SEMSEC302

Control and maintain the Semiconductor Manufacturing Process

Overview

This standard identifies the competences you need to control and maintain the Semiconductor Manufacturing Process (SMP) in accordance with approved procedures. You will be required to use appropriate work instructions and information to ensure that the SMP is operating in accordance with the specification required and to identify deviations and take remedial action where this is not the case to ensure optimal, safe and high quality production of a finished product.

The SMPs relevant to this standard are:

- Oxidation
- Photolithography
- Epitaxy
- Etching
- Deposition
- Doping
- Surface Mount Technology
- Packaging

Your responsibilities will require you to comply with organisational policy and procedures for the work activities associated with the control and maintenance of the semiconductor manufacturing processes, and to report any problems with the work activities, equipment (including plant) or materials 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 produce.

You will understand the techniques used, and their application, 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 activities 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 relevant others in the workplace.

Performance criteria

You must be able to:

1. access and accurately interpret all work instructions and information relevant to the control and maintenance of the semiconductor manufacturing processes
2. work safely at all times and in accordance with all relevant legislation, guidelines, policies, procedures and protocols
3. deal promptly and effectively with any problems within your control and report those which cannot be solved
4. identify and minimise hazards and risk in the workplace
5. access and gather the appropriate equipment, accessories and components to carry out the work activities
6. wear PPE in accordance with organisational procedures
7. ensure you have the necessary specification and operating parameters
8. ensure that the operating parameters are set
9. ensure that equipment and materials are ready for the processing operation
10. ensure that controls are set correctly as contained in the operating instructions
11. obtain operation data, and analyse by appropriate methods and techniques
12. adjust controls when necessary to produce specified quality and minimise waste
13. recognise deviations from the operating parameters
14. identify possible faults and causes of deviations from the operating parameters
15. identify the faults and causes of the problem
16. take relevant corrective action to restore process to within required operating parameters
17. check that the process is operating according to specification and within operating parameters
18. take representative samples at the specified time from the specified place when required
19. follow procedure for testing samples in accordance with organisational procedures
20. interpret sample results and take any necessary action
21. communicate, if required, with relevant others
22. complete and store all relevant documentation in accordance with organisational procedures
23. dispose of waste in accordance with organisational procedures
24. leave the work area in a safe condition on completion of the work activities in accordance with organisational procedures

Knowledge and understanding

You need to know and understand:

1. the current legislation, guidelines, policies, procedures and protocols which are relevant to your work practice and to which you must adhere
2. the scope and limitations of your own competence, responsibilities and accountability as it applies to your job role
3. how to access and interpret all relevant **work instructions and information**
4. specific procedures for reporting issues which are beyond your competence, responsibilities and accountability
5. the duty to report any acts or omissions that could be unsafe/detrimental to you or **relevant others**
6. the hazards and risks which may arise during the execution of your work role and how you can minimise these
7. how to select, put on and remove PPE
8. the correct use of equipment to protect the health and safety of you and relevant others
9. how to obtain the authority to enter the relevant work areas and any specific permit-to-work procedures that are used
10. the origin and principles of the Semiconductor manufacturing process and how they work
11. the meaning of terms used in operating instructions
12. the functions and uses of the different types of equipment, accessories, materials and components used in the operation
13. how to check that the equipment and materials are ready for processing
14. the importance of checking materials is as specified
15. the importance of checking that controls are as specified in the operating instructions
16. methods of obtaining process data, and how to analyse and interpret the data
17. how to adjust the process to meet the specified quality
18. what deviations may occur from the norm, and how to recognise them
19. what consequences can occur with deviations from the norm
20. the importance of remedial action
21. methods of investigating faults and causes
22. how to analyse information and identify faults and causes of the problem
23. how to obtain representative samples and why it is important

24. how to label samples correctly and why it is important
25. the correct method/procedure for testing samples
26. how to interpret sample results
27. what corrective action to take
28. how to control the process quality
29. the importance of minimising waste in the process
30. the importance of the work specification and operating parameters
31. the importance of regularly check operating parameters and ensuring they are being adhered to
32. the importance of communication, and of keeping relevant others informed during the operation
33. when it may be important to observe issues around security and confidentiality
34. what problems may occur in the operation and how to deal with them
35. the procedures and methods relating to the coordination of individuals and teams within and across services
36. how to dispose of waste in accordance with organisational procedures
37. how to complete and safely store all relevant documentation in accordance with organisational procedures

Scope/range related to performance criteria