

Minimum Requirements for the Education, Examination and Certification of European Plastics Welder

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Appendix I – Suggested Form for Acceptance on to Plastics Welder Training Courses

Appendix II – Example of EWF Approval Test Certificate and Identity Card (optional)

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Definitions

Welding process - general	Technique characterised by the method of softening to obtain permanent assembly.
Hot gas welding	Welding process in which the materials to be unified are softened by hot air or inert gas and are pressed together.
Round nozzle	Welding process in which the pressure is applied via the welding material or a suitable attachment such as a pressure roller.
High-speed nozzle	Welding process in which the welding material is suitably guided and pre-heated, the nozzle tip is provided with a profiled area to apply the welding pressure.
Extrusion welding	Welding process in which an extruder unit with a melting chamber gives the extruded material required by the thickness and shape of the joint. Hot air or inert gas heats simultaneously the base material.
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.
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.
Heated wedge	Welding process in which the lining membrane welded is gripped by rollers which guide and propel the welding machine which uses either hot gas to heat the lining membrane and the wedge to effect the weld or electrically heated wedge to heat the lining membrane in the area being welded.
Welding Procedure Specification (WPS)	Document providing in detail the required variables for a specific application to assure repeatability.
Welding Record Sheet	Document providing in detail the variables used for making the weld.
Welder	Person making a welded assembly by any process, whose manual skill and knowledge are two of the determining factors influencing the quality of the welded joint, or person performing a welding operation by means of mechanical or automatic machines.
Plastics fabricator	Person whose manual skill and knowledge in producing assemblies including marking out, developing complex shapes and forms, requires welding as an essential part.

Plastics Welding Examiner (PWE)	Qualified person acceptable to the contracting parties who verifies the compliance with the standard EN 13067 and who examines according to this schedule.
Manufacturer	Company, contractor or organisation who is responsible for the welding.
Range of approval	Welding processes, types of joint, materials, thicknesses and diameters for which a welder is approved.
Approval test	Theoretical and practical tests in order to verify the knowledge and the skill of the welder.
Approval 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 approval standard or other specification.
Test piece	Welded assembly which is used in the test.
Test specimen	Part or portion cut from the test piece for the test specified.
Training centre	Educational establishment for training plastics welding personnel and/or Plastics Welding Examiner.
Test house	Establishment having all relevant test equipment to carry out the required tests.
Manual machine	A machine where all welding parameters are set and controlled by the operator (except for temperature, which can be controlled automatically).
Semi-automatic machine	A machine where at least one of the welding parameters, time or pressure, is set and controlled by an electronic device.
Automatic machine	A machine where all welding parameters are set and controlled by an electronic device.
Mx.y	Denotes the module within the schedule covering specific welding processes and materials
Px.y	Denotes the practical exercise or training unit to prepare for an approval test piece or series of test pieces.
Tx.y	Denotes the test piece specification to meet the relevant sub-group approval.

Minimum Requirements for the Education, Examination and Certification of European Plastics Welders

Section I: Minimum Requirements for Education and Training

1. INTRODUCTION

This guideline for the education and training of plastics welders has been devised and formulated by a Special Working Group acting on behalf of the EWF Technical Committee. It is designed to provide a harmonised scheme for the comprehensive education and training of plastics welders. The scheme follows the procedures set down for approval testing of welders, thermoplastics welded assemblies, in EN 13067¹. This guideline provides a combination of high skill and the necessary theoretical background, leading to EN 13067 approval tests. Welders successfully completing specific modules or combinations of modules, achieve the relevant EN 13067 approvals.

The guideline covers the range of plastics welding processes and materials covered within EN 13067 as well as a few processes and materials not covered within the standard. A modular format has been designed to accommodate a 'mix and match' approach to suit the variety of needs within the plastics industry.

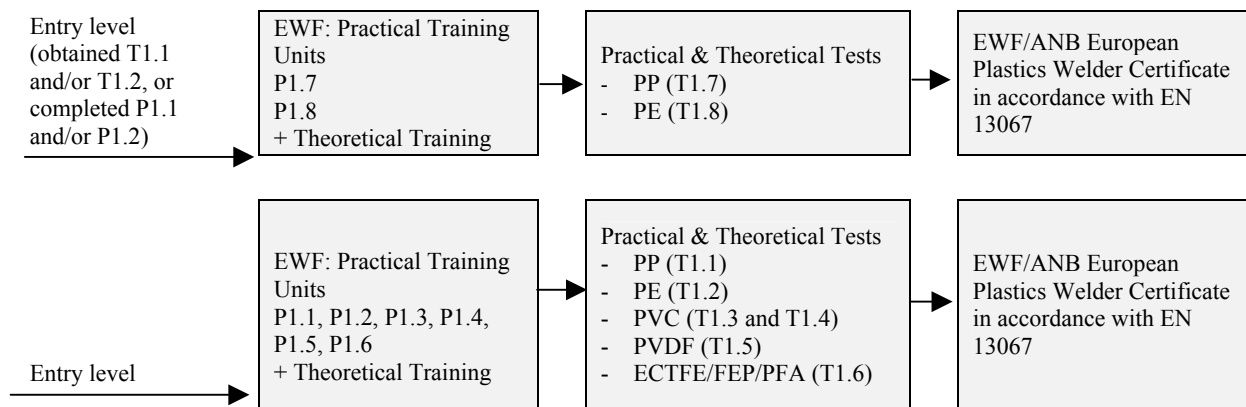
Standard EN 13067 will be the controlling document for this guideline.

A European Plastics Welder has proven skills in plastics welding and can carry out welding independently. He/she is 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 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 welding technology as covered by this guideline. The subsequent Section II of this document covers the minimum requirements for examination and approval.

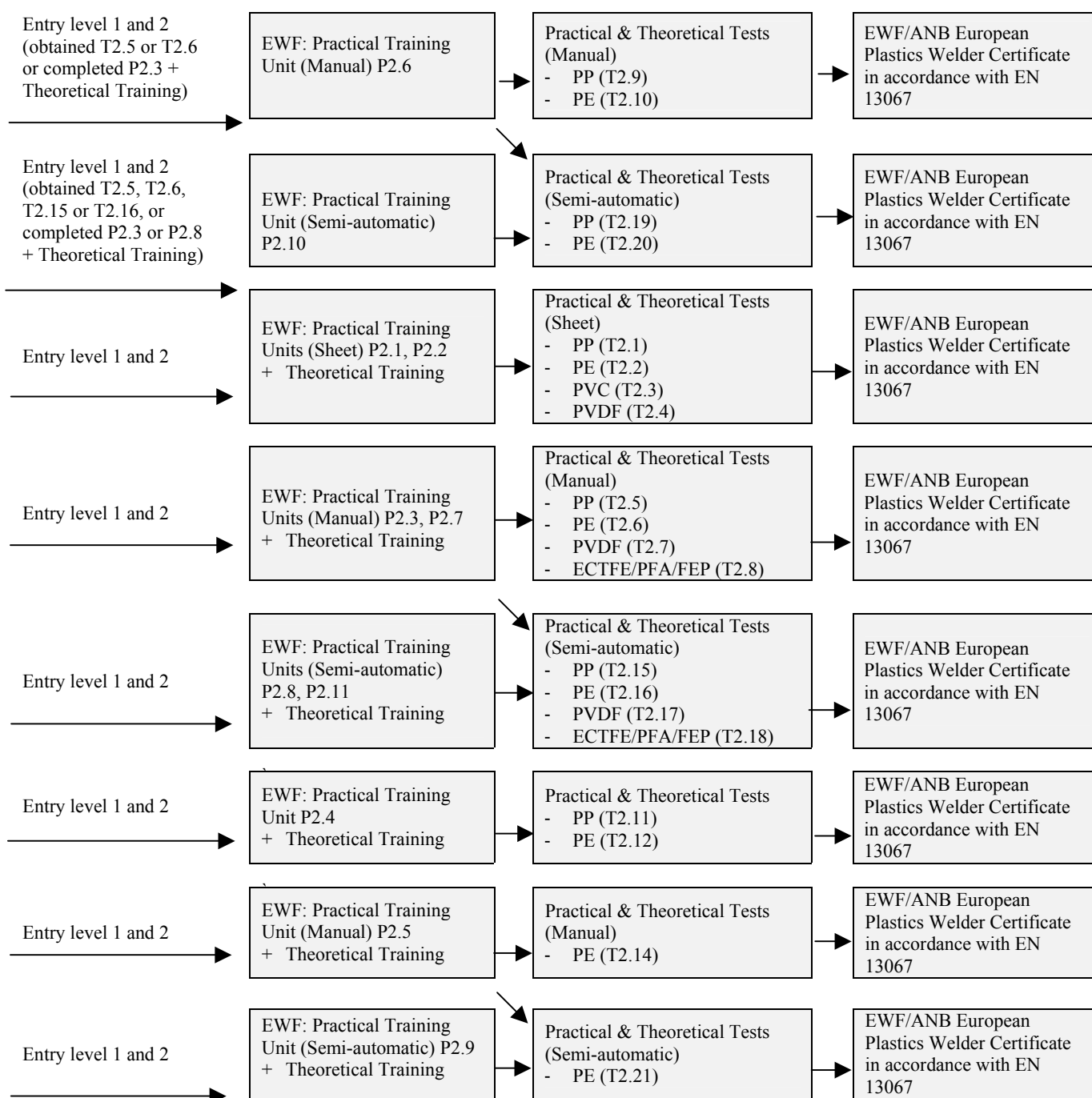
The structure is divided into five modules, Fig.1, to cover the range of welding processes and materials. Modules 1-3 provide training for specific tests in individual processes and materials. Modules 4 and 5 provide training for combined processes relevant to 1) site welding of water and gas pipe and 2) lining membranes. The guideline follows the European Standard (EN 13067 Plastics welding personnel – Approval testing of welders – Thermoplastics welded assemblies) and welders will achieve approvals in accordance with this standard. 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 (i.e. sheet or pipe) for each welding process, Tables 1 and 2.

