**MMM ULTRASONIC PROCESSING
 (Multi-frequency, Multimode, Modulated Sonic & Ultrasonic Technology)

Brand new solids and liquids processing solutions in various segments including Food Industry, Pharma, Offshore, Oil & Gas, Energy production, Mining, Environmental and General Industry markets.**

***FIELDS OF APPLICATIONS***

* ***Real time, Internal descaling, deposits-removal and cleaning without stopping technological process,***
* ***Fluid flow acceleration, chemical and petrochemical technologies, real-time, continuous and preventive maintenance and optimization,***
* ***Internal cleaning of heat exchangers, nuclear and electric power plant reactors, without stopping the process, with significantly increased time between two maintenances.***
* ***Fast stress relief in MMM, ultrasonically vibrated structures***
* ***Fatigue life extension***
* ***Accelerated aging and material-properties stabilization***
* ***Ability to treat components being too big for any oven with very small energy consumption***

Through comprehensive and unrivalled understanding in ultrasound wave formation, its coupling to mechanical systems, and its optimization through finite element analysis, MPI has the ability to provide solutions, which are not yet possible with state of the art technology. MMM Technology cleans heat exchangers continuously and during operation using ultrasound. MMM Ultrasonic transducers are attached to the tube-sheet of shell and tube exchangers. High frequency, low displacement vibrations prevent mineral scale and fouling build-up from settling, which improves heat transfer efficiency and significantly lowers operational-energy costs.

**Fixed Actuator System (for agitating large solid parts)**

The “future” advantage in the MMM technology is that it can be used for heat exchangers preventive maintenance, descaling and continuous in-line cleaning, as well as for stress relief without stopping industrial or technological processes.

Small number of strategically placed and well-fixed actuators will de-stress in minutes (less than 30min).

One Generator / Actuator system can be re-applied for a variety of “large” equipment and assets.

Generator / Actuator can simply be adjusted to fit a specific assets preventive and real-time maintenance and residual stress relief requirements.

**Elements of technology:**

1. MMM ultrasonic power supply or generator
2. High power ultrasonic converter tolerant to different signal modulations
3. Ultrasonic waveguides (metal bars for transferring ultrasonic energy from ultrasonic transducer to equipment or objects to be treated)
4. Different metal clamps for vibrating circular objects and metal pipes
5. Ultrasonic vibro-connectors, or specifically designed metal parts for transferring vibrations in objects to be treated.