



# THE SCIENCE OF SPEED

## DOW TECHNICAL PARTNERSHIP WITH USA LUGE

In the sport of luge, medals can be determined by a thousandth of a second. A precisely designed sled is vital to an athlete's competitive edge in the sport. This is why in 2007, the USA Luge team turned to Dow scientists to collaborate on designing and building an advanced sled based on scientific insights and solutions. The teamwork led to Dow becoming the Official Technical Partner of the USA Luge team in 2011.

With expertise in materials science, product design and advanced manufacturing capabilities, Dow and USA Luge team engineers work together to develop sleds that are faster, more tuned and more precise.

## DATA IS KEY

Dow and USA Luge team engineers rely on data-based decision making to improve the sled design. All ideas are tested using scientific and statistical rigor to enable decisions on improvements for the sled. Data is collected both in the lab and on the track. Feedback is gathered from the USA Luge sliders and third party firms that help with specialized testing. This allows the team to:

- Make robust decisions that improve the sled design
- Understand factors that influence the sled performance
- Quantify the impact of each improvement
- Identify opportunities for further improvements





### EXTREME OPERATING CONDITIONS

A luge sled must function effectively at low operating temperatures, high speeds and under high G-forces. This unique combination of challenging operating conditions necessitate systematic product development. Material selection and component design are critical to improving the performance required for extreme operating conditions. Therefore, it is essential for engineers to account for and test this during the design stage, as materials tend to become more rigid at low temperatures. When parts of the sled become less flexible, the athlete may have less control of the sled. Components also deform due to the stress of high-speed forces experienced during racing. Through virtual modeling, lab testing and prototyping, Dow works to create solutions that can withstand tough racing environments.

### BRINGING HOME THE MEDAL

Dow and USA Luge team engineers worked together on the design of sleds. During the Olympic Winter Games Sochi 2014 in Russia, Erin Hamlin made Team USA history by bringing home its first singles medal since the sport's Olympic Games debut in 1964. Her bronze medal also made USA the fifth country to earn a medal in women's singles luge. At PyeongChang 2018, Chris Mazdzer made another USA Luge history by winning the first men's singles, a silver medal.

Achievements like this inspire Dow and USA Luge to continue their momentum to innovate and advance the science of speed.



#### BIRTH OF USA LUGE

1979

##### USA LUGE FOUNDED

The same year that the first American artificial luge track was built in Lake Placid, New York.

The most successful National Governing Body for a winter sport, with **over 600 medals** in senior and junior international competition.

**Depth at each level of competition** through a nationwide network of luge clubs and recruitment programs.

#### USA LUGE MEDAL HISTORY

1998

##### OLYMPIC WINTER GAMES NAGANO 1998 (JAPAN)

Silver Medal, Doubles: Chris Thorpe and Gordon Sheer. Bronze Medal, Doubles: Mark Grimmette and Brian Martin

2002

##### OLYMPIC WINTER GAMES SALT LAKE CITY 2002 (USA)

Silver Medal, Doubles: Mark Grimmette and Brian Martin. Bronze Medal, Doubles: Clay Ives and Chris Thorpe

2014

##### OLYMPIC WINTER GAMES SOCHI 2014 (RUSSIA)

Bronze Medal, Singles: Erin Hamlin

2018

##### OLYMPIC WINTER GAMES PYEONGCHANG 2018 (SOUTH KOREA)

Silver Medal, Singles: Chris Mazdzer

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