



*Limited Liability Company
Engineering-Promotional Center
“Ingehim”*

Active since 1991

*Filters and filtering elements
developed by LLC EPC “Ingehim”*

LLC EPC “Ingehim”
14/83 Shalyapin Str., Kazan 420049, Russia,
Phone, Fax: +7(843)570-2318, +7(843)570-2328
E-mail: info@ingehim.ru
Web: <http://www.ingehim.ru>



Filtering element

LLC EPC “Ingehim” has designed and manufactures an essentially new and unique in terms of characteristics spiral-wound filtering element for removal of solid particles from liquids and gases.

The filtering surface is formed by a metal tape wound into a cylindrical spiral. The tape is profiled and fabricated in the form of trapezoidal waves; height of waves increases from the outer diameter of the cylindrical filtering surface toward its internal diameter.

When winding a tape, adjacent layers rigidly lean on each other at the waves’ lateral surfaces, providing the required fixed gap between adjacent layers of the tape (see Figs. 1-4 below).

Manufacturing is already mastered for filtering elements of outer diameters 80, 90 and 115 *mm* for filtration fineness ranging from 10 to 500 *microns*. At that, the used tape is made of stainless steel or titan 150, 200 and 250 *microns* thick and 6 *mm* wide.

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Filtering element of the spiral-wound type developed by LLC EPC "Ingehim"



