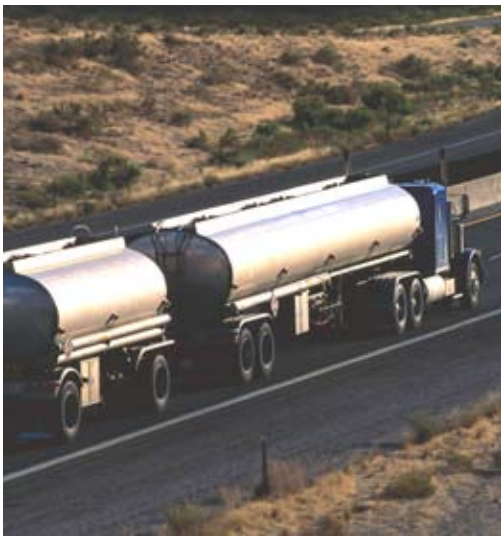
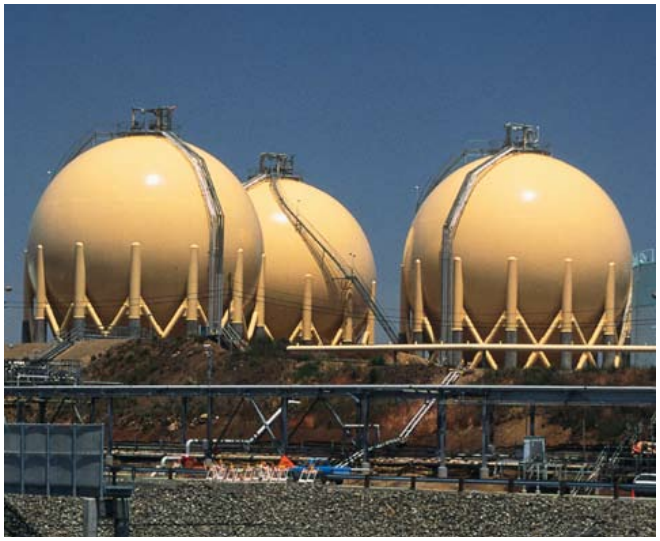
Pressure Vessel Technology

Lightweight, Inexpensive, Liquefied Natural Gas Storage Tanks





technology opportunity

NASA's Marshall Space Flight Center (MSFC) has developed a new composite vessel technology that is suitable for use as a liquefied natural gas (LNG) fuel storage tank for alternative fuel vehicles. This technology uses an improved composite over-wrapped technology to produce a pressure vessel that is simple to use, robust, and capable of withstanding high pressures. It is also lightweight and low cost. This technology shows great potential to help the United States and other countries move toward a cleaner environment while allowing for efficient use of a more natural fuel in many different applications.

Benefits

- Is relatively inexpensive (a 12" x 40" tank has been prototyped for under $2,000)
- Functions at high pressures (3,000 psi) suitable for compressed natural gas storage
- Provides increased strength through over-wrapped composite materials
- Uses common, commercially available aluminum tank liners
- Contains a superior, lightweight insulation material
- Has an impact-resistant environmental protectant layer on the outer surface
- Resists damage from abrasion, fire, or ultraviolet rays

For More Information

If you would like more information about this technology or NASA's technology transfer program, please contact:

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The Technology

NASA's composite over-wrapped pressure vessel technology provides for an effective means to store fuel for LNG alternative fuel vehicles. Current LNG vehicles use low-pressure, double-layered, vacuum-sealed, stainless steel fuel tanks that are heavy, complex, and expensive. In contrast, NASA's technology offers the industry a tank that is lightweight, strong, capable of withstanding high pressures, and low cost. It is based on the use of an aluminum tank liner, over-wrapped with composite materials, that contains abrasion-resistant, insulating, and environmentally protective components.

There are some similarities between the NASA technology and other fuel tank technologies being developed, but none of the others appears to contain an effective insulation component. This fuel tank contains a NASA-developed insulation that consists of aerogels. These aerogels enable cryogenic fuels and other cryogenic fluids to be more effectively contained.

Commercial Applications

- Fuel tanks for alternative fuel vehicles, aircraft, or spacecraft
- Storage/transport tanks for compressed natural gases or liquid cryogenic fuels

Opportunity

This technology is part of NASA's technology transfer program, which seeks to stimulate development and commercial use of NASA-developed technologies. NASA is flexible in its commercial agreements, and opportunities exist for licensing and/or joint development of this composite pressure vessel technology.