



ECOLOGY

INCREASE OF THE OPERATION RELIABILITY AND ECOLOGICAL SAFETY OF THERMAL POWER STATION BOILERS

Appointment:

Increasing the operational reliability and environmental safety of boilers of thermal power plants.

Advantages:

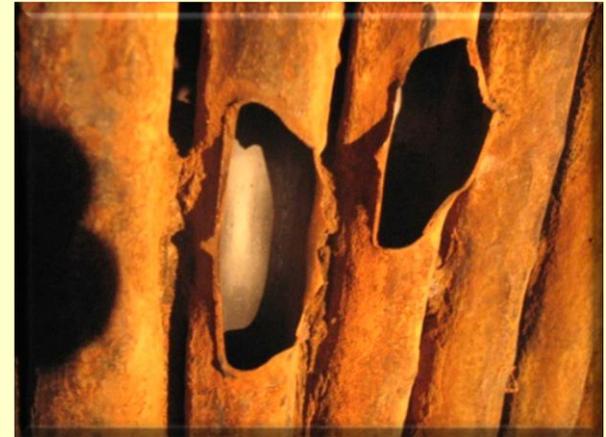
- ✓ high accuracy and informative results: detailed fields of velocities, temperatures and concentrations in the boiler volume;
- ✓ the ability to determine the efficiency of the proposed technical solutions in the early stages of development of measures to modernize the boiler;
- ✓ low cost.

Efficiency:

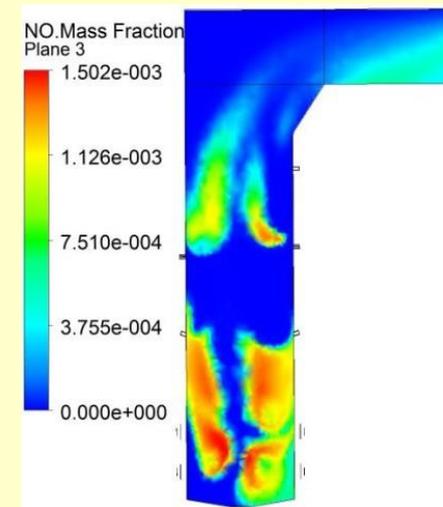
- ✓ extension of the service life of radiation and convective surfaces of pulverized coal boilers of TPPs of Ukraine by controlling the flow structure in the boiler volume by 10%;
- ✓ reduction of NO_x emissions from pulverized coal boilers of TPPs of Ukraine by 30 - 40%.

Implementation: DTEK Ladyzhynska TPP.

Patent of Ukraine: № 67268



Rupture of pipes of the radiation surface of a pulverized coal boiler caused by abrasive wear of metal



Distribution of nitrogen oxides concentration in three-stage coal combustion

DUST-CATCHING SYSTEMS



Appointment:

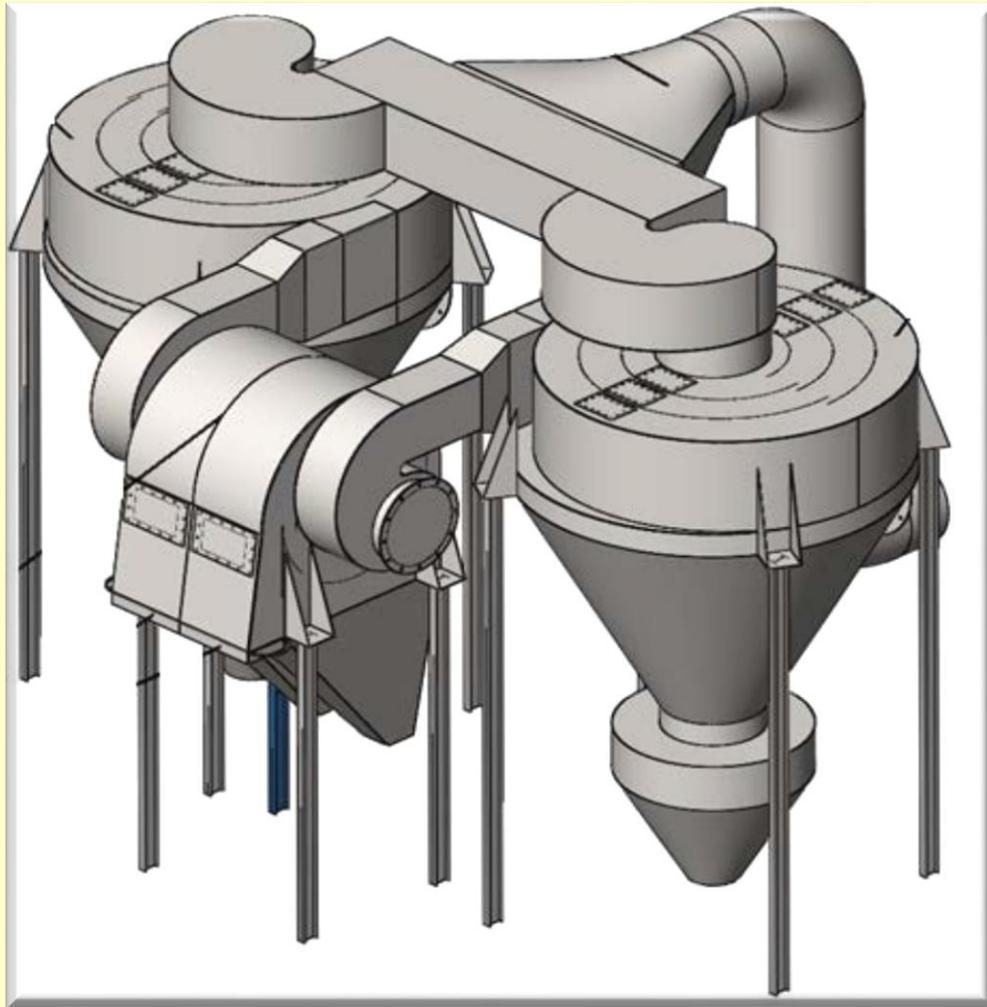
The centrifugal filter, cyclone-filter and cyclone dust-catcher are used in various industries:

