

# Complexes of cleanrooms for medical institutions



«Aseptic medical systems»

«Mass factory of medical equipment»



[www.laminar.ru](http://www.laminar.ru)



The total area of designed and created by association of «AMS-MFME» premises of cleanrooms during the 21 working years for health-care institutions is more than 100 000 m<sup>2</sup>. And 70 000 m<sup>2</sup> - for the premises of cleanrooms for other industries during the same period.

### Customers:

- Russian Federation - more than 200 health care institutions, including the leading clinics of Russian Academy of Medical science, the Ministry of Defence of the Russian Federation, the Ministry of Health of the Russian Federation, and city clinics: in Moscow, Saint-Petersburg, Chelyabinsk, Ekaterinsburg, Kazan, Ufa, Omsk, Izhevsk, Novosibirsk, Kemerovo, Kurgan and lots of other cities.
- Kazakhstan Republic - 8 medical care institutions in Astana, Actobe, Kostanai, Uralsk, Turkestan, Shymkent.



АМС®



МЗМО



## About Us

Research and manufacturing association of enterprises OOO «Miass Factory of Medical Equipment» - ZAO «Aseptic Medical Systems» (Miass, Chelyabinsk region, Russia) is among of the leading enterprises in Russia for designing and producing of cleanrooms and modern medicine units for high quality air cleaning.

The main directions of our products: designing, production, mounting, attestation of complexes of cleanrooms for medical institutions and industries, local clean areas; producing of elements of air preparing and it's supplying; building envelops; laboratory equipment; biological safety modules with the BSL-4 class; bandageless healing units.

Association of «AMS-MFME» are placed on their own production base with the total area more than 14 000 m<sup>2</sup>. The staff, who are working at factory - are more than 900 persons.



President of AMS-MFME, the academian of the Russian Academy of medical and Technical science  
**Vladimir Suprun**





As the base of cleanroom's creation of AMS-MFME there is an integrated approach, consisting in enterprise's carrying out of the all works - from designing till object's handover for operation.

The list of factory's performable services includes:

- designing of cleanrooms
- producing of cleanrooms
- erecting of cleanrooms
- attestation and validation
- after-sales service
- test operation and measurement of electrical facilities and net-works



