

EWF Special courses

WELDING REINFORCING BARS



Minimum Requirements for the Education, Examination and Qualification



Special Course for Welding Reinforcing Bars at the Specialist Level

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Section I: Minimum Requirements for the Education

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The use of this guideline is restricted to organisations approved by the Authorised National Body (ANB).

1 Introduction

This guideline for the European education and training in Welding Reinforcing Bars at the specialist level has been prepared, evaluated and formulated by Members of the Committee for Education and Training of the EWF. It is designed to provide the supplementary education in welding technology required for job functions in welding of reinforcing bars. The EU in the frame of the Leonardo da Vinci program has funded this comprehensive work.

The guideline covers the minimum requirements for education and training, agreed upon by all national welding societies within the EWF in terms of objectives, keywords and recommended 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". Students having successfully completed this course of education will be expected to be capable of applying welding technology as covered by this guideline. A subsequent document covers the examination and certification.

The contents are given in the following structure:

Theoretical Education	teaching hours
1. Introduction	2
2. Welding processes and equipment	2
3. Materials and their behaviour during welding	4
4. Construction and design	4
5. Fabrication, applications engineering and safety	4

	16
6. Practical demonstrations	4

Total	20

A teaching hour will contain at least 50 minutes of direct teaching time. It is not obligatory to follow exactly the order of the topics given in this guideline and choice in the arrangements of the syllabus is permitted. The depth to which each topic is dealt with is indicated by the recommended number of hours allocated to it in the Guideline. This will be reflected in the scope and depth of the examination.

2 Access to the Education

For the entry to the program, proper education according to EWE, EWT, EWS or EWP Guidelines or equivalent is recommended.

3 Theoretical supplementary education for Welding Reinforcing Bars

The module for Welding Reinforcing Bars aims at teaching technical knowledge in the specific field of welding reinforcing steels supplementary to existing basic knowledge in welding.

The module deals with the following subjects:

Subject

Hours

1. Introduction.....recommended number of hours: 2

Objective: To have knowledge of the basics of welding, the structure of the EWF and the job function of experts for Welding Reinforcing Bars in relation to EN standards.

Scope:

Survey on the contents of this course,

Repeat of basic knowledge,

Information on the EWF and its education and training system,

Job function of the experts for Welding Reinforcing Bars in relation to EN standards.

Result: Apply the basics of welding knowledge as far as related to the welding reinforcing bars.

Be aware of the function of the EWF and its activities and work with the relevant EN standards.

2. Welding processes and equipment for welding reinforcing steelrec. nr of hours: 2

Objective: To have knowledge on the basics of welding processes and equipment operating in the field of welding reinforcing steel.

Scope:

Basics of MMA (111), MIG/MAG (13x) and resistance welding (2xx),

Setting of machine data,

Effect of welding parameters,

Welding consumables for welding processes: MMA (111), MIG/MAG (13x).

Result: Identify the required welding process for a specific job, to adjust the machine settings so as to guarantee a sound connection. Select the desired welding consumables for a specific job.

3. Materials and their behaviour during welding;

Steel types for reinforcing.....recommended number of hours: 4

Objective: To have knowledge of the specific properties of materials related to the welding of reinforcing steel.

Scope:

Designation of steels,

Surfaces to be welded,

Properties of reinforcing steels,

The effect of heat on these steels,

Preheating in respect to bar diameter and material,

Welding dissimilar, low alloyed metals,

Weldability.

Result: Explain the designation of steels, identify the surfaces to be welded and know the effect of heat on those materials. Setting the requirements for preheating and for welding dissimilar low alloyed metals.

4. Construction and design in reinforcing steelrecommended number of hours: 4

Objective: To have an understanding of the specific construction details for welding reinforcing steel.

Scope:

Types of joints used (butt, lap, and cruciform),

Direct and indirect loading.

Result: Identify the most suitable type of joint used. Discuss the limits of weldability and give examples of direct and indirect loading.

5. Fabrication, applications engineering and safetyrecommended number of hours: 4

Objective: To have knowledge about the quality requirements as set forth in the relevant European and national Standards. He or she should be aware of the current safety requirements.

Scope:

Quality requirements to EN 729,

Welders approval testing to EN 287,

Welding Procedure Specification to EN 288,

Welding procedure approval testing to EN 288,

Safety requirements for welding reinforcing steels,

National standards.

Result: Demonstrate knowledge of the basics of the relevant European Standards. Give examples of specific safety requirements for welding reinforcing steel.

6. Practical demonstrationsrecommended number of hours: 4

Objective: To be familiar with applied welding processes and specific weld details. To demonstrate the ability of examining and reporting specific welders tests.

Scope:

Demonstrations of relevant welding processes,

Demonstration of weld details specific to welding reinforcing steels,

Examining and reporting specific welders tests.

Result: Demonstrate presence during the demonstrations and be able to examine and report a specific welders test.

Total hours:

20

Section II: Examination and Qualification

1 Introduction

The Guideline seeks to achieve harmonisation and common standards in the training, qualification of professional welding experts in welding reinforcing bars in Europe.

The national welding organisations, being members of EWF, mutually acknowledge the Diploma awarded in any Member State to experts in Welding Reinforcing Bars, following examination conducted in accordance with this Guideline.

Education must have followed this EWF guideline "Special Course for Welding Reinforcing Bars at the Specialist Level" part I, and the examination must have been conducted by the national body authorised by EWF for this purpose.

2 Requirements for Training and Examination centres

Requirements for teachers and instructors, examiners, training establishments, courses and examination / test centres are documented in EOTC/AG-15/97/001/416.

3 Board of Examiners

The Authorised National Body shall nominate the Chairman and the members of the Board of Examiners. The examining board shall consist of:

- a) The Chairman, who shall be a representative of the Authorised National Body, and he shall be independent from the training school;
- b) Main teacher(s) of the subjects;
- c) Experts from industry or other organisations may be invited.

The responsibilities of the Board of Examiners are given in the EOTC/AG-15/97/001/416.

4 Admission to the examination

Admission to the examination leading to the award of the qualification will be restricted to those who have participated in a course, approved by the Authorised National Body, according to this guideline.

Admission to the examination shall be denied for those who failed to attend 90 % of the training program. In case of special circumstances the board of examiners may use its discretion.

5 Examination procedures

The examination procedures described below are designed to simulate the different situations of a welding expert in reinforcing bars active in industry. The examination shall cover all topics in this Guideline.

5.1 Written examination

At the discretion of the Board of Examiners the examination shall consist of:

- a) A series of essay questions covering the whole field of the subject,
Or
- b) A series of multiple choice questions covering the whole field of the subject,
Or
- c) A combination of a) and b) with equal marks allocated to each type.

The time devoted to the written examination shall be a minimum of 1.5 hours.

5.2 Oral examination

The oral examination will be optional at the discretion of the board of examiners except in borderline cases where it will be mandatory.

6 Evaluation of performance

In order to pass the examination candidates must achieve at least 60% of the maximum possible mark.

7 Re-examination and appeals procedure

Refer to Doc. EOTC/AG-15/97/001/416.

8 Diploma

After successful examination the Authorised National Body awards a diploma to the candidate.

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