Fig. 1

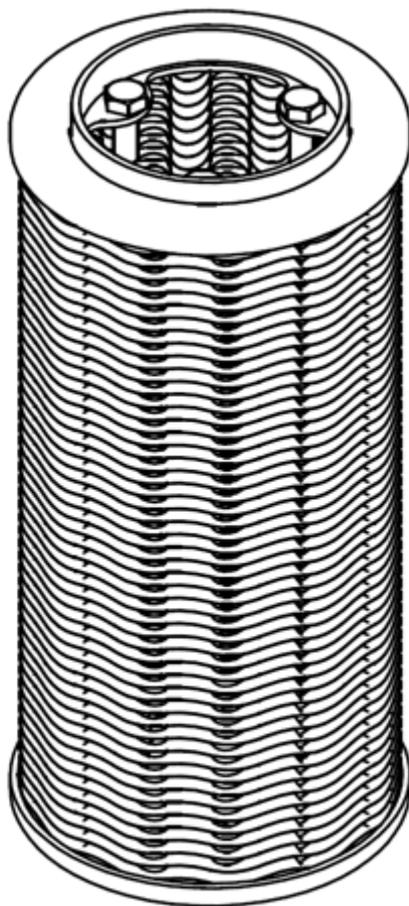


Fig. 2

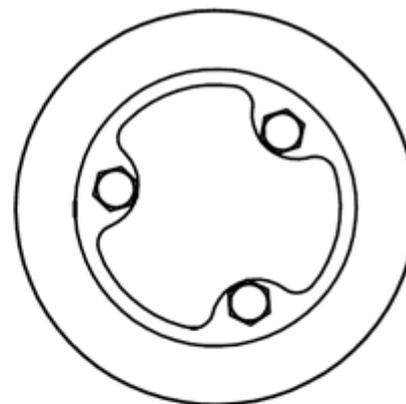


Fig. 3

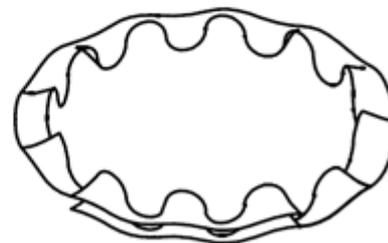
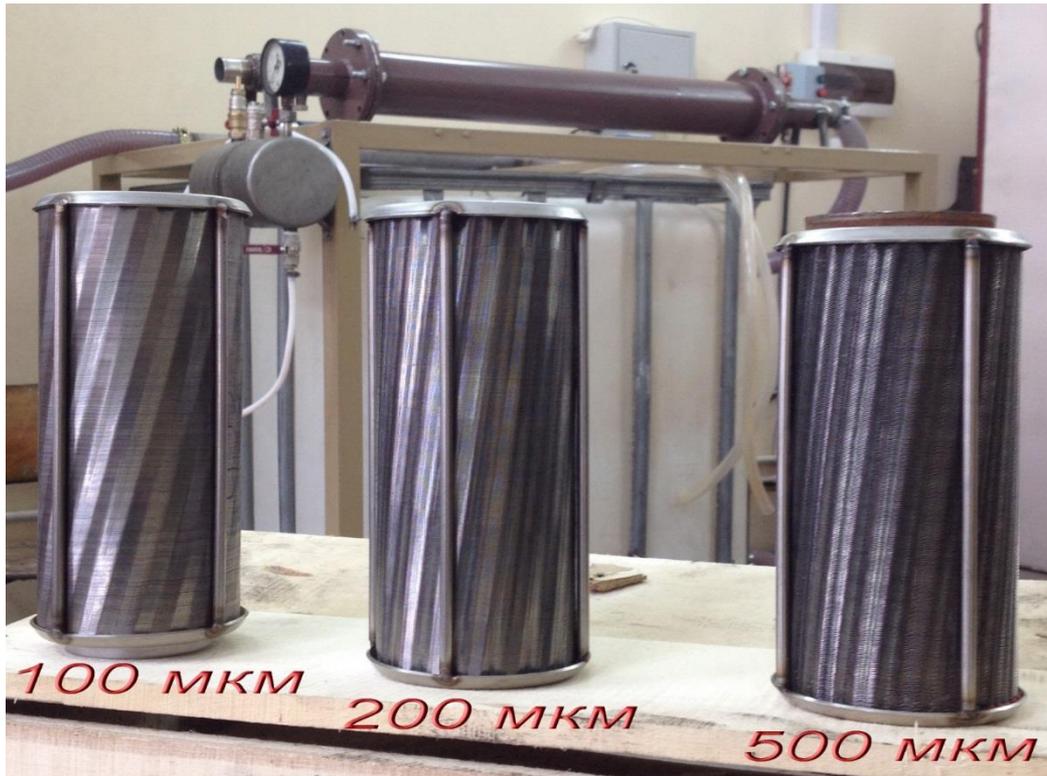


Fig. 4

Main advantages of spiral-wound filters:

- **Large relative free cross-section.** For example, when using a filtering element of diameter 115 mm for ensuring the filtration fineness 100 microns, the relative cross-section exceeds 41%. This allows reducing the length of filters used in oil wells by several times for ensuring the required filter capacity or to increase by several times the required capacity of a filter of a fixed length.
- **Ability to withstand high pressure differentials.** Being placed in a rigid metal framework, such filters maintain their properties even at pressure differentials of several tens of bars. This allows effective regeneration of filtering elements by using intensive back washing.
- **Ease of forming a filtering surface.** The filtering surface is formed simply by simultaneous winding a metal tape and molding of trapezoidal ledges into a cylindrical surface. It provides rather high productivity of filter manufacturing equipment and almost zero metal wastes at manufacturing.

Spirally-wound filtering elements developed by LLC EPC "Ingehim"



Filtering elements for filtration fineness 100, 200, and 500 microns



Russian patent

The design of the filtering element allows using a tape of corrosion-resistant steel grades for forming the filtering surface, which opens possibilities for filtration of various aggressive media.

Experimental investigations

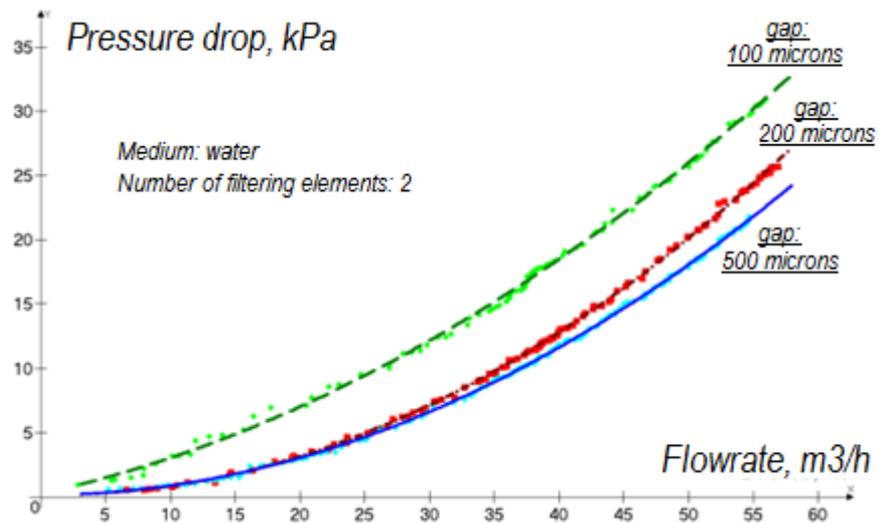


To study hydraulic characteristics of the spirally-wound filters, an automatic experimental stand was created.

The experimental stand allows measuring hydraulic resistance of different types of filtering elements depending on the fluid's flow rate.

In particular, hydraulic resistance of several types of filtering elements is measured for the water medium. As a result of the experiments, dependence of pressure drop across the filtering surface on flow rate is obtained.