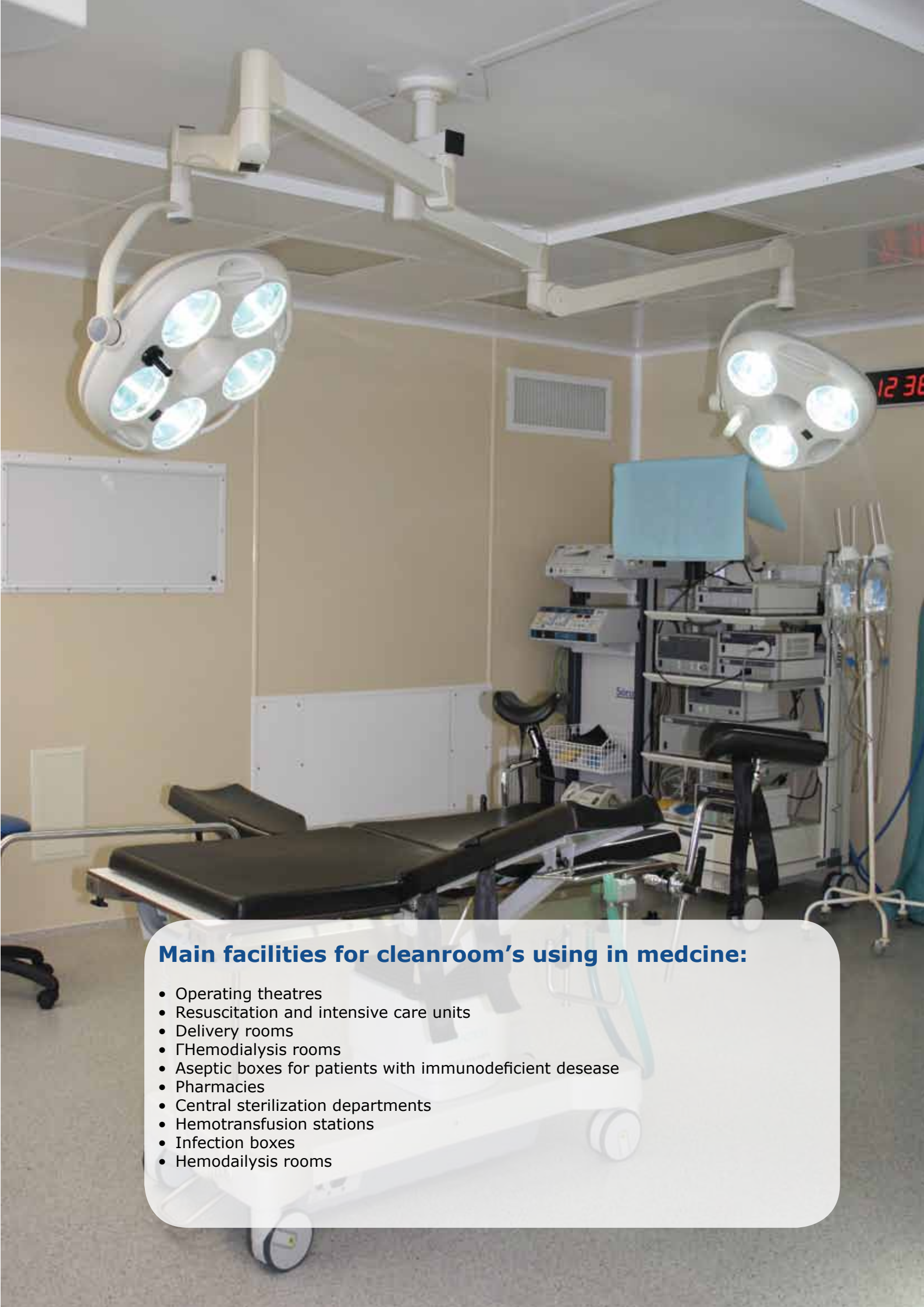
# Cleanrooms for medicine

The long finding of patients in hospitals becomes dangerous for them because already after short time all of them become bacilli carriers so-called hospital stocks and carriers of a various infection. It concerns as well the personnel of medical institutions.

The wide circulation of an hospital infection is connected with decrease in activity of an patient organism, change of structure and biological properties of microorganisms against decrease in efficiency of widely applied antibiotics and antiseptic preparations, occurrence steady against them various stocks microbial associations.

In comparison with traditional methods of preventive maintenance and the infection treatment, directed on struggle and destruction already available in microorganisms, basic difference of cleanrooms consists in constant removal by an air stream appearing in microorganisms and creation of reliable barrier to microflora available out of cleanroom.





### **Main facilities for cleanroom's using in medicine:**

- Operating theatres
- Resuscitation and intensive care units
- Delivery rooms
- Hemodialysis rooms
- Aseptic boxes for patients with immunodeficient disease
- Pharmacies
- Central sterilization departments
- Hemotransfusion stations
- Infection boxes
- Hemodialysis rooms

## What is cleanroom?

Cleanroom - is a premise, in which aerosol particles count is controled. It is used to minimize receipt, generation and accumulation of particles indoors. If it is necessary, other parameters such as temperature, humidity, pressure are supervised.

