Tracks

Terrestrial examples:

> a highly flexible material.
> ➢ 300 hour life (10 000 km)

ODG-Argo Metallic
Track development

Alignment pin

Gen II Tracks

- **T**andem **T**oothed **W**heels **W**ith **A**lternating **A**symmetrical **C**able **C**lamped **S**egmented **S**ystem (TWACS)
- One-way introvert drivers

- Tensioner system prevents derailment and jamming.
- Spring-loaded undercarriage follows ground contours and keeps track aligned.
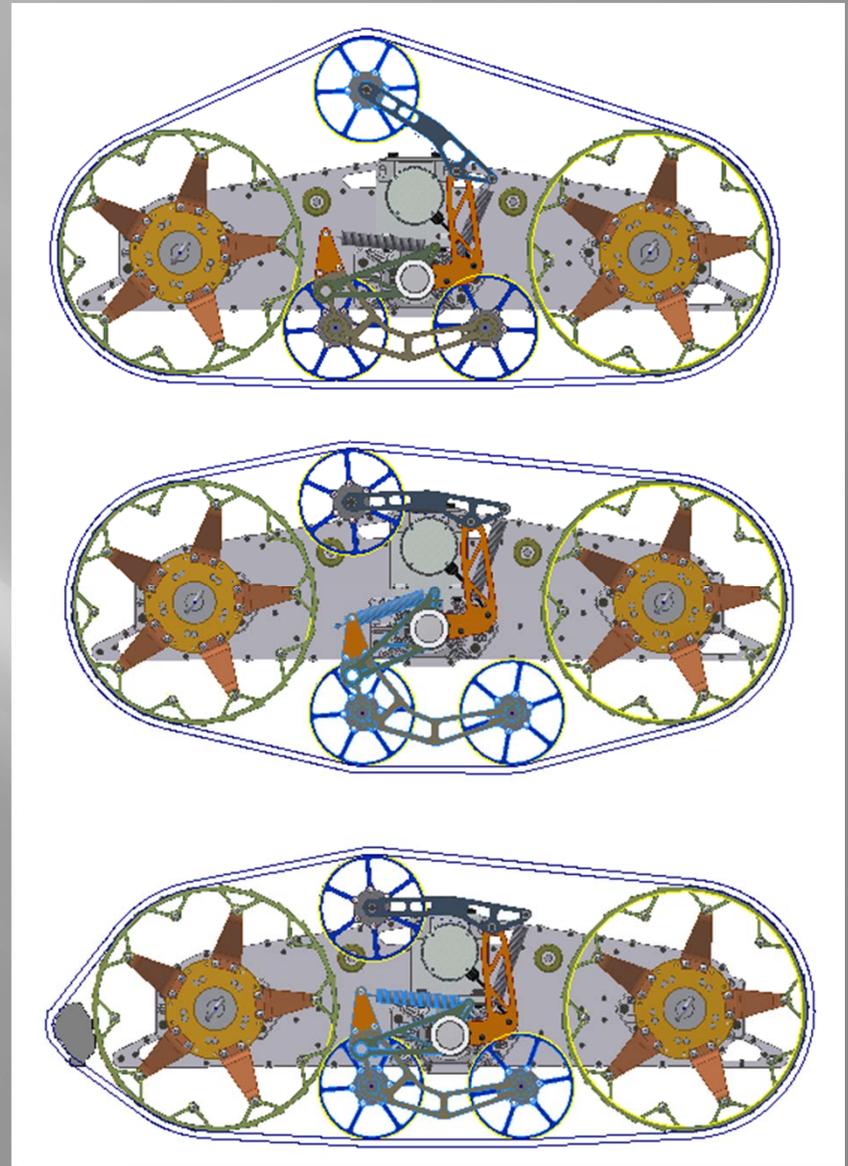
➤ Spring loaded bogie wheels follow central groove and distribute ground pressure

