This document provides specific information relating to the Metallographic Replication (MR) method with special reference to:
1) Examination admission requirements
2) Assessment and certification process
3) Repetition of the examination
in accordance with the requirements of UNI standard 11373:2010 "Non destructive testing - Qualification and certification of personnel responsible for non-destructive testing – Application of UNI EN 473 by personnel responsible for metallographic replication of pressure equipment subject to creep".

The reference standard for the applicaion of the MR method is UNI ISO 3057:2016 "Non destructive testing – Metallographic replica techniques of surface examination".

For anything not covered by this document, the provisions of document RC/C 14 and the ISO 9712:2012 standard shall apply.

1. EXAMINATION ADMISSION REQUIREMENTS

1.1 Physical requirements

The requirements of document RC/C 14 shall apply.

1.2 Training

Level 1 and 2

The candidate must provide evidence that he/she has attended theoretical and practical training courses on a continuous basis of a minimum total duration of:

- 40 hours for level 1

- 80 hours for level 2

- 120 hours for direct access to level 2

Level 3

Given its scientific and technical potential, the candidate must provide evidence of:

- having a class A or B school education according to table 1 below

- having attended training courses, conferences, seminars and workshops

- having taken part, as trainer/rapporteur, in training events, conferences, seminars and workshops.

1.3 Experience

Industrial experience in replica metallography must be acquired before the successful completion of the qualification examination.

Documented proof of experience must be confirmed by the employer and consists of a description of the activities carried out.

Level 1 and 2

The candidate must provide evidence of a minimum experience as stated in table 2, depending on the education class indicated in table 1.

In case of direct access to level 2, the required minimum experience is equal to the sum of the experience required for level 1 and level 2.

Table 1 – School education classes

Class	Education
A	University degree of a technical nature
B	Diploma of a technical-scientific nature
C	Certificate of compulsory schooling

Table 2 – Minimum working experience in months

Level	Class		
	A	B	C
1	6		
2	6	12	24

<u>Level 3</u>

The candidate must provide evidence of being in possession of a level 2 certificate for at least 4 years, during which he/she has acquired specific industrial experience.

2. ASSESSMENT AND CERTIFICATION PROCESS

Examination tests are focused on the subjects dealt with in Annex A to UNI 11373.

2.1 Level 1 and 2

The candidate must pass <u>a general and a specific examination</u>, answering the number of multiple-choice questions listed in Table 3

Table 3 – General and specific examination

Level	Minimum number of questions	
	General	Specific
1	30	20
2	40	20

The maximum time allowed for each question is 3 minutes.

The candidate must also pass a <u>practical examination</u> in accordance with the provisions of document RC/C 14, except for the number of samples to be examined, which is specified in Table 4.

Table 4 – Number of samples

Products	Level 1	Level 2	
Carbon steel	1 preparation and execution[a)b)]	1 preparation and execution [a)b)]	1 interpretation[c)]
Low alloy steel			1 interpretation [c)]
Austenitic stainless steel or other metal alloys			1 interpretation [c)]
a) Products chosen by the examiner			
b) On the basis of a written instruction			
c) To be performed under the microscope of replicas taken from welded joints			

The assessment of the general examination, of the specific examination and of the practical examination must be taken separately.

The qualification examination is passed if the candidate obtains a score of at least 70/100 for each of the examinations.

The assessment of the practical examination must be performed using the factors listed in Table 5.

Table 5 – Factors for consideration relating to the assessment of practical examination for levels 1 and 2

		Factors for consideration	
		Level 1	Level 2
1	Knowledge of methodology and equipment	20	10
2	Preparation and execution of the Metallographic replication	60	20
3	Sampling report and, for level 2, interpretation of the results	20	55
4	For level 2, written instruction for level 1	-	15

2.2 Level 3

The candidate must pass <u>a basic examination and a method examination.</u>

2.2.1 Basic examination

The basic examination consists of 50 multiple-choice questions.

The maximum time allowed for each question is 3 minutes.

2.2.2 Method examination

The method examination consists of a general examination, a specific examination and a practical examination.

2.2.2.1 General examination

The general examination consists of 30 multiple-choice questions.

The maximum time allowed for each question is 3 minutes.

2.2.2.2 Specific examination

The general examination consists of 30 multiple-choice questions.

The maximum time allowed for each question is 3 minutes.

2.2.2.3 Practical examination

The practical examination consists of the drafting and discussion of a dissertation on the metallographic replication method, prepared in a maximum of four hours.

The assessment of the basicl examination and that of the method examination must be taken separately.

The qualification examination is passed if the candidate obtains:

- a 70/100 score for the basic examination;

- a 70/100 score for each of the sections making up the method examination (general examination, specific examination and practical examination).

3. REPEATING THE EXAMINATION

The candidate who fails the examination due to ethically improper conduct must wait at least 12 months before being able to repeat the examination.

The candidate who fails any of the examinations can repeat the examination twice not earlier than one month and not later than 12 months from the original examination.