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Electromagnetic vortex layer system



# Waste Water Treatment Application



Hexavalent chrome and other heavy metals (chrome, lead, nickel, iron, mangapage, gapper)

### ganese, copper)

AVS makes the decontamination process continuous. Chrome reduction in the unit takes only fractions of a second, increasing processing rate and efficiency of the processing line.

### Phenol

Total purification is achieved after processing in the vortex layer from 0.1 to 2 seconds at wastewater temperature of 20-45 °C (compare with 95-100 °C and 3-5 hours of retention time in agitator units).

### Cyanide 🗕

The AVS can oxidize cyanides to carbonate and ammonia in one stage in basic medium at pH =  $10.5 \div 11.5$ .

### Fluorine and nitric compounds

The AVS significantly simplifies the technology process with better purification results. The amount of fluorine in the water at AVS outlet is below maximum allowable concentrations.

# Arsenic

The AVS can completely remove arsenic from wastewater in **1-5** seconds in the vortex layer, cutting chemical consumption by **3-5** times compared to the regular technology.

# Applications of AVS-P-100 in other industries

- Production (by mixing) of compounds with high melting point (titanium carbide, molybdenum silicide) with simultaneous grinding to the required grain size;
- Production (by grinding and subsequent mixing) of filled metal-polymers based on fluorine plastic and graphite;
- Dispersion of solid powder materials (e.g. dyes for the production of multicolor malachite imitation plastic);
- Mixing of various dry free-running materials (organically bound powders, metallic base powders, micropowders, ceramic frit components, graphite and metal powders in ultra hard material synthesis, grinding of diamonds (including needle-shaped) and ovalization of single-point diamonds;
- Mixing of charge components in production of diamond tools;
- Mixing of diamond-bearing molding powders.
- Activation and modification of rubber extenders;
- Treatment of resistance compounds in resistor production;
- Mixing and grinding of ferrite powders in ferrite production.
- The capacity of the machine (depends directly on the processed media and the technology process) is 50 kg per hour on average.

AS

The AVS vortex layer unit is applied to intensify the processes of wastewater treatment, acid water neutralization, sewage water treatment, water purification and disinfection. Treatment is performed on molecular level. All processes occur continuously without tanks with mixers.

The AVS electromagnetic vortex layer units are highly efficient in decontamination of industrial waste streams. This includes removal of heavy metals ions and other toxic substances, such as chrome, zinc, nickel, cadmium, mercury, cyanide, arsenic, fluorides etc, from water. The amount of chemicals required for waste water processing is **1.5-2** times lower than in the traditional process, with electric power consumption **2-8** times lower. Wastewater processed by the AVS may be released into sewage or water bodies, or can be reused in the technology process.

The vortex layer unit reduces power consumption by **50%**, reagent consumption by **2-10** times (depending on the type of wastewater and chemicals used). The required temperature is lower, as well as total processing equipment footprint (by **10-15%**). The processing in the AVS occurs in a hundredth of a second.

Wastewater type Initial parameter After AVS processing Hexavalent chrome Cr6+, mg/dm<sup>3</sup> 1000  $\bigcirc$ Heavy metals  $Fe^{2+3}$ , mg/dm<sup>3</sup> Ο 250  $0.5-10 \,\mathrm{g/dm^{3}}$ 50-100 mg/dm<sup>3</sup> Phenol Cvanides, mg/liter 8000 0.12 Arsenic, mg/dm<sup>3</sup> 2115  $\bigcirc$ Fluorine, mg/dm<sup>3</sup> 350 10

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AVS-150 K

AVS-100, 150

 protective bushing
non-magnetic chamber
inductor of rotating electromagnetic field

> 4) ferromagnetic elements

> > 5) inductor body