

Minimum Requirements for the Education, Training, Examination and Certification of European Plastics Pipe Welder and European Plastics Pipe Welding Operator

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Appendix I – Example of Experience Checklist

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Doc.EWF 641pr-07
February 2008

Definitions and Abbreviations

Approved Training Body (ATB)	Educational establishment for training plastics welding personnel and/or Plastics Welding Examiner.
Automatic machine	A machine where all welding parameters are set and controlled by an electronic device.
ECTFE	Ethylene-chlorotrifluoroethylene copolymer.
Electrofusion welding	Welding process concerning a joint between a socket or saddle electrofusion fitting and pipe or fitting with spigotted ends. The electrofusion fittings are heated by the Joule effect of the heating element incorporated at their jointing surfaces, causing the material to melt and the pipe and fitting surfaces to weld.
FEP	Fluorinated ethylene propylene copolymer.
Heated tool welding	Welding process in which the joint surfaces are adequately heated by exposure, through contact or non-contact, to heated elements and are welded under pressure.
Manual machine	A machine where all welding parameters are set and controlled by the operator (except for temperature, which can be controlled automatically).
Manufacturer	Company, contractor or organisation that is responsible for the welding.
Mx.y	Denotes the module within the schedule covering specific welding processes and materials.
PFA	Perfluoroalkoxy resin.
Plastics Pipe Welder	Person making a welded pipe assembly by manual heated tool welding, whose skill and knowledge are two of the determining factors influencing the quality of the welded joint.
Plastics Pipe Welding Operator	Person making a welded pipe assembly by automatic or semi-automatic heated tool or electrofusion welding whose skill and knowledge are two of the determining factors influencing the quality of the welded joint.
Plastics Welding Examiner (PWE)	Qualified person acceptable to the contracting parties who verifies the compliance with this document and who examines according to this schedule.
Plastics Welding Instructor (PWI)	Qualified person(s) responsible for the initial assessment and instruction in the safe and correct practical welding skills and/or theoretical knowledge required by the trainee to meet this guideline.
Px.y	Denotes the practical exercise or training unit to prepare for a qualification test piece or series of test pieces.

Qualification test	Theoretical and practical tests in order to verify the knowledge and the skill of the welder.
Qualification test certificate	A document confirming that an individual has satisfied a defined set of job competence criteria through theoretical and practical tests. Certificates cover a specific area of activity which is stated on the certificate and they are valid for a limited period, which is also stated. The precise conditions for validity and renewal are governed by the applicable qualification standard or other specification.
Range of qualification	Welding processes, types of joint, materials, thicknesses and diameters for which a welder is approved.
Semi-automatic machine	A machine where at least one of the welding parameters, time or pressure, is set and controlled by an electronic device.
Test house	Establishment having all relevant test equipment to carry out the required tests.
Test piece	Welded assembly which is used in the test.
Test specimen	Part or portion cut from the test piece for the test specified.
Tx.y	Denotes the test piece specification to meet the relevant sub-group approval.
Ux.y	Denotes the theoretical training unit.
Welding Procedure Specification (WPS)	Document providing in detail the required variables for a specific application to assure repeatability.
Welding process - general	Technique characterised by the method of softening to obtain permanent assembly.
Welding Record Sheet	Document providing in detail the variables used for making the weld.

Minimum Requirements for the Education, Training, Examination and Certification of European Plastics Pipe Welder and European Plastics Pipe Welding Operator

Section I: Minimum Requirements for Education and Training

1. INTRODUCTION

This part of the guideline for the education and training of plastics pipe welders and welding operators has been devised and formulated by a Special Working Group acting on behalf of the EWF General Assembly. It is designed to provide a harmonised scheme for the comprehensive education and training of plastics pipe welders and welding operators. This guideline provides a combination of high skill and the necessary theoretical background, leading to qualification tests. Operators successfully completing specific modules or combinations of modules, achieve the relevant qualification.

The guideline covers the range of plastic pipe welding processes and materials covered within EN 13067. A modular format has been designed to accommodate a 'mix and match' approach to suit the variety of needs within the plastics industry.

European Plastics pipe welders and welding operators have proven skills in plastics welding and can carry out welding independently. They are able to read and understand working instructions and is well informed about production methods concerning welded products, for both new constructions and repair work.

This guideline covers the recommended minimum requirements for education and training, agreed upon by all national welding and joining societies within the EWF, in terms of themes, keywords and times devoted to them. It will be revised periodically by the Committee to take into account any changes which may affect the state-of-the-art. Candidates having successfully completed this course of education will be expected to be capable of applying plastics pipe welding technology as covered by this guideline. The subsequent Section II of this document covers the recommended minimum requirements for test and qualification.

2. ROUTES TO CERTIFICATION

The structure is divided into two modules, Fig.1a and Fig.1b, to cover the range of welding processes and materials. Each module will require one theoretical test and then one or more practical tests to approve the candidate for specific sub-groups of materials and/or product forms for each welding process.

Candidates may forego the practical training modules providing they can show that they have had the relevant practical experience in the processes concerned by submitting an experience checklist.

An example of an experience checklist is shown in Appendix I.

