

STRATEGIC METALS SUPPORT CLEAN AUTOMOBILES



For the majority of Minnesotans, the primary mode for their everyday transportation needs is an automobile. Copper, nickel, platinum and palladium are critical raw materials in the manufacture and operation of modern gasoline-powered, hybrid and fully electric cars, helping to reduce harmful exhaust emissions, improve mileage, increase longevity, and support environmentally-friendly technological advances.

COPPER: A standard gas-powered car contains 42 pounds of copper, while today's modern hybrid vehicle requires 75 pounds of copper. Copper also helps vehicle engines run smoother and last longer, as soluble, antioxidant copper is often added to motor oil to reduce friction and maintain proper viscosity.

NICKEL: Stainless steel, a nickel alloy, is used in vehicle exhaust systems because its properties resist corrosion, mechanical stress and high temperatures. Stainless steel is also used in vehicle frames which weigh 20 percent less than carbon-based frames, thus contributing to improved fuel economy, reduced emissions and cost savings for consumers. Additionally, nickel is critical to the recharging capacity of specialized batteries found in today's hybrid and fully-electric cars. Nickel will be increasingly important in the ongoing development of long-range battery technology.

PLATINUM AND PALLADIUM: In 2012, 56 percent of gross world demand for platinum, palladium and rhodium was for the manufacture of catalytic converters for automobiles. Catalytic converters are the backbone of automobile emission reduction systems, accounting for the reduction of more than 90 percent of harmful exhaust emissions, including carbon monoxide, nitrogen and hydrocarbons. Platinum is also used in oxygen sensors that help gasoline engines operate more efficiently.

Platinum and palladium's durability and corrosion-resistance properties make these metals valuable in the electronic components of a vehicle's engine management systems, antilock brake systems and airbag initiators.

Sources:

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