

CITY OF DETROIT
BUILDINGS AND SAFETY ENGINEERING DEPARTMENT
MECHANICAL/ELECTRICAL DIVISION, COLEMAN A. YOUNG MUNICIPAL CENTER
2 WOODWARD AVE., FOURTH FLOOR-EXAMINATION SECTION-ROOM 404
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May 2013

MEMORANDUM

Subject: Procedure and subject matter that an applicant shall be familiar with, when applying for a First or Second Class Refrigeration Operator License

Prerequisites: The City of Detroit Ordinance No. 706-G requires that an applicant for First and Second Class Refrigeration Operator shall have at least two (2) year's experience in the operation of refrigeration equipment.

Application and Documentation: Bring properly completed application, proof of employment and proper picture I.D. for the written examination. The exam is conducted on every Second and Fourth Monday of each month. Fee \$81.00. Applicants will be interviewed at 8:00 A.M., the examination beginning at 8:30 A.M., punctuality being a very important part of this exam. You will be notified within 30 days by mail. If the written examination is passed, you will be given an appointment date for an oral examination, Fee \$251.00.

The subject matter of the written examination will be First Class (200), and Second Class (100) multiple choice statements in the following categories. There will also be required drawings pertaining to the categories below.

Fundamentals of Refrigeration

Compressors and their Accessories: Piston, centrifugal, rotary and hermetic types; capacity control, starting, stopping and operation; valves; stage, booster; pump-out and dual suction compressors; lubrication systems and lubricants; shaft seals; cylinder cooling; belts and coupling; indicator diagrams.

Evaporators and System Auxiliaries: Types of evaporators; cooling towers and spray ponds; accumulators, separators and traps; dryers and filters; valves and piping; expansion valves; types and uses, methods of operation; flash gas; sub-coolers; inter-coolers; insulation and the effects of moisture on insulation.

Condensers and Pressure Vessels: Evaporative, shell and tube, double-pipe, other types; operation and maintenance; liquid level indicators; automatic water valves; condensing water – circulation, cooling and treatment.

Safety Devices, Controls and Instruments: Relief valves; rupture discs and fusible plugs; high and low pressure controls; oil safety switch; thermostats, temperature pressure and humidity indicating and recording instruments; solenoid valves; other controls and instruments.

Systems and Applications: Direct, indirect dry expansion, flooded, cascade and other systems; air conditioning; temperature humidity and purity of air for comfort cooling and industrial applications; ice making; freezing time and temperature, water treatment; brine solutions; dairy, brewery, bakery, cold storage, skating rink and other applications.

Refrigerants: Ammonia, Carbon Dioxide, the Freon, the Carrenes, other refrigerants; toxicity; odor; color; flammability; stability; latent heat; action with oil, with moisture effect on metals; operating pressures and temperature at specified conditions; hazards of chemical compositions of refrigerants; substituting refrigerants.

Plant Operation: Causes and procedure in event of leaks and abnormal pressure and temperature conditions; leak testing; liquid slugs; purging; transferring and storing refrigerants; defrosting; short cycling; frost back; laying up for off-cooling season; adding oil; general maintenance.

General Knowledge: Detroit Code Regulations pertaining to: License limitations; post of duty, license revocation, refrigerant groups, relief devices charging and discharging, gas masks, operator's duties in event of emergency; preparation for inspection.

CONSTRUCTION DIVISION



Glenn A.Davis, Chief