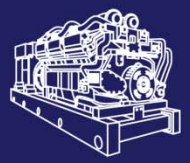
IMPACT DIESEL PARTICULATE FILTRATION (IDPF)

Sabertec IDPF Technology &
The Clean Diesel Emerging Technology Program



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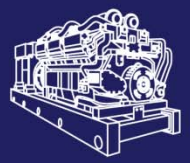
WHAT YOU SHOULD KNOW

- Who is Sabertec
- What is Impact Diesel Particulate Filtration
- Why are IDPF's Different from Conventional Filtration Technologies
- What Does IDPF Mean For You
- What is the Clean Diesel Emerging Technology Program (CDET)
- How Can You Equip Your Fleet with IDPF's via the CDET
- Technical FAQ



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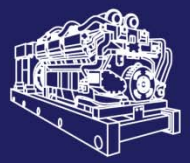
Sabertec is an environmental technology company that solves environmental challenges through technology, education and the inspiration of behavioral change.

Sabertec's two primary technologies are:

1. BLADE: a device which attaches to the tailpipe of gasoline vehicles to reduce emissions of gasoline particulates, reduce emissions of CO_2, and improve fuel economy.

2. IDPF: a highly effective, low cost, non-catalytic diesel particulate filter.



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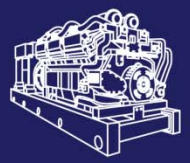
IMPACT DIESEL PARTICULATE FILTRATION

IDPF's are highly effective, low cost, diesel particulate filters.

They reduce total particulate emissions by over 85%, and they reduce emissions of hazardous PM 2.5 by ≥ 70%.

IDPF's are a revolution in particulate material filtration because IDPF's are non-catalytic, i.e. they capture, rather than burn particulates.



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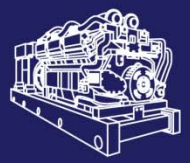
IDPF's ARE DIFFERENT THAN CATALYTIC TECHNOLOGIES

Unlike catalytic technologies, IDPF's

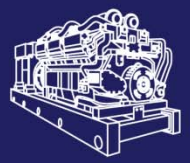
- ✓ Do not produce CO_2 as a by-product of filtration
- ✓ Do not burn large particles into smaller, more dangerous micro particles
- ✓ Are highly effective in poor quality (high sulfur content) fuel environments
- ✓ Are effective at altitudes that prohibit the use of catalysts
- ✓ Not negatively effected by low operating temperatures and IDPF function well under low load conditions.
- ✓ Are extremely affordable



IDPF's DO NOT PRODUCE CO_2 AS A BY-PRODUCT OF PM FILTRATION

- In order to reduce PM emissions, catalytic technologies oxidize ("burn") particulates. A large portion of particulates are comprised of elemental carbon and hydro-carbonic material. When these materials are oxidized, one of their primary byproducts is CO_2.
- In essence, the purpose of all catalytic technologies is to convert HC, NO_x, and CO into CO_2, H_2O and N, i.e. catalytic technologies are CO_2 factories by design!
- The amount of CO_2 that is produced during oxidation is significant: for every single pound of PM that is oxidized, four pounds of CO_2 is created. This is bad news for two reasons:
  1. CO_2 is a primary global warming gas
  2. The U.S. government is currently discussing a cap-and-trade system which will tax entities based on their production of CO_2.





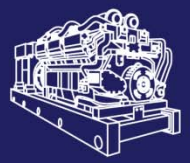

IDPF's DO NOT BURN LARGE PARTICLES INTO SMALLER, MORE DANGEROUS MICRO PARTICLES

Particulate Material (PM) is generally categorized into two categories:

1. PM 10 (large particles): ≤ 10 µm in diameter. PM 10 constitutes a small percentage of the total particulate count, but it constitutes the majority of the total particulate mass. These are the particles that you can see.
2. PM 2.5 (fine particles): ≤ 2.5µm in diameter. PM 2.5 constitutes the majority of the particle count (≥ 90%), but account for little of the total particulate mass (≤ than 3%). These are the particles that you can't see.

