Leading the World in Emissions Solutions
CDTI is a leading global manufacturer and distributor of heavy duty diesel and light duty vehicle emissions control systems and products to major automakers and retrofitters.

Our business is driven by increasingly stringent, global emission standards for internal combustion engines, which are major sources of a variety of harmful pollutants.

We know how to reduce emissions

Without increasing secondary emissions such as nitrogen dioxide (NO₂), our solutions significantly reduce four of the principal, harmful emissions formed by the combustion of fossil fuels and biofuels:

- **Particulate Matter (PM)** or “soot” that contains over 40 known cancer-causing compounds
- **Nitrogen Oxide (NOₓ)** produces smog
- **Hydrocarbons (HC)** a precursor to ground-level ozone, a serious air pollutant known to cause adverse health effects according to the Environmental Protection Agency (EPA)
- **Carbon Monoxide (CO)** reduces oxygen delivery within the body

Our complete, emissions reduction solution

As a vertically-integrated company, our principal objective is the worldwide deployment of technologies to reduce the overall emissions from diesel, gasoline, natural gas and biofuel applications and to continue a leadership position in emissions control technology.

With over 30 years of experience in vehicle emissions control technologies, we offer one of the industry’s most comprehensive portfolios of emissions systems - evaluated and verified for use in retrofit programs by the US Environmental Protection Agency (US EPA), California’s Air Resources Board (CARB) and regulators in several European countries.
**Our Business Divisions**

**Heavy Duty Diesel Systems Division**

Our Heavy Duty Diesel Systems Division is operated through our wholly-owned subsidiaries, Engine Control Systems Limited and CDTI Limited. This division is a global manufacturer and distributor of verified Heavy Duty Diesel (HDD) and Light Duty Vehicle (LDV) emission control systems and products to major automakers and retrofitters. Internal combustion engines with diesel exhausts are major sources of a variety of harmful pollutants. Our products include our Engine Control Systems (ECS) and Clean Diesel branded products.

**Catalyst Division**

Our Catalyst Division is operated through our wholly-owned subsidiary Catalytic Solutions Inc. This division primarily serves the LDVs market including major automaker customers and other original equipment manufacturers. This is where we sell our proprietary, low-platinum group metals advanced catalytic coatings which accelerate the breakdown of exhaust gases.

Diesel engines are more durable and are more fuel efficient than gasoline engines but can pollute significantly more. Current techniques for diesel engines to meet emission standards require the use of several methods including diesel oxidation catalysts, catalyzed diesel particular filters and selective catalytic reduction systems.

Our Catalyst Division products are based on our proprietary Mixed Phase Catalyst (MPC®), technology, which we have formulated for use in gasoline, diesel and natural gas emissions applications. We view our catalyst products as highly differentiated from competing products because they offer similar or better performance while using little or no platinum group metals.
Through persistent technology development, we maintain a broad portfolio of emissions control products ranging from catalysts to complete retrofit or OEM systems.

Our products are cost-effective, sustainable and used with proven success in new equipment and retrofit applications.

**Three-way Catalyst (TWC)**

A catalyst in a catalytic converter capable of simultaneously converting carbon monoxide (CO) hydrocarbons (HC) and oxides of nitrogen (NO\(_x\)) into carbon dioxide (CO\(_2\)), water (H\(_2\)O) and nitrogen (N\(_2\)). We offer palladium-only, palladium/rhodium and platinum/rhodium catalysts for gasoline-powered LDVs.

**Diesel Oxidation Catalyst (DOC)**

Pollutants are broken down in the exhaust stream and are turned into less harmful compounds. When combined with our closed crankcase ventilation system, our AZ Purifier T and Purimuffler\textsuperscript{®} DOCs can reduce particulate matter by up to 40%. Our line of DOC products also includes DZ and EZ Purifier T.

**Diesel Particulate Filter (DPF)**

Removes particulate matter from diesel engine exhaust. Our systems can reduce particulate matter by up to 90% or more. Our products are sold under the Purifier T, Purifilter\textsuperscript{®}, Cattrap\textsuperscript{®} and CombiFilter\textsuperscript{®} brand names. In addition to catalyzed DPFs, we offer DPF systems using our patented Platinum Plus\textsuperscript{®} fuel-borne catalyst.