- ✓ metallurgical, chemical, energy, woodworking, construction industry, etc.
- ✓ aspiration systems for units for pouring of friable materials;
- ✓ purification systems for drying drums, crushers, stripping tools, etc.;
- ✓ aspiration systems for foundries, cement mills, clinker coolers;
- ✓ ash-catching systems for solid fuel boilers.

Efficiency:

Developed method of modernization of standard cyclones of various types (CN, CIOT, LIOT, RISI, SKCN and others), based on the principle of cyclone dust-catcher construction (new design), allows to upgrade the standard cyclone without significant capital investments, with reduction of dust particles emissions from the cyclone by 2 - 4 times without increase in energy consumption for cleaning, and to extend the lifetime of the cyclone by 1.2 ... 1.4 times.

DEVICE FOR FLUE GASES CLEANING FROM SULFUR DIOXIDE AND ASH



Appointment:

Installation is used for complex flue gas cleaning of ash and sulfur dioxide by burning coal in boilers communal heating and industry capacity 3,15 - 30 MW.

Efficiency:

The installation allows to clean flue gases from sulfur dioxide to 50%, and from ash to 95%.

CYCLONE DUST-CATCHER



Appointment:

The cyclone dust-catcher is designed to clean dusty air (gas) from solid dust particles and liquid aerosols in aspiration systems and in wet gas cleaning systems as a droplet catcher.

Efficiency:

- ✓ the efficiency of dust collection in the cyclone dust collector is 90 - 95%
- ✓ ejection of dust from a cyclone dust-catcher is 2-4 times less than from a standard cyclone;
- ✓ two-stage purification of gas flow;
- ✓ increasing the lifetime of cyclone dust-catcher due to achieved reduction of abrasion wear and tear as a result of removing of large particles to a separate bin-bag.

CENTRIFUGAL FILTER



Appointment:

The centrifugal filter is intended for cleaning of gas air streams of ash and dust.

Efficiency:

- ✓ the efficiency of dust collection in the centrifugal filter is 92-98%;
- ✓ ability to achieve standards for emissions of particulate matter into the atmosphere;
- ✓ absence of replaceable filter elements;
- ✓ simplicity of a design and reliability in operation.

Basic technical characteristics

The number of channels in the centrifugal filter, n	1	2	3	4	5	6	7	8
Capture rate%	50	67	80	89	94	97	98	99

CYCLONE-FILTER



Appointment:

