

## ACTIVATING METHODS FOR ABRASIVE PARTICLE INSIDE THE JET TO PROCESSING WITH ABRASIVE JET IN SUSPENSION

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### ABSTRACT

During work is tackled the general considerations about the way of activation for mixing of the water with abrasive used for remaking and in the same time shall anticipated the trajectory which has it abrasive inside out the mixing room, as well as the way in which this is displaced fractionally accelerating. In the second part it is study the experimental method for activation. A last part is affected the method of graphic implementation on computer of the particle trajectory.

**KEYWORDS** abrasive particle, abrasive water jet, particle trajectory, matematical modelation

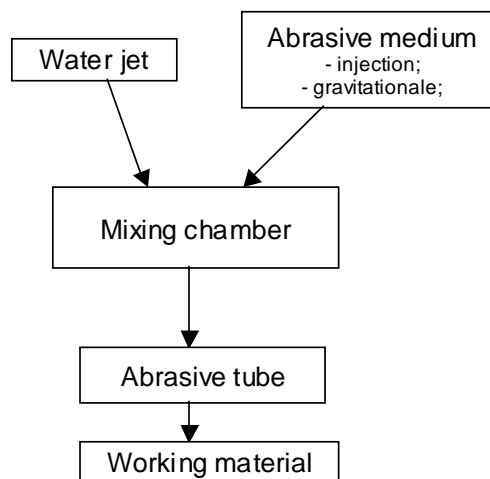
### 1. INTRODUCTION [1], [2], [3]

In inside of paper we analyzed some appearances schematic and which phenomenological made the object of experimental researches financed of to Minister Education and Research through the contract CEEEX 256/2006.

The processing of hardly and super hardly materials with jet abrasive an important part has it average abrasive. From viewpoint of phenomenological is coupled noted that to present onto world plan is applied compliant the logical scheme from the figure 1., medium fluidic mixing carrier, with average abrasive, through absorption special and less through injection in the blending chamber.

On world even the research activation of the water jet from viewpoint was studied as part as else more doctoral dissertations to the level of the way of achieve the nozzle of remaking [1]. Were made analyses from viewpoints phenomenological and from one of the mathematically modeling on digital path.

The working of material by type of titan, or ceramics materials, etc., it can be achieved efficiently with jets of fluid with abrasive in suspension she is study far back as 1987 in USA. Exists from constructive viewpoint the many methods of achieve the fluid blend with abrading medium.



**Fig. 1. The logical scheme of achieve the watery jet with abrasive**

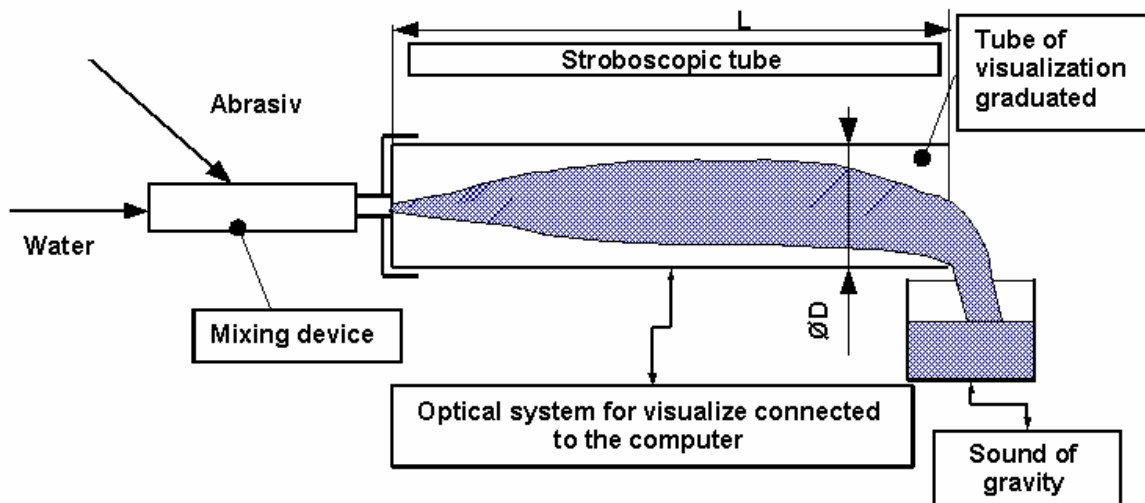


Fig. 2. Principe schema for the determination mode of blend

First between these is absorbed of the abrasive particles with the help of an jet with height velocity inside out of a blending rooms whence these are accelerated from a reduced as far as speed the speed of working.