¹ EN13067:2003 'Plastics welding personnel - Qualification testing of welders - Thermoplastics welded assemblies'.



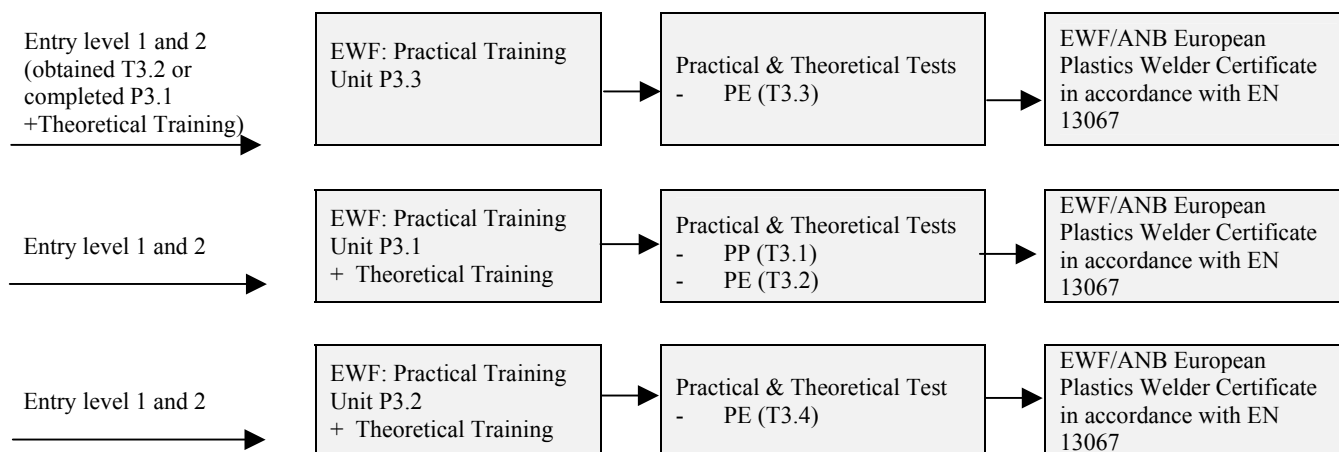
1a Module 1: Hot Gas and Extrusion (see also Tables M1.1-M1.3)

Figure 1 Structure of Welder Training and Examination Modules



1b Module 2: Heated Tool (see also Tables M2.1-M2.3)

Figure 1 Structure of Welder Training and Examination Modules (contd)



1c Module 3: Electrofusion (see also Tables M3.1-M3.3)

Figure 1 Structure of Welder Training and Examination Modules (contd)

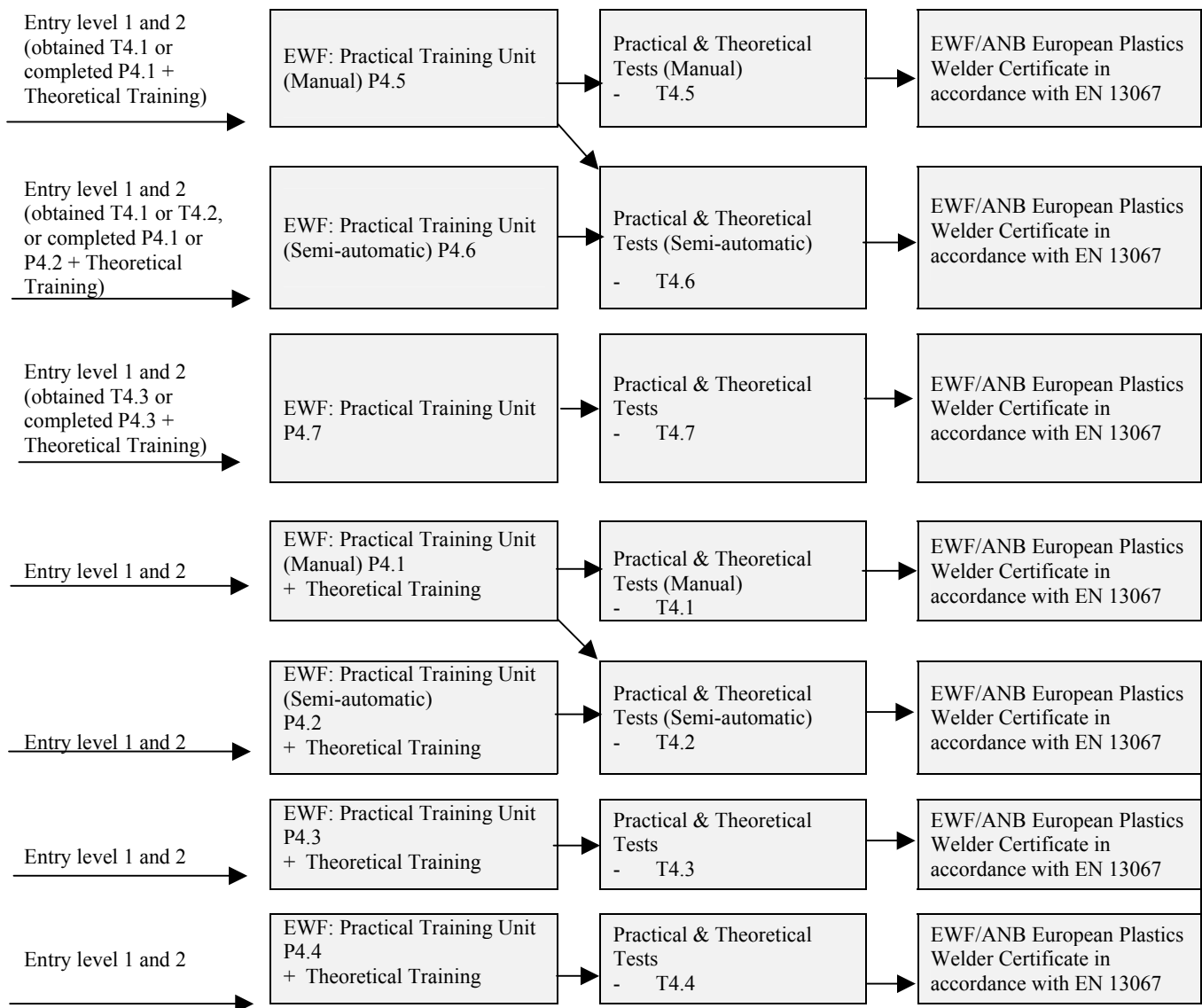
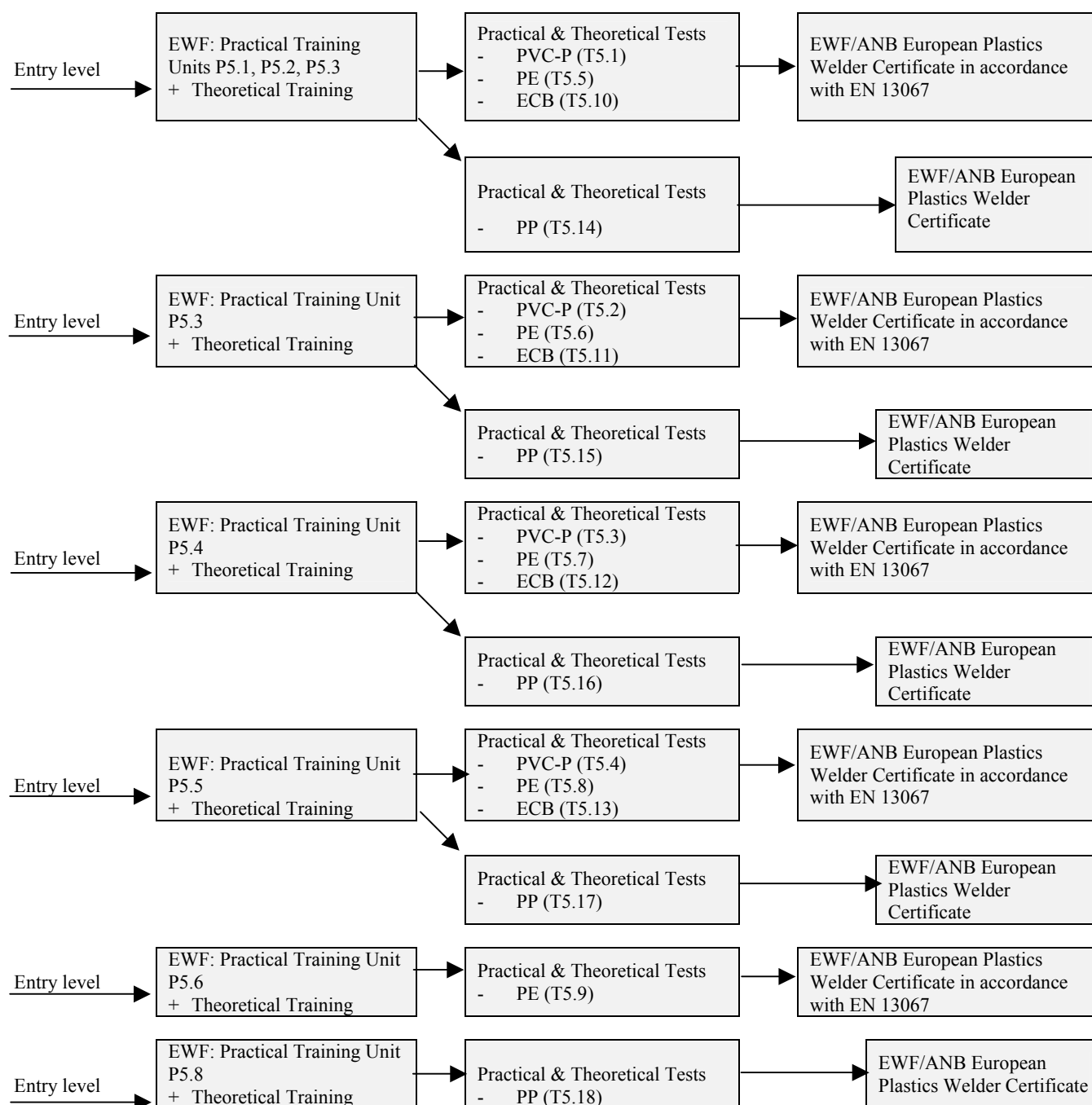