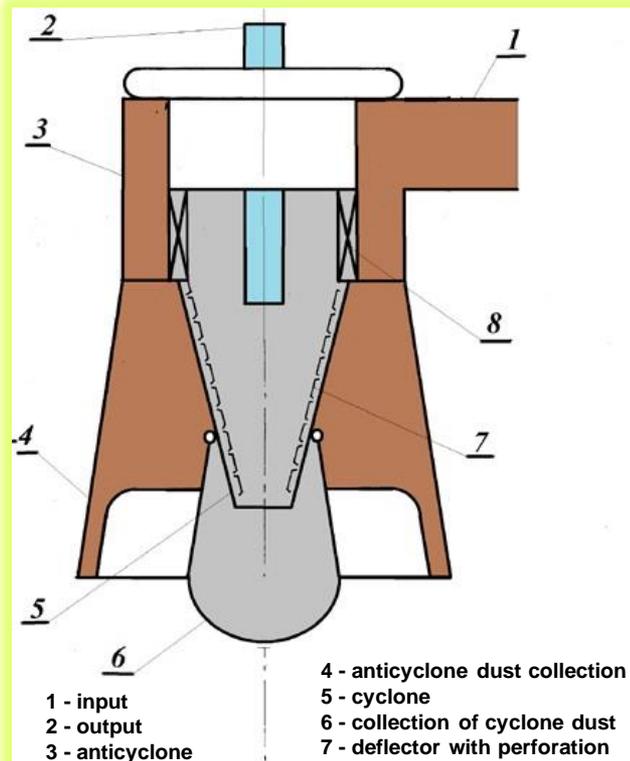
Cyclone-filter is a highly efficient dust-catcher that combines benefits of cyclone and bag filter. Functioning of cyclone-filter is based on three-stage purification:

- ✓ centrifugal in a separation channel;
- ✓ centrifugal in a cylindrical chamber;
- ✓ filtration through bag filters.

Efficiency:

- ✓ the dust catching efficiency of cyclone-filter is 99.9%;
- ✓ high cleaning efficiency that meet European standards;
- ✓ three-stage purification of gas flow is realized in one device;
- ✓ energy saving due to reducing the dust load on the bag filters by pre-treatment in a separation channel of device.

FINE AIR CLEANING FILTER



Appointment:

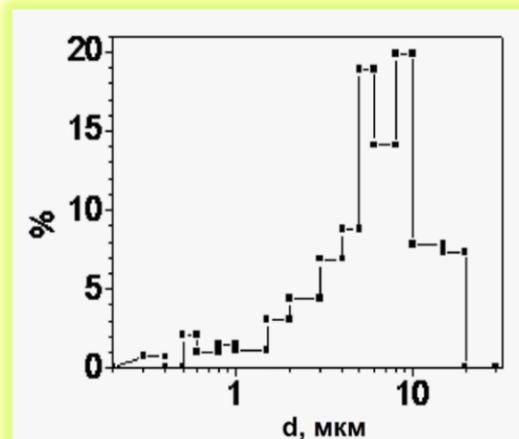
Purification of gases from solid particles.

Advantages:

Sequential two-stage separation of contaminants: larger - in the anticyclone, smaller - in the cyclone.

Basic technical characteristics

Environment parameters:	
Input pressure, kPa	104
Material consumption, g / sec	1,57
Air consumption, g / sec	12
T-catching, %	97



Efficiency:

Histogram of material (coal) at the exit. Particles larger than 10 - 20 microns are effectively separated.

Patent of Ukraine: № 54860 A

VORTEX BUBBLING CONTACT DEVICES



Basic technical characteristics

Gas consumption	up to 20 thousand m ³ /hour
The ratio of mass flow of gas and liquid	0,1...10
Specific interfacial surface	up to 1000 m ² / m ³
The residence time of the gas in the reaction volume	several ms
The degree of capture of solid aerosols	99,5%
Clipping diameter of particle capture	0,3 mkm

Appointment:

Chemical technology, contact heating and cooling of liquids, absorption gas cleaning, purification of gases from solid and liquid aerosols.

Advantages:

In comparison with traditional mass transfer columns, the vortex bubbling equipment has an order of magnitude smaller volume and material consumption, it provides two or three times intensification of heat and mass transfer processes, the ability to work at high average gas speeds in the complete absence of spray.

Efficiency:

- ✓ significant reduction of capital expenditures on new equipment;
- ✓ most suitable for fast-moving chemical processes and well-soluble gases, due to the short residence time of the gas.

Patent of Ukraine: № 23520 A

VORTICAL COOLERS OF AIR



Basic technical characteristics

The temperature of the cooled stream	up to -30°C
Compressed air pressure at the input	0,3...0,6 MPa
Air consumption	10... 100 nm ³ / hour

Appointment:

Cooling of CNC machines and other electronic equipment, blowing of electric motors, contact cooling of solutions and electrolytes, air conditioning of vehicle cabs, mini-refrigerators for food products, cooling of heat-stressed elements of lasers.

Advantages:

Small dimensions and material consumption, simplicity of construction, inertia, compactness, absence of moving parts.

Efficiency:

In the presence of a source of compressed air (pneumatic network at the enterprise, the compressor on the vehicle), capital costs are several times lower in comparison with the traditional refrigerating appliances.

Patent of Ukraine: № 23520 A
A.s. USSR №1763815