The problem of cleanroom maintenance in premises most effectively dares on the basis of the all-round approach considering not only specific features of each cleanroom (space-planning characteristics, technological appointment, made demands on cleanliness and climatic parameteres), but also features characterizing the premise as the element of set of premises, this position finds reflexion in creation of cleanrooms, which the main principles of designing are:

- zoning to the functional modules of premises;
- creation of physical barrier between modules;
- creation of physical barrier between modules and building constructions;
- maintenance of demanded settlement air exchange;
- preparation of incoming air with demanded parametres on humidity, temperature and microbiological cleanliness;
- rational organisation of air overflows from purer modules to less pure;

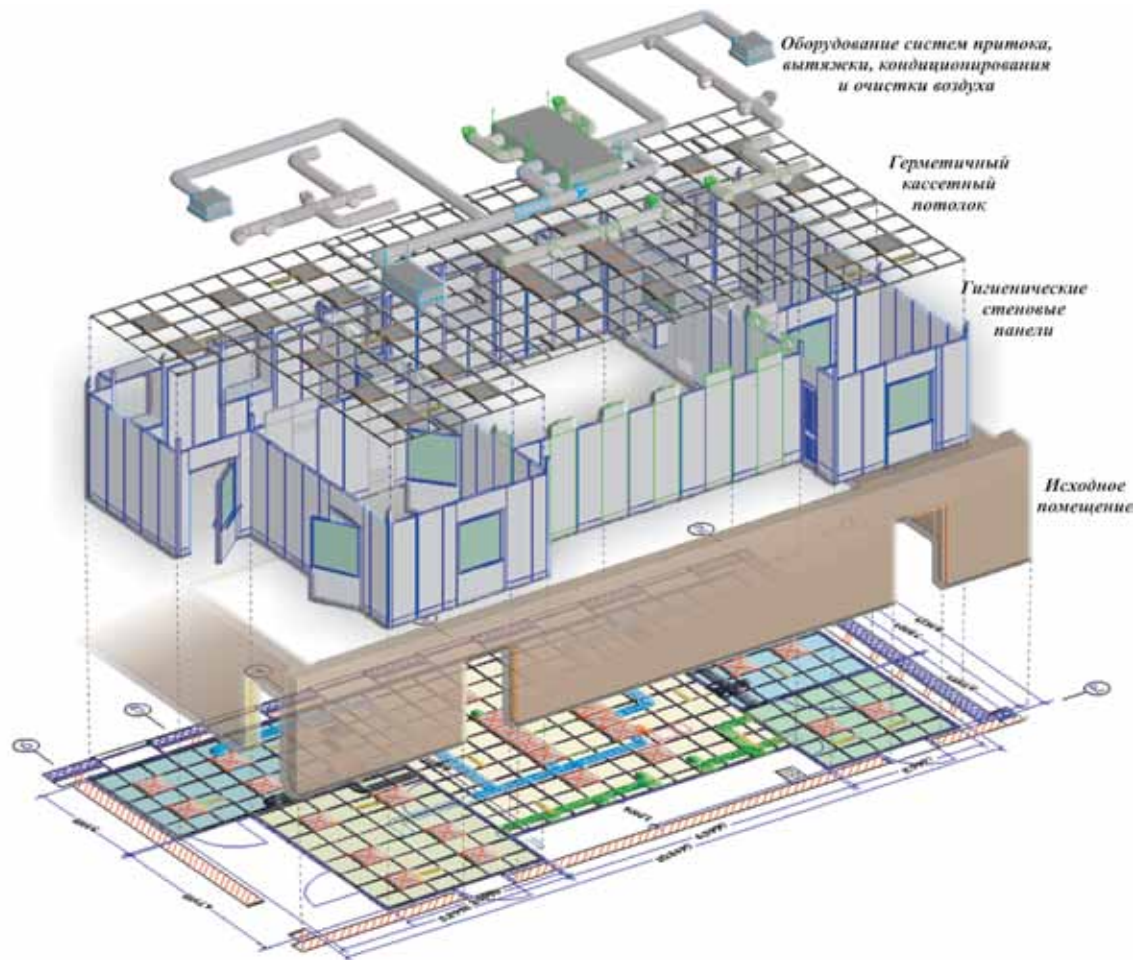
- air distribution in modules with the organisation of the set direction of its movement considering features of a premise and technological process;
- highly effective clearing of internal air in modules.