- When catalytic technologies oxidize PM, they transform a large percentage of large, measureable particles, into fine non-measureable particles. Often times, catalytic technologies actually increase the total PM particle count. This is really bad…
- The human body is relatively well equipped to protect itself against PM 10, yet is relatively defenseless against PM 2.5, i.e. PM 2.5 is much more harmful to human health than PM 10.

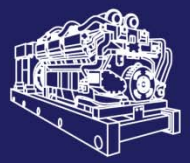





IDPF's ARE HIGHLY EFFECTIVE IN POOR QUALITY (HIGH SULFUR CONTENT) FUEL ENVIRONMENTS

- The United States and Europe have high quality fuel environments, i.e. most their diesel fuel contains less than 15 PPM. In other parts of the world, this is not the case.
- The United States Department of Energy (DOC) reports that catalyzed DPF's reduction efficiencies decreases to a point where DPF's actually become a source of PM emissions when using fuels with sulfur concentrations ≥ 150 PPM.
- The DOE reports further that DPF's that achieve 95% PM reductions when using fuels with 3-PPM sulfur have their filtration efficiencies reduced to only 74% when using fuels with 30-PPM. Further, these same devices are reduced to PM filtration rates of 0% to -3% when using fuels with 150-PPM sulfur, and they experience TPM emissions increases of 122% to 155% when using fuels with sulfur concentrations ≥ 350-PPM.
- Most countries in the world use diesel with ≥ 500 PPM sulfur. The environment in which IDPF technology was developed and tested (Brazil) has diesel sulfur concentration of 2,000 – 5,000 PPM!

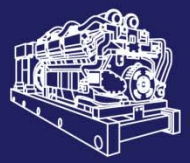





IDPF's ARE EFFECTIVE AT ALTITUDES THAT PROHIBIT THE USE OF CATALYSTS

- Catalytic technologies oxidize, or "burn" particulates in order to reduce them.
- The oxidation ("burning") process, requires an abundant supply of oxygen.
- At altitudes above 7,000 feet, oxygen levels become significantly reduced.
- In many parts of the world, (Andes, Alps, Himalayas, Rockies, etc.) diesel vehicles are unable to use catalytic technologies.
- A classic example of this is high altitude mining operations throughout the world, where heavy duty diesel equipment run 24 hours per day without any form of emission control because a lack of sufficient oxygen in the atmosphere precludes the use of catalysts.





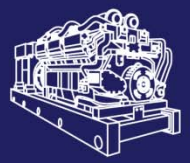

IDPF's ARE NOT NEGATIVELY EFFECTED BY LOW OPERATING TEMPERATURES.

- A catalyzed particulate filter is like a furnace that sits between your engine and your tail pipe. It reduces particulates by oxidizing, or "burning" them. In order to do this however, the filter need to be hot enough—about 600 degrees C.

- Unfortunately, a vehicle's engine doesn't always produce enough heat to allow the catalyst to achieve it's minimum operating temperature. Think of a truck when it's idling, a bus sitting in stop-and-go traffic, or an emergency power generator that is running under low load conditions.

- If a catalyst isn't hot enough, not only is it not reducing pollution the way it should be, but it also isn't "regenerating". That means that it's not self cleaning, or "regenerating" its filtration capacity. This can cause the filter to back up and ultimately fail. Failure is of a catalyzed particulate filter can completely destroy an engine.