Figure 1d Module 4: Heated Tool and Electrofusion for PE Water and Gas Pipe (see also Tables M4.1-M4.3)

Figure 1 Structure of Welder Training and Examination Modules (contd)



1e Module 5: Lining Membranes (see also Table M5.2)

Figure 1 Structure of Welder Training and Examination Modules (contd)

Table 1 Practical Examination Sub-Groups in Modules 1 to 4

Module 1			Module 2*				Module 3			Module 4*		
Hot gas round nozzle welding Hot gas high speed welding Extrusion welding			Heated tool welding Heated tool socket or saddle welding				Electrofusion (socket or saddle)			Heated tool and electrofusion welding of water and gas pipes		
Welding process	Material	EN13067 Sub-groups	Welding process	Materials	Product form	EN13067 Sub-groups	Welding process	Material	EN13067 Sub-groups	Welding process	PE pipe size	EN13067 Sub-groups
Hot gas high speed	PP	2.1	Heated tool	PP PE PVC PVDF	Sheet sheet sheet sheet	2.3 3.3 1.3 4.2	Electrofusion socket	PP pipe (63mm, SDR 11)	2.7	Heated tool	110 or 180mm SDR 11 or 17.6	3.1
Hot gas high speed	PE	3.1	Heated tool	PP	pipe (110mm) SDR 17.6	2.4	Electrofusion socket	PE pipe (90mm, SDR 11)	3.6	Electrofusion socket	90mm, SDR 11	3.1
Hot gas round nozzle	PVC	1.1	Heated tool	PE	pipe (110 or 180mm, SDR 11 or 17.6)	3.4	Electrofusion socket	PE pipe (315mm, SDR 17.6)	3.7	Electrofusion saddle	32 on 90mm, SDR 11	3.1
Hot gas high speed	PVC	1.2	Heated tool	PVDF	pipe (110mm)	4.3	Electrofusion saddle	PE pipe (32mm on 90mm, SDR 11)	3.8	Heated tool	≥400mm, SDR ≤17.6	3.1
Hot gas high speed	PVDF	4.1	Heated tool	ECTFE/ PFA or FEP	pipe (110mm)	5.2						
Hot gas high speed	ECTFE or PFA or FEP	5.1	Heated tool	PP	Pipe (≥400mm, SDR ≤17.6)	2.5				Electrofusion socket	315mm, SDR 17.6	3.1
Extrusion	PP	2.2	Heated tool	PE	Pipe (≥400mm, SDR ≤17.6)	3.5						
Extrusion	PE	3.2	Heated tool - socket	PP	pipe (63mm, SDR 11)	2.6						
			Heated tool - socket	PE	pipe (63mm, SDR 11)	3.9						
			Heated tool - socket	PVDF	pipe (63mm)	4.4						
			Heated tool - saddle	PE	pipe (32 on 90mm)	3.10						

* The practical Examinations for Heated Tool welding must differentiate between manual and semi-automatic equipment.

Table 2 Practical Examination Sub-Groups in Module 5

Module 5		
Welding of lining membranes		
Hot gas manual welding		
Hot gas by machine		
Heated wedge welding		
Extrusion manual		
Welding process	Material	EN13067 Sub-groups
Hot gas manual	PVC-P	6.1
Hot gas by machine	PVC-P	6.2
Heated wedge by hot gas	PVC-P	6.3
Heated wedge electric	PVC-P	6.4
Hot gas manual	PE	7.1
Hot gas by machine	PE	7.2
Heated wedge by hot gas	PE	7.3
Heated wedge electric	PE	7.4
Extrusion manual	PE	7.5
Hot gas manual	ECB	8.1
Hot gas by machine	ECB	8.2
Heated wedge by hot gas	ECB	8.3
Heated wedge electric	ECB	8.4
Hot gas manual	PP	
Hot gas by machine	PP	
Heated wedge electric	PP	
Heated wedge by hot gas	PP	
Extrusion manual	PP	

2. ACCESS TO THE COURSE

This guideline has different entry points dependent on the level of automation of the welding process:

Hot Gas, Extrusion and Membrane Welding

This guideline is restricted to candidates with experience in the processes concerned. This is because significant experience is necessary before individuals have the required skills to undertake welding of critical structures. As a rule, candidates will be accepted to the training module provided one of the following conditions is met:

- completed an apprenticeship as a plastics fabricator
- at least two years relevant experience as a plastics welder
- completed a nationally approved theoretical and practical training course, followed by at least six months of on-the-job training supervised by a welder with a certificate in the relevant welding technique.

