



**Nederman**



# Fire & Emergency Vehicles

Complete Exhaust Removal Solutions



The Clean Air Company

Since 1944



# Clean, Safe and Healthy

Firefighters face many health risks including exposure to diesel exhaust within the station. Left unchecked, vehicle exhaust fumes migrate throughout the apparatus bays and into office and living spaces negatively impacting the health, performance and well-being of first responders. Diesel exhaust is considered a Group 1 carcinogen by global health and safety organizations including NIOSH, OSHA and the WHO. Thankfully, new technologies including clean diesel have significantly reduced the exposure but does not fully eliminate the risk.

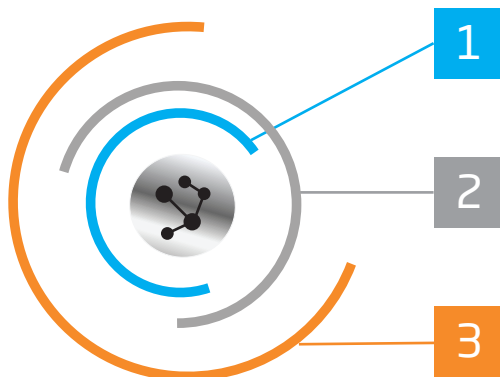
Nederman is the Clean Air Company and a global leader in protecting people, planet and workplaces from the harmful effects of indoor air pollution, including emergency vehicle exhaust, for over 75 years.



## Did you know?

According to the National Institute for Occupational Safety and Health (NIOSH), firefighters are 9% more likely to be diagnosed with cancer and 14% more likely to suffer from a cancer-related death.

## What is Diesel Particulate Matter (DPM)?



1

### Complex Mixture Derived from Exhaust

DPM is a component of diesel exhaust that includes soot particles made up of carbon, ash, metallic abrasion particles, sulfates and silicates.

2

### Classified as a Carcinogen

DPM has been classified as a toxic carcinogen by the World Health Organization (2013) and the International Agency for Cancer Research (2012).

3

### Less than 2.5 Micron

90% of diesel particulate matter is less than 2.5 micron in diameter. Almost all particles are extremely small and can reach into deep regions of the lungs.



## Nederman Emergency Vehicle Exhaust Solutions

- The Clean Air Company trusted at thousands of fire stations throughout the world
- High quality construction and exceptional performance that maximizes protection
- Broad range of solutions that align with the unique needs of each station

### Why Nederman?

#### ✓ Quality, Reliability and Durability

Experience and reputation you can trust as do thousands of firefighters throughout the world every day. Nederman is known for its quality and durability which translates into lasting solutions with reduced maintenance and operating expenses.

#### ✓ Source Capture Approach

The only reliable way to protect those working the fire station is to immediately capture exhaust contaminants as they exit the tailpipe before they can migrate throughout the station. While ambient air cleaners eventually reduce contaminants, they do not protect the firefighters.

#### ✓ Engineered Solutions

Not all fire stations are built or operated in the same way. Nederman offers a broad range of solutions and services to meet these unique requirements.

#### ✓ Committed to Sustainability

Nederman is committed to being part of sustainable solutions for creating clean air.



Our facilities are  
ISO 14001:2015 certified





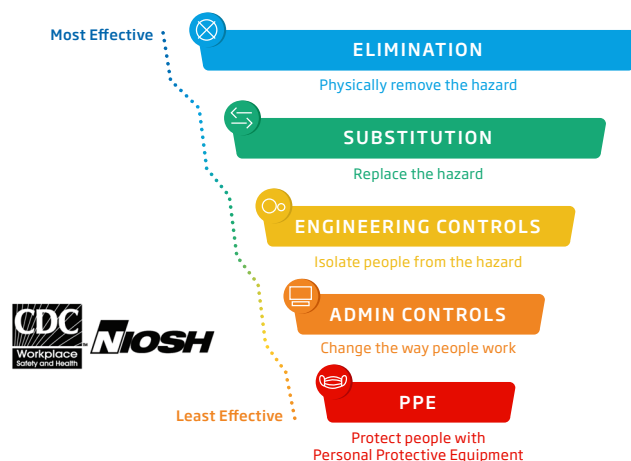
# Health, Safety and Performance are Priorities



## Source Capture Approach

Nederman is committed to protecting firemen from the harmful effects of diesel exhaust and the most effective way to accomplish this is by capturing the contaminant immediately upon discharge from the vehicle. This approach virtually eliminates worker exposure or migration throughout the facility.