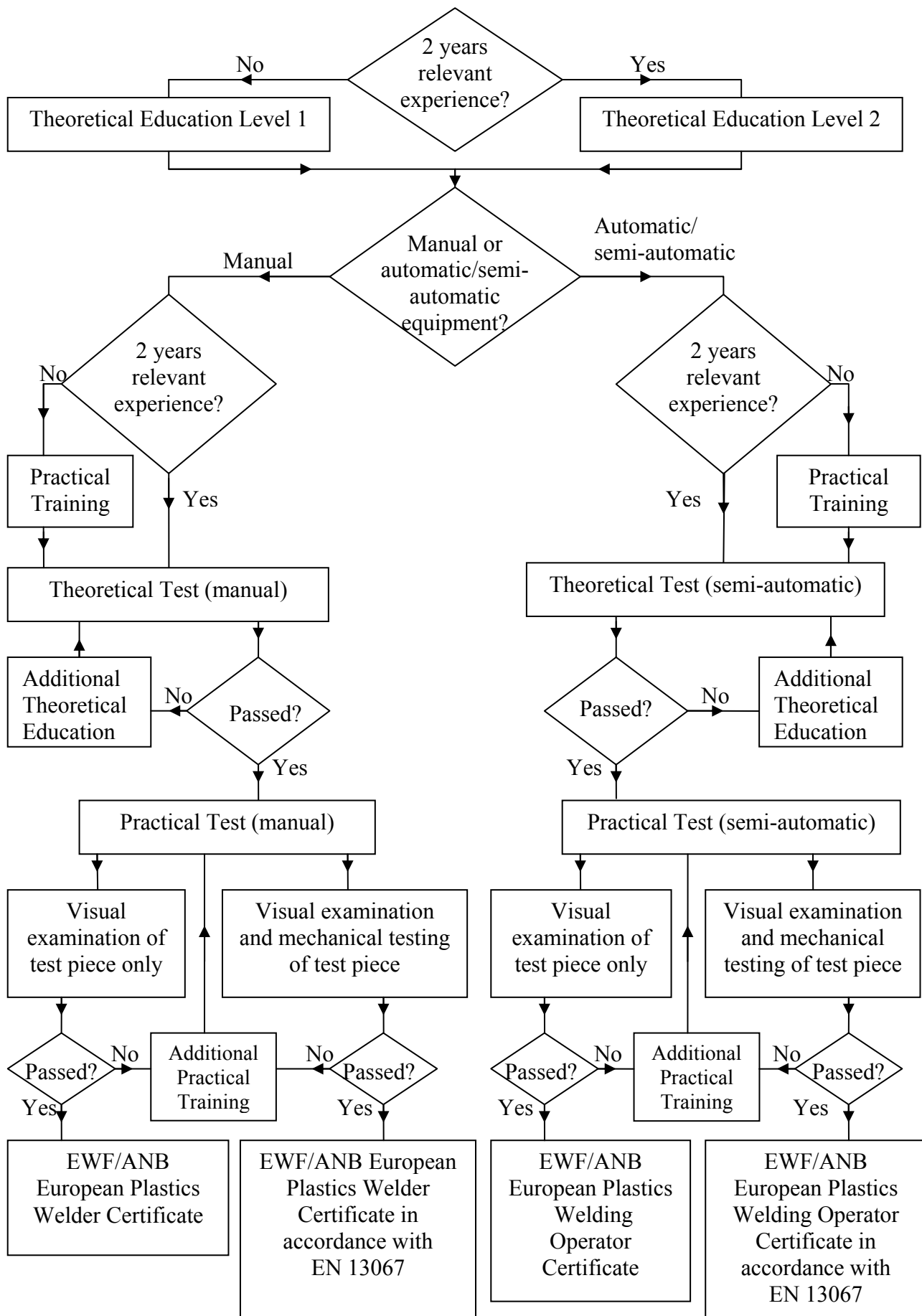


Figure 1a Structure of pipe welder and welding operator training and examination routes for heated tool welding (Module 1).