➤ Semi-cylindrical blocks clamp cable and interface with driver

➤ Alignment pins ensure that the track has adequate lateral rigidity
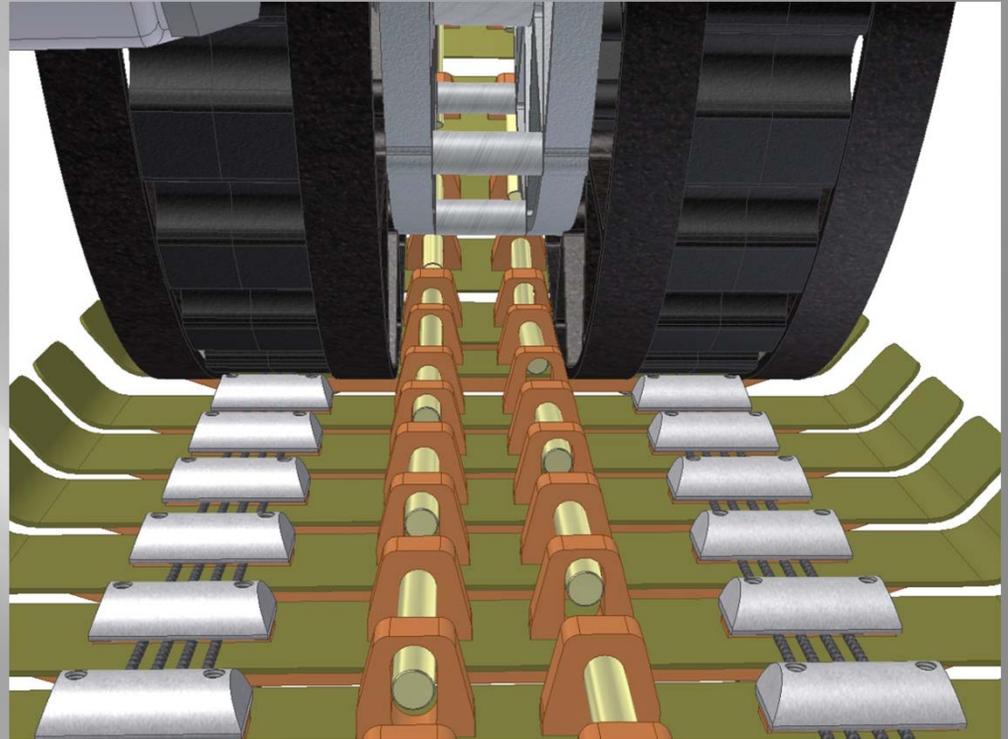
Gen II mass = 147 kg per rover (compared to 72 kg per rover for the Tweel / Goodyear Non-Pneumatic wheel.

Durability testing – Gen II:

Sand Testing

- Compared tracks to baseline rubber tires

- Simulated vehicle weight at 200, 400, and 550 kg (1 G)