The minimum information on the documents of verification required to fulfil the above is:

Name, signature and address of candidate and
Welding processes and materials in which experience gained and

Name of organisation providing the apprenticeship plus signature of the representative person within the organisation or

Name of organisation(s) employing the candidate for minimum of two years plus signature of the representative person within the organisation.

A typical form indicating the information required is shown in Appendix I.

Heated Tool and Electrofusion Welding

Entry to the training courses (Modules 2-4) at entry level 1 requires normal physical and mental capability.

To enter at the higher level of 2, candidates will need to demonstrate that they are likely to pass the relevant test. This will normally be the case if at least one of the following conditions is met:

- a) at least two years relevant experience
- b) held a relevant plastics welder approval previously accepted under national standards
- c) completed a nationally approved theoretical and practical training course, followed by at least six months of on-the-job training supervised by a welder with a certificate in the relevant welding technique.

This information must be supplied by the candidate and must include the certificate or signed documentation of the training organisation or relevant company. The form shown in Appendix I can again be used.

General

Candidates shall have good command of the course language so they can successfully participate in the instruction part of the course. Candidates may enter the approval test after completion of the appropriate training.

3. INSTRUCTION PROGRAMME

The instruction programme consists of theoretical and practical exercises structured through Modules, Fig.1. Where appropriate, candidates can be trained and tested in a range of sub-sets between the various Modules. For example, a welder of PE may require training and testing in hot gas, heated tool and extrusion 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 Modules M1 to M3.

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 through the 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 M5.1 represent the 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 teaching staff to establish the sequence of exercises, both practical and theoretical, to ensure the candidate gains the required skills

to enable entry to the tests. Particular care is advised for the sequence of practical courses for hot gas welder training, because of the wrist fatigue involved.

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 and one theoretical test are performed. The test pieces to be welded are given by the standard EN 13067; the general rules for the approval test are given in Section II of this guideline.

4. TRAINING MODULES

The European course for plastics welders consists of modules M1 to M5:

M1	Hot Gas and Extrusion Welding
M2	Heated Tool Welding
M3	Electrofusion Welding
M4	Heated Tool and Electrofusion Welding of PE Water and Gas Pipe.
M5	Lining Membranes

4.1 MODULE M1 HOT GAS AND EXTRUSION WELDING OF PLASTICS

Module 1 provides theoretical and skills training in hot gas and extrusion welding for eight sub-groups. There are six practical training units for hot gas welding (P1.1-P1.6 in Table M1.1) to cover the relevant materials and process variants. The practical training is tailored to the relevant practical tests, (T1.1 to T1.6 shown in Table M1.2).

The time indicated in Table M1.1 is the minimum time required to train a candidate for entry to the practical test.

Candidates for the extrusion welding training, must first demonstrate their capability in hot gas welding (e.g. have achieved hot gas welder approval or have received appropriate hot gas welder training prior to examination), before receiving the extrusion welding practical training leading to the relevant test. The two extrusion welding exercises are indicated at P1.7 and P1.8 in Table M1.1. Completion of these exercises leads to the practical tests indicated in Table M1.2 (T1.7 and T1.8).

The theoretical training for this module contains instruction on plastics materials and then training on hot gas and extrusion welding, Table M1.3. The element on extrusion welding is only for those candidates taking the extrusion welding test option. The questions for the theoretical test will be selected for individual candidates, with extrusion welding questions only being given to those candidates seeking approval on this process.

The test units are given in Table M1.2; the test pieces (relevant to the test) shall be welded for evaluation by the PWE. *Practical tests can only be completed following completion by the candidate, of the relevant practical training element. The one exception is that the test for hot gas welding of PE can be taken following the hot gas practical welder training of PP. (The reverse is not possible).* Passing the approval test leads to the award of the EWF Certificate European Plastics Welder, endorsed for the relevant processes, sub-group(s) and range of approval in accordance with EN 13067.

The training elements will be composed by the training organisation, including appropriate breaks in the practical training to avoid the wrist fatigue possible with hot gas welding.

Table M1.1 Practical exercises for hot gas and extrusion welding

Practical Training Units		Content	Minimum Time, hours
Process	Material		
All		Introduction * – material identification, equipment, hand tools, weld preparation	1
P1.1 Hot gas high speed nozzle	PP	Practical – double V-butt weld	5
P1.2 Hot gas high speed nozzle	PE	Practical – double V-butt weld	5
P1.3 Hot gas round nozzle	PVC	Practical – V-butt weld	5
P1.4 Hot gas high speed nozzle	PVC	Practical – V-butt weld	5
P1.5 Hot gas high speed nozzle	PVDF	Practical – V-butt weld	5
P1.6 Hot gas high speed nozzle	ECTFE or PFA or FEP	Practical – V-butt weld	5
P1.7 Extrusion	PP	Practical – V-butt weld	5
P1.8 Extrusion	PE	Practical – V-butt weld	5

* Any single (or groups of) practical training in either hot gas or extrusion, must be preceded by this introductory unit – tailored to the relevant process.

Table M1.2 Test units for hot gas and extrusion welding

Test Units		EN 13067 Sub-group	Weld Form	Product Form and Thickness
Process ¹	Material			
T1.1 Hot gas high speed nozzle	PP	2.1	Double V-butt	Sheet, 10mm
T1.2 Hot gas high speed nozzle	PE	3.1	Double V-butt	Sheet, 10mm
T1.3 Hot gas round nozzle	PVC	1.1	V-butt	Sheet, 5mm
T1.4 Hot gas high speed nozzle	PVC	1.2	V-butt	Sheet, 5mm
T1.5 Hot gas high speed nozzle	PVDF	4.1	V-butt	Sheet, 4mm
T1.6 Hot gas high speed nozzle	ECTFE or PFA or FEP	5.1	V-butt	Sheet, 2.3mm
T1.7 Extrusion	PP	2.2	V-butt	Sheet, 10mm
T1.8 Extrusion	PE	3.2	V-butt	Sheet, 10mm

¹ Test pieces in accordance with EN 13067

Table M1.3 – Instruction units of the theoretical training relevant to hot gas and extrusion welding

Element	Themes and Keywords	Minimum Teaching Hours
1	<u>Materials technology of plastics</u> Introduction to thermoplastics (PP, PE, PVC, PVDF, ECTFE) Advantages and disadvantages of plastics Application examples	1
2	<u>Processing of thermoplastics</u> How plastics are made Production methods for semi-finished and finished products	1
3	<u>Welded joints and terminology</u> Joint type (e.g. butt, fillet) Symbols	0.5
4	<u>Basics of hot gas welding</u> Principles of welding Welding rod and tools Round versus high speed nozzles Joint preparation Critical parameters Temperature measurement of gas ⁽¹⁾	1
5	<u>Welding Rework</u>	0.5
6	<u>Health & Safety</u> Electric shock Burns and fires Fume control Basic personal protection Consequences of misapplying critical welding parameters	1
7	<u>Testing welds and joints</u> Visual inspection Bend test Tensile test	0.5
8	<u>Weld imperfections</u> Type of imperfections Origins of imperfections Effect of imperfections on performance Acceptance criteria	0.5
9	<u>Documentation</u> Weld Procedure Specification Completing Welding Reports Awareness of standards (where available)	1
10	<u>Basics of extrusion welding</u> * Welding tools Shoe shaping Temperature measurement (extrudate and gas) ⁽²⁾ Environment (temperature and humidity)	1
	<u>TOTAL</u>	7 (or 8 including extrusion element)

* This element is only for those candidates wishing to take the extrusion welding test.

(1) Measurement by thermocouple approximately 5mm inside the nozzle.

(2) Extrudate temperature measurement at the extrudate outlet of the welding extruder. Gas temperature measurement between plane of nozzle outlet and 5mm inside the nozzle.

The main subjects in the shaded elements are common to all theoretical training modules, but the times devoted to them may differ.

4.2 MODULE M2 HEATED TOOL WELDING OF PLASTICS

Module 2 provides theoretical and skills training in machine heated tool welding.

There are two practical training units, P2.1 and P2.2, devoted to training on sheets (which can be taken singly or together) leading to separate practical tests in the relevant materials (four sub-groups). The practical training units are given in Table M2.1, and show the minimum time required to train for the test units for novices and experienced individuals.

There are four practical training units, P2.3-P2.5 and P2.7, all devoted to training on manual machines (which can be taken singly or in groups) leading to separate practical tests in the relevant materials/process variants/ product forms (eight sub-groups). The practical training units are given in Table M2.1, and show the minimum time required to train for the test units for novices and experienced individuals.

