WELDING
(WG-203)
MARBELLA INSTITUTE OF TECHNOLOGY

EWF/IIW Welding Diploma

   An internationally recognised qualification supported by the International Institute of Welding (IIW) and the European Federation for Welding, Joining and Cutting (EWF) for assessing the competence of tasks and responsibilities during welding coordination (BS EN ISO 14731).

   BS EN ISO 14731:2006 Welding Coordination - Tasks and responsibilities, specifies that responsible welding coordination personnel shall be able to demonstrate adequate general and specific knowledge in welding and allied processes to perform these tasks. Such knowledge must be the result of a combination of theory, training and experience.

   Personnel holding EWF/IIW Diploma are qualified to perform welding coordination activities as described in ISO 14731, whose compliance is required by BS EN ISO 3834 (Quality requirements for fusion welding of metallic materials).

   In its Part 1 -Criteria for the selection of the appropriate level of quality requirements), BS EN ISO 3834 states that in order 'to ensure sound and effective manufacturing, management needs to understand and appreciate the sources of potential trouble and to implement appropriate procedures for their control' (1).
 This standard identifies measures applicable in different circumstances, being two of the most representative contractual situations and assessment of welding quality performance between customers, manufacturers, third parties etc. In consequence, the compliance of 14731 and 3834 are priorities in the success of any metallic weldingrelated business.

The EWF/IIW Welding Diploma consists of three different levels: Specialist (IWS), Technologist (IWT) and Engineer (IWE). Although the topics covered in each level are similar, the depth and breadth are increased as progress is made towards the engineering level. The goals of each level are in line with the responsibilities outlined in BS EN ISO 14731 and quality requirements of BS EN ISO 3834.

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MODULE 1 - Welding processes and equipment

- General introduction to welding technology
- Oxy-gas welding and related processes
- Electrotechnics - a review
- The arc
- Power sources for arc welding
- Introduction to gas shielded arc welding
- Tig welding
- MIG/MAG and flux cored arc welding
- MMA welding
- Submerged-arc welding
- Resistance welding
- Other welding processes (laser, electron beam, plasma)
- Cutting and other edge preparation processes
- Joining processes for plastics
- Joining processes for ceramics and composites
- Consumables

MODULE 2 -Material and their behaviour during welding

- Manufacture and designation of steels
- Testing materials
- Structure and properties of pure metals
- Alloys and phase diagrams
- Heat treatment
- Structure of the welded joint
- Steels: plain carbon, carbon-manganese steels, fine grained, low alloy, high alloy etc.
- Cracking phenomena in welded joints
- Introduction to corrosion
- High alloy creep resistant and heat resistant steels
- Cast irons and steels
- Non ferrous metals and alloys

MODULE 3 - Construction and design

- Basic theory of structural systems
- Fundamentals of the strength of materials
- Welded joint design
- Basics of weld design
- Behaviour of welded structured under different types of loading
- Design of welded structures with predominantly static loading
- Behaviour of welded structures under dynamic loading
- Design of dynamically loaded welded structures
- Design of welded pressure equipment
- Design of aluminium alloys structures
- Reinforcing-steel welded joints

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MODULE 4 - Fabrication, applications engineering

- Introduction to quality assurance in welded fabrication
- Quality control during manufacture
- Residual stresses and distortion
- Plant facilities, welding jigs and fixtures
- Heath and safety
- Measurement, control and recording in welding
- Non destructive testing
- Economics
- Repair welding
- Fitness-for-purpose
- Case studies
- Welding qualifications and procedures