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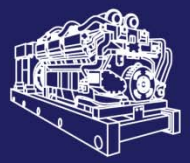
IDPF's ARE EXTREMELY AFFORDABLE

- The price of a Sabertec IDPF is approximately $4,750!
- The price of a catalyzed diesel particulate filter can range from $8,500 - $30,000! In order to comply with California Air Resource Board Legislation, the members of the California Trucking association estimate budgeting approximately $20,000 per vehicle.
- The reason that catalytic devices are so expensive is because they use catalysts. Catalysts are typically made from super precious metals like platinum, rhodium or palladium. These materials cost more per ounce than gold!
- What does Sabertec's price advantage mean for you?
  - It means that you're going to save a lot of your own money equipping your fleet
  - And if you're using grant money to equip your fleet, it means that you're going to be able to equip many more of your vehicles. A $250,000 grant will equip 13 vehicles with catalyzed diesel particulate filters. That same $250,000 will equip 53 vehicles with IDPF's!



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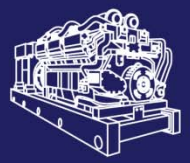
WHAT DOES IDPF MEAN FOR YOU

This is your opportunity to green your fleet and:

- ✓ Improve your community's environment by reducing toxic particulate material.
- ✓ Improve human health conditions within your community by cleaning the air.
- ✓ Ensure that PM reduction doesn't result in increased CO_2 production in your community.
- ✓ Make your community a national environmental leader by pioneering innovative environmental technologies.
- ✓ Become a world wide example of how to recycle / turn your pollution into cash flow.
- ✓ Ensure that your community's environment benefits from available Federal Funds






THE CLEAN DIESEL EMERGING TECHNOLOGY PROGRAM

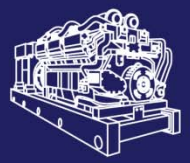
As part of the American Recovery and Reinvestment Act, and the EPA's Fiscal Year 2009 Appropriations, the EPA is distributing $300MM through the National Clean Diesel Emissions Reduction Program (DERA).

DERA consists of two components through which you can work with Sabertec:

1. The Clean Diesel Emerging Technologies Program (CDET) is a program through which the EPA is granting $20MM to Eligible Entities to purchase new, emerging diesel filtration technologies. This is a near term opportunity.

2. The National Clean Diesel Funding Assistance Program (NCDFA) is a program through which the EPA is granting $190MM to Eligible Entities to purchase of EPA-verified and certified technologies. This is a long term opportunity.



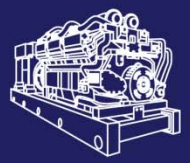



HOW YOU CAN EQUIP YOUR FLEET WITH IDPF'S VIA THE CDETP

If you have a fleet of diesel vehicles and/or equipment:

1. Partner with Sabertec!
2. Work with Sabertec to submit and Application for Grant Funding under the CDET program.
3. Work within a Cooperative Agreement with Sabertec and the EPA to collaborate, improve and monitor success of the program.

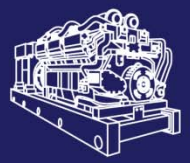





COMMONLY ASKED TECHNICAL QUESTIONS

- Will using an IDPF jeopardize the warranty of my vehicle?
- What testing has been conducted on IDPF to-date?
- Where is the technology currently being used?
- What is the filter's service interval?
- How is the filter serviced?
- What do I do with the captured particulate / is it hazardous?

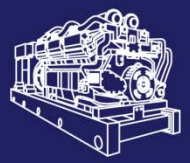





WHAT SABERTEC NEEDS FROM YOU

- We want to work with the most common vehicle in your fleet.
  - What is the make, model and year of that vehicle?
  - What is the make, model and year of that vehicle's engine?
  - If possible, we would like to receive pictures of the vehicle.
- Who is the primary contact in your maintenance department?
- Who is the lead contact who will assist in the grant writing process?






HELPFUL RESOURCES

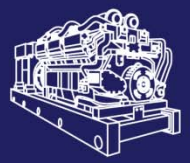
To learn more about Sabertec & IDPF, visit

www.sabertec.org

To learn more about the CDET and find grant applications, visit

www.sabertec.org/grants






QUESTIONS…

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