


Program:
**13.04.01 Heat Power
Engineering, MSc**



South Ural State University
National Research University

Form of training: Full-time
**Department: of Thermal
power engineering**



AIR CONDITIONING AND VENTILATION SYSTEMS

Lecturer: Dmitry Rastvorov,
Department: of Thermal power engineering

Course: Air conditioning and ventilation systems

Upon completion of this course, students will be able to:

- ▶ Apply the fundamental principles of heat transfer to real-life situations;
- ▶ Analyze the efficiency of heat exchange solutions for industries and residential buildings;
- ▶ Design, install, maintain and operate ventilation systems
- ▶ Choose the best air-conditioning system under the given conditions;
- ▶ Offer their own solutions in the field of ventilation and air conditioning



LEARNING
Objectives



Lectures

1	Introduction	The concept of heat exchangers. Terms and Definitions. Ways of using heat exchangers.
2	Ventilation systems, purpose, classification, solutions	Ventilation. Ventilation systems. Classification of ventilation systems.
3	Supply ventilation system	Air exchange in buildings with forced ventilation system.
4	Supply and exhaust ventilation system	Exhaust ventilation. Blowers.
5	General ventilation	General ventilation modes.
6	Air exchange	The principles of air exchange between rooms. Air leakage control for residential buildings.
7	Air Parameters	Pressure. Temperature. Density. Air humidity.
8	Air conditioning systems	Types of air conditioning systems. Split systems. Chillers.

Practice tutorials

1	Introduction	Ventilation solutions for industrial enterprises.
2	Ventilation systems, purpose, classification, schemes	Ventilation solutions for residential and public buildings.
3	Supply ventilation system	Calculation of air exchange when using a supply ventilation system.
4	Supply and exhaust ventilation system	Calculation of air exchange when using a supply and exhaust ventilation system.
5	General ventilation	General ventilation modes.
6	Organization of air exchange	Calculation of air exchange between rooms.
7	Air Parameters	Calculation of air humidity. Calculation of absolute and relative humidity.
8	Air conditioning systems	Calculation of split systems. Choosing a split system.

Summary of laboratory classes

1	Introduction	Thermal regime of buildings and structures. The factors the efficiency of buildings heat consumption depend on.
2		
5	Ventilation systems, purpose, classification, schemes	The thermal regime of industries.
6	Supply ventilation system	Design characteristics of supply ventilation systems.
	Supply and exhaust ventilation system	Design characteristics of supply and exhaust ventilation systems.
8	General ventilation	Thermal operating modes of general ventilation.
	Organization of air exchange	Optimization of air exchange schemes.
	Air Parameters	The study of the humidity regime of the room.
	Air conditioning systems	Operation of chillers

Laboratory Stands

The stand "Pumping station.
The study of water circulation
in air cooling systems "