The complex design is defined by concrete appointment of cleanrooms, their configuration and the sizes operating with standard requirements to the air environment. In a general view delivered complexes are carried out by a modular principle and include following functional systems and elements:

- system of preparation, disinfecting and air distribution;
- microclimate control system of premises;
- constructive of complex (constructive elements for hermetic sealing of premises);
- built-in medical, technological and engineering equipment.



## Structure of complexes of cleanrooms of «AMS-MFME»



### BUILDING ENVELOP

- Hygienic impervious suspended ceiling
- Hygienic impervious walls
- Doors and windows
- Pass-through window with air flow
- Pass-through window without air flow
- Sluice - physical barrier

### LOCAL RECIRCULATION SYSTEMS

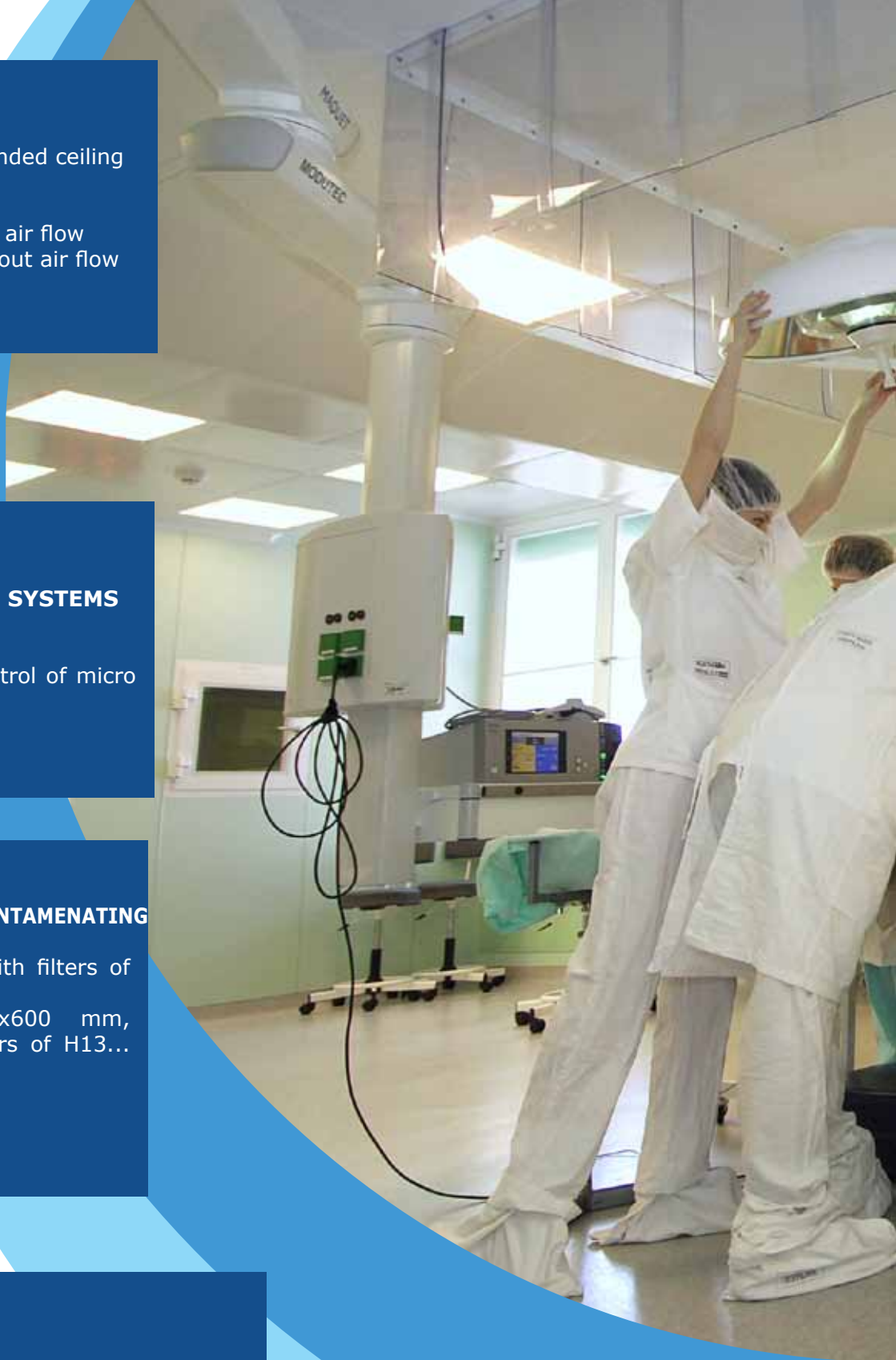
- Low-profile quiet unit
- Channel Heater
- System of personel' s control of micro climate

