




## Developments in DPF cleaning including ultrasonic technology

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## Company Overview

A family owned & operated company established in 1974

Specialists in developing & manufacturing standard and customized replacement exhaust components for all brands of marine, transport, earth moving and mining equipment.

Constantly develop products for exhaust and emission solutions

Global reputation for industry proven products.  
Innovative solution provider to the industry

divisions of















## Who Is DPF Alternatives?

**DPF Alternatives** was created as the development and international business expansion arm of its predecessor; Diesel Doc.

Diesel Doc was founded as a research and service company with the sole purpose of developing the most effective DPF and related component "restorations".

Upon the perfection of our proprietary process and equipment design we branded ourselves DPF Alternatives to communicate that as a brand **we offer people and companies an "Alternative" to deleting their DPFs (breaking the law in many cases) or costly unnecessary DPF replacements (provided the DPF is capable of performing its function).**




## The History of DPF Cleanings to Restorations

Timeline of events:

- DPF technology began as early as the 1970's but didn't really begin to take off until the mid-2000's.
- For many years the only means to service/clean these filters was to bake at high temperature to effectively force a regen and then blow out using a pneumatic air knife - **filters left 66% clean**
- 3-5 years ago concerns were appearing that filters weren't getting a full clean with the bake and blow method and some experimentation done in some regions with flush station to try and wash the filters. **Filters left 85% clean**
- Recognizing that there was still something missing with getting DPF's clean. DPF Alternatives set about experimenting with ultrasonic technology beginning in 2015. Perfecting this in 2017 there is now multiple locations set up across the USA servicing many large fleets - **Full filter restoration process leaving filters 98% clean**




## Concerns with traditional cleaning methods

- High pressure air blast over an extended period of time
- Baking of filter substrate at very high temperatures
- On some filters exposing precious metals (catalyzed filters) to above typical operating temperatures
- How much impacted ash residue is left inside filter after 'cleaning' even though flow test may show clean. Shown up when a Pin Test is taken
- Life expectancy of DPF - observation that hair line cracks and break-up of substrate begin to show up after 4-6 cleanings.
- Concerns by OEM's that filters were not getting sufficiently clean leading many to recommend filter replacement rather than cleaning




## Evolution of DPF cleaning equipment

On Vehicle  
Flush



Pneumatic Air Blast  
& Bake



Fluid flush &  
Dry





Kiln Dry



Flush  
Station



Ultrasonic  
Tank



Flow  
Test






## What is Ultrasonic technology?

Ultrasounds are sound waves with frequencies above the human auditory range (20 – 100 kHz). The ultrasound applications are based on the physical phenomenon of cavitation which may be induced in any liquid medium.




The sound waves cause the microscopic bubbles present in the natural liquids to expand (during phases A and B of low pressure) and contract until they implode (during phases C and D of high pressure). The formation and implosion of bubbles (cavitation process) is produced thousands of times per second.








Why is Ultrasonic technology required?

- To break up impacted ash residue that can not be removed either with air or with just a fluid/solution flush
- To restore the filter substrate to 'almost new' condition
- To extend filter life as the filter is not subjected to high psi pneumatic air blasting for extended periods of time and then a high temperature baking
- To extend the number of operating hours on the equipment between cleanings

1. With proper maintenance a DPF can last indefinitely
2. Maintenance cycles cannot be determined solely on miles driven due to excessive idle times
3. As a DPF begins to collect contaminants it's performance impact on the engine increases - so the longer you postpone proper maintenance the greater the inefficiencies of the engine become
4. To improperly clean a DPF during a scheduled maintenance cycle reduces the DPFs ability to perform properly until its next scheduled down time, and in many cases prevents the equipment from operating as long as necessary
5. A DPF that is not properly "restored" has between 2 and four "cleaning" cycles before it is fully impacted with ash and only recoverable by using Ultrasonics
6. Soot-to-ash conversions = a fine powder within the DPF, moisture from the exhaust turns the ash to a paste that locks itself into the DPF. The operating temperature of the engine bakes the moisture our leaving an immovable dense plaque/concrete substance forever in the DPF



### Availability of Services

The truth is: most service shops can use compressed air to perform blow-out of a DPF to get slightly more life out of the filter as long as the DPF was not damaged due to over Regeneration

The use of a Kiln does help reduce the density of the soot, however it does not address impacted ash. There are many options including some dealerships that offer this service.

Some companies are just now experimenting with water, so more of these options will be seen in the next 12 months.

**DPF Alternatives** currently offers Ultrasonic restorations, and any other level of cleaning requested -

30+ locations across the USA - 1 location in Canada (Winnipeg) with locations in Sudbury, Edmonton, Toronto opening soon...



**Mammoth**  
Equipment and Exhausts

**DPF**  
ALTERNATIVES  
SUPERIOR EMISSIONS SOLUTIONS

Thank you for your time