Source capture is a highly effective engineering control used for addressing workplace hazards. In 2016, NIOSH recommended the use of engineering controls for reducing firefighter exposure to diesel engine exhaust.\*



### Source Capture



Source capture proactively captures the exhaust discharged from the tailpipe and removes it from the building virtually eliminating exposure to the firefighters.

### Ambient Air



Ventilation or ambient air cleaning near the roof allows the diesel to migrate throughout the facility and does not eliminate fume exposure to the firefighter's breathing zone.

\* <https://www.cdc.gov/niosh/hhe/reports/pdfs/2016-0094-3267.pdf>



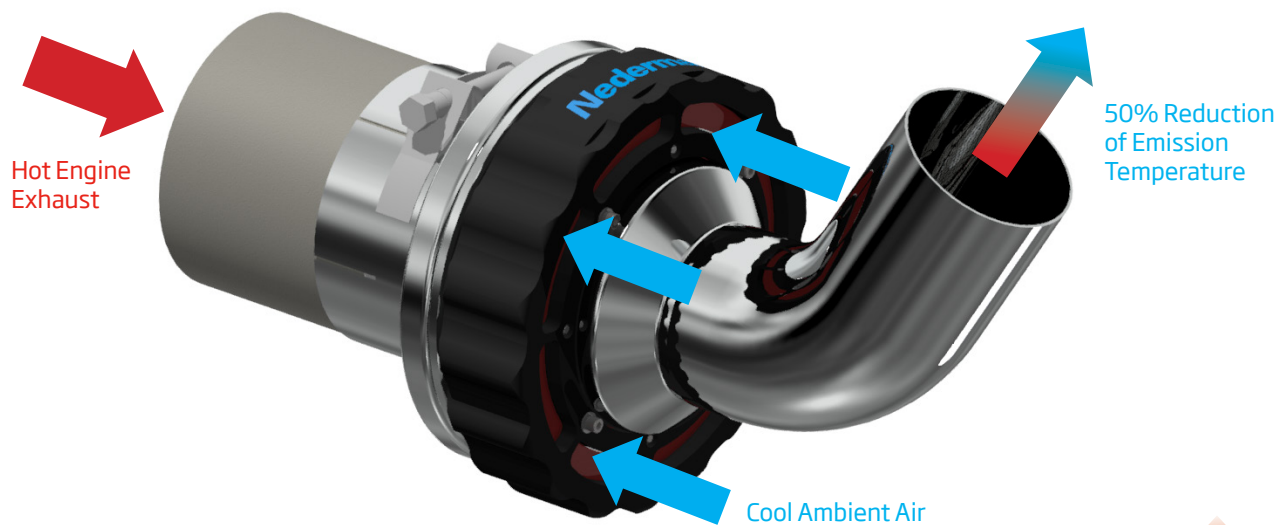
## Solutions Based on Engineering and Experience

- Approach recommended by leading health and safety organizations to protect firefighters from diesel exhaust fumes
- Maximizes the health and safety with proven and reliable technology
- Product design that extends component life and reduces maintenance needs

### Ambient Air Mixing

Diesel engine exhaust is at an extremely high temperature which accelerates the wear and tear on an exhaust system including the flexible duct, seals, motors and bearings. By blending cool, ambient air with the engine exhaust you can quickly reduce the air stream temperature and extend the useful life of the exhaust system.

Nederman's nozzle designs permit ambient air mix in the air stream – immediately reducing the emission temperature up to 50% at the point of capture. This prolongs component life and prevents burning hazards.




### Responsive Actuation

The more responsive the exhaust system is, the more effective it is in controlling the fume. Nederman offers a wireless, dashboard actuator system that senses when the engine turns on and immediately turns on the exhaust fan to begin capturing the fume.

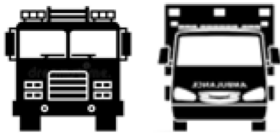






# Vehicle Exhaust Solutions for Every Station's Needs

Not all fire stations are the same and neither should their vehicle exhaust system. When selecting or designing a exhaust system, it is important to consider several key factors that delivers the reliability and durability at the right value. Some of the factors include the type of truck, the exhaust pipe geometry, the station design, run frequency, geography and maintenance budget.



