



Innovative Emission Solutions for
POWER GENERATION APPLICATIONS



**LARGE ENGINE
POWER PLANTS**



**DATA
CENTERS**



**DISTRIBUTED
GENERATION**



BIO-GAS



**WATER
PUMPING**

MIRATECH

Your Experienced Catalyst & Silencer Partner

MIRATECH® is the expert in providing fully integrated, proven innovative emission solutions.

Reciprocating engine power plants have cleaned up their emissions with MIRATECH catalysts and controls. Environmentally conscious engine owners around the world increasingly specify our products for the Best Available Control Technology (BACT) exhaust emission solutions, which often include not only reduced exhaust emissions but also better noise abatement.

Our engineering specialists have a comprehensive knowledge of regulations including:

- Tier 4 Interim and Final
- RICE NESHAP
- California Air Resources Board (CARB)
- Ozone Changes within National Ambient Air Quality Standards (NAAQS)
- U.S. State Implementation Plans
- Canadian Province Standards
- World Bank Standards
- T. A. Luft Standards

Consulting specifying engineers and developers contact MIRATECH directly to learn how their project becomes a reality. MIRATECH field representatives and distributors provide one-to-one guidance with customers who are developing the catalyst/silencer/control system solution for any size project. In concert, customers receive support from the design stage to commissioning, to ongoing operations—whatever it takes.

Engineered Catalyst & Silencer Emission Systems: Single-Point, Complete Solutions Done Right

Customers come to MIRATECH for the best catalyst and silencer technology available to the industrial engine business today. The lowest cost of total ownership and best uptime performance is a result of our expertise, engineering skills and product craftsmanship.

MIRATECH systems can reduce regulated exhaust stream pollutants to failsafe, first-step compliance levels for any stationary reciprocating natural gas, diesel or dual-fuel gas engine.

These pollutants include:

- Oxides of Nitrogen (NOx)
- Carbon Monoxide (CO)
- Hazardous Air Pollutants (HAPs)
- Unburned Hydrocarbons (THC)
- Volatile Organic Compounds (VOCs/NMNEHC)
- Particulate Matter (PM)



ASME Section 9 quality welds and reinforcement



Integrated catalyst and silencer technology



Packaged with low pressure drop

***“MIRATECH just handled the whole project:
the specification, permit assistance, catalyst
and exhaust silencer design, installation,
commissioning and service. Thanks.” –End User, NJ***

Depending upon the site air permit and type of fuel, MIRATECH can blend catalyst formulations to meet your compliance requirements with a reliable and durable solution.

MIRATECH also integrates noise abatement to exhaust systems which reduces the sound by up to 60 dB(A). Whether your on-site power project is 20 miles from the nearest building or adjacent to the emergency room, MIRATECH is ready for the challenge. We have thousands of successful installation examples to demonstrate our expertise. MIRATECH silencers are integrated into the catalyst housing to keep the noise low. Our silencers attenuate engine exhaust noise for operator comfort and the property line requirements.



