carrying out the activities, and the responsibility these requirements place on you
3. the protective equipment that you need to use for both personal protection (PPE) and, where appropriate, the protection of others
4. the hazards associated with moulding acrylic materials, and with the tools and equipment used, and how these hazards can be minimised
5. the application of COSHH regulations in relation to the storage, use and disposal of materials and consumables used in the acrylic moulding process
6. 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
7. how to interpret imperial and metric systems of measurement
8. quality procedures used in the workplace to ensure production control (in relation to currency, issue, meeting specification), and how to complete such documents
9. the supply of acrylic sheet (such as colour, thickness, sheet size, surface texture, material protection)
10. the sheet profiling procedures, and material trimming methods/procedures
11. the methods of sheet trimming and sheet cleaning prior to moulding
12. the material cleaning methods and procedures to be applied
13. the principles of deep drawing, concave/convex moulding, positive pressure moulding and stress relieving
14. the different methods of heating acrylic materials, and the temperature control methods
15. the use of forming aids
16. the preparation methods and procedures applied to the moulding surface
17. the methods and techniques for lifting, handling and supporting the components/equipment/materials during the moulding activities
18. how to recognise moulding defects (such as misalignment, distortion, damage, contamination and surface defects)
19. the tools and equipment used in the moulding activities, and their calibration, care, preparation and control procedures
20. the problems that can occur with the moulding operations, and how these can be overcome
21. the care and safe handling of production tooling and acrylic

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- mouldings throughout the production cycle
- 22. the procedure for the safe disposal of waste materials
- 23. the recording documentation to be completed for the acrylic moulding activities undertaken and, where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation
- 24. the extent of your own authority, and whom you should report to if you have problems that you cannot resolve

### Scope/range related to performance criteria

1. Carry out **all** of the following during the acrylic moulding activities:
  1. ensure that you have the correct documentation for the acrylic moulding operations (such as drawings, job instructions, aircraft standards)
  2. adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations
  3. use the correct tools and equipment for the activity, and ensure that they are safe to use
  4. use the correct materials and consumables, as specified in the production documentation
  5. apply safe and appropriate working practices and procedures at all times
  6. dispose of waste items and materials in a safe and environmentally acceptable manner, in line with company procedures
  7. return all tools and equipment to the correct location on completion of the activities
  8. leave the work area in a safe condition and free from foreign object debris
2. Carry out **one** of the following acrylic moulding techniques:
  1. vacuum moulding
  2. positive pressure shaping
  3. deep drawing
  4. stress relieving
  5. shape clamping
3. Carry out **four** of the following operations during the moulding process:
  1. tool/equipment preparation
  2. sheet preparation
  3. trimming
  4. setting and controlling temperatures
  5. stress relieving
  6. sheet forming
  7. de-moulding
4. Produce a range of aircraft acrylic components with **two** of the following features:

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1. box sections
  2. concave shapes
  3. cylindrical section
  4. single curvatures
  5. convex shapes
  6. double curvatures
5. Produce a range of acrylic mouldings which comply with **one** of the following standards:
1. Civil Aviation Authority (CAA)
  2. Ministry of Defence (MoD)
  3. customer standards and requirements
  4. Federal Aviation Authority (FAA)
  5. company standards and procedures
6. Complete the relevant paperwork, to include **one** from the following, and pass it to the appropriate people:
1. production documentation
  2. records of machine settings
  3. quality control documentation
  4. other specific records

## Behaviours

# Additional Information

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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