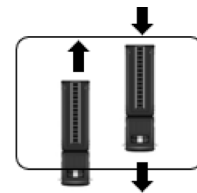
## Vehicle Type and Quantity

Different types of vehicles, tailpipe styles and sizes require different types of solutions.



## Exit Speed

How fast do trucks exit the station? Faster exits require more durable construction and smoother release of the exhaust hose.



## Apparatus Bay Orientation

Do the trucks always back in or do they drive through? Is there more than one truck per bay? Each of these factors influence the exhaust control system design.



## Run Frequency

Is your station located in a busy urban area or a rural area? The number of runs per day influence what type of system may work best.



## Geography

Some locations are constantly driving through snow, ice or in rough terrain that may make undercarriage components more vulnerable to damage.



## Maintenance Budget Considerations

Do you have the ability to perform in-house maintenance or need to rely on outside resources? If maintenance is a challenge, durability and reliability are critical.





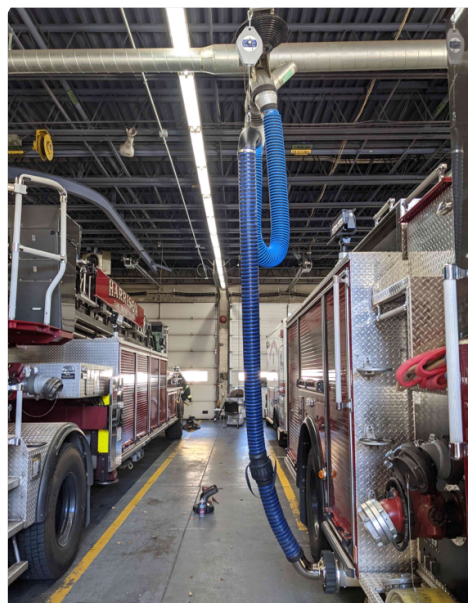
## Experience and Expertise Built Into Every Solution

- Exhaust solutions engineered to your station's unique needs
- Full range of solutions to address any circumstance or station arrangement
- Durability to reduce maintenance and total cost of ownership

### System Arrangement

#### Undercarriage Exhaust Arrangements

For emergency vehicles that have exhaust tailpipe(s) under the vehicle carriage, Nederman offers a broad range of solutions that accommodate the station configuration, number of vehicles and operation with a track or rail system that includes an exhaust hose that reaches down to the tailpipe and then safely conveys the exhaust from the building.



#### Vertical Exhaust Stack Arrangements

Some types of heavy duty emergency vehicles or crash trucks commonly used at airports have vertical exhaust stacks which require a different solution arrangement. Nederman offers a range of products to fit these needs with both back-in or drive through exhaust stack solutions.

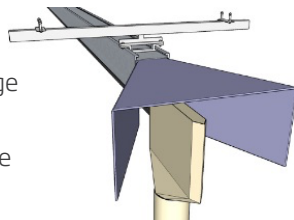
##### MagnaStack

MagnaStack is a system designed for normal sized engines and vehicles with vertical exhaust stacks that back in to stations.



##### VerticalStack

VerticalStack is designed for large sized engines and vehicles with vertical exhaust stacks that drive through or back in to stations.





# Creating the Ideal Solution



## Track, Rail and Trolley Styles

### Track ST

The Track ST features an aluminum track and looping hose supported by a sliding balancer. This configuration is ideal for stations with less frequent runs and slower exit speeds.



- Maximum Exit Speed: Up to 10 mph (15 km/h)
- Number of Vehicles: 1
- Travel Direction: Back-In (typical) or Drive Through
- Track Length Range: 24 - 40 FT (7 - 18 m)
- Run Frequency: Low to Medium

### Track HS

The Track HS features an aluminum track and vertical hose supported by a coiled balancer for back-in or drive through stations. This configuration is suited for stations with average frequency runs and higher exit speeds.



- Maximum Exit Speed: Up to 15 mph (25 km/h)
- Number of Vehicles: 1
- Travel Direction: Back-In (typical) or Drive Through
- Track Length Range: 24 - 40 FT (7 - 18 m)
- Run Frequency: Medium

### Rail

MagnaRail is a high capacity system designed to handle the highest operational requirements. Up to four vehicles can be attached to the same rail each, with a designated disconnection point. For a drive through application for vehicles with either high level or low level tail pipes.