Factory direct custom catalyst and silencer solutions



Catalyst and silencers from 20 kW to 20MW+



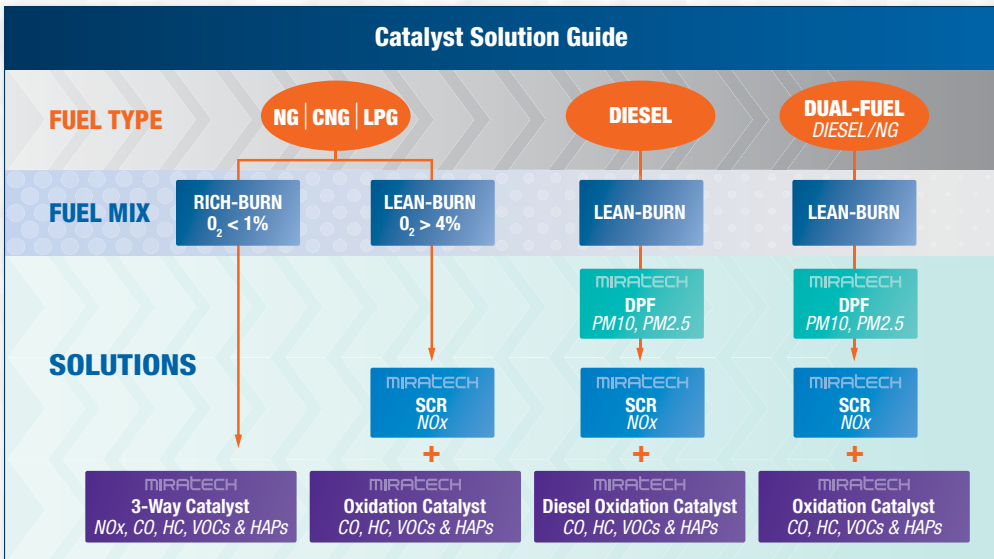
Handcrafted catalyst for a precision fit



MIRATECH

Catalysts: Versatile Design Choices

The right fit for any system, the MIRATECH catalyst comes in a wide variety of shapes, sizes and formulations to match a broad range of engine sizes, applications and site conditions. The final system selection is based on the specific exhaust and noise regulations. MIRATECH guides our customers through the process.



Whether the catalyst construction needs to be metal foil or ceramic, MIRATECH has it all to withstand the punishing environment catalysts must endure. MIRATECH engineers start the conversation around the site requirements and match the technology with the application—the right choice every time.

Catalyst Substrates: Innovative Designs

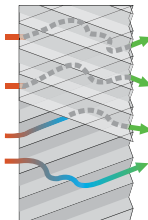
MIRATECH has a complete family of elements and configurations, from metal foil with open metal channels, to substrates with extra turbulent zones in NEXT™ and VORTEX™ element configurations. The NEXT and VORTEX substrates offer “Free washes for life” and a two-year warranty. Both are better-performing, longer-lasting catalysts. Ceramic elements for oxidation, SCR and DPF catalysts are also available.

Each groove in the NEXT substrate creates a separate turbulent zone in the channel. Multiple turbulent zones boost catalyst performance because more emissions are allowed to react with the precious metal compounds that line the substrate walls.

The VORTEX features an electrically fused corrugated substrate, layered in an offsetting turbulent mixing pattern. Throughout the substrate, the static mixing design increases catalytic reaction.



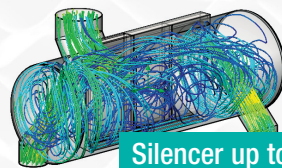
NEXT



VORTEX

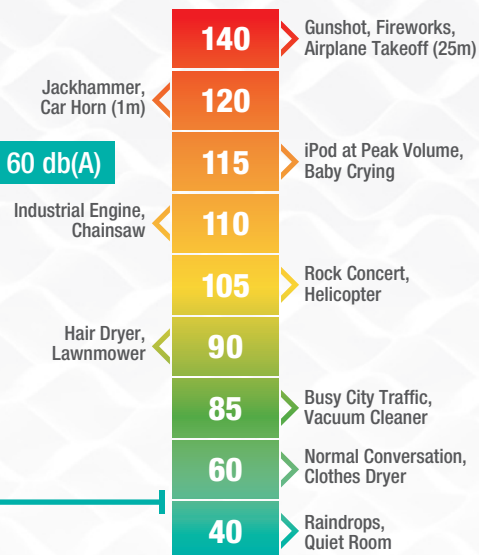
Noise Control—Acoustic Technology

The robust MIRATECH industrial exhaust silencer effectively shapes the exhaust stream inside the housing to achieve the required sound attenuation level at an optimum pressure drop. Our engineers carefully analyze the exhaust profile to achieve all of the desired performance characteristics.