This characteristic is needed for calculating hydraulic resistance of the filter and selecting the optimum filtering surface.



Dependence of hydraulic resistance on flow rate of water for various filtering elements

Filters developed by LLC EPC "Ingehim"

- In addition to manufacturing filtering elements, LLC EPC "Ingehim" also manufactures shells of horizontal and vertical apparatuses for filtration of gases and liquids.

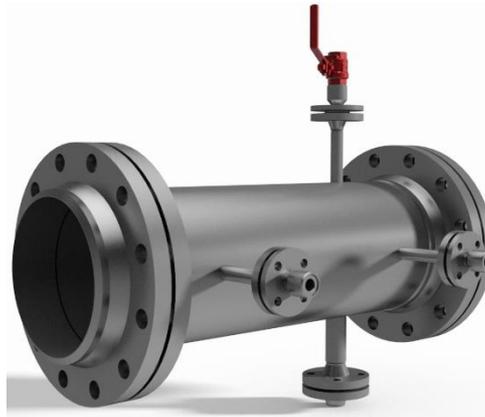
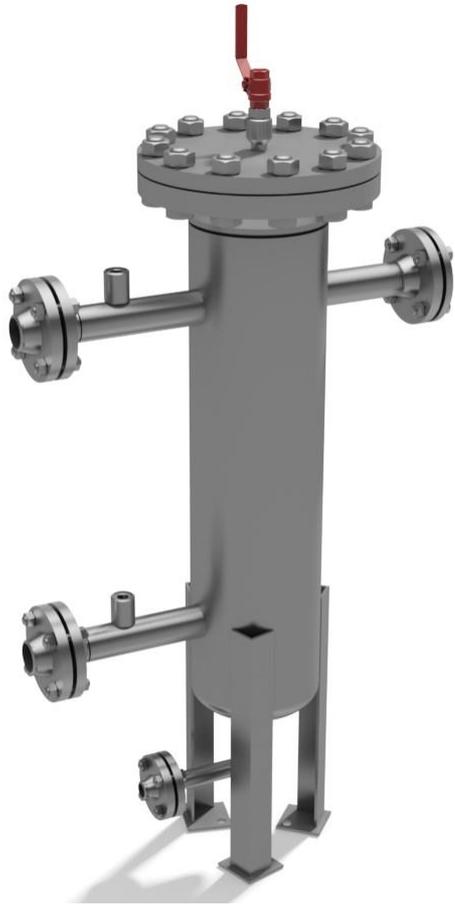
Application areas:

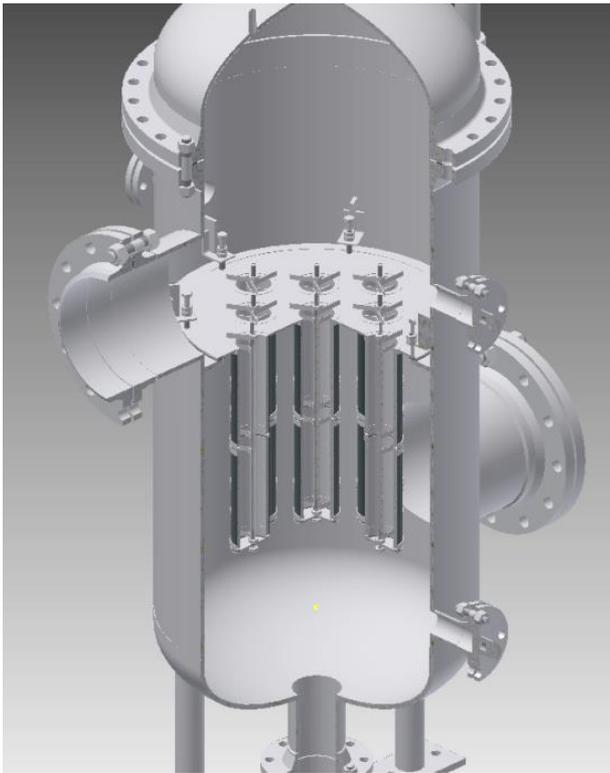
- Recycling water supply;
- Purification of cooling water before complex process equipment (compressors, boilers, heat exchangers, pumps);
- Purification of process water;
- Purification of process liquids (petroleum products, acids, alkalis, etc.);
- Purification of fuel gas

Industries:

- Heat power engineering
- Metallurgy
- Chemical industry
- Oil and gas refining
- Water supply, water treatment
- Pulp and paper industry
- Food industry

Filters developed by LLC EPC "Ingehim"





LLC EPC “Ingehim” is ready to design and manufacture spiral-wound filters of a wide range of capacities and filtration finenesses to technical specifications of the Customer.