- Maximum Exit Speed: Up to 15 mph (25 km/h)
- Number of Vehicles: Up to 4
- Travel Direction: Back-In (typical) or Drive Through
- Track Length Range: 24 - 98 FT (7 - 30 m)
- Run Frequency: High



## Available Track and Nozzle Options for Your Needs

- The Magna System electromagnet connection is the gold standard for safety and performance
- The MAX Nozzle offers great value in performance in an easy-to-use and durable design

## Nozzle and Connection Styles

### Electromagnet – Side Panel Target with Electromagnet

The industry leading electromagnet provides a powerful vehicle connection resulting in effective exhaust capture at the source, reliable performance and smooth release.

- **Effective Capture.** Nozzle located immediately at the exhaust ensuring capture and entrainment of cooler, ambient air.
- **Smooth Release.** Sensor controlled release disconnects the nozzle at the perfect spot reliably, every time.
- **Ergonomic.** The connection plate is conveniently located where no leaning or excessive handling is required for connection.
- **No Tailpipe Modifications.** The connection is made on a targeted plate above the tailpipe so no modification or adapter is required.
- **Maximum Versatility.** A slightly oversized and offset nozzle arrangement adapts to most tailpipe arrangements including dual, tapered or other odd shaped exhaust tailpipes.



### MAX Nozzle – Direct Connection to Tailpipe

The MAX Nozzle arrangement offers a simple, direct, rare earth magnetic connection to the vehicle tailpipe that captures exhaust at the source. A patent pending design delivers an easy to use, reliable and durable solution.

- **Easy to Use.** Connects directly to tailpipe for simple operation and effective capture.
- **Consistent Release.** Rare earth magnetic connection until hose tension during vehicle exit.
- **Air-Cooled Magnets.** Cool, ambient air is induced over the magnets, maintaining magnetic strength and extending useful life while cooling the exhaust airstream.
- **Durable Finish.** Electrolytic nickel plating for improved durability and corrosion resistance.
- **Robust Tailpipe Adapter.** Thick, steel contact plate reduces on-road damage and costly repairs.



### Green – Side Panel Target with Rare Earth Magnets

The Green connection is comparable to the electromagnet connection but instead uses rare earth magnets to secure the nozzle to the engine. This arrangement provides the same effective capture, ergonomics and tailpipe versatility but at a reduced cost for stations that have lower operational demands.





# A Complete, Engineered Solution



## The Full Range of Components to Build a Complete System

### 1 Exhaust Fan

Once the system configuration is known, Nederman will select a fan that ensures proper air flow at each extraction point.

### 2 Track / Rail Trolley

Based on the run frequency, exit speed, number of vehicles or other factors and select the style that best meets your operation.

### 3 System Controls

Nederman offers UL Listed system control panels that operate the fan and actuators. Optional Variable Frequency Drives can be used to further automate the system.