Silencer up to 60 db(A)

Noise Level Comparison Decibels (dB)



Genset Diesel Engines: DPF Solutions

MIRATECH offers both active and passive diesel particulate filter (DPF) solutions. As a design principle, MIRATECH applies technology to meet your application and operating requirements while packaging the system for minimal space and long service intervals.

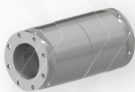


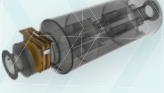




Solutions: Market Leadership

MIRATECH provides the proper solution for the job by offering engine users a choice of catalyst technologies including:

- SCR
- DPF
- Oxidation
- Urea Hydrolysis
- 3-Way
- HAPs
- Diesel Oxidation
- Ammonia Killer

Our unique combination of substrates, formulations and housings is often the standard for BACT (Best Available Control Technology) that allows end-users to achieve first-pass compliance. MIRATECH catalysts are reliable, high-performance elements with superior mechanical and thermal durability.

Choose your housing solution with or without a silencer, up to 60 dB(A).

Engine Size Horsepower	MIRATECH Housings Catalytic Converters	MIRATECH Catalytic Converters with Silencers: Up to 60 dB(A)	Catalyst Options
20 - 325			<ul style="list-style-type: none"> • 3-way • Diesel Oxidation
200 - 8,000			<ul style="list-style-type: none"> • 3-way • Oxidation • Diesel Oxidation
1,200 - 5,000			<ul style="list-style-type: none"> • 3-way • Oxidation • Diesel Oxidation
100 - 20,000+			<ul style="list-style-type: none"> • Oxidation • Diesel Oxidation • DPF • SCR
1400 - 20,000+			<ul style="list-style-type: none"> • 3-way • Oxidation • Diesel Oxidation

What does a MIRATECH 60 dB(A) silencer sound like to me?

Industrial natural gas and diesel engines emit exhaust noise at approximately 110 dB(A) at full load, three (3) meters from the exhaust pipe. With 60 dB(A) MIRATECH silencer technology, you can expect the exhaust to sound equivalent to the noise of people talking.

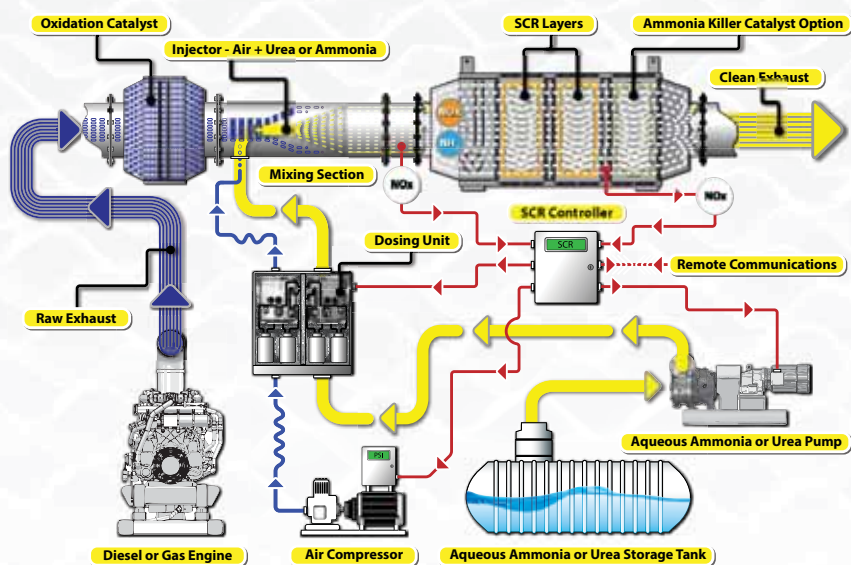


SCR with ACIS™ technology

MIRATECH

Controls: Simply the Best

Advanced MIRATECH control systems reduce both the costs and the hassles of emissions compliance—ensuring maximum efficiency and performance with least distraction from your core operations.