A further training unit, P2.6, also on manual equipment but at a larger pipe diameter can only be taken when the candidate has either passed a specific approval test (T2.5 or T2.6 for either PP or PE) or has completed the practical training unit, P2.3, for the smaller diameter pipe and the theoretical training.

There are three practical training units, P2.8, P2.9 and P2.11, all devoted to training on semi-automatic machines (which can be taken singly or in groups) leading to separate practical tests in the relevant materials/process variants/product forms (five sub-groups). The practical training units are given in Table M2.1, and show the minimum time required to train for the test units for novices and experienced individuals.

A further training unit, P2.10, also on semi-automatic machines but at a larger pipe diameter can only be taken when the candidate has either passed a specific approval test (T2.15 or T2.16 for either PP or PE) or has completed the practical training unit, P2.8, for the smaller diameter pipe and the theoretical training.

The test units are given in Table M2.2; the test pieces shall be welded by the candidate for evaluation by the PWE. Candidates may take one or more practical tests.

The theoretical training for this module contains instruction in plastics materials and then training on heated tool welding. The themes and keywords are shown in Table M2.3 with the minimum teaching hours for entry levels 1 and 2.

Passing the approval test leads to the award of the EWF Certificate European Plastics Welder, endorsed for the relevant processes, sub-group(s) and range of approval in accordance with EN 13067. **The certificate must indicate the type of machine (manual or semi-automatic) on which the heated tool practical tests were undertaken.**

Candidates trained on a manual machine may enter approval tests for either manual or semi-automatic machines, however a pass on a manual machine automatically qualifies the candidate for semi-automatic and automatic welding.

The Module also covers training and approval tests on semi-automatic machines. Candidates trained on semi-automatic machines may only enter approval tests for semi-automatic machines, which will qualify them for welding using semi-automatic or fully automatic machines BUT NOT manual machines.

Table M2.1 Practical exercises for heated tool welding of thermoplastics.

Practical Training Unit	Material	Instruction Unit	Minimum time, hours		Entry to following Test Units (EN 13067 sub-groups)
			Entry Level 1	Entry Level 2	
		Introduction*: material identification, equipment, joint preparation	3	0.5	
P2.1	PP or PE sheet	[[machine	1	0.5	T2.1 (2.3) T2.2 (3.3)
P2.2	PVC sheet	[[machine	1	0.5	T2.3 (1.3) T2.4 (4.2)
P2.3	PP or PE pipe (diameter ≤315mm)	[[manual machine	2	0.5	T2.5 (2.4 manual) T2.6 (3.4 manual) T2.7 (4.3 manual) T2.15 (2.4 semi-automatic) T2.16 (3.4 semi-automatic) T2.17 (4.3 semi-automatic)
P2.4	PP or PE pipe	Socket machine	1	0.5	T2.11 (2.6) T2.12 (3.9) T2.13 (4.4)
P2.5	PE pipe	Saddle manual machine	1	0.5	T2.14 (3.10 manual) T2.21 (3.10 semi-automatic)
P2.6	PP or PE pipe (diameter >315mm)	[[manual machine	2	0.5	T2.9 (2.5 manual) T2.10 (3.5 manual) T2.19 (2.5 semi-automatic) T2.20 (3.5 semi-automatic)
P2.7	ECTFE or FEP or PFA pipe	[[manual machine	2	1	T2.8 (5.2 manual) T2.18 (5.2 semi-automatic)
P2.8	PP or PE pipe (diameter ≤315mm)	[[semi-automatic machine	2	0.5	T2.15 (2.4 semi-automatic) T2.16 (3.4 semi-automatic) T2.17 (4.3 semi-automatic)
P2.9	PE pipe	Saddle semi-automatic machine	1	0.5	T2.21 (3.10 semi-automatic)
P2.10	PP or PE pipe (diameter >315mm)	[[semi-automatic machine	2	0.5	T2.19 (2.5 semi-automatic) T2.20 (3.5 semi-automatic)
P2.11	ECTFE or FEP or PFA	[[semi-automatic machine	2	1	T2.18 (5.2 semi-automatic)

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

Table M2.2 Test units for heated tool welding of thermoplastics.

Test Unit ¹	Material	Weld form	Type of product	EN13067 sub-group
T2.1	PP	]] machine	Sheet 10mm	2.3
T2.2	PE	]] machine	Sheet 10mm	3.3
T2.3	PVC	]] machine	Sheet 5mm	1.3
T2.4	PVDF	]] machine	Sheet 4mm	4.2
T2.5	PP	]] manual machine	Pipe 110mm diameter, SDR17.6	2.4 manual
T2.6	PE	]] manual machine	Pipe 110 or 180mm diameter, SDR11 or 17.6	3.4 manual
T2.7	PVDF	]] manual machine	Pipe 110mm diameter, 5.3mm wall	4.3 manual
T2.8	ECTFE or PFA or FEP	]] manual machine	Pipe 110mm diameter, 3mm wall	5.2 manual
T2.9	PP	]] manual machine	Pipe ≥400mm diameter, SDR ≤17.6	2.5 manual
T2.10	PE	]] manual machine	Pipe ≥400mm diameter, SDR ≤17.6	3.5 manual
T2.11	PP	Socket machine	Pipe 63mm diameter, SDR11	2.6
T2.12	PE	Socket machine	Pipe 63mm diameter, SDR11	3.9
T2.13	PVDF	Socket machine	Pipe 63mm diameter, 3mm wall	4.4
T2.14	PE	Saddle manual machine	Pipe 32 on 90mm diameter, SDR11	3.10 manual
T2.15	PP	]] semi-automatic machine	Pipe 110mm diameter, SDR17.6	2.4 semi-automatic
T2.16	PE	]] semi-automatic machine	Pipe 110 or 180mm diameter, SDR11 or 17.6	3.4 semi-automatic
T2.17	PVDF	]] semi-automatic machine	Pipe 110mm diameter, 5.3mm wall	4.3 semi-automatic
T2.18	ECTFE or PFA or FEP	]] semi-automatic machine	Pipe 110mm diameter, 3mm wall	5.2 semi-automatic
T2.19	PP	]] semi-automatic machine	Pipe ≥400mm diameter, SDR ≤17.6	2.5 semi-automatic
T2.20	PE	]] semi-automatic machine	Pipe ≥400mm diameter, SDR ≤17.6	3.5 semi-automatic
T2.21	PE	Saddle semi-automatic machine	Pipe 32 on 90mm diameter, SDR11	3.10 semi-automatic

¹ Test pieces in accordance with EN 13067

Table M2.3 – Instruction units of the theoretical training relevant to heated tool welding

Element	Themes and Keywords	Minimum Teaching Hours (Entry Level 1)	Minimum Teaching Hours (Entry Level 2)
1	<u>Materials technology of plastics</u> Introduction to thermoplastics (PP, PE, PVC, PVDF, ECTFE relevant to candidate's needs) Advantages and disadvantages of plastics Applications of plastics	3	1
2	<u>Processing of Thermoplastics</u> How plastics are made Production methods for semi-finished and finished products	2	1
3	<u>Welded Joints and Terminology</u> Joint types Symbols	1	0.5
4	<u>Basics of heated tool butt welding</u> Principles of welding Joint preparations Semi and fully automatic equipment Welding parameters	1	0.5
5	<u>Basics of socket and saddle welding</u> Principles of socket welding Principles of saddle welding Joint preparations Welding parameters	1	0.5
6	<u>Application of heated tool welding</u> Effect of material Welding of sheet and pipe Non contact welding Selection of heated tool butt, socket and saddle welding	1	1
7	<u>Health & Safety</u> Burns and fires Fume control Safe lifting/handling Basic personal protection Consequences of misapplying critical welding parameters	2	1
8	<u>Testing welds and joints</u> Visual inspection Bend test Tensile test	1	0.5
9	<u>Weld imperfections</u> Types of imperfection Origins of imperfections Effect of imperfections on performance Acceptance criteria	2	0.5
10	<u>Documentation</u> Weld Procedure Specification Completing welding reports Manual and automatic reports Awareness of standards (where available)	2	1
	<u>TOTAL HOURS</u>	16	7.5

The main subjects in the shaded elements are common to all theoretical training modules, but the times devoted to them may differ.

