ED

EMPOWERING DEVICE

Housed in a special designed container, it is transportable, silenceable, modular, expandable and easily implementable in any already existent workflow. With the setupped accessories, it is possible to treat any kind of liquid: after the analsis, the pollutants and / or minerals and / or salts will be removed and, if necessary, the water will even made drinkable. It can be easily placed at the input, at the output or in parallel to any existing process or we could easily build around it a new chemical plant.

some applications we have explored

1 BREWERIES

ED helps to reduce the size of the malt grains up to less than 100 microns allowing to skip the grinding and to increase the speed of the integral release of the starch to the must. The greater speed and efficiency allows to operate at lower temperatures drastically cutting production times and costs as well as a drastic reduction of gluten due to the degradation of proline residues in the yeasts.

2 OLIVE OIL

Using ED increases quality, processable quantity and efficiency of the extraction plant. Compared to traditional methods, the yield increases at least 10% as well as total polyphenols that the chlorophylls, while tocopherols increase by about 50% and carotenoids increase bynabout 20%. Finally, the organoleptic evaluations of the oils obtained by means of cavitation have shown an improved taste harmony.

3 OENOLOGY

The use of the ED interacts with the kinetics of the extraction of phenolic compounds during the maceration of red grapes and on the lysis of yeast. Increasing the indices of total polyphenols (over 50%) as well as anthocyanins (over 100%). Even the drawing off is accelerated by reducing the time required by up to 60%: about 2 days against the 5 days normally required with classical methods.

4 SPIRITS

The use of ED accelerates the aging of any liquid containing alcohol as it oxidizes it. Allows in a few minutes or days to performn all those chemical processes that often take years to be carried out: the natural aging is then accelerated by extracting flavors and colors from wood chips submerged in the fluid that flows through the equipment. Evaporation is completely avoided.

5 MILK - DAIRY

In addition to pasteurization, with ED it is possible to recover unexpected and large quantities of nutrients present in the waste water destined for landfill. After the first loop could be extracted 80% of the proteins and 85% of the animal oils and fats. A second cycle of cavitation on water deprived of fats, will allow a reduction of the COD / BOD of 11%. Furthermore, an interesting increase in the conductivity of the fluid is obtained.

6 PASTEURIZATION HOMOGENIZATION

The advantages for pasteurization and homogenization derives from the homogeneity of the obtained heating. The combined effect of the average liquid temperature and the localized, widespread and homogeneous release of large quantities of thermal and mechanical energy, allows to achieve the required food safety parameters, at average temperatures significantly lower than those of traditional processes.

7 OIL

High pressure and temperature rise activate many processes and accelerate chemical reactions. Petroleum, even the heavy bituminous one, which is subjected to cavitation for about 15 minutes, is transformed by increasing the homogeneity, viscosity, gravity of the API (American Petroleum Institute) and other physical properties, acquiring the most sought-after peculiarities to get higher prices.

8 FRACKING

The water recovered from the wells is highly corrosive due by an high concentration of salt, other impurities and the additives used by the oil companies. ED allows to treat these waters on site, making them suitable for use immediately again. This can mean elimination of contributions to landfill and a 30 to 50% less use of new water for each well.

9 ETHANOL

ED contributes to reducing the size of the particles containing starch because each particle of the starchy bean structure is fractured completely, thus increasing the interacting surfaces and thus increasing the ethanol yield, with the same initial matrix, from 1% to 2.5% and 2% to 4% or more with no additional energy input and therefore with lower total raw material costs.

10 BIODIESEL

Thanks to ED, production plants can use a larger quantity of input matrices with extremely higher values of free fats (FFAs). Therefore, used cooking matrixes, exhausted industrial process oils, palm oils, beef tallow, poultry, etc. can be used as production matrices. Furthermore, by speeding up the reactions, the quantities of catalysts to be used to complete the processes decrease.

11 BIOMASS

ED acts directly on the fibrous component of the matrices, increasing their methanogenic potential: therefore, different by-products (straw, pomace, exhausted pomace, etc.) can be used which, previously, could not be adequately valorised for energetic purposes.

12 WATER

ED triggers the release of nascent oxygen which oxidizes the organic substrate and also eliminates viruses and bacteria. Furthermore, it assists the magnetic conversion of insoluble calcite into soluble aragonite. ED does not add or remove anything from water but it amplifies and enhances the natural capacity of water to biodegrade and break down pathogens and pollutants by oxidation. It is possible to add chemicals for targeted and specific interventions.

13 DESALINATION

Given its portability, ED, including desalination module, can be brought to "domicile" if needed, solving a multitude of problems, especially during emergencies or war operations. At the same time, decentralized realities, such as hotels or communities without access to direct water resources, can be equipped with ED, also powered by solar energy, obtaining up to 30 cubic meters per hour of drinking water.

14 EXTRACTION

The use of the ED allows the molecules to come into contact with each other with great ease and speed and, therefore, to trigger an oxidation reaction of cyanides typically present on processing in gold mines, by mixing the waters polluted by cyanides with CO_2 and air compressed. In extreme cases, ED could be equipped with higher yield ozonizers and / or specific chemicals.

15 LIVESTOCK

Water subjected to cavitation treatment increases the digestibility of the food, reducing the production of intestinal gas, promotes the growth of the animal in a healthier environment, with less stimulation of the immune system, lower pharmaceutical costs and lower costs for morbidity and mortality.

16 TANNERIES

ED contributes to break down the high concentrations of sulphides by using atmospheric air instead of oxygen: the gas / liquid ratio is maximized obtaining a stable emulsion with consequent reduction of the time necessary for the completion of the same operation, of the costs as well as efficiency process. In few minutes shall obtained results previously obtained in weeks.

17 PAPER MILLS

With ED it is possible to improve the emulsion and the homogenization of the additives, inks or waxes dispersed, both organic and inorganic, with densities even higher than 50%. No deposits can be verified thus reducing maintenance times. Additive dosages fall by more than 30% while retentives by more than 25% with significant increases in the production capacity of the plant in general.

18 COSMETICS

The action of ED allows molecules to come into contact with each other with great ease and speed and, therefore, maximizes the gas / liquid ratio obtaining a stable emulsion with consequent reduction of the time previously needed for the completion of the same operation, of the costs as well as of the improving of the whole process.