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## AirDuo-Carrier

### Background

Recent research focused on sources of volatile and semi-volatile organic compounds has uncovered a new source of these compounds in which they are released into the atmosphere in the forms of gas or aerosol. Various composites emit gaseous compounds considered as non-combustion sources. However, these compounds emit submicron atmospheric aerosols which exert serious impacts on human health as well as the climate. In addition, intense sun exposure and high temperatures promotes loss of volatiles from construction elements. These volatiles are air pollutants, and some are ozone precursors, regardless of the source of emission from pavements, roofs, buildings, or furniture. There is a growing need to contain these compounds in a way that is safe and effective.

### Invention Description

Researchers at Arizona State University have developed AirDuo, a novel method of creating functionalized carbon derived from various biomass to selectively remove hazardous emissions. AirDuo can be embedded in coatings, paint, sealant, straight bitumen of various grade, fog seal, sealant, and other composites and polymeric materials as carriers. AirDuo can facilitate the trapping and retaining of volatiles regardless of the source of emission. The ability of AirDuo to trap and retain harmful volatiles promotes improved air quality, increased human health and durability of construction elements.

### Potential Applications

- Advanced coatings
- Paint or sealants
- Fog seal

### Benefits & Advantages

- Use of biomass such as wood, plants, algal, or animal waste
- Use of pyrolysis or hydrothermal liquefaction to create bio-char sulfur
- Adsorbing free radicals which accelerate aging of outdoor constructions exposed to heat and sun
- Retaining volatiles which emit from various construction elements exposed to heat and sun

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