In figure 2 it is presented the schematic solution of such device of power transfer.

The disadvantage of the use of this solutions is the fact that the acceleration is produced at the impact of drops of water with abrasive particle in the blending room with little speed. The transfer of energy is reduced and is produced an acceleration of the a abrasive particles is reduced. The way of production of the power transfer it can achieved with of a help ensemble format from of generate part of abrasive jet and respective a part of cause the form and the structure of the jet to go out of the abrasive high nozzle and the tube of focalize the kinetic energy.

## 2. Experimental standing [3]

Standing with help whom are shall does the experimentations shall be like from constructive viewpoints with one presented previously, adding the many components of measure the which sizes influences the process of generate the abrasive spurt, the one of measure the pressure, visualize the way of evolution of the jet and determination on optic path of the way of evolution formation of the jet and this modification, etc. In the figure 3 is presented the solution which want to achieve it practically. For the experimental attempts are recommended a range of material of guy formal spherical his

cylindrical particles, of which diameter is contained between 0,8 mm and 0,05 mm.

The sizes of the tube it is dictate of the fluid used-up pressure and the sizes of abrasive particles. The value for the length of visualization tube is proxy. 4 m and the diameter is 150 mm. The pressure of used thing is recommended to be between 500 bars and 2.500 bars. The diameter of water nozzle is shall become of 0.3 mm to 0,8 mm, and for the one the tube of focus is shall utilized a range from 1.5 mm to 2, 5 mm.

From constructive viewpoint we employed else many sonde to determination the input parameters in system.

First of these is a derrick of which flow causes the watery debit entered the in the watery circuit and two carry causes the watery flow with abrasive in which suspension is entered the in system on the circuit of abrasive. Parallel with this in is sound which causes the pressure on the watery circuit and on one watery with abrading. Firstling is of guy turbines again two of hombres membrane and both the by-path foreknowledge with the interface of liaison to computer and digitally notice board of the sizes is determined.

Upon the part of circuit of input with abrasive he is mounted a system of generate of a field magnetic which assures the concentration of the particles abrasive. He is equipped with electronically devices for modify the intensity of the field magnetic generated which also is connected to computer.

To the level of the blending room am provided three viewing zones with optic tube mode of realization the blend of the water

with abrasive entered the in suspension. Firstling is situated central to the level man way abrasive in blending room, two to 10 mm

of first and the last to the level of the tube of focus.