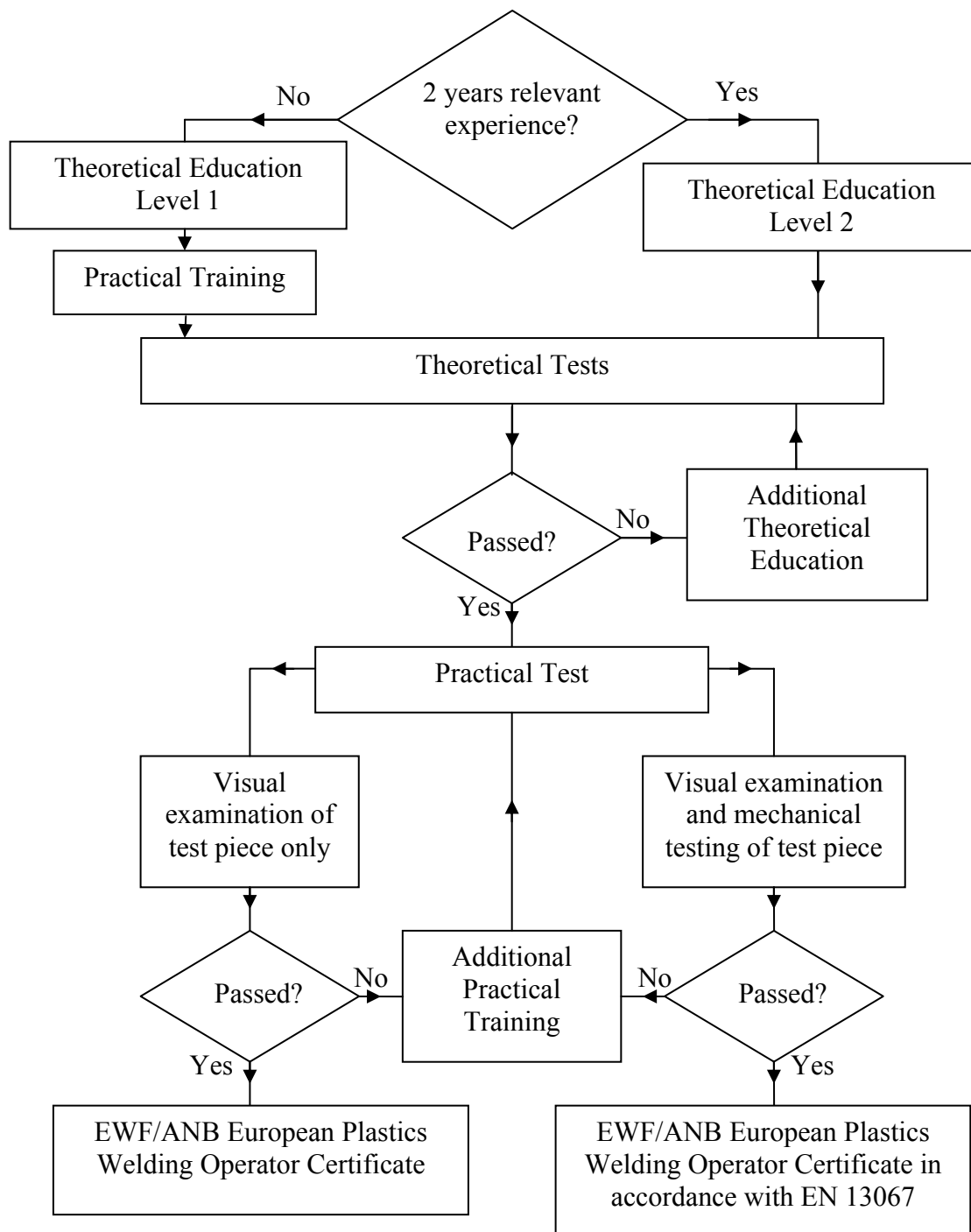


Figure 1b Structure of pipe welding operator training and examination routes for electrofusion welding (Module 2).

3. ACCESS TO THE COURSE

Entry to the training courses requires suitable physical and mental capability. Candidates shall have good command of the course language so they can successfully participate in the instruction part of the course.

4. INSTRUCTION PROGRAMME

The instruction programme consists of theoretical and practical exercises structured through Modules, Fig.1a and Fig.1b. Where appropriate, candidates can be trained and tested in a range of sub-sets between the various Modules. For example, a PE pipe welder may require training and testing in heated tool and electrofusion welding of PE. In this case, the training organisation can design the relevant theoretical and practical training from the guidelines given in the tables within both modules.

The theoretical training provides the candidates with verbal and written knowledge given by lectures. Certain elements of the main subjects of the theoretical training are common to both modules to enable tailoring of training programmes to specific needs. However, the times devoted to each subject may differ.

The practical training provides hands on training by means of demonstration and welding trials. The practical training is designed to simulate production welding applications.

The periods of time given in Tables M1.1 to M2.2 represent the recommended minimum time required to attain the expected level of skill. The actual time needed may vary according to the capability of the candidate.

For each individual training programme it is at the discretion of the PWI to establish the sequence of exercises, both practical and theoretical, to ensure the candidate gains the required skills to enable entry to the tests.

The theoretical instruction given to the candidates aims at a basic understanding of the process and the materials behaviour including standards and safety regulations. A 'teaching hour' will contain at least 50 minutes of direct teaching time. After each training programme, one or more practical tests and one theoretical test are performed once all entry requirements are met. The test pieces to be welded are given by the standard EN 13067; the general rules for the qualification test are given in Section II of this guideline.

5. TRAINING MODULES

The European course for plastics pipe welders and welding operators consists of modules M1 to M2:

M1 Heated Tool Welding

M2 Electrofusion Welding

5.1 MODULE M1 HEATED TOOL WELDING OF PLASTIC PIPES

Module 1 provides theoretical education and practical training in machine heated tool welding.

The theoretical training for this module is described in Table M1.1, which contains instruction in plastics materials and then training on heated tool welding of plastics pipes.

Table M1.1 Theoretical units for Module 1 - heated tool welding of plastics pipes.

U1.1 Materials technology and processing of thermoplastics	Level 1	Level 2
Objective: Understand and describe the principles of plastic materials and processing of thermoplastics and designation of plastics.	5	2
Scope: Introduction to thermoplastics (PP, PE, PVDF, ECTFE, PTFE relevant to candidate's needs). Symbols and abbreviations for plastics. Advantages and disadvantages of plastics. Manufacturing of plastics. Production of plastic pipes and fittings. Applications of plastics. Principles of plastics welding.		
Expected Result: Explain the differences between the various types of plastics. Identify the advantages and disadvantages of various types of plastics over other pipe materials. Know how plastic pipes and fittings are produced. Describe the designation and marking of products. Describe how plastics weld.		
U1.2 Basics and applications of heated tool butt welding	Level 1	Level 2
Objective: Understand the basics of heated tool butt welding.	3	2
Scope: Principles of heated tool butt welding. Procedure for welding plastic pipes including joint preparation. Welding parameters. Types of heated tool butt welding equipment. Effect of material. Influence of weather condition. Applications of heated tool butt welding.		
Expected Result: Describe the heated tool butt welding process. Identify the correct procedure for heated tool butt welding of plastic pipes. Identify the circumstances where this procedure cannot be used and what should be done in this event. Understand the different welding parameters based on the specification. Explain the differences between manual, semi-automatic and automatic welding equipment. Describe how plastic material is affected by heated tool welding. Describe when weather conditions are unsuitable and what measures must be taken to continue welding. Identify when and why selection of heated tool butt welding is done.		

U1.3 Basics and applications of socket and saddle welding	Level 1	Level 2
Objective: Understand the basics of socket and saddle welding.	1	0.5
Scope: Principles of socket welding. Principles of saddle welding. Joint preparation for socket and saddle welding. Welding parameters. Effect of material. Applications of socket and saddle welding. Influence of weather conditions.		
Expected Results: Describe the socket welding process. Describe the saddle welding process. Explain how the joint preparation is made for the two types of welding. Understand different welding parameters based upon specifications for the two types of welding. Describe how plastic material is affected by heated tool welding. Identify when and why selection of socket or saddle welding is done. Describe when weather conditions are unsuitable and what measures must be taken to continue welding.		

