

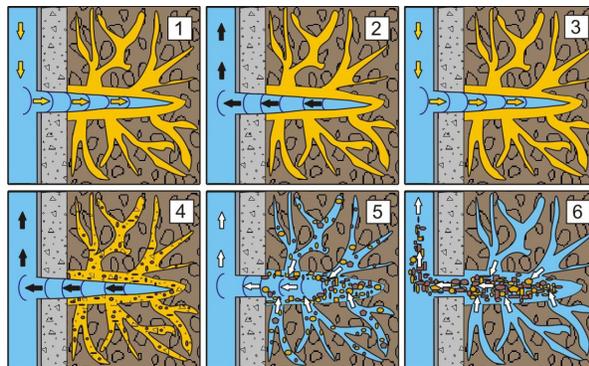
Pulsonix® TFA Service

INNOVATIVE PROCESS FOR OPTIMIZING MATRIX TREATMENT EFFECTIVENESS

OVERVIEW

The Halliburton Pulsonix® Tuned Frequency Amplitude (TFA) service is an innovative tool to help optimize near-wellbore treatment effectiveness. The Pulsonix TFA service enables the best placement and response from the treating fluids, using fluidic oscillator technology. The service is excellent for a wide variety of vertical and horizontal wells (both openhole and cased hole), including oil, gas, injection, geothermal, carbon dioxide (CO₂), water, disposal, monitoring, and solution mining.

The newest innovation of this process, tuned frequency amplitude, enables better control when matching fluid rates to the most desirable frequency and amplitude of the pressure pulses, based on the requirements of the application.



Conceptual view of how the pulsing of pressure removes damage from the near-wellbore area.

APPLICATIONS

- » Removing deposits, emulsions, cross-linkers, and other fluid damage from the near-wellbore area, perforations, and screens
- » Enhancing the placement and effectiveness of treatment fluids
- » Stimulating high-permeability formations
- » Removing fill from open hole or casing
- » Optimizing injection profiles

BENEFITS

- » Pressure waves propagate radially from the tool and can break up many types of near-wellbore damage through cyclic loading
- » Enhances penetration of chemical treatments into the formation matrix and existing fractures
- » Eliminates the standoff requirements of jetting nozzles
- » Can be run in conjunction with other tools
- » Can be installed anywhere in a jointed pipe string

FEATURES

- » Patented metal-to-metal sealing and no moving parts
- » Side jets for direct impingement on casing or formation walls
- » Side-jet turbulence to aid with lifting debris
- » Down-jet insert to clear obstructions or debris
- » Adaptable to jointed or coiled tubing
- » Customized inserts to maximize flow rates and pressures
- » H₂S service compatibility

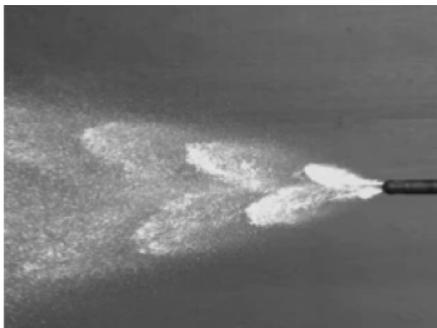
Pulsonix® TFA Tool Specifications

The Pulsonix® TFA tool is available in 1.69-inch, 2.12-inch, and 2.88-inch outside diameters (ODs), and can be configured with down-jet, fan-jet, or side-jet inserts, or a combination of inserts.

The inserts are available in a range of rate options:

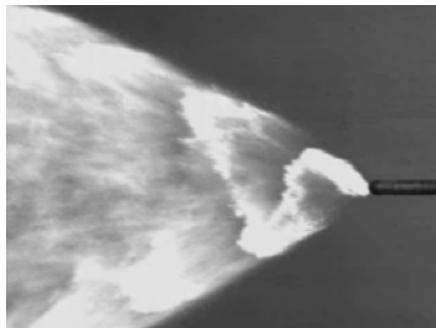
Recommended Pump Rate (bbl/min)

Insert Type	1/4	1/2	3/4	1	1-1/4	1-1/2	1-3/4	2	3
1.69-Inch OD									
Down-Jet	√	√	√	√	√	√	—	—	—
Fan-Jet	√	√	√	√	√	√	—	—	—
Side-Jet	√	√	√	√	√	√	—	—	—
2.12-Inch OD									
Down-Jet	—	—	√	√	√	√	√	√	√
Fan-Jet	—	—	√	√	√	√	√	√	√
Side-Jet	—	—	√	√	√	√	√	√	√
2.88-Inch OD									
Down-Jet	—	—	—	√	√	√	√	√	√
Fan-Jet	—	—	—	√	√	√	√	√	√
Side-Jet	—	—	—	√	√	√	√	√	√



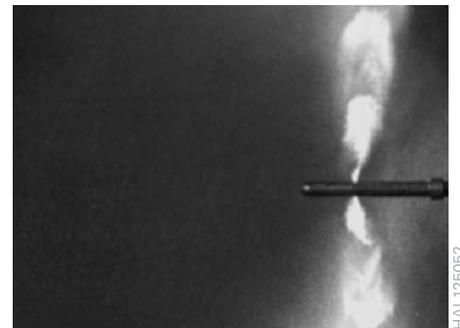
Down-Jet Insert

HAL125042



Fan-Jet Insert

HAL125031



Side-Jet Insert (Stackable)

HAL125052

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.

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