- Conducted in very fine grained sand

Baseline Rubber tire

Tractive Force for Tires
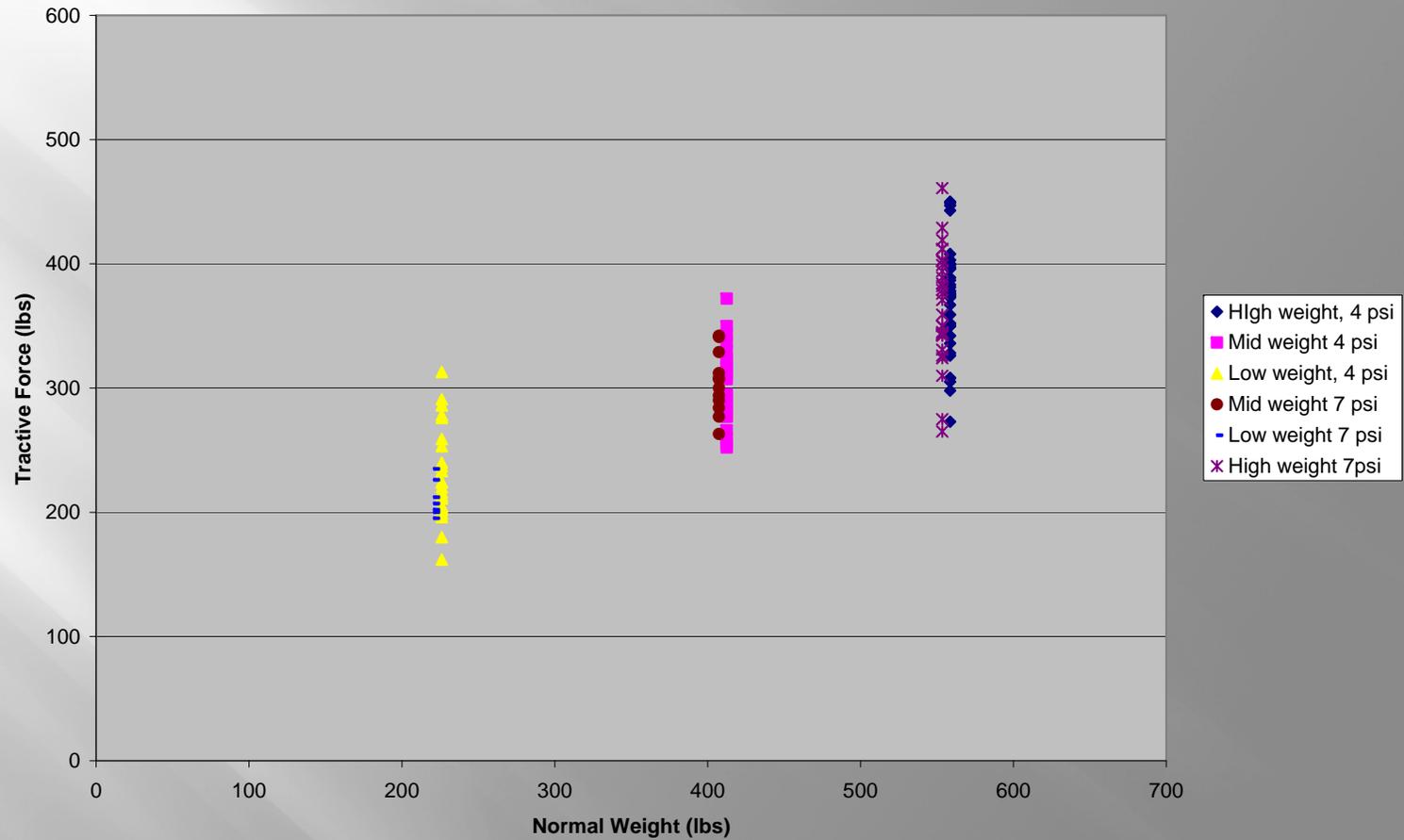
Gen II TWACS

Tractive Force for Tracks
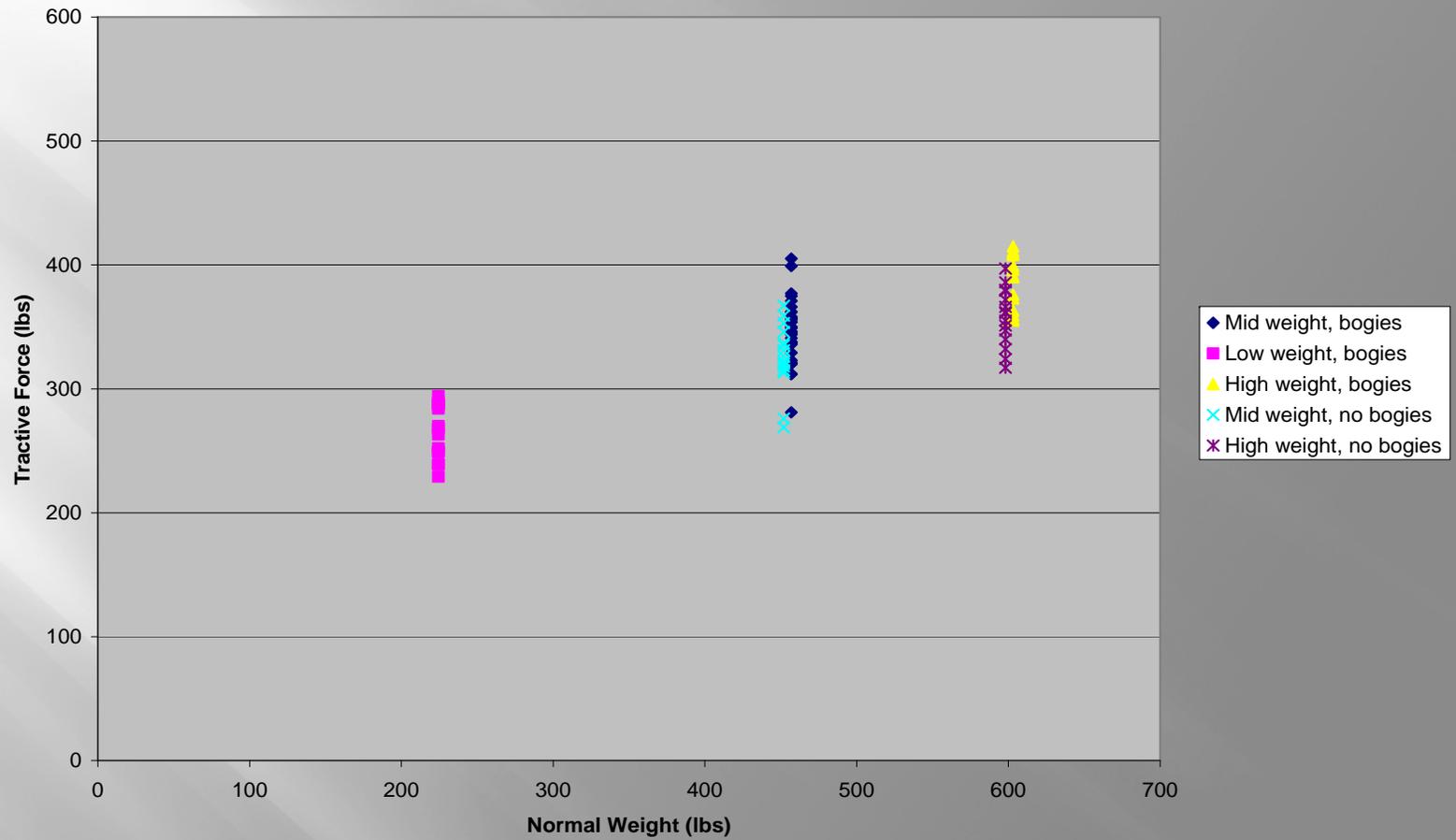
Tires vs. Tracks

