



Nuchar® FuelSorb™

# Adsorbed natural gas (ANG): a low-pressure, bi-fuel natural gas vehicle solution

ANG technology is made possible by Ingevity's activated carbon which reduces the storage pressure of natural gas without sacrificing the on-board volume of gas stored through a process known as adsorption. Lower-pressure storage removes the need for large, costly commercial CNG stations and enables safe, economic fueling at work and at home.





## Driven by Experience

With over 100 years of experience in activated carbon development, Ingevity is the leading global supplier of activated carbon products used in automotive gasoline vapor emission control systems. Nuchar activated carbon products have proven life-of-vehicle performance, and have been used for over 40 years in nearly one billion vehicles worldwide. Ingevity is advancing ANG technology with the development of FuelSorb activated carbon monoliths.

## Opening Doors for Light-Duty Vehicles

ANG is an alternative fuel option for large, light-duty vehicles like SUV's, half-ton pickup trucks and service vans. The technology has many benefits compared to CNG.

Adsorbed Natural Gas (ANG)	VS.	Compressed Natural Gas (CNG)
900 psig (25% of CNG)		3,600 psig
Nested, cylindrical tanks (conformability factor <0.65)		Cylindrical tanks (conformability factor <0.55)
Cost of compression: \$0.15-0.20 per GGE*		Cost of compression: 2x ANG
Affordable private fueling appliances (<\$2,500 per unit)		Expensive public fueling infrastructure, <1,000 CNG stations in U.S. (\$1-3 MM per station)

\*gasoline gallon equivalent

### Has a low-pressure, bi-fuel design:

ANG technology is made possible by activated carbon which reduces the storage pressure of natural gas without sacrificing the volume of gas stored through a process known as adsorption.



### Brings convenient private fueling:

ANG technology - compared to CNG - removes the need for large, costly commercial fueling stations and enables safe, economic fueling at work and at home. ANG fueling reduces energy consumption by over 50 percent and fuels 60 percent faster.



### Costs less per GGE:

Fuel savings range from \$1.00-\$1.50 per GGE compared to gasoline.



### Performs over the vehicle's life:

ANG tanks do not experience the significant loss in range and capacity that electric vehicle battery packs do, nor do they require replacement before the useful life of the vehicle.



### Is better for the environment:

ANG vehicles are 90 percent cleaner than the EPA's current NOx standard and emit over 25 percent fewer greenhouse gas (GHG) emissions than comparable gasoline and diesel vehicles. When fueling with renewable natural gas, GHG emissions can be reduced by up to 125 percent. Additionally, ANG vehicles have cleaner engine operation due to the higher octane and higher combustion efficiency of natural gas (source: NGVAmerica).



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