

ENERGY DEVELOPMENT PARTNERS

EOR CAVITATION TECHNOLOGY AND CAVITATION GENERATOR

We use the revolutionary proprietary patented environmentally clean liquid jets (without any moving parts) to create high speed high pressure liquid cavitation to clean the well-bore from scales, precipitants, mud filtrate, drilling liquid sediments, cement or any other permeability blocks.

The set of multi-nuzzle jets creates a powerful compressed waves of cavitation that stimulates the oil and gas deposits in horizontal direction as far as up to 500 feet around treated well to recover up to 90% of hydrocarbons left in abandoned and low productivity wells.

The avalanche of cavitation is radiated 360 degree horizontally around well without vertical rock hydro disruptions, preventing oil from migration in vertical direction away from productive perforated zone. Cavitation is the formation and immediate avalanched implosion of cavities in a liquid – i.e. macroscopic liquid-free vacuum zones ("bubbles") – that are the result of forces acting upon the liquid, when a liquid is subjected to rapid changes of high pressure, that cause the formation of cavities, where the pressure is relatively low.

Very Intense periodical liquid pulses, focused under high pressure through patented row of jets, evaporate gases into the cavities from the surrounding medium; the cavities are not a perfect vacuum, but have a relatively low gas pressure inside of cavity compared to surrounding ambient liquid.

Such a very low-pressure cavitation bubbles in a liquid begins to collapse due to the higher pressure of the surrounding ambient liquid. As the bubbles collapses, the pressure and temperature of the vapor within microscopic bubbles increases very much, reaching up to 1000 degree of Celsius. The bubble eventually collapses to a minute fraction of its original size, at which point the gas within bubbles dissipates into the surrounding ambient via violent mechanism, which releases a significant amount of energy into surrounding ambient.

At the point of total collapse, the temperature of the vapor within the bubble may be several thousand Kelvin degree, and the pressure is several hundred atmospheres. The physical process of cavitation inception is to some degree similar to boiling. When the cavitation bubbles collapse, they force energetic liquid into very small volumes, thereby creating spots of high temperature and emitting shock waves into surrounding area.

The process of bubble generation, the subsequent growth and collapse of the cavitation bubbles, produces very high energy densities, resulting in very high temperatures and pressures at the surface of the microscopic bubbles for a very short time. The overall liquid environment remains at ambient conditions. By controlling the flow of the cavitation, its power is harnessed and non-destructive.

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Controlled cavitation break down the long carbon molecules of oil in more short ones, API and liquidity of recovered oil increases; the process creates a powerful pulsing compression waves that stimulates the surrounding of oil areas as a whole. Prior testing has shown: oil/gas wells, as far as 500 feet from the well being stimulated, have increased oil production as a result of the stimulation by cavitation process.

The cavitation stimulator directs the high pressure focused pulsed streams of liquid through patented jets row constructed of super-hard patented material, creating the pulsed avalanches of microscopic bubbles and a powerful pulsing compression waves. Depending on well and bedrock specification, the water (in most cases), oil, oil derivatives and environmentally clean synthetic solution are used as a working liquid.

The wells treatment requires limited amount of liquid: only part of liquid is converted into cavitation caverns/bubbles, the rest of liquid is recycled back to high pressure liquid pump at the surface. The amount of liquid, needed to treat one well, is from 5 to 40 cubic meters (depending how deep is well).

Treatment time and personnel:

Depleted working wells: 2 technicians, 2 -3 workdays

Abandoned capped wells: 10 technicians, 7 – 10 workday