

Chicago Stationary Engineer Licensure Examination Information

This candidate guide should help you prepare for the Chicago Stationary Engineer licensure examination. Part I contains general information about testing procedures. Part II describes the content of the examination and recommends study materials. Part III includes sample questions to help you prepare for the test.

Part I General Information

PURPOSE OF THE EXAMINATIONS

This examination is required for professional licensure of Stationary Engineers in the City of Chicago. You must pass this test to be licensed.

TEST VALIDITY & TEST LENGTH

The test is timed to be three hours in length. All test questions have been subjected to strict psychometric controls and reflect standards and practices as described stationary engineers who are licensed in the City of Chicago.

STUDY MATERIALS

Study materials for this examination are described in Part II of this candidate guide. Each may be purchased directly from the publishers identified in Part II or from the Prairie Avenue Bookshop, 418 S. Wabash Avenue, Chicago 60605 (312-922-8311).

MISSING AN EXAMINATION

There are no "make-up" examinations. You may re-register for the next examination date. **THERE ARE NO REFUNDS.**

SUCCESS/ LICENSURE

Candidates who score 70 or higher will receive a PASS notice and an application for licensure.

FAILURE

Candidates who score below 70 will receive a FAILURE notice and an application for re-examination. Candidates are encouraged to retake the examination; many candidates who initially fail such an exam pass on subsequent attempts.

Part II Test Content and Recommended Study Materials

Stationary engineers must demonstrate that they are familiar with safe practices and procedures in their profession. Content areas and their relative importance in this test are outlined below.

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|--------------|---|---------------------------|
| I. | Types of Boilers | 10% of Examination |
| | High and low pressure fire tube, water tube, cast iron and electric boilers; package boilers | |
| II. | Basic Principles and Units | 12% of Examination |
| | Steam boilers, fittings & accessories, feedwater systems, fuel systems, draft systems, steam systems | |
| III. | Water and Steam Properties | 7% of Examination |
| | Steam action, feedwater & steam accessories, boiler water treatment, steam & water residue | |
| IV. | Combustion Principles | 12% of Examination |
| | Theory & process of combustion, combustion accessories, fuels used in combustion, control of combustion | |
| V. | Safe Operation of Steam Boilers | 16% of Examination |
| | Safety requirements, operating procedures | |
| VI. | Controls | 16% of Examination |
| | Safety controls, draft controls, combustion controls, operating controls | |
| VII. | Maintenance and Safety | 8% of Examination |
| | Cleaning, repairs, replacement | |
| VIII. | Equipment and Safety | 12% of Examination |
| | Valves, boiler accessories, pumps, joints & piping, boiler room safety | |
| IX. | Fuel Combustion and Byproducts | 7% of Examination |
| | Gas, oil & electric | |

Recommended Study Materials

All candidates must respond to test questions that are based on information provided in the following sources. Most publishers will accept telephone orders to be charged to your VISA, Mastercard or American Express account. These references also may be available from Internet bookstores such as Amazon.com or Barnes and Noble (bn.com).

1. Steingress, Frederick M. *Low Pressure Boilers, 2nd Edition* 2001 or *3rd Edition* 2008.
Publisher: American Technical Publishers Phone: (708) 957-1100
1155 West 175th Street, Homewood, IL 60430
Website: <http://www.go2atp.com>
2. Steingress, Frederick M. and Frost, Harold J. *High Pressure Boilers, 3rd Edition* 2003 or *4th Edition* 2008.
Publisher: American Technical Publishers Phone: (708) 957-1100
1155 West 175th Street, Homewood, IL 60430
Website: <http://www.go2atp.com>
3. Woodruff, Everett B., Lammers, Herbert B., and Lammers, Thomas F. *Steam Plant Operation*, Eighth Edition (2004).
Publisher: McGraw-Hill Publishing Company Phone: (800) 722-4726
Website: <http://books.mcgraw-hill.com>
4. *ASME Boiler & Pressure Vessel Code, Volume VI: Recommended Rules for the Care and Operation of Heating Boilers*
Publisher: American Society of Mechanical Engineers
22 Law Drive, P.O. Box 2300, Fairfield, NJ 07007-2300
Phone: (800) 843-2763 Website: <http://www.asme.org/codes/>
5. *ASME Boiler & Pressure Vessel Code, Volume VII: Recommended Guidelines for the Care of Power Boilers*
Publisher: American Society of Mechanical Engineers
22 Law Drive, P.O. Box 2300, Fairfield, NJ 07007-2300
Phone: (800) 843-2763 Website: <http://www.asme.org/codes/>

Part III Sample Test

All questions on these examinations are multiple choice with one correct answer and three incorrect choices. **For this sample test only, answers and references are provided at the end of this section to help you prepare for these tests.**

1. High pressure steam boilers generally operate at pressures
 - A. above 15 psi and over 6 boiler horsepower.
 - B. below 15 psi and over 8 boiler horsepower.
 - C. above 250 psi and over 6 boiler horsepower.
 - D. at 212 psi and over 8 boiler horsepower.