4.3 MODULE M3 ELECTROFUSION WELDING OF PLASTICS

Module M3 provides theoretical and skills training in electrofusion welding.

There are three practical training units leading to separate practical tests. The practical training units are given in Table M3.1 (P3.1-P3.3) and show the minimum time required to train for the test units, for novices (Entry Level 1) and experienced individuals (Entry Level 2).

Training unit P3.3, on large diameter pipe, can only be taken when the candidate has either passed approval test T3.2 or has completed the practical training unit P3.1, for the smaller diameter pipe and the theoretical training.

The test units are given in Table M3.2; the test pieces shall be welded by the candidate for evaluation by the PWE. Candidates may take one or more practical tests.

The theoretical training for this module contains instruction in plastics materials and then training on electrofusion welding. The themes and keywords are shown in Table M3.3 with the minimum teaching hours for Entry Levels 1 and 2.

Passing the approval tests leads to the award of the EWF Certificate European Plastics Welder, endorsed for the relevant processes, sub-group(s) and range of approval in accordance with EN 13067.

Table M3.1 – Practical exercises for electrofusion welding of thermoplastics.

Practical Training Unit	Material	Instruction Unit	Minimum time, hours		Entry to following Test Units (EN 13067 sub-groups)
			Entry Level 1	Entry Level 2	
		Introduction*: material identification, equipment, joint preparation	3	0.5	
P3.1	PP or PE pipe (diameter ≤225mm)	Socket	3	1	T3.1 (2.7) T3.2 (3.6)
P3.2	PE pipe	Saddle	3	1	T3.4 (3.8)
P3.3	PE pipe (diameter >180mm)	Socket	2	1	T3.3 (3.7)

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

Table M3.2 –Test pieces for electrofusion welding of thermoplastics.

Test Unit ¹	Material	Weld form	Type of product	EN 13067 sub-group
T3.1	PP	Socket	Pipe 63mm diameter, SDR11	2.7
T3.2	PE	Socket	Pipe 90mm diameter, SDR11	3.6
T3.3	PE	Socket	Pipe 315mm diameter, SDR17.6	3.7
T3.4	PE	Saddle	Pipe 32 on 90mm diameter, SDR11	3.8

¹ Test pieces in accordance with EN 13067

Table M3.3 – Instruction units of the theoretical training relevant to electrofusion welding

Element	Themes and Keywords	Minimum Teaching Hours (Entry Level 1)	Minimum Teaching Hours (Entry Level 2)
1	<u>Materials technology of plastics</u> Introduction to thermoplastics (PP, PE and PVC) Advantages and disadvantages of plastics Applications of plastics	3	1
2	<u>Processing of Thermoplastics</u> How plastics are made Production methods for semi-finished and finished products	2	1
3	<u>Welded Joints and Terminology</u> Joint types Symbols	1	0.5
4	<u>Basics of electrofusion welding</u> Principles of welding Joint preparations Welding parameters	1	0.5
5	<u>Basics of socket and saddle welding</u> Principles of socket welding Principles of saddle welding Joint preparations Welding parameters	1	0.5
6	<u>Application of electrofusion welding</u> Effect of material Selection of socket and saddle welding	1	1
7	<u>Health & Safety</u> Burns and fires Fume control Safe lifting/handling Basic personal protection Consequences of misapplying critical welding parameters	2	1
8	<u>Testing welds and joints</u> Visual inspection Peel test	1	0.5
9	<u>Weld imperfections</u> Types of imperfection Origins of imperfections Effect of imperfections on performance Acceptance criteria	2	0.5
10	<u>Documentation</u> Weld Procedure Specification Completing welding reports Manual and automatic reports Awareness of standards (where available)	2	1
	<u>TOTAL HOURS</u>	16	7.5

The main subjects in the shaded elements are common to all theoretical training modules, but the times devoted to them may differ.

4.4 MODULE M4 HEATED TOOL AND ELECTROFUSION WELDING OF PE WATER AND GAS PIPE

Module M4 provides theoretical and skills training specific to heated tool and electrofusion welding (mostly on site) of PE water and gas pipe.

There is one level providing theoretical and practical training leading to examinations in heated tool and electrofusion welding for small diameter pipes (up to 315mm and 225mm for heated tool and electrofusion respectively); then a further level with practical training only leading to practical tests in both processes for large diameter pipe (greater than 315mm and 180mm for heated tool and electrofusion respectively).

The practical training units are given in Table M4.1 (a and b) and show the minimum time required to train for the test, for novices (Entry Level 1) and experienced individuals (Entry Level 2).

Candidates trained on manual machines may enter approval tests for either manual or semi-automatic machines, however a pass on manual machines automatically qualifies the candidate for semi-automatic and automatic welding.

The Module also covers training and approval tests on semi-automatic machines. Candidates trained on semi-automatic machines may only enter approval tests for semi-automatic machines, which will qualify them for welding using semi-automatic or automatic machines BUT NOT manual machines.

The test units are given in Table M4.2; the test pieces have to be welded by the candidate for evaluation by the PWE. Candidates are expected to take all tests relevant to the water and gas industry. However, individual practical tests can be undertaken and the approval will then be specific to those tests passed.

The theoretical training for this module contains instruction in plastics materials and PE in particular, then training in both heated tool and electrofusion welding. The themes and keywords are shown in Table M4.3 with the minimum teaching hours for Entry Levels 1 and 2.

Passing the approval test leads to the award of the EWF Certificate European Plastics Welder, endorsed for the relevant processes, sub-group(s) and range of approval in accordance with EN 13067.

The certificate must indicate the type of machine (i.e. manual or semi-automatic) on which the heated tool practical tests were undertaken.

Table M4.1 – Practical exercises for heated tool and electrofusion welding of PE pipes.

a) Diameters $\leq 315\text{mm}$ for heated tool and $\leq 225\text{mm}$ for electrofusion.

Practical Training Unit	Pipe dimensions	Instruction Unit	Minimum time, hours		Entry to following Test Units (EN 13067 sub-groups)
			Entry Level 1	Entry Level 2	
		Introduction*: material identification, equipment, joint preparation	4	1	
P4.1	Diameter $\leq 315\text{mm}$	II manual machine	2	1	T4.1 (3.4 manual) T4.2 (3.4 semi-automatic)
P4.2	Diameter $\leq 315\text{mm}$	II semi-automatic machine	1	0.5	T4.2 (3.4 semi-automatic)
P4.3	Diameter $\leq 225\text{mm}$	Electrofusion socket	3	1	T4.3 (3.6)
P4.4	All	Electrofusion saddle	3	1	T4.4 (3.8)

* Any single (or group of) practical training in the various processes must be preceded by the introduction unit – tailored to the relevant process(es).

b) Diameters $> 315\text{mm}$ for heated tool and $> 180\text{mm}$ for electrofusion.

Practical Training Unit	Pipe dimensions	Instruction Unit	Minimum time, hours		Entry to following Test Units (EN 13067 sub-groups)
			Entry Level 1	Entry Level 2	
		Introduction†: material identification, equipment, joint preparation	1	1	
P4.5	Diameter $> 315\text{mm}$	II manual machine	3	1	T4.5 (3.5 manual) T4.6 (3.5 semi-automatic)
P4.6	Diameter $> 315\text{mm}$	II semi-automatic machine	2	0.5	T4.6 (3.5 semi-automatic)
P4.7	Diameter $> 180\text{mm}$	Electrofusion socket	3	1	T4.7 (3.7)

† Training can be conducted in heated tool or electrofusion welding or both, in all cases the introduction unit must be included.

Table M4.2 –Test units for heated tool and electrofusion welding of PE pipes.