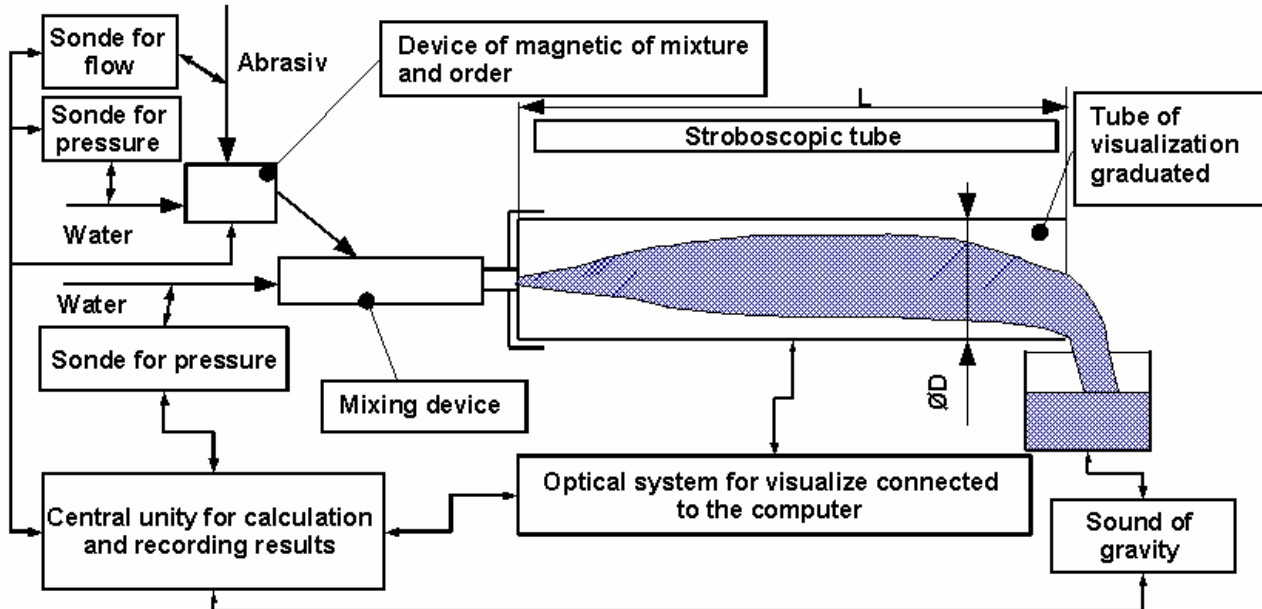


Fig. 3. Schema for study of the abrasive water jet phenomenon

In the same time such according as is noticed and from figure 3 else foresees a second viewing system on zone of exit the tube of which focus is of optic types with stroboscopic his room of type laser for the determination of the structure and the way of dissipation in sectional the abrading particles of the in the spurt the format.

Last stood of caused the which modifications appear to generate the watery spurt with abrading in suspension is one of cause the watery amount with abrading collected after process the and of cause the degree of destruction like succession the internal process of interaction among the particles of abrasive on the accelerating part.

The determination is played through weighed the in temporally what the determination degradation abrasive is done through riddle with riddle successive vibration. Is can such he finished if the field magnetic impinges on the process of generate the watery jet with abrasive in suspension.

### 3. Method for graphical implementation

For the implemented from viewpoint graphic through simulation 3D trajectory and the way of power transfer from the which zones appear to the generation of the water jet with

abrasive in suspension passed to the of a elaboration the program investigatory experimental.

To the level of past blending room we determination the primness factors of influence. After this in experimental path with method of the factorial fractional experiment we are shall cause principals which sizes influences the process of remaking. Are shall caused yes comparative for spray with abrasive in suspension without activation and respective with activation. Are shall caused adding formula of the speed of the particle of the in blending room one in three points mentioned previously and to go out of the tube of power concentration depending on the input parameters in system:

- debit of water,
- debit of abrasive,
- diameter of water orifice,
- diameter of abrasive orifice,
- diameter medium of the abrasive particle,
- distance from the point of mixing in the mixing chamber and the point of outside point of water orifice,
- diameter of energetically concentration orifice,
- length of mixing chamber from the point of entrance in the mixing up to

the inside in the orifice for energetically concentration tube,

- length of energetically concentration tube.

Same in were determinate on path trajectory which has it a particular in inside out the blending room for the case with activation and one without activation.

To the level of the zone from exit the tube of focus we are also analyzed the which sizes influences the process dial-up the spurt and through experiment factorial were determinate structure and the way of generate the watery spurt with abrasive. Among these we are analyzed speed of the particle on distance of exit, the casting abrasive in structure jet and the watery diameter with abrasive on the length of the spurt. Among the which sizes influences the process of generate the spurt to go out of the tube of concentration mention:

- diameter of focusing tub,
- distance between the outside and the point for determination of the parameter.

Mathematical modeling is possible through the utilization of the program of analytics STATGRAPHICS and shall do the of to another object work of research.

For graphical modeling 3D of the pattern of generate the spurt on optic path he caused trajectory of the particle on the strength of mathematical which formula then is shall entered in a programs of generation of images 3D of scream Blender obtained the film of the way of achieve jet.

#### **4. Conclusions**

In conclusively is can asserted as through work is tackled another from viewpoint the process for form's sake the watery jet with abrasive. This is incite one phenomenological of activate the watery spurt with abrasive how much and to the level of model mathematics and graphic simulation of the process of generate jet.

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