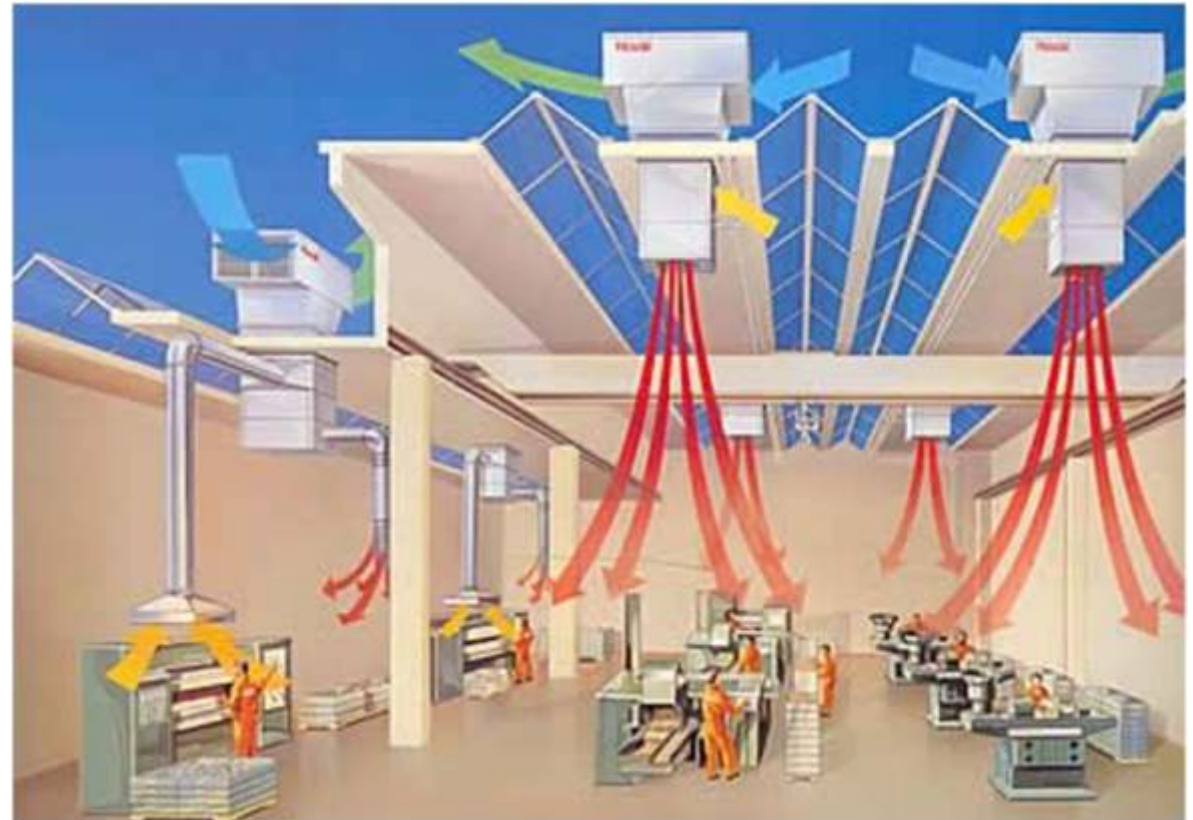
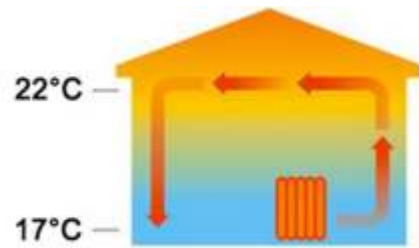
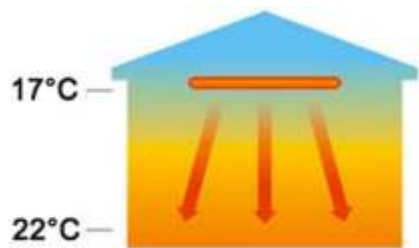
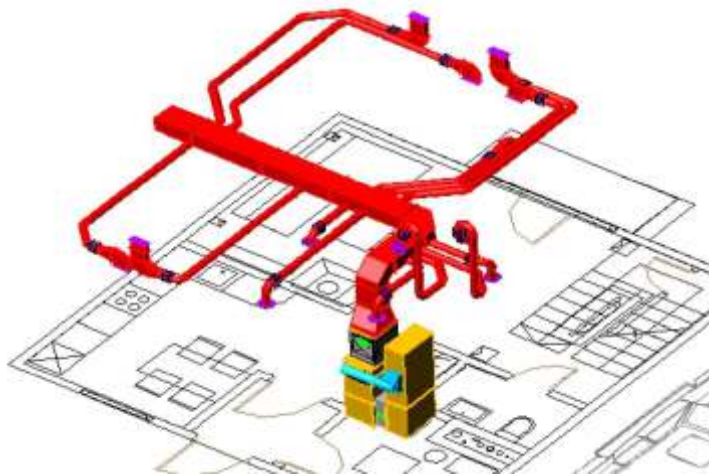
Industrial Applications I