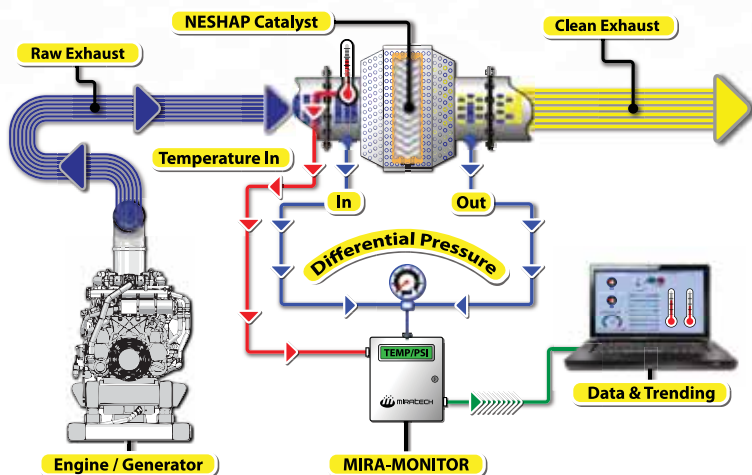


SCR Control–Analysis Controlled Injection System (ACIS™)

MIRATECH ACIS™ makes SCR control easier than ever. ACIS, featuring info-at-a-glance graphics, integrates key monitoring points and control functions. Payback starts the minute you switch to the MIRATECH ACIS for the SCR.

The key? ACIS closed-loop system continuously monitors actual post-catalyst NOx emissions and automatically adjusts reactant injection to ensure compliance whether you're running a base-load or load-following application from idle to 100% rated load.

The payoff? Continuous, ongoing compliance, guaranteed—and maximum efficiency in reactant use—via an incredibly user-friendly monitoring and control system. Plus, with features like remote monitoring and troubleshooting, ACIS cuts man-hours required for SCR operations.



MIRA-MONITOR™ Continuous Parametric Monitoring System

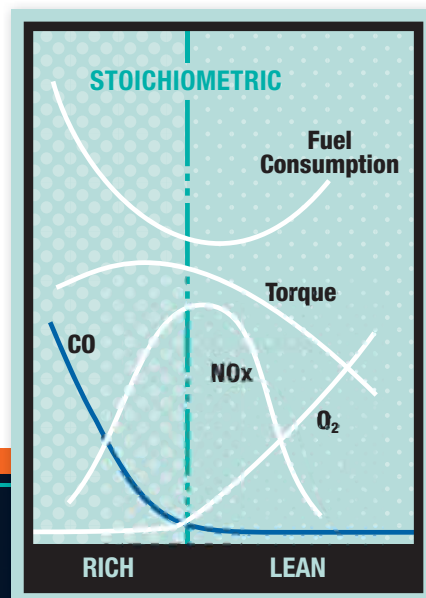
The advanced MIRATECH MIRA-MONITOR is a complete, easy-to-install, easy-to-operate, PC-based system that monitors and records catalyst operating parameters as required by the U.S. EPA National Emission Standards for Hazardous Air Pollutants (NESHP) regulations. The MIRA-MONITOR provides local indication of the catalyst temperature and differential pressure alarms with two LEDs. Easy-to-use controls allow the user to start or stop logging and manually step through the operating parameters.

Air/Fuel Ratio Control for Natural Gas Engines

The MEC-R™ rich-burn air/fuel ratio controller continuously monitors and precisely controls the air/fuel mix in rich-burn, carbureted natural gas-fueled engines. The system is designed with a MIRATECH 3-way catalyst system maintaining the proper air/fuel ratio over varying:

- Engine Loads
- Speeds
- Fuel Quality
- Ambient Conditions

MEC-R maximizes the efficiency of both the engine and its 3-way catalytic converter. MIRATECH exclusively offers three levels of rich-burn controllers based on the site and regulation needs.