Test Unit ¹	Weld form	Type of pipe product	EN13067 sub-group
T4.1	[[manual machine	110 or 180mm diameter, SDR11 or 17.6	3.4 manual
T4.2	[[semi-automatic machine	110 or 180mm diameter, SDR11 or 17.6	3.4 semi-automatic
T4.3	Electrofusion socket	90mm diameter, SDR11	3.6
T4.4	Electrofusion saddle	32 on 90mm diameter, SDR11	3.8
T4.5	[[manual machine	≥400mm diameter, SDR≤17.6	3.5 manual
T4.6	[[semi-automatic machine	≥400mm diameter, SDR≤17.6	3.5 semi-automatic
T4.7	Electrofusion socket	315mm diameter, SDR17.6	3.7

¹ Test pieces in accordance with EN 13067

Table M4.3 – Instruction units of the theoretical training relevant to heated tool and electrofusion welding of PE pipe

Element	Themes and Keywords	Minimum Teaching Hours (Entry Level 1)	Minimum Teaching Hours (Entry Level 2)
1	<u>Materials technology of plastics</u> Introduction to thermoplastics Advantages and disadvantages of plastics Basics of PE Applications of PE	2	1
2	<u>Processing of Thermoplastics</u> How plastics are made Production methods for semi-finished and finished products	2	1
3	<u>Welded Joints and Terminology</u> Joint types Symbols	1	0.5
4	<u>Basics of heated tool butt welding</u> Principles of welding Joint preparations Welding parameters	1	0.5
5	<u>Basics of electrofusion welding</u> Principles of welding Joint preparations Welding parameters	1	0.5
6	<u>Basics of electrofusion socket and saddle welding</u> Principles of socket welding Principles of saddle welding Joint preparations Welding parameters	1	0.5

Element	Themes and Keywords	Minimum Teaching Hours (Entry Level 1)	Minimum Teaching Hours (Entry Level 2)
7	<u>Application of welding process</u> Effect of PE grade Selection of heated tool and electrofusion welding	0.5	0.5
8	<u>Health & Safety</u> Burns and fires Fume control Safe lifting/handling Basic personal protection Consequences of misapplying critical welding parameters	2	1
9	<u>Site Working</u> Cleaning procedures Weather protection Storage of materials	1	0.5
10	<u>Testing welds and joints</u> Visual inspection Bend test Peel test Tensile test	1	0.5
11	<u>Weld imperfections</u> Types of imperfection Origins of imperfections Effect of imperfections on performance Acceptance criteria	2	0.5
12	<u>Documentation</u> Weld Procedure Specification Completing welding reports Manual and automatic reports Awareness of standards (where available)	2	1
	TOTAL HOURS	16.5	8

The main subjects in the shaded elements are common to all theoretical training modules, but the times devoted to them may differ.

4.5 MODULE M5 WELDING OF LINING MEMBRANES

Module M5 provides theoretical and skills training in welding of lining membranes.

There are eight practical training units leading to separate practical tests. The practical training units are given in Table M5.1 (P5.1-P5.8) and show the minimum time required to train for the test units.

The test units are given in Table M5.2; the test pieces have to be welded by the candidate for evaluation by the PWE. Candidates may take one or more practical tests.

The theoretical training for this module contains instruction in plastics materials and then training in those processes relevant to lining membranes. The themes and keywords are shown in Table M5.3 with the minimum teaching hours.

Passing the approval tests leads to the award of the EWF Certificate European Plastics Welder, endorsed for the relevant processes, sub-groups and range of approval in accordance with EN 13067.

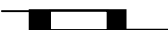
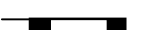
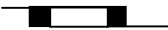
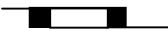
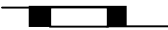
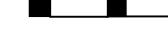
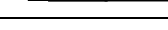
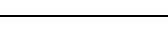
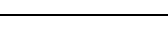
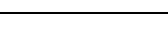
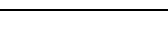
Table M5.1 – Practical exercises for welding of lining membranes.

Process	Material	Minimum time	Entry to the following Test Units (EN 13067 Sub-groups)
		Hours	
Introduction*: material identification, equipment, joint preparation		1	
P5.1 Hot gas manual	PVC-P	2	T5.1 (6.1)
P5.2 Hot gas manual	PE	2	T5.5 (7.1) T5.14†
P5.3 Hot gas by machine	PE or PVC-P or ECB	1	T5.2 (6.2) T5.6 (7.2) T5.11 (8.2) T5.15†
P5.4 Heated wedge by hot gas	PE or PVC-P or ECB	2	T5.3 (6.3) T5.7 (7.3) T5.12 (8.3) T5.16†
P5.5 Heated wedge electric	PE or PVC-P or ECB	1	T5.4 (6.4) T5.8 (7.4) T5.13 (8.4) T5.17†
P5.6 Extrusion manual	PE	4	T5.9 (7.5)
P5.7 Hot gas manual	ECB	2	T5.10 (8.1)
P5.8 Extrusion manual	PP	4	T5.18†

* Any single (or group of) practical training in the various materials must be preceded by the introduction unit – tailored to the relevant processes/materials.

† Although not in EN 13067, the training relevant to PP is included in the Guideline for circumstances where it may be needed.

Table M5.2 –Test units for welding of lining membranes

Sub-group ¹	Material	Welding Method	Weld Form	EN 13067 Sub-group
T5.1	PVC-P	Hot gas manual		6.1
T5.2	PVC-P	Hot gas by machine		6.2
T5.3	PVC-P	Heated wedge by hot gas		6.3
T5.4	PVC-P	Heated wedge electric		6.4
T5.5	PE	Hot gas manual		7.1
T5.6	PE	Hot gas by machine		7.2
T5.7	PE	Heated wedge by hot gas		7.3
T5.8	PE	Heated wedge electric		7.4
T5.9	PE	Extrusion manual		7.5
T5.10	ECB	Hot gas manual		8.1
T5.11	ECB	Hot gas by machine		8.2
T5.12	ECB	Heated wedge by hot gas		8.3
T5.13	ECB	Heated wedge electric		8.4
T5.14	PP	Hot gas manual		N/A
T5.15	PP	Hot gas by machine		N/A
T5.16	PP	Heated wedge by hot gas		N/A
T5.17	PP	Heated wedge electric		N/A
T5.18	PP	Extrusion manual		N/A

¹ Test pieces in accordance with EN 13067

N/A = not applicable

Table M5.3 – Instruction units of the theoretical training relevant to welding lining membranes

Element	Themes and Keywords	Minimum Teaching Hours
1	<u>Materials technology of plastics</u> Introduction to thermoplastics (PP, PE, PVC, ECB as relevant to the candidate's needs) Applications of plastics	1
2	<u>Processing of Thermoplastics</u> How plastics are made Production methods for semi-finished and finished products	1
3	<u>Welded Joints and Terminology</u> Joint types Symbols	0.5
4	<u>Basics of hot gas welding</u> Principles of welding Manual and machine welding Joint preparations Welding parameters	0.5
5	<u>Basics of heated wedge welding</u> Principles of wedge welding Hot gas and electric wedge Joint preparations Welding parameters	0.5
6	<u>Basics of extrusion welding</u> Principles of extrusion welding Joint preparation Welding parameters	1
7	<u>Health & Safety</u> Burns and fires Fume control Safe lifting/handling Basic personal protection Consequences of misapplying critical welding parameters	1
8	<u>Site Working</u> Cleaning procedures Weather protection Storage of materials	0.5
9	<u>Testing welds and joints</u> Visual inspection Peel test Spark test Pressure test	0.5
10	<u>Weld Quality</u> Types of imperfection Origins of imperfections Effect of imperfections on performance Acceptance criteria	0.5
11	<u>Documentation</u> Weld Procedure Specification Completing welding reports Manual and automatic reports Awareness of standards (where available)	1
	<u>TOTAL HOURS</u>	8

The main subjects in the shaded elements are common to all theoretical training modules, but the times devoted to them may differ.

Section II: Minimum Requirements for Examination and Certification

1. INTRODUCTION

This guideline seeks to achieve harmonisation and common standards in training, examination, testing and certification of professional plastics welders in Europe. The national welding and joining organisations, being members of the EWF, mutually acknowledge the Certification awarded by any Authorised National Body approved to implement this Guideline. This "Authorised National Body" (ANB) will normally be the National Welding and Joining Organisation, but may be another organisation with the agreement of the EWF Member.

Education must have followed this EWF guideline "European Plastics Welders" Section I, and the examination and approval tests must have been conducted by the National Body authorised by the EWF for this purpose.

The training and approval testing 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 tests.

2. APPROVAL OF THE TRAINING COURSE

Any training course leading to the EWF examination must be approved by the Authorised National Body, in accordance with EOTC/AG-15/97/001/416.

