

# AEROSPACE

Space Report 2021



Space exploration invites discovery. Curiosity drives progress, especially on *Mars*.

Take a trip to Mars and back again with Minnesota Wire in our special edition Aerospace Report.

## Mission of Curiosity

NASA's Mars Exploration Program Mission of Curiosity lays the foundation for future programs

## Continuous Discovery

Aerospace Industry Review  
Aerospace Quality Standards  
AS9100 certification & certified manufacturers

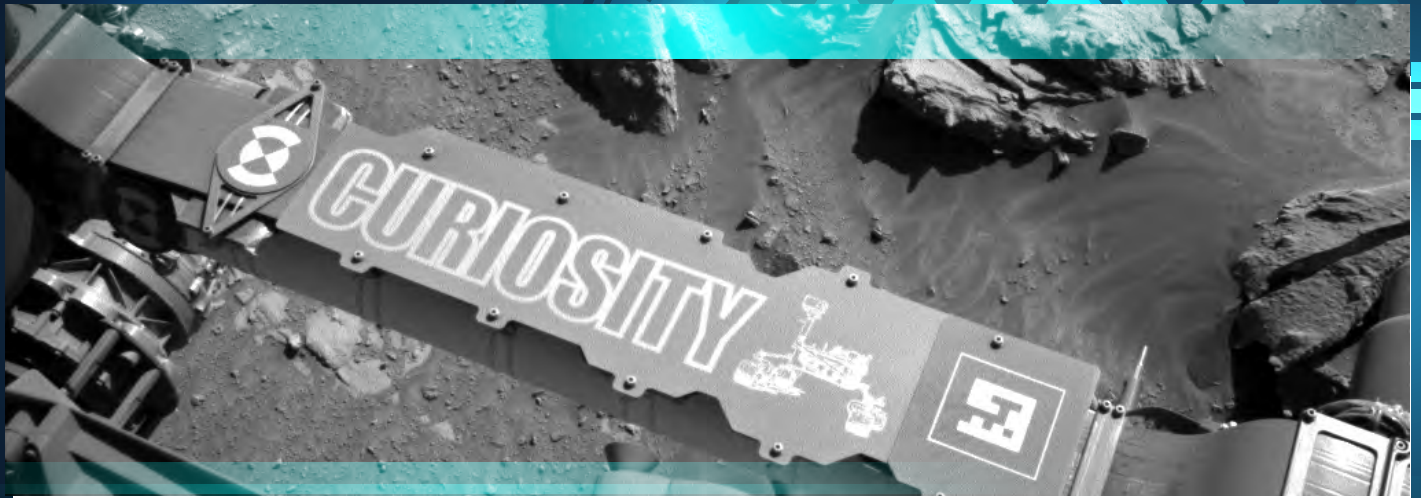
## Payload Protection

Inside our Aerospace Lab  
Lift-off with lightweight Wire  
Carbon Nano Tubes  
Copper Wire Production

## High-bandwidth Network

Community of Exploration  
Message from Astronaut Duane Carey  
Invitation to continue the discovery

Explore space with us.



## Mars Curiosity Rover Paved the Way for Perseverance

The Perseverance rover, the centerpiece of NASA's \$2.7 billion Mars 2020 mission, is based on the previous Curiosity Rover. Like its predecessor, the Perseverance Rover will hunt for signs of ancient life, collect and cache samples for future return to Earth and help demonstrate a variety of new exploration technologies, among other tasks.

The Mars Exploration Program studies Mars as a planetary system in order to understand the formation and early evolution of Mars as a planet, the history of geological processes that have shaped Mars through time, the potential for Mars to have hosted life, and the future exploration of Mars by humans.

All landings on Mars are difficult, but NASA's Perseverance rover is attempting to touch down in the most challenging terrain on Mars ever targeted on February 18, 2021. The intense entry, descent, and landing phase, begins when the spacecraft reaches the top of the Martian atmosphere. Engineers have referred to the time it takes to land on Mars as the "seven minutes of terror." This is just one of the reasons payload really counts in space travel.

