



# NACE MR0175-Carbon Steel Exam

## NACE-MR0175-CS

### Exam Preparation Guide

#### August 2018

*\*Note: Exam is on a biennial revision cycle (inclusive of available reference material). The next update to the exam is expected to be in 2020. Any available reference material will be updated then.*



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## Introduction

The MR0175-Carbon Steel Exam is designed to assess whether a candidate has the requisite knowledge and skills that a minimally qualified MR0175 Certified User- Carbon Steel must possess. The exam comprises 50 multiple-choice questions that are based on the MR0175 Standard (Parts 1 and 2).

Test Name	NACE MR0175 Carbon Steel Exam
Test Code	NACE-MR0175-CS
Time	4 hours
Number of Questions	50
Format	Computer Based Testing (CBT)
Passing Score	Pass/Fail

## Target Audience

An MR0175 Certified User-Carbon Steel is recognized as persons working in the following areas:

- User oil and gas production equipment
- Equipment designers
- Manufacturers, suppliers and purchasers
- Construction and maintenance contractors
- Equipment operators
- Industry regulators

## Requirements

### MR0175-Carbon Steel

#### Requirements for MR0175 Carbon Steel: 1 Core Exam

Work Experience Requirements:
Two (2) years relevant experience (documented) and a degree in one of the following: metallurgy, material science, chemical engineer, applied chemistry, mechanical engineer, corrosion  OR  Five (5) years relevant experience, including 2 years of responsible charge.
Core Exam Requirements
<b>The following exam is required:</b>
MR0175 Carbon Steel Exam

**Certification Application is required** - An application must be submitted prior to taking the examination to allow time for NACE to verify work experience requirements. The application is subject to approval.

**Certification renewal requirements** – Recertification application\* required every 3 years – including the following:

- A minimum of 1.5 years of Carbon Steel sour service work experience
- A completed re-certification application (subject to approval)
- A minimum of 20 Professional Development hours (PDHs) per year/60 PDHs every 3 years.

Upon successful completion of all requirements, the candidate will be awarded a MR0175 Certified User Carbon Steel.

**\*Approval required**

## Knowledge and Skills Areas Tested

DOMAIN	Percent of Items
1. Understanding the significance of sour service, and the roles and responsibilities for the selection of materials for use under such conditions.	16 - 20 %
2. Evaluation, & definitions of service conditions to enable materials selection	16 - 20 %
3. Understanding how personnel work together: purchasing, project engineers, consulting, and others to consider all factors in materials selection, to define roles and responsibilities with respect to information gathering evaluation, and execution of materials selection	8 - 12 %
4. Basic understanding of the materials types included in the standard	8 - 12 %
5. Understanding and demonstrating compliance with metallurgical properties that govern the behavior of materials in H <sub>2</sub> S containing environments	2 - 6 %
6. Understanding the significance of changes to materials brought about by fabrication on their resistance to H <sub>2</sub> S, and their measurement.	14 - 18 %
7. Basic Understanding of the oil/gas equipment/components included in the standard	1 - 5 %
8. Understanding/auditing the process of materials selection for sour service using the standard	4 - 8 %
9. Basic understanding of laboratory testing methods	10 - 14 %
10. Applying the standard to respond to case studies similar to those provided in the examination's study resources	2 - 6 %

## Types of Questions

### Description of Questions

The questions on this exam are multiple-choice and based on the knowledge and skills required in the industry for a certified user of the MR0175 Standard- Carbon Steel. While the NACE MR0175 Seminar is an excellent method of preparation, it is **strongly recommended** but not required. The primary reference used in the development of the questions is the MR0175 Standard. Additional references can be found in the Reference section.

### Sample Questions

The sample questions are included to illustrate the formats and types of questions that will be on the exam. Your performance on the sample questions should not be viewed as a predictor of your performance on the actual test.

1. You urgently need a replacement carbon steel valve to handle a sour fluid. You are offered a wrought steel valve with 0.020% sulphur from one supplier and a cast one with 0.026% sulphur from another. Both have hardness below 22HRC, but neither has been HIC tested. What is the position of the standard about accepting these two valves?
  - a. Neither wrought nor cast is acceptable
  - b. Wrought is not acceptable but cast is acceptable
  - c. Wrought is acceptable but cast is not acceptable
  - d. Both are acceptable
2. A new carbon/low alloy steel installation is to be built to handle wet gas, from a nearby field, that contains H<sub>2</sub>S at a level below that traditionally described as sour with respect to sulfide stress cracking (SSC) (0.05 psi H<sub>2</sub>S). A group of project engineers are doubtful about the need for sour service materials and is concerned about their cost. You are a project engineer and have input to the group decision. What is your input, according to the standard?
  - a. Explain the types of cracking H<sub>2</sub>S can cause even at levels below the threshold for SSC, the possible consequences of cracking, and how costs can be minimized.
  - b. Accept the engineers' approach to select non-sour materials for the plant, and recommend assessing the risks to personnel and the surrounding area.
  - c. Emphasize that H<sub>2</sub>S-resistant materials are required by the standard even less than 0.05 psi H<sub>2</sub>S.
  - d. Recommend that H<sub>2</sub>S-resistant materials be used, with a view, nevertheless, toward minimizing the costs.

#### Answer Key

1. D

Reference: Section 8

2. C

Reference: 7.1.1 and 7.2.1.3

## Preparation

### Training (Strongly Recommended)

One day NACE MR0175 Workshop

Designed to help you and your company prevent corrosion stress cracking in H<sub>2</sub>S containing oil production environments, attend a NACE MR0175/ISO 15156 One-Day Seminar to understand how the standard can be implemented to improve the quality of your company's assets and what you can do to comply with the standard. NACE International's MR0175/ISO 15156 is the premier standard to reference in combatting corrosion cracking through material selection and qualification and the seminar is for anyone from entry level to experienced oil production professionals to gain a thorough knowledge of this globally mandated standard.

### Suggested Study Material

NACE MR0175/ISO 15156 Standard

EFC 17

NACE TM0177

NACE TM0198

NACE TM0316

### Books

Introductory Handbook for NACE MR0175

### Other

Materials Performance inquires and answers (see NACE website)

<http://www.nace.org/resources/magazines-and-journal/>

## Reference Material Electronically Provided During the Exam

MR0175 Standard/ISO 15156 Standard (2015)

MR0175/ISO 15156 Technical Circular (2016)