Design of air exchange systems
for residential buildings
and industries

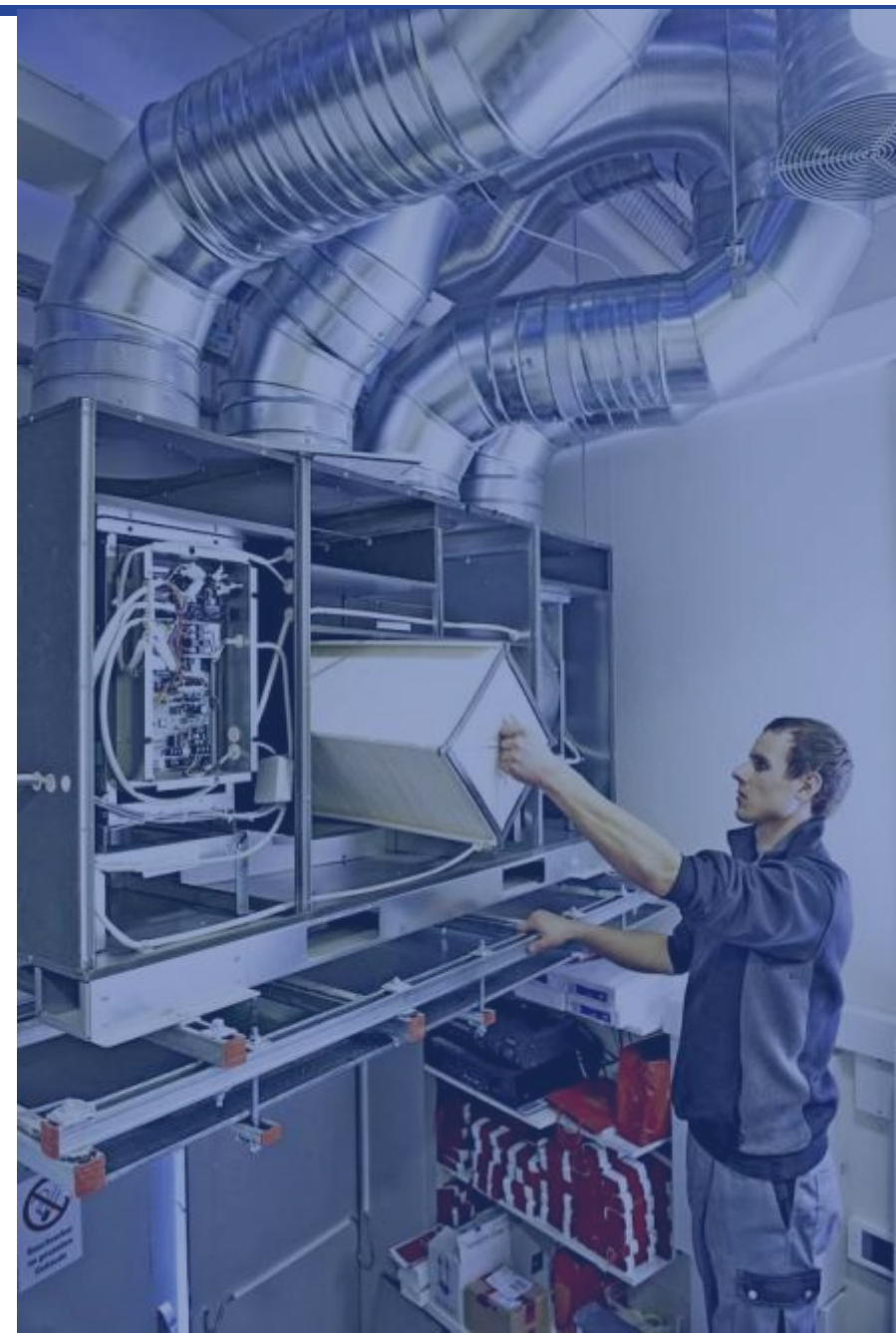
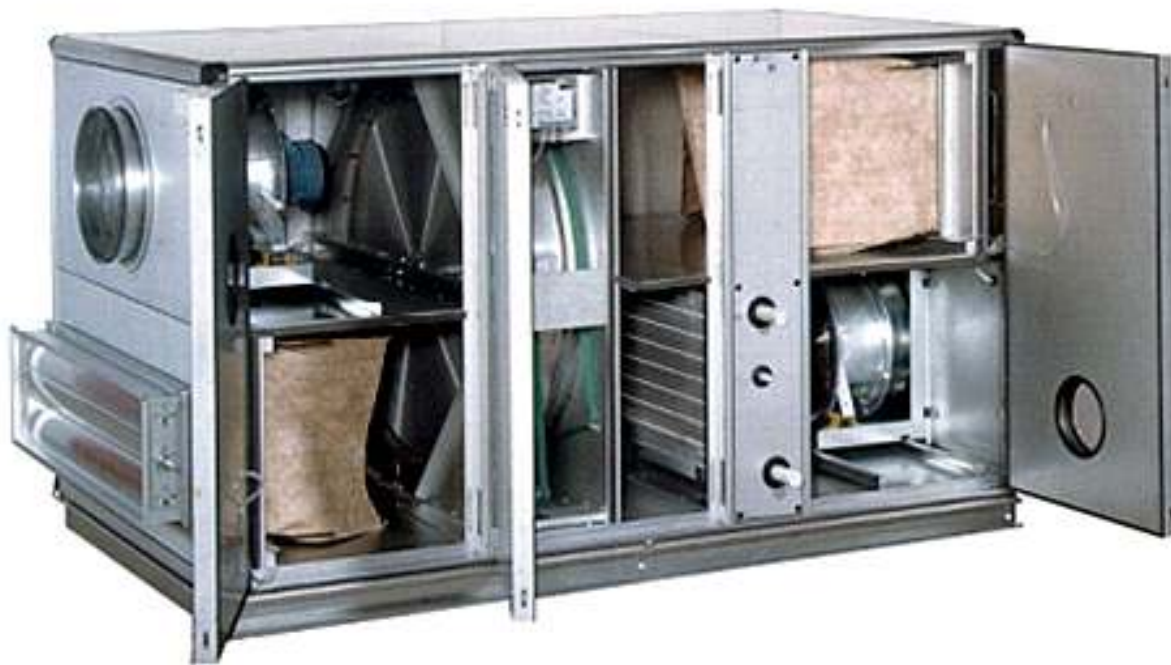


Industrial Applications II

Design of heaters, aerodynamic calculation of air channels, calculating air change rates for rooms and buildings



Examples of industrial applications
of the knowledge gained during
the laboratory tutorials



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Thanks for attention!