



STUDY OUTLINE FOR R-4 REFRIGERATION OPERATORS

Neighborhood and Business Development
City Hall Room 121B, 30 Church Street
Rochester, New York 14614-1290

This exam was developed by the City of Rochester Board of Examiners for Stationary Engineers and Refrigeration Operators. The majority of the R-4 Refrigeration Operators examination will be taken from this suggested outline.

SAFETY

Applicants MUST demonstrate an understanding of proper safety procedures and techniques in the following areas:

- 1) Effects of ammonia on humans and the action to be taken in the event of exposure to ammonia.
- 2) How to enter an ammonia filled room.
- 3) Precautions to be taken before opening an ammonia system for repairs or working on refrigeration equipment.
- 4) Handling of ammonia cylinders during charging of the system with ammonia.
- 5) Use of gas masks and self-contained breathing apparatus.
- 6) What to do in the event of an explosion or severe ammonia leak.
- 7) Major hazards encountered in the operation of an ammonia plant.
- 8) Safety features on ammonia systems.
- 9) Causes of explosions in refrigeration equipment.

AMMONIA COMPRESSION SYSTEM

Applicants MUST have an understanding of the cycle of refrigeration, be able to draw a schematic diagram of a simple compression system, indicate and explain the temperatures and pressures of an ammonia system operating under standard ton rating conditions.

Applicants must define and explain:

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| 1) Heat | 6) BTU |
| 2) Temperature | 7) Absolute Pressure |
| 3) Specific Heat | 8) Desirable Characteristics for a Refrigerant |
| 4) Sensible Heat | 9) Gage Pressure Refrigerant Effect |
| 5) Latent Heat | |

PLANT EQUIPMENT

Applicants for R-4 Refrigeration Operators License must be able to discuss and explain the operation of his/her plant's equipment.