2.1 PLASTICS WELDING INSTRUCTOR

A Plastics Welding Instructor must have:

- Three years welding experience relevant to the training module.
- Passed the relevant test(s) for which he/she will be instructing. If an instructor has passed the test in a key category he/she can instruct in more than one category, see below:

Test	Practical Instruction Units
PP hot gas high speed nozzle	P1.1, P1.2
PVC hot gas high speed nozzle	P1.1, P1.2, P1.3, P1.4
PVDF hot gas high speed nozzle	P1.1, P1.2, P1.3, P1.4, P1.5, P1.6
PP extrusion	P1.7, P1.8
PE manual heated tool butt pipe weld >315mm	P2.3, P2.6, P2.8, P2.10, P4.1, P4.2
PVC-P heated wedge by hot gas	P5.3, P5.4, P5.5

- Approval of the ANB to undertake the training modules.

3. BOARD OF EXAMINERS

The Chairman and members of the Board of Examiners shall be nominated by the Authorised National Body. The Board of Examiners shall consist of:

- Main teachers of the subject.
- Experts from industry or other organisations.
- ANB representative

The Chairman shall be a representative of the Authorised National Body, and shall be independent from the training centre.

The responsibilities of the Board of Examiners are:

- approval of the PWE(s)
- approval of the training centre and course material
- approval of the trainer(s)
- approval of theoretical test papers.

4. PLASTICS WELDING EXAMINER

The Plastics Welding Examiner is a person approved by the ANB on the recommendation of the relevant Board of Examiners. The Board of Examiners must specify the range of modules/tests/sub-groups, the PWE is approved to examine, with due recognition of his/her 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 system. It is not necessary for the PWE to have passed relevant tests himself/herself.

The duties of the PWE are:

- to check the identity of the candidate, the test house approval and, where applicable, the training centre
- to check the materials, WPS, machines and equipment available for the test
- to supervise the theoretical test
- to supervise the welding of the test piece
- to visually check the test piece after completion by the welder
- to select test pieces for the specified test at an approved test house
- to reach his/her professional decisions independently
- to mark the test piece selected for testing with the number or mark of the PWE and the welder
- to 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
- to evaluate the test results.

The PWE must not examine any candidate that he/she has trained himself/herself.

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.

Errors made or occurring during the hot gas or extrusion welding may be repaired only after permission has been given by the PWE. This repair should be duly noted by the PWE on the WPS.

5. ADMISSION TO THE TEST

Admission to the test leading to the award of the European Plastics Welder certificate will be restricted to those who fulfil the access conditions defined in Section I Clause 2, and who have successfully completed the relevant course.

6. TEST PROCEDURES

The approval test comprises both the theoretical test and relevant practical test(s).

Theoretical Test

The theoretical test 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 Plastics Welding Examiner shall sign all completed papers to confirm that the test has been conducted in a proper manner.

Practical Test

The candidate shall weld the required test piece(s) for each sub-group under the supervision of the PWE, and shall complete the welding record sheet(s) controlled and witnessed by the PWE.

7. EVALUATION OF TEST RESULTS

The evaluation of test results shall be in accordance with EN 13067.

8. RE-TEST AND APPEALS PROCEDURE ARE COVERED BY DOC EWF 416

9. EUROPEAN PLASTICS WELDERS CERTIFICATE AND/OR IDENTITY CARD

After successful practical and theoretical examination a certificate and/or identity card, endorsed for the relevant sub-group according to EN 13067 is awarded to the candidate by the Authorised National Body.

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

- welder full name
- date, place and country of birth
- clear photograph of good likeness
- reference to EN 13067 and the group of materials and sub-group number(s) of approval test passed
- date of overall assessment pass
- date of issue
- date of validity
- issuing authority (full name and address and individual certificate identification number).

Those approved as "European Plastics Welder" may be called European Plastics Welder in the national language and use the professional designation "EPW" (invariable in all member countries). This professional designation must be accompanied by the relevant range of approval, and, for heated tool welding, state whether manual or semi-automatic.

An example of an Approval Test Certificate and Identity Card (optional) are shown in Appendix II.

10. PERIOD OF VALIDITY OF APPROVAL

Initial Approval

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

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

- a. the welder shall be engaged with reasonable continuity on welding work within the range of approval corresponding to the approval 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 under which the approval test certificate is awarded.

Prolongation of Approval

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

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 test results from an independent test house on specimens taken from a test piece made according to EN 13067, relevant to the category or categories being submitted for prolongation.

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

10.1 PERIOD OF VALIDITY OF TEST CERTIFICATE

Approval test certificates have a period of validity of one year. A new certificate shall be awarded annually, provided that the approval is maintained in accordance with the above.

11. APPROVAL TEST CERTIFICATE RENEWAL

An approval test taken within three months of the expiry date of the test certificate shall commence from that date of expiry.

12. 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 will be eligible for the award of the Approval Test Certificate if they have passed a theoretical and practical test in accordance with EN 13067 or a test 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 his/her 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 certificate.

APPENDIX I

**SUGGESTED FORM FOR ACCEPTANCE
ONTO PLASTICS WELDER
TRAINING COURSES**

EWF Plastics Welder Certification – Experience Checklist

Name:

Company:

Address:

Welding technique		How many year experience do you have in this welding technique?	What percentage of your time is spent welding using this technique?	Which materials do you have welding experience with (please underline the material(s) you most commonly work with)?	Which sheet thickness(es)/pipe diameter(s) do you work with?
Sheet	Hot gas round nozzle				
	Hot gas high speed nozzle				
	Extrusion				
	Heated tool				
Pipe	Heated tool				
	Socket fusion				
	Electrofusion socket				
	Electrofusion saddle				
Lining Membrane	Hot gas manual				
	Hot gas by machine				
	Heated wedge				
	Extrusion				

Does your company have written Welding Procedures for the techniques you have ticked above?

YES/NO (delete as applicable)

Signed: (Welder)

Signed: (Company Representative)

Job Title

Name: Job Title

APPENDIX II

EXAMPLE OF
EWF APPROVAL TEST CERTIFICATE
AND IDENTITY CARD (OPTIONAL)



Approval Test Certificate

ANB Logo

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

CERT No 7633/2

This is to certify that:

[Name of Welder]

Date of birth

Photo of Welder (if an
Identity Card is not
issued).

has demonstrated proficiency as a European Plastics Welder in accordance with the requirements published in Document No EWF 581-01 and amendments in force on the examination date. This certificate is valid for the special categories mentioned below:

Lining membrane welding

7.4 Heated wedge electric welding of PE lining membrane

7.5 Extrusion welding of PE lining membrane

Date of issue 13 June 2003

Date of expiry 10 June 2004

EXAMINER

Signed _____

SIGNATURE OF HOLDER

(Person named above) _____ Date _____

PLEASE READ THE NOTES OVERLEAF

Photocopies are unauthorised

Issued by:

(ANB)

(REVERSE OF APPR OVAL TEST CERTIFICATE)

THIS IS A VALUABLE DOCUMENT WHICH SHOULD BE KEPT IN A SAFE PLACE. A FEE WILL BE CHARGED FOR DUPLICATES WHICH WILL ONLY BE ISSUED AFTER EXTENSIVE ENQUIRIES.

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. This certificate does not constitute such approval which should be sought from the authority concerned.
2. Validity. Certificates are valid only if: a) they are within date; b) all fees have been paid; c) they are on standard cream [ANB] paper bearing the [ANB] logo, signed by an official of [ANB] and embossed with the [ANB] stamp; d) they are signed by the individual to whom the certificate is awarded.
The approval shall remain valid for the two year period providing that all the following conditions are fulfilled:

- a) the welder shall be engaged with reasonable continuity on welding work within the current range of approval corresponding to the certification. An interruption for a period no longer than 6 months is permitted. The manufacturer shall advise the [ANB] at twelve monthly intervals that this is the case.
- b) the welder's work shall be in general accordance with the technical conditions under which the approval test was carried out.
- c) there shall be no specific reason to question the welder's knowledge and skill.

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

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

- d) the [ANB] is advised before the expiry date that extension is sought.
- e) proof of welding quality is forwarded to the [ANB]
- f) 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 approval test.

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:

[Address of ANB]

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

Identity Card

Photo of Welder	ANB Logo	
European Plastics Welder <Name of holder> <Categories held> <Expiry date>		<ANB Address>
This card is the property of the <ANB> and must be surrendered on demand. It is not valid without the EWF Approval Test Certificate		