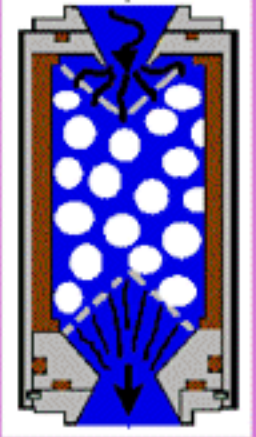


**The WAVEGUARD** range of 3 types by **PulseGuard** Ltd & Inc  
 Guard against pressure waves      Guard against pulsation

3 variants of Pressure Pulsation Dampener with no moving parts, no foam to clog or degrade. Designed to address Pressure Pulsation, (not flow fluctuations) with high frequency pumping systems. 1. WAG-Cer. w/Ceramics 2. WAG-HO Orifice tech. 3. WAG-MT. Liquid Compressibility



**1** Always use 5 D bends between pump & damper

The differential area from valve seat diameter to the pump chamber, to the outer seat diameter to the system, causes the check valve not to open until up to a 60% pressure differential. The release of these 60% over pressure spikes into the system produces high frequency pressure pulsation.  
 Type 1 in clean systems "WAG-Cer"  
 Type 2 in systems that can tolerate some pressure drop "WAG-HO".  
 Type 3 - they are much larger - for liquids that are not clean "WAG-Mt"

A gradual transition from system connection to orifice diameter at a 7 Degree \* taper ensures that it does not bounce the pressure pulsation back into the system.

"WAG-HO" WAVEGUARD Multi Chamber Plus "Ram-Jet"

tries to compress some almost totally trapped liquid, to a very high pressure. The decompression escapes back through the gear tolerance gap, makes a pressure spike.

The answer to, high pressure medium high frequency, low volumetric pulsation, for systems without suspended solids.

- Or - for HF

By exploding pressure peaks through small holes into large chambers pulsation is destroyed

The source of the disturbance

The very last point, at the end of the port slot, as the vane sweeps over it, a high pressure "blip" occurs.

The answer, to high frequency low volumetric pulsation, for clean liquids.

**WAVEGUARD** Ball path Disperser

By causing the pressure waves to travel down many paths of different length, the time base of a transient peak is spread, and so its height is removed.

**1**

**ALL LIQUIDS ARE COMPRESSIBLE**  
 For example ambient water is compressible by 0.05 ml per liter per bar (or say  $50e-10^6$ ). That is to say that you can pump 5 gallons into a full 100,000 gallon vessel simply by raising the pressure by a bar - say 15psi.

Let us say your triplex mud pump produces 1/2 Gal per stroke per plunger, and that the divisor for a triplex is the square number of plungers - so 9, then the fluctuation will be 12.8 in3. Therefore a 554 gallon system, pipe volume plus bottle volume, will reduce pulses to 2 bar - say 30psi.

So on slurry where we can not use the benefit of our 7° tubes, the compressibility is a vital figure for selecting a Wag/MT.

**WAVEGUARD** WAG-Mt Volume Sphere

**3**

An Empty Sphere is not an "acoustic" damper except at specific frequencies.

The volume of slightly compressible liquid reduces acceleration head pulsation.