2. Pressure gauges should never have a range less than
 - A. half the safety valve set pressure.
 - B. double the safety valve set pressure.
 - C. $\frac{3}{4}$ times the safety valve set pressure.
 - D. $1\frac{1}{2}$ times the safety valve set pressure.

3. After water is blown out of a siphon, why should live steam never be allowed to enter a Bourdin tube?
 - A. The steam will rupture the siphon tube.
 - B. Combustion gases will mix with the steam.
 - C. Live steam will damage the pressure gauge.
 - D. The water level gauge will be damaged or destroyed.

4. All of the following are essential to maintain the proper fuel oil pressure with fuel oil accessories ***EXCEPT***
 - A. achieving the right flow of fuel.
 - B. proper atomization of the fuel oil.
 - C. heating fuel oil to the correct temperature.
 - D. obtaining the correct difference in pressure inside and outside the boiler.

5. Which of the following could be dangerous to safe operation of a low pressure boiler?
 - A. Adding water to an operating boiler when the water level cannot be seen in the gauge glass tube.
 - B. Opening the blowdown valve at the bottom of the water gauge glass before making a water level reading.
 - C. Checking the water level using the try cock valves when the line to the glass gauge tube is clogged.
 - D. Opening the water column blowdown valve every day.

6. Which of the following is best if a low-pressure boiler does not have an air vent?
 - A. Vent the boiler with the try cocks.
 - B. Vent the boiler with the safety valve.
 - C. Vent the boiler with the fusible plug.
 - D. Vent the boiler with the blowdown line.

7. What is the purpose of an evaporation test on a low pressure boiler?
 - A. To test the water column
 - B. To test the bottom blowdown valve
 - C. To test the steam pressure safety valve
 - D. To test the low water cutoff control

8. Following flame failure, controls must de-energize fuel and ignition circuits
 - A. within 4 seconds.
 - B. within 6 seconds.
 - C. within 10 seconds.
 - D. within 15 seconds.

9. How can an operator prevent damage to the tubes while using a cleaner to remove scale from boiler tubes?
 - A. Never use a chemical cleaning procedure.
 - B. Never use cleaning water under pressure.
 - C. Never allow the cleaner to stay in one place.
 - D. Never clean the tubes more often than every six months.

10. In a steam boiler, which of the following should never be placed between the safety relief valve and the boiler?
- A. A steam trap
 - B. A shut-off valve
 - C. An air eliminator
 - D. A discharge pipe
11. Which of these should be used on live electrical fires?
- A. Class D extinguishers
 - B. Class C extinguishers
 - C. Class B extinguishers
 - D. Class A extinguishers
12. If certain grades of fuel oil are not preheated properly, they may cause
- A. higher temperatures in the furnace.
 - B. back pressure and leaks in the fuel lines.
 - C. poor combustion and high fuel consumption.
 - D. increased pressure and dangerous levels of steam.

ANSWER KEY

Question	Correct Answer	Reference(s)
1	A	<i>High Pressure Boilers</i> , p. 2
2	D	<i>ASME Code Section VII</i> , C4.300(c)(2)
3	C	<i>Low Pressure Boilers</i> , pp. 39-41
4	D	<i>High Pressure Boilers</i> , p. 108 (3 rd Ed.), p. 92 (2 nd Ed.)
5	A	<i>Low Pressure Boilers</i> , pp. 43-45
6	A	<i>Low Pressure Boilers</i> , pp. 53-55
7	D	<i>Low Pressure Boilers</i> , p. 75
8	A	<i>High Pressure Boilers</i> , p. 172 (3 rd Ed.), p. 143 (2 nd Ed.)
9	C	<i>Steam Plant Operation</i> , 7 th Edition, p. 437
10	B	<i>ASME Code VI</i> , 3.20 G
11	B	<i>High Pressure Boilers</i> , p. 241 (3 rd Ed.), p. 195 (2 nd Ed.)
12	C	<i>Steam Plant Operation</i> , 7 th Edition, pp. 204-5; <i>ASME Code Section VI</i> , 4.03 F