MIRATECH Engineers & Fabricators

Have the Expertise to Tackle Real-World Applications

MIRATECH high-performance catalysts and silencers are reliable, with superior mechanical and thermal durability. Exhaust pipe components provide single source ordering and system integration.

From consulting engineers to end-users who specify and purchase from MIRATECH again-and-again, our customers typically have a unique mixture of project concerns with their applications due to:

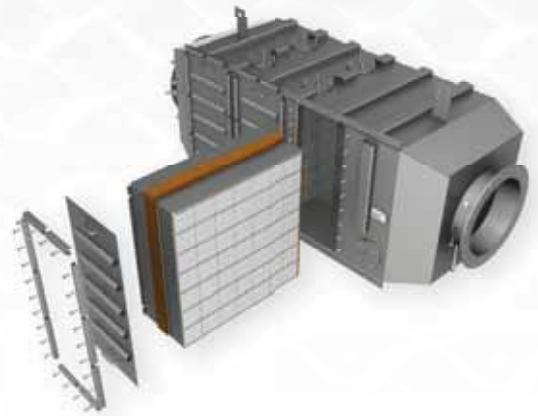
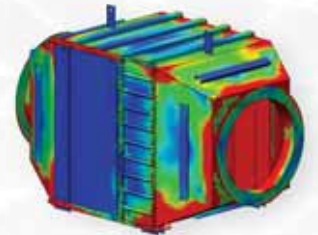
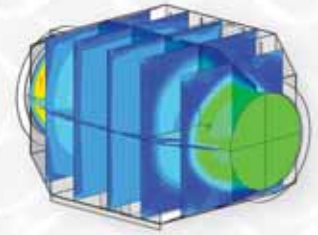
- Extreme Wind Speeds and Shears
- Seismic Location and Codes
- Altitude
- Humidity Variations
- Ambient Temperature Swings
- Space Limitations
- Noise Requirements
- Air Permit Requirements

Proper housing structural integrity, catalyst performance and noise reduction require a team of seasoned, expert engineers who know how to push the limits of their:

- Engineering Knowledge
- Software Tools
- Real-world Experience

Our MIRATECH sales team believes “We execute reliably on standard projects and excel on extreme applications.” End-users know this to be true as well.

*From design to installation,
count on MIRATECH to deliver.*



MIRATECH Technical Services

Single-Point, North American Factory-Direct, Cost-Effective Compliance Assistance.

Count on MIRATECH for high-value assistance to help increase your bottom line.

Available services include:

- Turnkey—from Design to Commissioning
- Design and Construction
 - Regulatory Insight
 - Design and Installation Review
 - Construction and Operating Permit Review
 - Project Management
- Commissioning
- Site-specific Training
- Product Support
- Troubleshooting
- Maintenance
 - NSCR and SCR
 - General Support and Maintenance of MIRATECH Emission Control Products
 - Catalyst Washes and Repairs (See Below)

