

Іноземна мова (англійська)

Посібник з розвитку навичок читання та говоріння для студентів напряму підготовки «Машинобудування»

# Processing and Preservation Equipment



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## ПЕРЕДМОВА

Посібник "Processing and Preservation Equipment" призначений для студентів 1-2 курсів напряму підготовки "Машинобудування".

Ціллю посібника є розвиток у студентів вмінь та навичок читання та безперекладного розуміння оригінальної технічної літератури англійською мовою, вміння вилучати потрібну для роботи інформацію, письмового перекладу технічних текстів, а також навичок говоріння згідно з програмою.

Посібник включає у собі 7 основних циклів, що поєднані між собою за тематичним принципом та охоплюють такі питання: методи збереження сільськогосподарської сировини, обладнання для переробки молока, м'яса, фруктів та овочів, машини для переробки зернових та виготовлення хлібобулочних виробів, обладнання для виробництва рослинної олії. Тексти взяті з оригінальних сучасних джерел.

Інформацію текстів доповнюють схеми, малюнки та графіки, що полегшують розуміння текстів, сприяють розвитку навичок мовлення, розвивають важливе для спеціаліста вміння співвідносити словесний опис із малюнком, схемою, а також для вміння самостійно знаходити термінологічні еквіваленти з опорою на малюнок.

Об'єм лексико-граматичних вправ забезпечує роботу в аудиторії та виконання домашніх вправ. Перед першими текстами вказаний граматичний матеріал, що повторюється на даному уроку. У граматичних вправах забезпечується повторення теоретичних знань як за допомогою перекладу, так й засобами, що виключають прямий переклад (заповнення пропусків, підстановкою, точним описом, множинним вибором та ін.).

Перед кожним текстом є англо-український словник спеціальних термінів.

# UNIT 1

## FOOD PRESERVATION AND STORAGE EQUIPMENT

### Text A. Low-temperature preservation equipment. Refrigeration systems.

*Grammar:* Indefinite Active Tense, Indefinite Passive Tense

Participle I, Participle II

#### Vocabulary

brewing	пивоваріння
capillary tube	капілярна трубка
chill	холод, охолоджувати
compressor	компресор
condenser	конденсатор
cool	охолоджувати
coolant	холодильний агент
electric current	електричний струм
equipment	обладнання
evaporative cooling	випарне охолодження
evaporator	випарник
expansion device	розширювальний прилад
expansion valve	розширювальний клапан
junction	з'єднання
liquid	рідина
meat-packing industry	м'ясопереробна промисловість
refrigerant	холодильний агент
refrigerate	охолоджувати
refrigerator	холодильник
semiconductor	напівпровідник
turbine	турбіна
valve	клапан
vapour	пара
vapour-compression refrigeration system	парова компресійна холодильна система

#### Part 1. History of Refrigerating Machines.

**Exercise 1.** Read and translate the following international words. Put these words into alphabetic order.

Method, nation, transport, condition, form, comfort, mechanical, vacuum, demonstrate, fundamental, compression, result, practical, machine, industry, system, principal, construct, control, initiate.

**Reading.** Read the text and say what substances have been necessary for cooling process since ancient times.

In the industrialized nations refrigeration is chiefly used to store foodstuffs at low temperatures. Air-conditioning, the use of refrigeration for comfort cooling, has also become widespread in more developed nations.

Before mechanical refrigeration systems were introduced, ancient peoples cooled their food with ice transported from the mountains. Wealthy families made use of snow cellars, pits that were dug into the ground and insulated with wood and straw, to store the ice. In this manner, packed snow and ice could be preserved for months. Stored ice was the principal means of refrigeration until the beginning of the 20th century, and it is still used in some areas.

In India and Egypt evaporative cooling was employed. If a liquid is rapidly vaporized, it expands quickly. If water is placed in shallow trays during the cool tropical nights, its rapid evaporation can cause ice to form in the trays, even if the air does not fall below freezing temperatures. By controlling the conditions of evaporation, it is possible to form even large blocks of ice in this manner.

Cooling caused by the rapid expansion of gases is the primary means of refrigeration today. The technique of evaporative cooling has been known for centuries, but the fundamental methods of mechanical refrigeration were only discovered in the middle of the 19th century. The first known artificial refrigeration was demonstrated by William Cullen at the University of Glasgow in 1748. Cullen let ethyl ether boil into a partial vacuum; he did not, however, use the result to any practical purpose. In 1805 an American inventor, Oliver Evans, designed the first refrigeration machine that used vapour instead of liquid. Evans never constructed his machine, but one similar to it was built by an American physician, John Gorrie, in 1844.

