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LIQUID MOVEMENT REGIMES STUDY USING HONEYCOMBS AND GRATINGS OF DIFFERENT DIAMETERS

The founder of research into the establishment of fluid motion regimes is the English physicist Osborne Reynolds. When studying the flow of dropping liquids with different physical properties, Reynolds found that the movement can be laminar and turbulent. "Laminar" comes from the Latin word lamina - layer. This is such a regime when the fluid flow moves in separate streams or layers and the trajectories of individual particles do not intersect with each other. In practice, the laminar regime occurs when moving liquids with high viscosity (oil, lubricating oils), when moving water through thin tubes, in pipelines at low flow rates.

"Turbulent" comes from the Latin word turbulentus, erratic. In such a regime, when the flow jets are broken, all streams are mixed, and the trajectories of moving particles acquire a complex shape, intersecting with each other. In practice, most often there is a turbulent regime of fluid motion.

Honeycomb - (from English honeycomb - honeycomb, honey - honey) is a structure consisting of hexagonal cells with thin walls (Fig. 1). Honeycomb aligns the flow in the direction, breaking up large eddies, and also reduces the uneven distribution of longitudinal velocities.

The grates are designed to extract large dirt from wastewater: paper, bones, rags, branches, stones, vegetable and fruit residues, and plastic containers. Typically, the grate consists of inclined or vertical metal rods mounted on a metal frame installed in the sewage channel. The distance between two adjacent bars in a lattice is called a transparent lattice. The value of the transparent grating determines the minimum value of one of the impurities measured on the grating.

Lattices are divided:

- depending on the size of the transparent grating;
- depending on the method of cleaning grates from dirt;
- depending on the design.

Development of dampers in the laboratory of hydraulics

At the installation of the laboratory of hydraulics, when performing laboratory work Investigation of water flow modes, it is impossible to visually determine the boundary between laminar and turbulent water flow modes. In order to observe the laminar flow of water, it is necessary to calm the flow of water. For this purpose, effective designs of water flow dampers have been introduced and applied:

– lattices of different diameters;

- honeycomb.

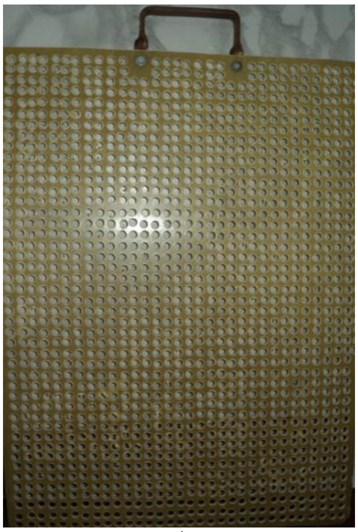
a) b)

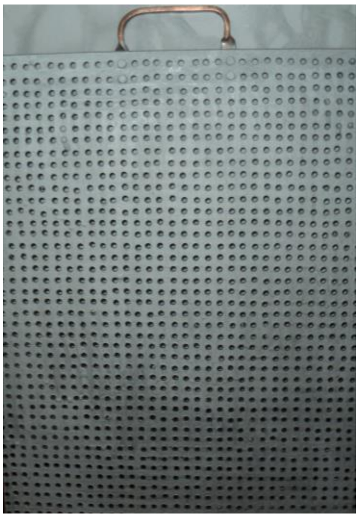
Figure 1 - Examples of honeycombs:
a) honeycombs resemble a honeycomb in the context.
b) a honeycomb made of plastic pipes with a diameter of 16 mm and a length of 15 cm, made in a hydraulics laboratory.

The grate is an inclined or vertical metal rods, mounted on a metal frame, installed in the channel for the movement of wastewater. The distance between two adjacent bars in a lattice is called a transparent lattice.

Honeycomb is a lamellar grating in a pipe channel to equalize fluid flow.

After the study, the value of the Reynolds criterion was determined as the boundaries of laminar and turbulent regimes for various designs of water flow dampers. A comparison of the results of visual observation and analytical calculations was also made.





a) b)

Figure 2 - Photo of honeycombs
a) A metal grate measuring 46x35 cm. 1530 - holes, diameter 5 mm;
b) Plastic grid 46x35 cm. 1440 - transparent, diameter 6 mm.

Thanks to the use of calming water flow, we can visually observe and analytically calculate the transition from laminar to turbulent water flow using the Reynolds formula.

The methodology for performing laboratory work on the modes of fluid movement in pipes has been improved, which is used in the educational process in the laboratory of hydraulics in the study of the discipline "Technical mechanics of fluid and gas".

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BRICK WORK DESTRUCTION STAGES UNDER THE COMBINED ACTION OF VERTICAL AND HORIZONTAL FORCES

Vertical and horizontal loads act together on any building. Vertical loads include the own weight of the building, people, and furniture (or equipment). Horizontal loads include wind loads with dynamic and static components. Its value depends on the gustiness of the wind and its speed. In modern combat conditions, one should also take into account the dynamic load on the building from explosions and from blast waves.

The piers of the bearing walls under the action of a horizontal seismic force are in loading conditions that are close to those that appear in the frame when it is skewed.

In the first stage of masonry deformation (Fig. 1), when the horizontal forces (from seismic load or blast wave) are small, the partitions work together with the entire contact area above the window belt. The vertical load is transferred from the upper partitions to the lower ones at all levels along the entire horizontal section.

In the second stage, cracks form in the stretched zones of the horizontal