**Fuel Borne Catalysts (FBC)**

To assist in the regeneration of diesel particulate filters, CDTi offers a range of FBC solutions, which include a problem solver for difficult applications such as city driving or high sulphur fuel environments, and as the principle regeneration catalyst for applicable passenger car, LDV and HDD applications. The catalyst reduces the burn-off temperature of accumulated soot and aids regeneration thereby improving the functionality of DPF systems.
Selective Catalytic Reduction (SCR)

An after-treatment process in which urea is injected into the exhaust stream to chemically react with oxides of nitrogen to create diatomic nitrogen, carbon dioxide and water. Our solutions offer low and high temperature SCR technology for LDV and HDD vehicles. Our SCR systems reduce up to 90% of oxides of nitrogen and can meet EPA 2010 and Euro 6/VI Standards.

Urea Injection

Reducing agents (hydrocarbons) are injected into the exhaust stream for applications such as (i) lean oxides of nitrogen traps, (ii) catalyzed diesel particulate filter regeneration systems, and (iii) urea injection for selective catalytic reduction. Our patented Advanced Reagent Injection System, or ARIS®, for selective catalytic reduction reduces nitrogen oxide by up to 90%.

Exhaust Gas Recirculation (EGR)

Reduces oxides of nitrogen when starting a cold engine and re-circulates part of the exhaust gas stream to reduce engine-out oxides of nitrogen emissions – used in combination with SCR to meet the strictest oxides of nitrogen reduction criteria. We have patented intellectual property holdings for the design and implementation of EGR/SCR systems and have licensed these patents to several industry providers.

Closed Crankcase Ventilation Systems (CCV)

Assist in elevating the level of exhaust emission reduction by eliminating crankcase emissions. Our closed crankcase ventilation system is a truly closed crankcase ventilation system that effectively eliminates 100% of crankcase emissions at all times.
Our research and development in catalyst technology has resulted in a broad array of products for the LDV and HDD markets that meet and exceed regulatory emission standards.

Our greatest strength in the catalyst business lies in the technical sophistication and cost-to-performance ratio of our products.

**Mixed Phase Catalyst (MPC®) Technology**

This is our novel, patented technology for creating and manufacturing catalysts. It involves the self-assembly of a ceramic oxide matrix with catalytic metals precisely positioned within three-dimensional structures.

The MPC® design gives our catalyst products two critical attributes that differentiate them from competing offerings. These include:

1. **Superior stability that allows heat, resistance and high performance with very low levels of precious metals.**
2. **Base metal activation which allows base metals to be used instead of costly platinum group metals without compromising catalytic performance.**

**Platinum Plus® Technology**

We have developed and patented our Platinum Plus® fuel-borne catalyst as a diesel-fuel soluble additive, which contains minute amounts of organo-metallic platinum and cerium catalysts.

Platinum Plus® is used to improve combustion which acts to reduce diesel emissions and improve the performance and reliability of emission control equipment.

This fuel-borne catalyst takes catalytic action into engine cylinders where it improves combustion, thereby reducing particulates, unburned hydrocarbons (HC) and CO₂ emissions. Because of this, it lends itself to a wide range of enabling solutions including: diesel particulate filtration, low emission biodiesel, carbon reduction and exhaust emission reduction.

Environmentally-conscious corporations and fleets can utilize this solution to voluntarily reduce emissions.
**ARIS® Technology**

In addition to our MPC® Technology and our Platinum Plus® fuel-borne catalyst, we have developed technology for SCR using urea, which is a highly effective method of reducing NO\textsubscript{$\chi$}. ARIS® technology forms a key part of the SCR system and is an advanced computer-controlled regeant injection system.

**Combined EGR/SCR Technology**

We have developed and patented the concept of combined use of EGR and SCR, to minimize emissions and take advantage of the benefits each can bring in terms of NO\textsubscript{$\chi$} reduction.

**Just some of the applications**

Through persistent technology development, we maintain a broad portfolio of emissions control products ranging from catalysts to complete retrofit or original equipment manufacturer (OEM) systems.

Our products that are cost-effective, sustainable and used with proven success in new equipment and retrofit applications in:

- On-Road (Heavy Duty, Medium Duty, Light Duty, Passenger Car)
- Construction
- Mining
- Ports and Marine
- Stationary Power
- Material Handling

**Proprietary technologies with a competitive edge.**

With our technology, you’ll experience strong engineering capabilities, an experienced team, streamlined product-development processes, solid experience in the verification and approval process, and a competitive advantage through the use of customized catalysts for our emission control systems.