Commercial refrigeration is believed to have been initiated by an American businessman, Alexander C. Twinning, in 1856. Shortly afterward, an Australian, James Harrison, examined the refrigerators used by Gorrie and Twinning and introduced vapour-compression refrigeration to the brewing and meat-packing industries. A somewhat more complex system was developed by Ferdinand Carré of France in 1859. Unlike earlier vapour-compression machines, which used air as a coolant, Carré's equipment contained rapidly expanding ammonia. Carré's refrigerators were widely used, and vapour-compression refrigeration became, and still is, the most widely used method of cooling.

*Retrieved and adapted from: <http://www.britannica.com/EBchecked/topic/495746/refrigeration>*

**Exercise 2.** Translate the following groups of words:

To equip – equipment, to design – designer, to install – installation, to construct – construction – constructor – constructive, to investigate – investigator – investigation, to produce – product – production – productive, to refrigerate – refrigerator – refrigeration, to compress – compressor – compression, to transport – transporter – transportation, to use – user – usage.

**Exercise 3.** Complete each sentence with a word or phrase from the box. Use each word or phrase only once.

meat-packing industry	mechanical refrigeration	practical purpose
refrigerating machine	vapour-compression refrigeration	

1. \_\_\_\_\_ has been the most widely used cooling method.
2. The original methods of \_\_\_\_\_ were discovered in the 19<sup>th</sup> century.
3. Oliver Evans never constructed his \_\_\_\_\_.
4. Commercial refrigerators were initially employed in \_\_\_\_\_.
5. The vacuum refrigerating machine did not find any \_\_\_\_\_.

**Exercise 4.** Translate the following sentences paying attention to different meanings of the word "one".

1. Modern processing industry requires more equipment than the electric one.
2. Computer-based control systems production is one of the youngest branches in our industry.
3. One cannot do this work without using a computer.
4. The discovery of one more synthetic refrigerant may will be a sensation in science.
5. One of the important characteristics of this device is its high accuracy.

**Exercise 5.** Choose a word or word-combination in the logical group which was not mentioned in the text. Give a title for each words group.

- 1) vapour-compression refrigerating machine, domestic refrigerator, commercial refrigerator, mechanical refrigerating machine;
- 2) lethyl ether, ammonia, Freon, air, liquid, vapour;
- 3) packed snow, stored ice, cooled water, cold air.

**Exercise 6.** Word building.

Form nouns that mean a device or a doer with the suffixes **-or/ -er**. Translate the resulting nouns.

To operate, to refrigerate, to produce, to work, to compute, to create, to use, to compress, to evaporate, to cool, to construct, to freeze, to employ, to make, to open, to initiate, to translate, to collect, to generate.

**Exercise 7.** Choose the answers to the questions from the box.

Yes, they are.	Yes, it is.	No, it did not.	Yes, he did.	Yes, it was.
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1. Did Cullen's discovery find any practical application?
2. Was the first artificial refrigeration demonstrated in the 18<sup>th</sup> century?
3. Did a French scientist develop an ammonia compression refrigerating machine?
4. Are the vapour-compression refrigerating machines the most widely used in modern industry?
5. Is ammonia used as a coolant in modern refrigerators?

**Exercise 8.** Fill in the gaps with the suitable verbs. Answer the following questions.

1. When \_\_\_ people begin to cool products?
2. Why \_\_\_ it necessary?
3. What substances \_\_\_ used for cooling purposes?
4. Which of them \_\_\_ been still used in some countries?
5. What \_\_\_ the disadvantages of ancient refrigerating methods?
6. How many years ago \_\_\_ scientists try to create first refrigerating machines?
7. \_\_\_ all their attempts successful?
8. What substances \_\_\_ used as coolants in refrigerating machines?
9. Which of them \_\_\_ the most effective ones?
10. What refrigerating machines \_\_\_ widely employed in our days?

**Exercise 9.** Make up sentences about means of refrigeration using the correct verb form.

Greeks and Romans	be	vapour-compression refrigerators since 1856.
Wealthy families	employ	the first vapour refrigeration machine.
Indians and Egyptians	cool	the principal means of refrigeration until the beginning of the 20 <sup>th</sup> century.
In 1805 Oliver Evans	make use of	their food with ice transported from the mountains.
Stored ice	design	snow cellars, that were dug into the ground.
People	use	evaporative cooling.

Try to retell the brief history of means of refrigeration using this information and facts you have already known.

**Exercise 10.** Rearrange the sentences to make a summary of the text.

1. Commercial refrigeration was initiated by Alexander C. Twinning in 1856.
2. In Eastern countries evaporative cooling was employed.
3. The fundamental methods of mechanical refrigeration were discovered in the 19th century.
4. Ancient peoples cooled their foodstuffs with natural substances.
5. Vapour-compression refrigeration is the most widely used method of cooling.