### 4 System Actuator

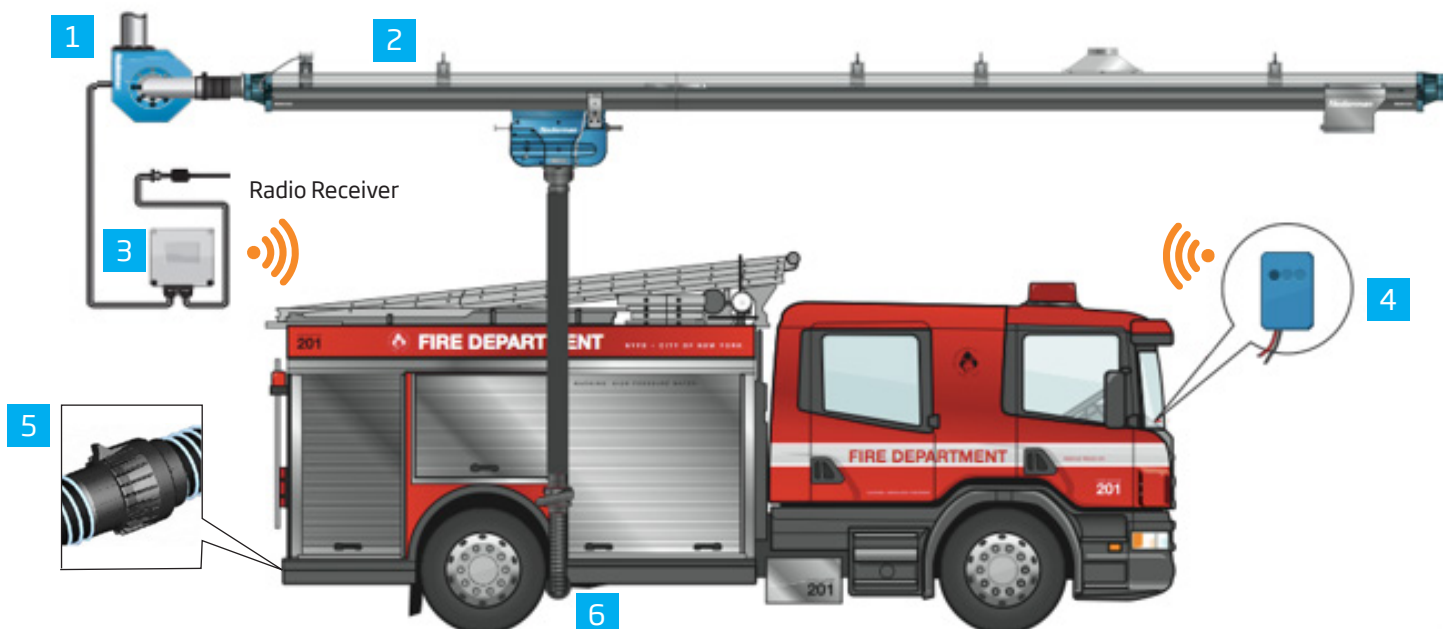
Standard in-dashboard actuator and receiver turns the fan on immediately when the engine is turned on. A pressure switch actuator is also available for MAX Nozzle configurations.

### 5 Options and Accessories

Nederman offers additional options and accessories including safety disconnects, hoods, duct, etc.

### 6 Nozzle Style

Select from the available sizes for either the direct tailpipe connection MAX Nozzle option or the high-performance electromagnet nozzle connection.





## The Total Package

Let Nederman's experienced team configure a complete, turnkey exhaust solution that protects your facility and firefighters.

System	Location	Track / Rail Trolley	Magnet Style	Connection Point	Actuator
<b>MagnaTrack ST Green</b>	Undercarriage	Track	Green Rare Earth	Target Plate	In Dash
<b>MAX Track ST</b>	Undercarriage	Track	MAX Rare Earth	Tailpipe Adapter	In Dash / Pressure Switch
<b>MagnaTrack HS Green</b>	Undercarriage	Track	Green Rare Earth	Target Plate	In Dash
<b>MagnaRail Green</b>	Undercarriage	Rail	Green Rare Earth	Target Plate	In Dash
<b>MAX Rail</b>	Undercarriage	Rail	MAX Rare Earth	Tailpipe Adapter	In Dash / Pressure Switch
<b>MagnaTrack HS</b>	Undercarriage	Track	Electromagnet	Target Plate	In Dash
<b>MagnaRail</b>	Undercarriage	Rail	Electromagnet	Target Plate	In Dash
<b>MagnaStack</b>	Vertical Stack	NA	Electromagnet	NA	In Dash



## The Nederman Advantage

- Design and Engineering Support
- Engineered Solution Unique to Your Needs
  - Reliable Protection
  - Simple to Use and Operate
  - Durability and Low Cost of Ownership
- Installation and Planning
- Post-Sale Support and Service



## The Clean Air Company

### **Our promise - to contribute to a sustainable future**

Clean air is one of the cornerstones of sustainable production. Our customers want to improve profitability by streamlining their processes as much as possible. They want to be able to meet all strict environmental requirements and protect their employees against dust, smoke and exhaust fumes, among other hazards. Nederman can help with all these points with its knowledge and solutions. This is how we create value, and together we can make a difference.

### **The Clean Air Company - Nederman vision 2025**

Nederman celebrated his 75th anniversary in 2019. Right from the start, the business idea was clean air. Today, the environment and sustainability are more relevant than ever and the demands to actively contribute to more efficient and reduced emissions in industry are increasing. The next generation of solutions for cleaning industrial air flows is coming. Nederman is at the forefront of this development.