### AIR CLEANING AND DECONTAMENATING UNITS

- Laminar air dispensers with filters of H14 class
- Air dispensers (600x600 mm, 600x1200 mm) with filters of H13... H14 class
- Wall air ingress units

HEATING UNITS, BUILT-IN THE WALL PANELS

SANITARY-HYGENIC COMPLEXES, BUILT-IN THE WALL PANELS





### **BUILT-IN MEDICAL EQUIPMENT**

- Surgery lamps
- Bactoreocidal irradiators
- X-ray view boxes

### **MEDICAL GASES EQUIPMENT**

- Ceiling consoles (surgical and anesthesiological)
- Floor-standing supported console
- Wall resuscitation console
- Wall ward console

### **AUTOMATIC UNITS**

- Equipment of electrical watches
- Safeguard equipment
- Video signal equipment

### **ENGINEERING AND CONTROL EQUIPMENT**

### **EQUIPMENT FOR ELECTRICAL SUPPLY'S CONROL**

**LUMINESCENT LAMPS  
HERMETICAL (IP54 CLASS),  
BUILT-IN THE WALL PANELS**

## COMPLEXES OF CLEANROOMS FOR SURGERY SUITS

More than 30 % patients among all hospitalized are surgical, thus about half operated – patients are more senior 45 years (the group of the raised risk development of an infection in the postoperative period).

In modern conditions surgical in-patient hospitals – in fact are infection sections, in which however the mode of infectious hospital is not organized. It can lead to preservation and accumulation in departments of hospital activators.

The possibility of infection operated people considerably above in comparison with other hospitalized. It's caused by that patients are in hospital longer, have extensive entrance gate for the infection activator, are exposed to influence of the numerous factors raising risk

of development disease at various mechanisms of infection. To such factors belong: age of patients, operations lasting more than 4 hours, plural traumas, extensive thermal defeats, earlier transferred infections, repeated operations, long terms of stay in hospital, long application of antibacterial preparations and so on.

Successful struggle against hospital infections in premises of operating theatre is impossible without creation of obstacles in a way of distribution of infection activators.

The complex of equipment cleanrooms of operating theatre in general includes following modules:

- the module of an operating theatre;
- the module of preoperating;
- the premise module of patient preparation (narcotic);
- the module of sterilizing;
- the module of postoperative (postoperative room).

Designing of these modules is carried out with meeting requirements of standard documents with following features:

- in operating theatre , a premise of patient preparation (narcotic) and postoperative room internal clearing of air by means of what frequency rate of air exchange more than 20 is reached is carry out
- air delivery in zone of an operation table in an operating theatre is carried out by a falling laminar stream that creates an air passage with the raised frequency rate of air exchange and allows to reach the highest lever of cleanliness;





**Magnitogorsk  
Medical health-care unit and  
OAO «MMK»**

- local illuminating in operating theatres is provided with installation of the operational fixture;
- for transfer of materials and tools between sterilizing and an operating theatre performance of pass-through windows is provided.