The landing sequence is complex and targeting a location like Jezero Crater on Mars is only possible because of new landing technologies known as Range Trigger and Terrain-Relative Navigation.



### Perseverance Driving Data Collection

The Mars 2020 rover, Perseverance, is based on the Mars Science Laboratory's Curiosity rover. It is car-sized, about 10 feet long (not including the arm), 9 feet wide, and 7 feet tall. But at 2,260 pounds, it weighs less than a compact car. The rover is designed to be light and able to fully explore and collect data. Data analysis will help direct future missions.

# AS9100 Certification

## Aerospace Industry Requirements and Progress

AS9100 is a company level certification based on a standard published by the Society of Automotive Engineers (SAE) titled "Quality Systems-Aerospace-Model for Quality Assurance in Design, Development, Production, Installation and Servicing".

This is the required standard for organizations that design, develop, or provide aviation, space, and defense products and services. The aerospace industry has unique requirements for quality management, which is why many companies that deliver products and services within the aviation, space and defense spheres work to earn AS9100 certification.

**The aerospace industry is an ever-evolving field thanks to recent and upcoming advancements in technology.** Science will continue to provide us with more powerful and efficient ways to explore the skies and outer space of our world.

As aerospace exploration began to grow, Minnesota Wire saw the opportunity and need to support the next phase of innovation. We began our journey to achieve AS9100 certification and world-class expertise in Carbon Nano Technology. **Taking on new challenges in critical environments is exactly what we love to tackle at MN Wire.** Today, we produce the most advanced lightweight wire for aerospace applications from our Aerospace labs in St. Paul, Minnesota. Now we are a part of delivery life savings connections in space.

## Payload Protection Inside our Aerospace Labs

When weight really counts, Minnesota Wire has you covered. We have been supporting light weight wire applications from our AS9100 approved labs. We are ready and excited to be a part of space exploration.

Through our careful quality process and equipment, we produce the highest functioning light weight wires. We have invested deeply in our Carbon Nanotube (CNT), carbon and Metalized Raw Materials processes. These complex materials provide up to 50% weight savings with substitution for copper shields and conductors. We stock Oasis and Kapton materials for wrap and sintering which produce low to no gassing.

**Lightweight payloads are critical in take-off and landing.** Our rigorous testing ensure we deliver wire at the highest quality standard with connection integrity. When the connection and quality must be impeccable, companies come to Minnesota Wire.

Much like the Mars Exploration Rover, we base our culture on curiosity and perseverance. Developing and producing elegant, custom solutions to complex wire and cable challenges is what inspires us everyday. We embrace every opportunity to contribute our expertise to the programs and projects that will advance aerospace travel and research. **Bring your high stakes projects to us and trust Minnesota Wire to deliver the most functional, light weight wire for your application.**

## Special Communications: Respected Aerospace Industry Partners

During this exciting time in space exploration, we are excited to connect with our proven partners in the industry. It is a source of great pride at Minnesota Wire to be recognized by respected space-flight experts.

Hear a special message from our favorite astronaut Duane "Digger" Carey on our website and on our Youtube Channel.

Thank you, Digger, for your kind words and your contribution to the NASA space program.

**Join the celebration  
at [mnwire.com](http://mnwire.com)**



Mars Curiosity Rover



### Watch Digger's Message

Duane Gene "Digger" Carey is a retired lieutenant colonel in the United States Air Force and a former NASA astronaut. Digger is a St. Paul, Minnesota native.

### Invitation to Continue the Journey

Continue the journey of curiosity and perseverance with Minnesota Wire. We are committed to being an indispensable partner to customers in need of AS 9100 certified contract manufactures. From concept to delivery, we are excited to move progress forward under the most critical applications.

Let's start a journey of curiosity together. Connect with an expert at Minnesota Wire and begin the quote process.

Established in 1967, Minnesota Wire is a family-owned, vertically integrated, contract manufacturer of wire, cable, connectors and assemblies. Proudly based in the United States, we primarily serve the medical, aerospace, and defense industries. We hold a variety of patents and proprietary processes, including AS9100 certification. Over our lifetime, we have made we have made multi-million single and multi-use wires for hundreds of unique applications.



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