U1.4 Health and Safety	Level 1	Level 2
Objective: Understand the risks and hazards related with the heated tool welding processes and the standard safety procedures.	2	1
Scope: Hazard sources. Burns and fires. Fume control. Safe handling of pipes. Basic personal protection. Consequences of misapplying critical welding parameters. Mandatory requirements.		
Expected Results: Explain how to prepare a welding site from a safety point of view. Manage fire extinguishers and put out fires. Correctly describe necessary personal protection equipment and how and when it is to be used. Explain how lifting and handling of pipes is carried out in a safe way. Explain the safety implications of not following the correct welding procedures or incorrect setting of welding parameters.		

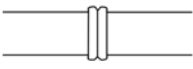
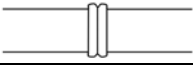
U1.5 Imperfections in heated tool welded joints	Level 1	Level 2
Objective: Understand the welding imperfections, their origin and influence on the performance of the joint in service in accordance with EN 14728.	2	1
Scope: Types of imperfection. Origin of imperfections. Effects of imperfections on performance. Acceptance criteria (eg DVS 2202-1 or equivalent national requirements).		
Expected Results: Identify different types of imperfections from the different welding methods and explain the possible origins. Explain effects of imperfections on joint performance. Correctly describe acceptance criteria and actions to be taken if a weld doesn't meet acceptance criteria. Correctly describe influence of defects coming from the wrong welding parameters.		

U1.6 Testing of heated tool welded joints	Level 1	Level 2
Objective: Understands the various testing methods available for welded joints in accordance with EN12814-1, EN12814-2, and EN13100-1.	1	0.5
Scope: Visual inspection. Bend test. Tensile test. Hydro test (where applicable).		
Expected Results: Explain how to perform visual inspection before and after welding. Describe the bend test in general and the performance criteria. Describe the tensile tests in general and explain the various failure modes. Describe the hydro test in general and the performance criteria (where applicable).		

U1.7 Documentation for welding	Level 1	Level 2
Objective: Understand the basic documents usually required in quality assurance and control.	2	1
Scope: Weld Procedure Specification (WPS). Completing welding reports. Reports from manual and automatic welding. Reporting of test results. Awareness of standards (where available).		
Expected Results: Be able to complete written reports and explain electronic reports for the weld traceability. Describe the content of the WPS and its essential variables. Discuss the content of reports regarding the quality control of the joints. Describe how welding records should be stored. Basic knowledge of relevant standards.		

The practical training units are given in Table M1.2, and show the recommended minimum time required to train an inexperienced candidate for entry to the practical test.

Table M1.2 Practical exercises for Module 1 heated tool welding of plastics pipes.

Practical Training Unit	Material	Instruction Unit	Minimum time, hours	Entry to following Test Units (EN 13067 sub-groups)
P1.0		Introduction: material identification, equipment, joint preparation	2	
P1.1	PP or PE pipe (diameter $\leq 315\text{mm}$)	Butt manual machine 	3	T1.1 (2.4 manual) T1.2 (3.4 manual) T1.3 (4.3 manual) T1.11 (2.4 semi-automatic) T1.12 (3.4 semi-automatic) T1.13 (4.3 semi-automatic)
P1.2	PP or PE pipe	Socket machine 	2	T1.7 (2.6) T1.8 (3.9) T1.9 (4.4)
P1.3	PE pipe	Saddle manual machine 	1	T1.10 (3.10 manual) T1.17 (3.10 semi-automatic)
P1.4	PP or PE pipe (diameter $> 315\text{mm}$)	Butt manual machine 	3	T1.5 (2.5 manual) T1.6 (3.5 manual) T1.15 (2.5 semi-automatic) T1.16 (3.5 semi-automatic)
P1.5	ECTFE or FEP or PFA pipe	Butt manual machine 	3	T1.4 (5.2 manual) T1.14 (5.2 semi-automatic)
P1.6	PP or PE pipe (diameter $\leq 315\text{mm}$)	Butt semi-automatic machine 	1.5	T1.11 (2.4 semi-automatic) T1.12 (3.4 semi-automatic) T1.13 (4.3 semi-automatic)
P1.7	PE pipe	Saddle semi-automatic machine 	1	T1.17 (3.10 semi-automatic)
P1.8	PP or PE pipe (diameter $> 315\text{mm}$)	Butt semi-automatic machine 	3	T1.15 (2.5 semi-automatic) T1.16 (3.5 semi-automatic)
P1.9	ECTFE or FEP or PFA	Butt semi-automatic machine 	2	T1.14 (5.2 semi-automatic)

Any single (or groups of) practical training in the various materials/processes must be preceded by the introductory unit P1.0 – tailored to the relevant material/processes.

Training unit, P1.4, on manual equipment for large diameter pipe can only be taken when the candidate has either passed a specific qualification test (T1.1 or T1.2 in Table M1.3 for either PP or PE) or has completed the practical training unit, P1.1, for the smaller diameter pipe and the theoretical training.

Training unit, P1.8, on semi-automatic machines for large diameter pipe can only be taken when the candidate has either passed a specific approval test (T1.1, T1.2, T1.11 or T1.12 in Table M1.3 for either PP or PE) or has completed the practical training unit, P1.1 or P1.6, for the smaller diameter pipe and the theoretical training.

5.2 MODULE M2 ELECTROFUSION WELDING OF PLASTICS PIPES

Module 2 provides theoretical and skills training in electrofusion welding.

The theoretical training for this module is described in Table M2.1, which contains instruction in plastics materials and then training on electrofusion welding of plastics pipes.

