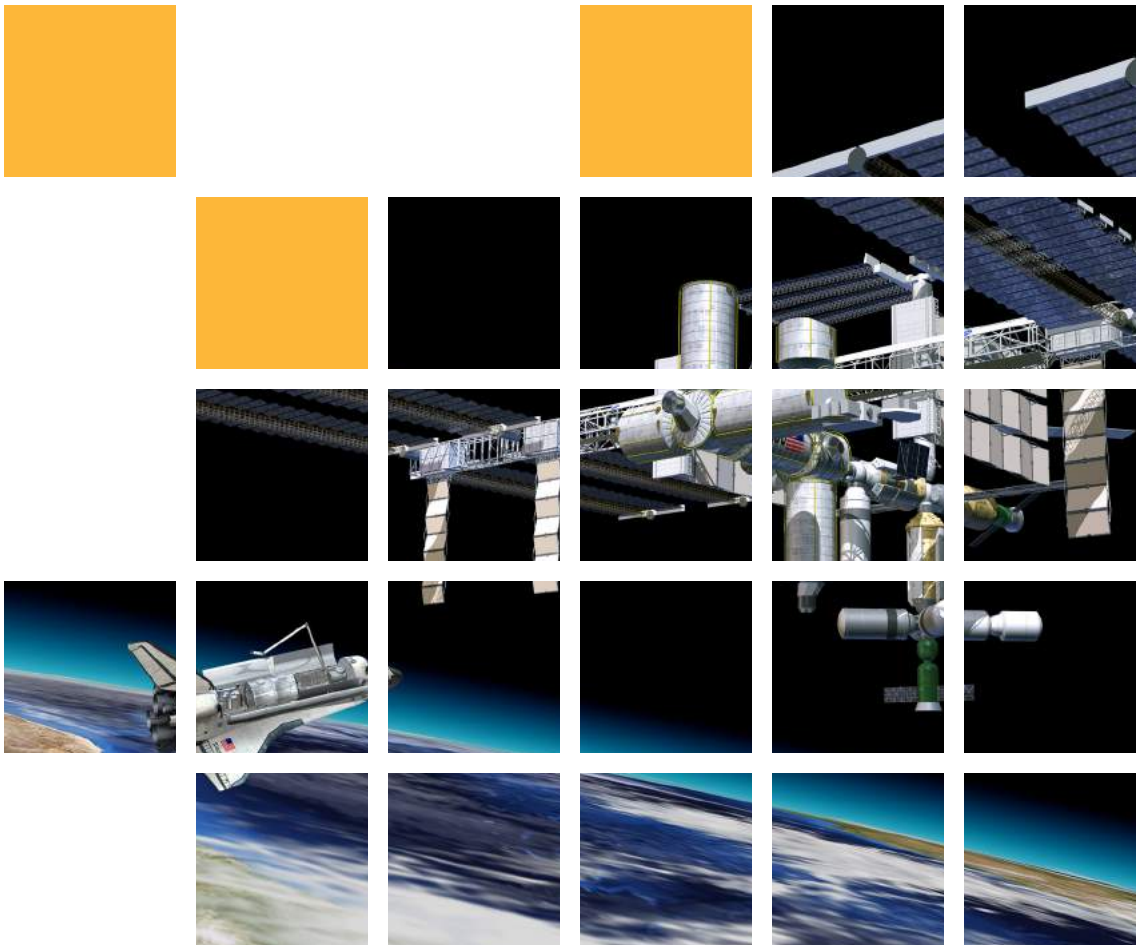


LUBRICANTS IN SPACE

Lubricants for aerospace applications are designed for extreme conditions where long life is critical for the success of the mission.

Since 1844
Nye® Lubricants
TECHNOLOGY IN MOTION™

LUBRICANTS IN SPACE

Lubricants for aerospace applications have been formulated at Nye for over 65 years. Below is a demonstration of Nye's space heritage, including some examples of lubricants designed specifically for applications that must survive the severe conditions of the space environment.

250 MILES

International Space Station (ISS)

Device: Multiple Mechanisms

Lubricant: Various products including Rheolube® 2000

Multiple devices for positioning and control; Vibration Isolation Systems for Advanced Resistance Exercise Equipment.

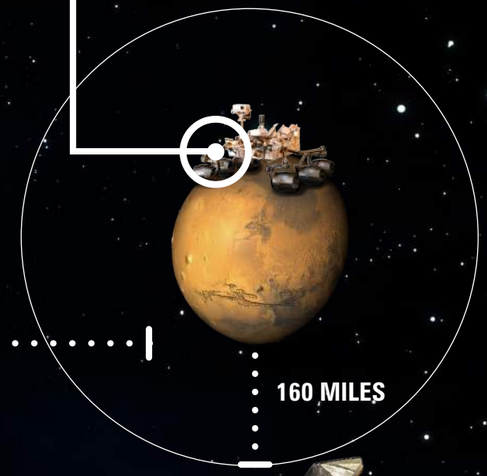
34 - 249,000,000 MILES

Mars Rover Curiosity

Device: Mast Camera

Lubricant: NyeBar® Barrier Film

Mars Rover Curiosity has provided photos along with data concerning climate and geology since August 2012.



160 MILES

55 - 217 MILES

CubeSats/NanoSats

Device: Reaction Wheels

Lubricant: Pennzane™ Grease, Pennzane™ Oil & NyeBar® Barrier Film

The reaction wheels located on CubeSats/NanoSats provide an efficient, high-performance solution for attitude control.

438 MILES

Thermal Infrared Sensor (TIRS)

Device: Angular Contact Bearings

Lubricant: Rheolube® 2000 & Synthetic Oil 2001

The Thermal Infrared Sensor located on the Landsat Data Continuity Mission (LDCM) measures land surface temperature.

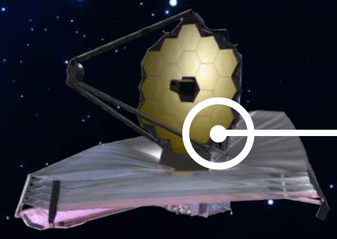
Mars Climate Sounder (MCS)

Device: Actuator

Lubricant: Synthetic Oil 2001A

The Mars Climate Sounder observes the temperature, humidity, and debris content of the Martian atmosphere.

1,000,000 MILES



James Webb Space Telescope (JWST)

(Launching in 2018)

Device: Multiple Mechanisms

Lubricant: Custom Pennzane™ Oil Formulation

The James Webb Space Telescope will be a large infrared telescope with a 6.5 meter primary mirror. The telescope will be launched on an Ariane 5 rocket from French Guiana in October of 2018.

253 MILES

Global Precipitation Measurement (GPM)

Device: Harmonic Drive Gear

Lubricant: Rheolube® 2004 & Synthetic Oil 2001-3PB

Global Precipitation Measurement is a joint mission between JAXA and NASA that records precipitation characteristics on Earth.

NOT TO SCALE

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ISO 9001:2008
ISO 13485:2003
ISO 14001:2004
ISO/TS-16949:2009

Photographs are courtesy of NASA.
Special thanks to Blue Canyon Technologies.