- air delivery in the preoperative and sterilizing is carried by a turbulent stream;
- in maintenance of connection of electroequipment and supply of medical gases in, an operating theatre installation of the ceiling console of the surgeon and in preparation of patient (narcotic) and postoperative chamber – the wall medical supply console is provided;



**Kazakhstan Republic,  
Astana  
City hospital №1**



**Kurgan  
District  
Perinatal center**

## COMPLEXES OF CLEANROOMS IN MATERNITY DEPARTMENTS

The variety of clinical forms of hospital infections of newborns and women in childbirth is caused by presence of plural gate of an infection (skin, mucous membranes of the top respiratory ways and eyes, intestines, umbilical injury), also is conditional-pathogenic character of activator causing these diseases.

On a share of purulent-septic diseases in the pathology structure there are 4-5 % of newborns. During flashes of these disease depth can be reach 18 %.

One of the basic ways of distribution of hospital infection in maieutologist in-patient clinic is hospital air, where there are aerogene activators of illnesses even when you observe all the rules of current and final disinfection. The complex of cleanrooms removes the problem of staphylococcal infection in maternity hospitals.

The complex of cleanrooms in maternity hospitals includes following modules:

- the module of patrimonial room;
- the module of prepartimomial room;
- the module of preparation premise for personnel;
- the module of resuscitation for newborns;
- the module of small operating with a sluice;
- the module of the sterilizing room;
- the module of the postoperative chamber;
- the module of the intensive care unit.



**Kazakhstan Republic, Astana  
City Maternity hospital №3**



**Kurgan  
District  
Perinatal center**

Designing of these modules is carried out with meeting requirements of standard documents with following features:

- in patrimonial room, postoperative, resuscitation room for newborns, intensive care unit internal clearing of air by means of what frequency rate of air exchange more than 20 is reached is carry out;



**Kursk,  
District  
Perinatal center**

- air delivery in the other premises is carried by a turbulent stream;
- in maintenance of connection of electroequipment and supply of medical gases in, an small operating installation of the ceiling console of the surgeon and in intensive care unit – the wall medical supply console is provided;
- local illuminating in small operating and patrimonial room is provided with installation of the operational fixture.

- air delivery in zone of an operation table in an small operating and to the zone of maientologist bed is carried out by a falling laminar stream that creates an air passage with the raised frequency rate of air exchange and allows to reach the highest lever of cleanliness;



**Omsk  
City Clinic Maternity  
hospital №1**



**Nizhnij Tagil  
Perinatal center**

## COMPLEXES OF CLEANROOMS IN RESUSCITATION AND INTENSIVE CARE UNITS

The contingent of the patient who is in branches of resuscitation, is characterized by considerable infringements of the immune status as a result of the basic disease and operative intervention. These patients are most subject to colonization hospital stocks is conditional-pathogenic microflora.

The risk of development of hospital disease in resuscitation units is highest and reaches 20-25 % and at separate kinds of pathology – to 70 %.

Increasing value of branches of resuscitation and intensive care units in occurrence of hospital infections causes a presentation of increased requirements to planning decisions of these branches, observance of sanitary-and-hygienic and antiepidemic regimes

In general the complex of cleanrooms for operating theatres and intensive care units includes the following modules:

- the module of resuscitation unit;
- the module of preoperational;
- the module of the intensive care unit.



**Omsk  
City  
Hospital №12**



**Saransk  
City Clinic  
Hospital №14**





**Moscow  
N.I. Pirogov  
City Clinic Hospital №1**

- air delivery in zone of an operation table in a resuscitation unit is carried out by a falling laminar stream that creates an air passage with the raised frequency rate of air exchange and allows to reach the highest level of cleanliness;
- air delivery in the preresuscitation and intensive care unit is carried by a turbulent stream;

Designing of the specified modules is carried out with meeting all requirements standard documents with following features:

- in resuscitation and intensive care units internal clearing of air by means of what frequency rate of air exchange more than 20 is reached is carry out;



**Kazakhstan Republic, Astana  
City hospital №1**



**Moscow  
K.A. Timiryazev  
Children Clinic  
Hospital №20**

- in maintenance of connection of electroequipment and supply of medical gases in, a resuscitation unit installation of the ceiling console of the anesthesiologist and in intensive care unit – the wall medical supply console is provided

## ASEPTIC BOXES FOR PATIENTS WITH IMMUNODEFICIENT DISEASE

World and domestic experience shows that the treatment of patients with immunodeficient disease should be made in special aseptic chambers, provided antimicrobial mode with requirement parameters of air environment and microclimate.