Table M2.1 –Theoretical units for Module 2 - electrofusion welding of plastic pipes

U2.1 Materials technology and processing of thermoplastics	Level 1	Level 2
Objective: Understand and describe the principles of plastic materials and processing of thermoplastics and designation of plastics.	5	2
Scope: Introduction to thermoplastics (PP, PE, PVDF, ECTFE relevant to candidate's needs). Symbols and abbreviations for plastics. Advantages and disadvantages of plastics. Manufacture of plastics. Production of plastic pipe and fittings. Applications of plastics. Principles of plastics welding.		
Expected Result: Explain the differences between the various types of plastics. Identify the advantages and disadvantages of various types of plastics over other pipe materials. Know how plastic pipes and fittings are produced. Describe the designation and marking of products. Describe how plastics weld.		
U2.2 Basics of electrofusion welding	Level 1	Level 2
Objective: Understand and describe the principles of the electrofusion welding process and its typical application.	2	1
Scope: Principles of socket and saddle welding. Ancillary equipment. Welding machines and their characteristics. Joint preparations and fit-up. Welding procedures. Setting of appropriate welding parameters.		
Expected Results: Explain the principle of the electrofusion welding process. Describe the characteristics of the welding machines for electrofusion. Describe the typical joint preparations. Explain the welding procedures adopted. Be able to set up the appropriate welding parameters for each joint type.		

U2.3 Application of electrofusion welding	Level 1	Level 2
Objective: Understand and describe the most common application of the electrofusion welding process.	1	0.5
Scope: Effect of material. Selection of socket and saddle welding. Advantages and disadvantages in comparison with heated tool welding. Typical applications: gas, water distribution; other applications.		
Expected Results: Describe the influence of the base material on the weld. Discuss the possible selection of socket or saddle welding. Explain the advantages and disadvantages of the process. Describe the most common applications such as water, gas distribution.		

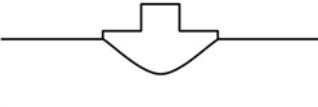
U2.4 Health and Safety	Level 1	Level 2
Objective: Understand the risks and hazards related with the electrofusion welding process and the standard safety procedures.	2	1
Scope: Hazard sources. Burns and fires. Fume control. Safe lifting/handling. Basic personal protection and related individual safety devices. Consequences of misapplying critical welding parameters. Mandatory requirements.		
Expected Results: Explain how to prepare a welding site from a safety point of view. Manage fire extinguishers and put out fires. Correctly describe necessary personal protection equipment and how and when it is to be used. Explain how lifting and handling of pipes is carried out in a safe way. Explain the safety implications of not following the correct welding procedures or incorrect setting of welding parameters.		

U2.5 Imperfections in electrofusion welded joints	Level 1	Level 2
Objective: Understand the welding imperfections, their origin and influence on the performance of the joint in service in accordance with EN14728.	2	1
Scope: Types of imperfection. Origin of imperfections. Effect of imperfections on performance. Acceptance criteria (e.g. DVS 2202-1 or equivalent national requirements).		
Expected Results: Identify different types of imperfections from the different welding methods and explain the possible origins. Explain effects of imperfections on joint performance. Correctly describe acceptance criteria and actions to be taken if a weld doesn't meet acceptance criteria. Correctly describe influence of defects coming from the wrong welding parameters.		

U2.6 Testing electrofusion welded joints	Level 1	Level 2
Objective: Understand the destructive and non destructive tests adopted for the quality control of electrofusion welded joints in accordance with EN12814-4, and EN13100-1.	1	0.5
Scope: Visual inspection. Crush test. Peel test. Hydro test (where applicable).		
Expected Results: Explain how to perform visual inspection before and after welding. Describe the crush and peel tests in general and the performance criteria. Describe the hydro test in general and the performance criteria (where applicable).		
U2.7 Documentation for welding	Level 1	Level 2
Objective: Understand the basic documents usually required in quality assurance and control.	2	1
Scope: Weld Procedure Specification (WPS) Completing welding reports. Reports from manual and automatic welding. Reporting of test results. Awareness of standards (where available).		
Expected Results: Be able to complete written reports and explain electronic reports for the weld traceability. Describe the content of the WPS and its essential variables. Discuss the content of reports regarding the quality control of the joints. Describe how welding records should be stored. Basic knowledge of relevant standards.		

The practical training units are given in Table M2.2, and show the recommended minimum time required to train an inexperienced candidate for entry to the practical test.

Table M2.2 – Practical exercises for Module 2 electrofusion welding of plastics pipes.

Practical Training Unit	Material	Instruction Unit	Minimum time, hours	Entry to following Test Units (EN 13067 sub-groups)
P2.0		Introduction: material identification, equipment, joint preparation	2	
P2.1	PP or PE pipe (diameter $\leq 225\text{mm}$)	Socket 	2.5	T2.1 (2.7) T2.2 (3.6)
P2.2	PE pipe	Saddle 	2	T2.4 (3.8)
P2.3	PE pipe (diameter $> 225\text{mm}$)	Socket 	3	T2.3 (3.7)

Training can be conducted in socket or saddle welding individually or combined, but in all cases the introductory unit P2.0 must be included.

Training unit P2.3, on large diameter pipe, can only be taken when the candidate has either passed qualification test T2.2 or has completed the practical training unit P2.1, for the smaller diameter pipe and the theoretical training.

Section II: Minimum Requirements for Examination and Certification

1. INTRODUCTION

This part of the guideline seeks to achieve harmonisation and common standards in examination and certification of professional plastics welders and welding operators. The national welding and joining organisations, being members of the EWF, mutually acknowledge the Certification awarded by any Authorised National Body (ANB) approved to implement this Guideline.

Education must have followed Section I of this EWF guideline, and the examination must have been conducted by the ANB.

