HYDRAULIC RESISTANCES IN PIPES AND THEIR HYDRAULIC CALCULATION

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Abstract: *A pipeline is a system of cylindrical parts connected by connecting elements and used to transport chemicals and other materials. As a rule, underground pipelines are used to transport substances in chemical plants. As for the autonomous and isolated parts of the installation, they also apply to the pipeline system or network.*

Key words: *wells, hydraulic resistance in wells, height, speed, steady, unsteady motion.*

INTODUCTION

All these elements are produced separately, after which they are connected as a single pipeline system. In addition, pipelines can be equipped with heating and necessary insulation in various materials.

The volume of pipes and materials for their production is selected in each individual case based on the process and requirements for resignation. But in order to standardize the sizes of pipes, they are classified and combined. The main criterion is the permissible pressure at which the pipeline can operate and is safe. Nominal diameter is a parameter used in the calculation of hydraulic pipes in piping systems as a performance factor that aligns parts such as pipes, valves, fittings. Nominal diameter is a volumetric value, numerically equal to the internal diameter of the structure. An example of a nominal inner diameter: DN 125. The nominal inner diameter is not indicated on the drawings and does not replace the actual diameters of the pipe. When calculating hydraulics, it corresponds to an approximate exact diameter for certain sections of the pipeline. When numerical nominal diameters are provided, they are selected to increase the pipe throughput from one nominal diameter to another by up to 40%.

Nominal diameters are set to avoid problems with the mutual compatibility of parts when calculating hydraulic losses in the pipeline. When determining the nominal diameter, based on this value, an indicator is selected that is as close as possible to the diameter of the pipe.

When calculating hydraulic losses, the nominal pressure for the pipeline is selected based on the pressure created in it during operation by choosing the largest value. In addition, fittings and valves must also be compatible with the same pressure level in the system. The thickness of the pipe wall is calculated based on the nominal pressure and ensures that the pipe works at a pressure equal to the nominal pressure. When choosing

materials for the production of pipeline systems, such characteristics as the parameters of the transported medium are taken into account. through the pipeline and the initial working pressure in this system. In the hydraulic calculation of heating pipes, the possibility of corrosive effect of the internal environment on the wall material should also be taken into account. Most piping systems are made of steel. Gray cast iron or non-alloy designs are used for pipes without high mechanical loads or corrosive effects.

In the hydraulic calculation of heating pipelines at high working pressure and in the absence of loads with an active effect of corrosion, a pipeline made of steel castings is used. If the corrosion resistance is high or the purity of the product is strict, the pipes are made of stainless steel. If the pipeline system has to withstand the influence of sea water, copper-nickel alloys are used for its production. Aluminum alloys and metals such as tantalum or zirconium are also used. Various types of plastics are often used as pipe materials in the hydraulic design of pressure pipes due to their high corrosion resistance, low weight and ease of processing. This material is suitable for sewage pipes.

Nominal pipes with internal diameters above DN 80 must be equipped with thermal insulation with a lower shell. Such a case has compression rings, staples and a metal lining made of galvanized mild steel or stainless steel. The space between the pipe and the metal case is filled with insulating material. The thickness of the insulation is calculated as a determination of production costs and losses caused by heat loss and ranges from 50 to 250 mm.

When a high-temperature medium is transported through a pipe, it must be insulated to prevent heat loss. If a low-temperature environment is transported through the pipeline, insulation is used to prevent its heating. In such cases, insulation is carried out using special insulation materials wrapped in pipes.

The following materials are usually used:

At temperatures as low as 100 °C - rigid foam polystyrene or polyurethane.

Average around 600°C - in the form of sheaths or mineral fibers such as rock wool or glass felt.

At high temperatures around 1200 °C - ceramic fiber aluminum silicate.

Summary. In the article cited above, we have provided information on the hydraulic calculation of wells. When designing wells, its diameter, length, and pressure are taken into account.

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