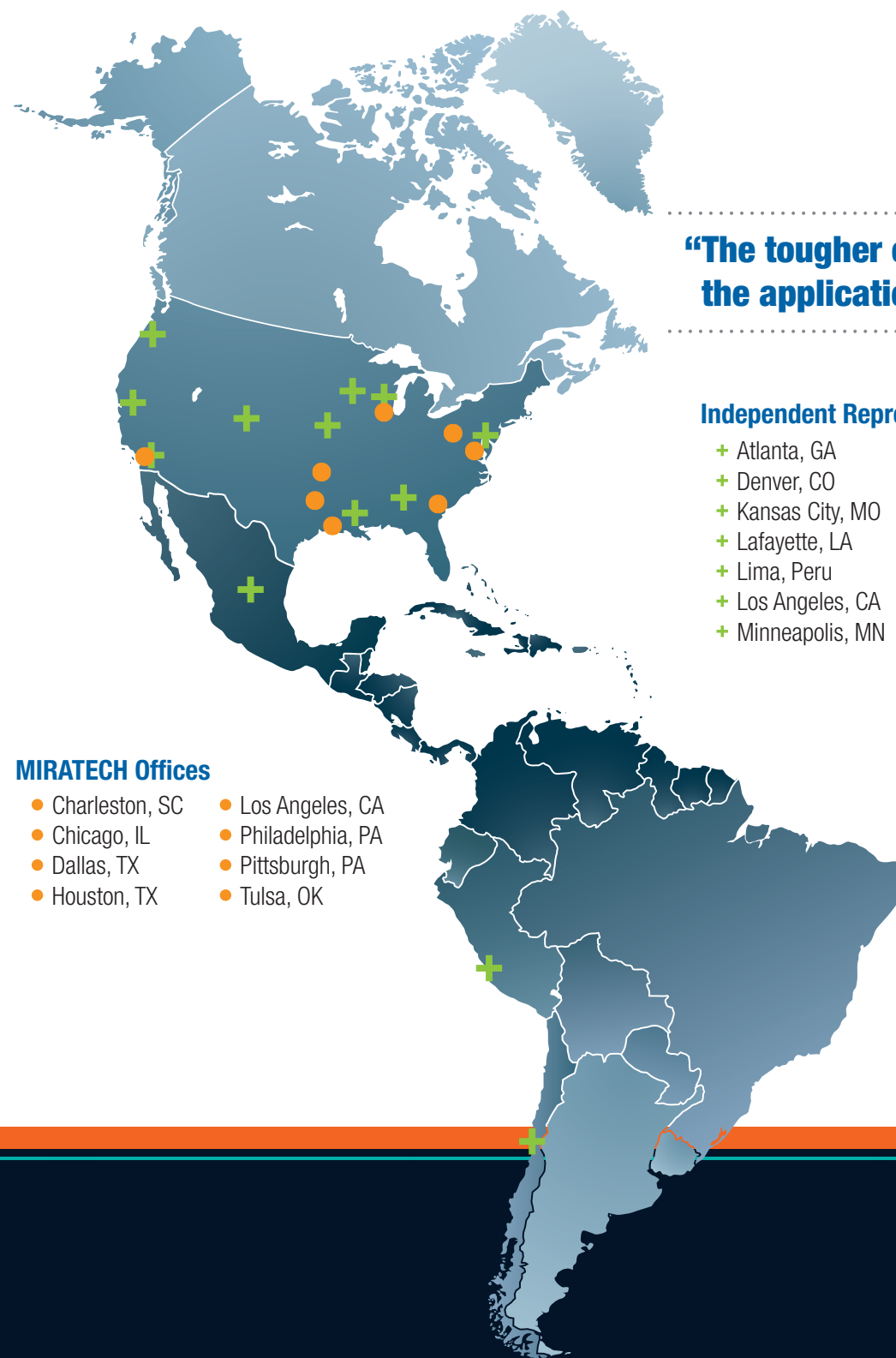


CAUSTIC SOLUTION
Removes inorganic masking,
fouling & poisoning agents

DEIONIZED WATER
Removes same masking & fouling
agents, as well as caustic/acidic
washing agents

ACIDIC SOLUTION
Removes organic resins,
residues & deposits from
lube-oil contamination





**“The tougher or the more extreme
the application is, the better we do.”**

Independent Representative or Distributor Offices

- + Atlanta, GA
- + Denver, CO
- + Kansas City, MO
- + Lafayette, LA
- + Lima, Peru
- + Los Angeles, CA
- + Minneapolis, MN
- + Napa, CA
- + Philadelphia, PA
- + Portland, OR
- + Racine, WI
- + San Luis Potosi, Mexico
- + Santiago, Chile

MIRATECH Offices

- Charleston, SC
- Chicago, IL
- Dallas, TX
- Houston, TX
- Los Angeles, CA
- Philadelphia, PA
- Pittsburgh, PA
- Tulsa, OK



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Learn More: Phone • Email • Web • “The Emissions Monitor”
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