The training and examination must be carried out at organisation(s) approved by the ANB in accordance with the requirements of this Guideline, EWF Doc 416, and EN 13067. A Plastics Welding Examiner (PWE) shall witness and assess all examinations.

2. APPROVAL OF THE TRAINING COURSE

Training courses leading to the EWF examination must be approved by the Authorised National Body, in accordance with IAB001.

2.1 PLASTICS WELDING INSTRUCTOR

A Plastics Welding Instructor (PWI) must have:

- Three years welding experience relevant to the training module.
- Teaching ability - evidence of training in lecturing, public speaking or verbal communication.
- Passed the relevant examination(s) for which they will be instructing. If an instructor has passed the examination in Sub-group 3.5 in EN 13067 (PE manual heated tool butt pipe weld >315mm) they can instruct in the following practical instruction units: P1.1, P1.4, P1.6 and P1.8.
- Approval of the ANB to undertake the training modules.

The PWI for the theoretical training and practical training does not necessarily have to be the same person.

3. PLASTICS WELDING EXAMINER

The Plastics Welding Examiner (PWE) is a person approved by the ANB on the recommendation of the relevant Board of Examiners to comply with the requirements given in IAB001. The Board of Examiners must specify the range of modules/tests/sub-groups the PWE is approved to examine, with due recognition of their experience. The PWE must have a minimum of five years experience in plastics welding, knowledge of relevant standards (e.g. EN 13067, EN 13100-1), and familiarity with the EWF qualification/certification system. It is not necessary for the PWE to have passed relevant examinations him/herself.

The duties of the PWE are to:

- Check the identity of the candidate, the test house approval and, where applicable, the training centre.
- Check the materials, WPS, machines and equipment available for the test.
- Supervise the theoretical test.
- Supervise the welding of the test piece.
- Visually check the test piece after completion by the welder.
- Select test pieces for the specified test at an approved test house.
- Reach their professional decisions independently.

- Mark the test piece selected for testing with the number or mark of the PWE and the welder.
- Terminate the test if the welding conditions are not in compliance with the WPS or the welder does not have the skill required to obtain a satisfactory result.
- Evaluate the test results.

The PWE must not examine any candidate that they have trained themselves.

Difficulties and corrections whilst welding the test piece

If difficulties arise during the welding of a test piece, not caused by the welder, the PWE may approve replacement of the test piece.

4. ADMISSION TO THE EXAMINATION

Admission to the examination leading to the award of the European Plastics Welder certificate or European Plastics Welding Operator certificate will be restricted to those who have successfully completed the relevant course(s).

The maximum period of time between completing the training course and completing the associated examination shall be three years.

5. EXAMINATION PROCEDURES

The examination comprises both theoretical and relevant practical part(s).

Theoretical Examination

The theoretical examination paper following each theoretical module shall consist of 20 multiple-choice questions and will be set under the authority of the Board of Examiners of the ANB. The PWE shall sign all completed papers to confirm that the examination has been conducted in a proper manner.

Practical Examination

The candidate shall weld the required test piece for each test unit (Tables M1.3 and M2.3) under the supervision of the PWE, and shall complete the welding record sheet(s) controlled and witnessed by the PWE.

Candidates may take one or more practical tests.

Table M1.3 Test units for Module 1 heated tool welding of plastics pipes.

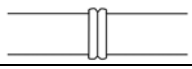
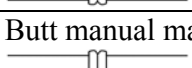
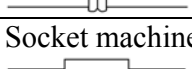
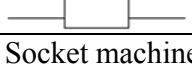
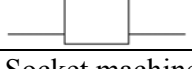
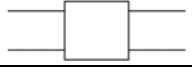
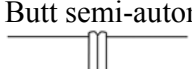
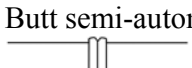
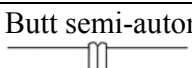
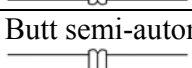
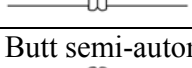
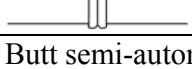
Test Unit	Material	Weld form	Type of product	EN 13067 sub-group
T1.1	PP	Butt manual machine 	Pipe 110mm diameter, SDR17.6	2.4 manual
T1.2	PE	Butt manual machine 	Pipe 110 or 180mm diameter, SDR11 or 17.6	3.4 manual
T1.3	PVDF	Butt manual machine 	Pipe 110mm diameter, 5.3mm wall	4.3 manual
T1.4	ECTFE or PFA or FEP	Butt manual machine 	Pipe 110mm diameter, 3mm wall	5.2 manual
T1.5	PP	Butt manual machine 	Pipe ≥ 400 mm diameter, SDR ≤ 17.6	2.5 manual
T1.6	PE	Butt manual machine 	Pipe ≥ 400 mm diameter, SDR ≤ 17.6	3.5 manual
T1.7	PP	Socket machine 	Pipe 63mm diameter, SDR11	2.6
T1.8	PE	Socket machine 	Pipe 63mm diameter, SDR11	3.9
T1.9	PVDF	Socket machine 	Pipe 63mm diameter, 3mm wall	4.4
T1.10	PE	Saddle manual machine 	Pipe 32 on 90mm diameter, SDR11	3.10 manual
T1.11	PP	Butt semi-automatic machine 	Pipe 110mm diameter, SDR17.6	2.4 semi-automatic
T1.12	PE	Butt semi-automatic machine 	Pipe 110 or 180mm diameter, SDR11 or 17.6	3.4 semi-automatic
T1.13	PVDF	Butt semi-automatic machine 	Pipe 110mm diameter, 5.3mm wall	4.3 semi-automatic
T1.14	ECTFE or PFA or FEP	Butt semi-automatic machine 	Pipe 110mm diameter, 3mm wall	5.2 semi-automatic
T1.15	PP	Butt semi-automatic machine 	Pipe ≥ 400 mm diameter, SDR ≤ 17.6	2.5 semi-automatic
T1.16	PE	Butt semi-automatic machine 	Pipe ≥ 400 mm diameter, SDR ≤ 17.6	3.5 semi-automatic
T1.17	PE	Saddle semi-automatic machine 	Pipe 32 on 90mm diameter, SDR11	3.10 semi-automatic

Table M2.3 Test pieces for Module 2 electrofusion welding of plastics pipes.