Typical aseptic laminar chamber represents the complex of equipment, placed by a principle "premise in premise". Isolation of patient from aerogene infection activators is reached without loss of possibility of contact to personnel and relatives.

The structure of the equipment and its placing are individual for every concrete case and are defined during the projecting process taking into account initial parameters and premise lay-on, and also Customer's wishes.



**S.-Petersburg  
Ministry of Emergency  
Situation of the Russian  
Federation**

In the result of cleanrooms placing the initial premise is divided into zones:

- zone for treatment (further – box);
- zone for supervision (preboxing);
- technological zone.

The box is calculated on 1-2 cots.

The creation of horizontal and vertical laminar air flow with automatically supported standard characteristics of microclimate is provided. Highly effective cleaning (2-3 steps, the terminal filter of class no less than H13), disinfecting of air arriving in boxing by an ultraviolet irradiation at frequency rate of air exchange not less than 50 allow to provide a cleanless class not more low P7 (10000) 0,5 MK (100) (see GOST R 50766-95).

The noise level doesn't exceed 50 dB (A).



**Balashikha  
Moscow Regional Children  
Oncology Dispanser**

## LABORATORY EQUIPMENT

Factory produces the following run-equipment:



**sterile laminar boxes**  
II A 2 class (СЛШ-1,2 АМ, СЛШ-1,2 АА,  
СЛШ-1,5 АМ, СЛШ-1,8 АМ, СЛШ-1,2 АМЦ)  
и II B 2 class (СЛШ-1,2 ВМ)



**sterile laminar box of II A 2 safety class  
like VIS-A-VIS**



**safety fume hoods**



**fume hoods**



**PCR-boxes**



**local clean areas**

## LABORATORY EQUIPMENT



**Ceiling consoles**



**Resuscitation wall consoles**



**Ceiling consoles of «Bridge» type**



**Built-in electrical supply console**



**Wall ward consoles**



**Valve system**



**Additional technological equipment**



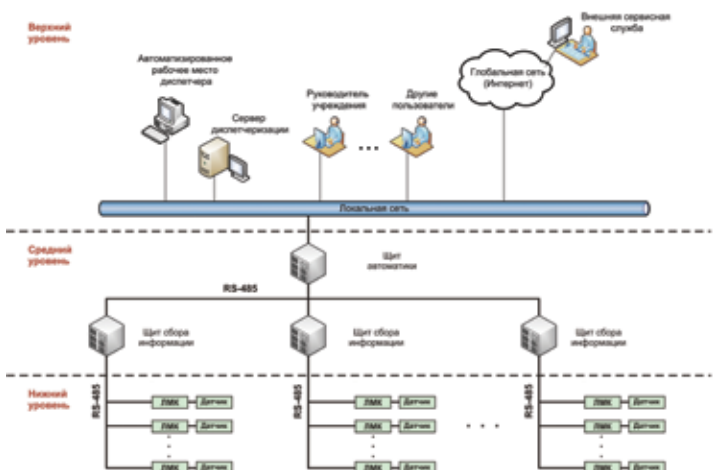
**Control-tripping device**



**Systems of medical gases supply**



**Medical gases control system**







TURGOYAK ROAD 2/16, MIASS,  
CHELYABINSK REGION, RUSSIA, 456313

[WWW.LAMINAR.RU](http://WWW.LAMINAR.RU)

TEL.: +7 (3513) 25-52-01

FAX: +7 (3513) 25-52-00