Test Unit	Material	Weld form	Type of product	EN 13067 sub-group
T2.1	PP	Socket 	Pipe 63mm diameter, SDR11	2.7
T2.2	PE	Socket 	Pipe 90mm diameter, SDR11	3.6
T2.3	PE	Socket 	Pipe 315mm diameter, SDR17.6	3.7
T2.4	PE	Saddle 	Pipe 32 on 90mm diameter, SDR11	3.8

All welded test pieces shall be made in accordance with EN 13067 and shall be subjected to visual examination. In order to obtain a certificate to EN 13067 the welded test pieces shall also be subjected to the destructive tests in accordance with EN 13067.

Passing the examination on manual heated tool equipment leads to the award of the EWF Certificate European Plastics Welder, endorsed for the relevant sub-group(s) and range of qualification. Passing the examination on semi-automatic heated tool and electrofusion equipment leads to the award of EWF Certificate European Plastics Welding Operator, endorsed for the relevant sub-group(s).

Candidates trained on a manual heated tool machine may enter examinations for manual or semi-automatic machines. A pass on a manual heated tool machine also qualifies the candidate for semi-automatic and automatic welding.

Candidates trained on semi-automatic heated tool machines may only enter examinations for semi-automatic heated tool machines, which will qualify them for welding using semi-automatic or automatic machines BUT NOT manual machines.

6. EVALUATION OF TEST RESULTS

The evaluation of test results shall be in accordance with EN 13067, where applicable. Visual examination shall be carried out in accordance with EN 13100-1 and EN 14728.

7. RE-EXAMINATION AND APPEALS PROCEDURE

These are covered by Document EWF 416.

8. EUROPEAN PLASTICS WELDER AND WELDING OPERATOR CERTIFICATE AND IDENTITY CARD

After successful practical and theoretical examination a certificate (and identity card), endorsed for the relevant sub-group is awarded to the candidate by the ANB.

The qualification test certificate and identity card shall be issued in at least one of the official CEN languages (English, French or German) and shall contain at least the following information:

- Welder full name.
- Date, place and country of birth.
- Clear photograph of good likeness.
- Reference to EN 13067 (if relevant) and the group of materials and sub-group number(s) of examination passed.
- Date of overall examination pass.
- Date of issue.
- Date of validity.
- ANB (full name and address)
- Individual certificate identification number according to EWF Doc. 416.

Those approved as ‘European Plastics Welder’ or ‘European Plastics Welding Operator’ may be called European Plastics Welder or European Welding Plastics Welding Operator in the national language and use the professional designation ‘EPW’ or ‘EPWO’, respectively (invariable in all member countries). This professional designation must be accompanied by the relevant range of qualification.

The template for the Qualification Test Certificate is shown in Appendix II, and the template for the front of the Qualification Test Certificate in accordance with EN 13067 is shown in Appendix III. An example of an Identity Card is shown in Appendix IV.

9. PERIOD OF VALIDITY OF QUALIFICATION

Initial Qualification

The validity of the welder’s qualification begins from the date when all necessary examinations have been passed. This date may be different to the date of issue marked on the certificate.

A welder’s qualification shall remain valid for a period of two years providing the following conditions are fulfilled:

- The welder shall be engaged with reasonable continuity on welding work within the range of qualification corresponding to the qualification test certificate. An interruption period longer than six months is not permitted;
- There shall be no specific reason to question the welder’s skill and knowledge;
- Annually the manufacturer shall establish that the welder’s quality is in accordance with the technical conditions for which the qualification test certificate is awarded.
- The certificate is signed and dated every six months from the date of overall examination pass by the responsible personnel of the employer.

Prolongation of Qualification

Prolongation is only allowed when the ANB is advised before expiry of the period of initial qualification.

Prolongation is only allowed when proof of welding quality is available to the ANB who accepts that this is the case. The proof shall consist of examination results from an independent test house on specimens taken from a test piece relevant to the category or categories being submitted for prolongation.

The validity within the range of qualification is extended under the original qualification for a further two years provided the conditions above are fulfilled. When this prolongation expires a new examination is required.

10. QUALIFICATION TEST CERTIFICATE RENEWAL

An examination must be taken within three months of the expiry date of the test certificate to continue the validity of qualification.

11. TRANSITION ARRANGEMENTS

An ANB can offer Transitional Arrangements for a period of up to three years from the implementation of the guideline by the ANB.

Practising plastics welders and welding operators will be eligible for the award of the Qualification Test Certificate if they have passed a theoretical and practical examination in accordance with this guideline or an examination under equivalent technical conditions.

Certificates may be awarded under Transitional Arrangements in the following cases:

- a) By the ANB in the country in which the applicant received their national welding certificate, or
- b) By the ANB in the country in which the applicant is currently practising, in contact with the ANB of the country that issued the original national welding certificate.

APPENDIX I

EXAMPLE OF EXPERIENCE CHECKLIST

EWF PLASTICS PIPE WELDER/WELDING OPERATOR

EXPERIENCE CHECKLIST

Personal Details

Name of Applicant:		Date of Birth:
<u>Current Employer</u> Company name: Contact name: Tel. no:	<u>Previous Employer (if within the last 2 years)</u> Company name: Contact name: Tel. no:	

Work Experience

*Please note that to qualify as an experienced welder you must demonstrate having **at least two years experience or have completed an apprenticeship** in the relevant welding technique(s).*

Welding Technique	No. of Years Experience	Pipe Materials Installed	Pipe Sizes Installed
Heated tool butt			
Heated tool socket			
Heated tool saddle			
Electrofusion socket			
Electrofusion saddle			

Evidence of Experience:

Contract 1

Name (Site)		
Dates (month/year)		
Welding technique(s)		
Material(s)/pipe size(s)		
Approx. length installed (m)		
Company responsible for QA		Tel No.

Contract 2

Name (Site)		
Dates (month/year)		
Welding technique(s)		
Material(s)/pipe size(s)		
Approx. length installed (m)		
Company responsible for QA		Tel No.

Contract 3

Name (Site)		
Dates (month/year)		
Welding technique(s)		
Material(s)/pipe size(s)		
Approx. length installed (m)		
Company responsible for QA		Tel No.

Contract 4

Name (Site)		
Dates (month/year)		
Welding technique(s)		
Material(s)/pipe size(s)		
Approx. length installed (m)		
Company responsible for QA		Tel No.

Contract 5

Name (Site)		
Dates (month/year)		
Welding technique(s)		
Material(s)/pipe size(s)		
Approx. length installed (m)		
Company responsible for QA		Tel No.

Contract 6

Name (Site)		
Dates (month/year)		
Welding technique(s)		
Material(s)/pipe size(s)		
Approx. length installed (m)		
Company responsible for QA		Tel No.

I declare all the information given in this form is correct and true to the best of my knowledge.

Signature of Applicant _____ Date: _____

Verified by representative from current employer:

Authorised Signature (Director/Manager) _____

Print Name _____

Position in Company _____

APPENDIX II

TEMPLATE FOR

EWF QUALIFICATION TEST CERTIFICATE



Qualification Test Certificate

Certificate No:

This is to certify

[Name of Welder]

[Date and Place of Birth]

Photograph of
welder (if Identity
Card is not issued)

has demonstrated proficiency as a [European Plastics Welder / European Plastics Welding Operator] in accordance with the requirements published in Document No EWF 641-07 and amendments in force on the date of examination date. This certificate is valid for the special categories mentioned below:

[list of categories passed]

Date of issue:

Date of expiry:

Examiner:

Signed:

Issued by:

[ANB]

Confirmation of validity

Name	Signature	Position in Company	Date

(REVERSE OF QUALIFICATION TEST CERTIFICATE)

THIS IS A VALUABLE DOCUMENT WHICH SHOULD BE KEPT IN A SAFE PLACE. A FEE WILL BE CHARGED FOR DUPLICATES.

NOTES:

1. Some authorities require additional reassurance concerning equipment, quality of supervision and working conditions before permitting the use of a certificate holder on their work, which is outside the scope of this certificate.
2. Validity. Certificates are valid for a period of two years provided: a) they are within date; b) all fees have been paid; c) they are on standard EWF paper signed by an official of [ANB] and marked with the [ANB] stamp; d) they have been signed and dated at six monthly intervals from the date when all necessary examinations have been passed by the responsible personnel of the employer to confirm that the following conditions have been fulfilled:
 - a. The welder shall be engaged with reasonable continuity on welding work within the range of qualification corresponding to the qualification test certificate. An interruption period longer than six months is not permitted;
 - b. There shall be no specific reason to question the welder's skill and knowledge;
 - c. Annually the manufacturer shall establish that the welder's quality is in accordance with the technical conditions for which the qualification test certificate is awarded.

IF ANY OF THESE CONDITIONS ARE NOT FULFILLED THE CERTIFICATE SHALL BE CANCELLED

VALIDITY MAY BE EXTENDED FOR A FURTHER TWO YEARS PROVIDED THAT:

- a) The [ANB] is advised before the expiry date that extension is sought.
- b) Proof of welding quality is forwarded to the [ANB]
- c) Conditions a), b) and c) have been satisfied.

Please contact your ANB well in advance of the expiry date so that the above assessment can be made.

Following a second two year period, renewal must be achieved by a new examination.

3. New employers who are shown this certificate should satisfy themselves that the certificate holder has been employed with reasonable continuity, see 2(a) above, on work for which the certificate was granted.

Enquiries concerning this certificate may be addressed to the issuing ANB at:

[Address of ANB]

**PROSPECTIVE EMPLOYERS SHOULD ALWAYS ASK TO
SEE THE CERTIFICATE HOLDER'S EWF PLASTICS WELDER OR PLASTICS WELDING OPERATOR'S
ID CARD *(if issued)***

APPENDIX III

**TEMPLATE FOR FRONT PAGE OF
EWF QUALIFICATION TEST CERTIFICATE
IN ACCORDANCE WITH EN 13067**



Qualification Test Certificate

EN 13067: Plastics Welding Personnel - Qualification Testing of Welders – Thermoplastics Welded Assemblies

Certificate No:

Photograph of
welder (if Identity
Card is not issued)

This is to certify

[Name of Welder]

[Date and Place of Birth]

has demonstrated proficiency as a [European Plastics Welder / European Plastics Welding Operator] in accordance with the requirements published in Document No EWF 641-07 and amendments in force on the date of examination date. This certificate is valid for the special categories mentioned below:

[list of categories passed]

Date of issue:

Date of expiry:

Examiner:

Signed:

Issued by:

[ANB]

Confirmation of validity

Name	Signature	Position in Company	Date

APPENDIX IV
EXAMPLE OF IDENTITY CARD

Photo of Welder	ANB logo	
European Plastics Welding Operator <Name of holder>		ANB Address
Reference No. (Country code/number)		
This card is the property of the <ANB> and must be surrendered on demand. It is not valid without the EWF Qualification Test Certificate		