Traction coefficient
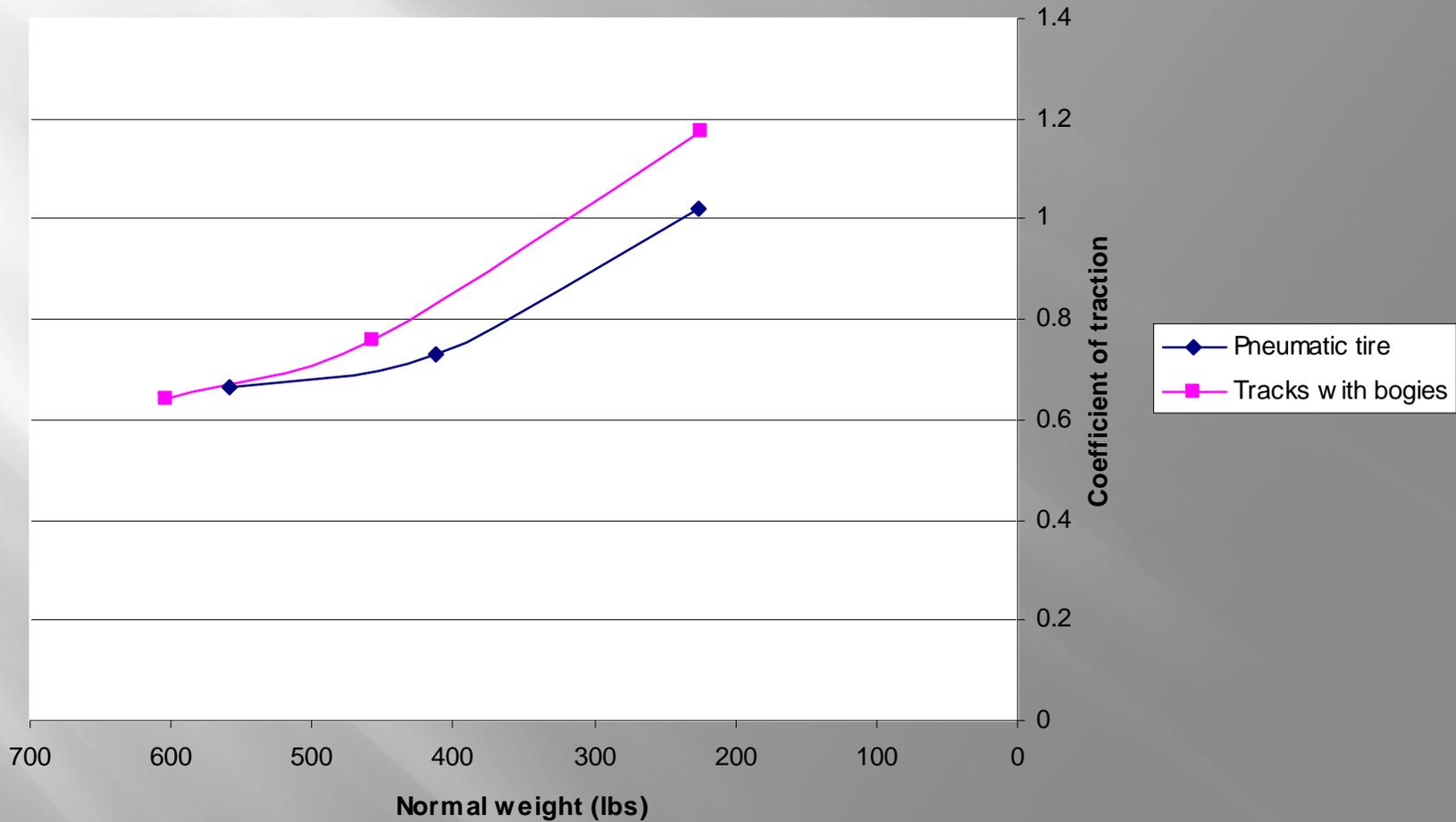
TWACS Evolution – Gen III

- More advanced materials
- Minor design changes

Ti6Al4V Grade 5
Heat treated - spring grade

Stainless steel

Ti6Al4V Grade 5

6061 Aluminium
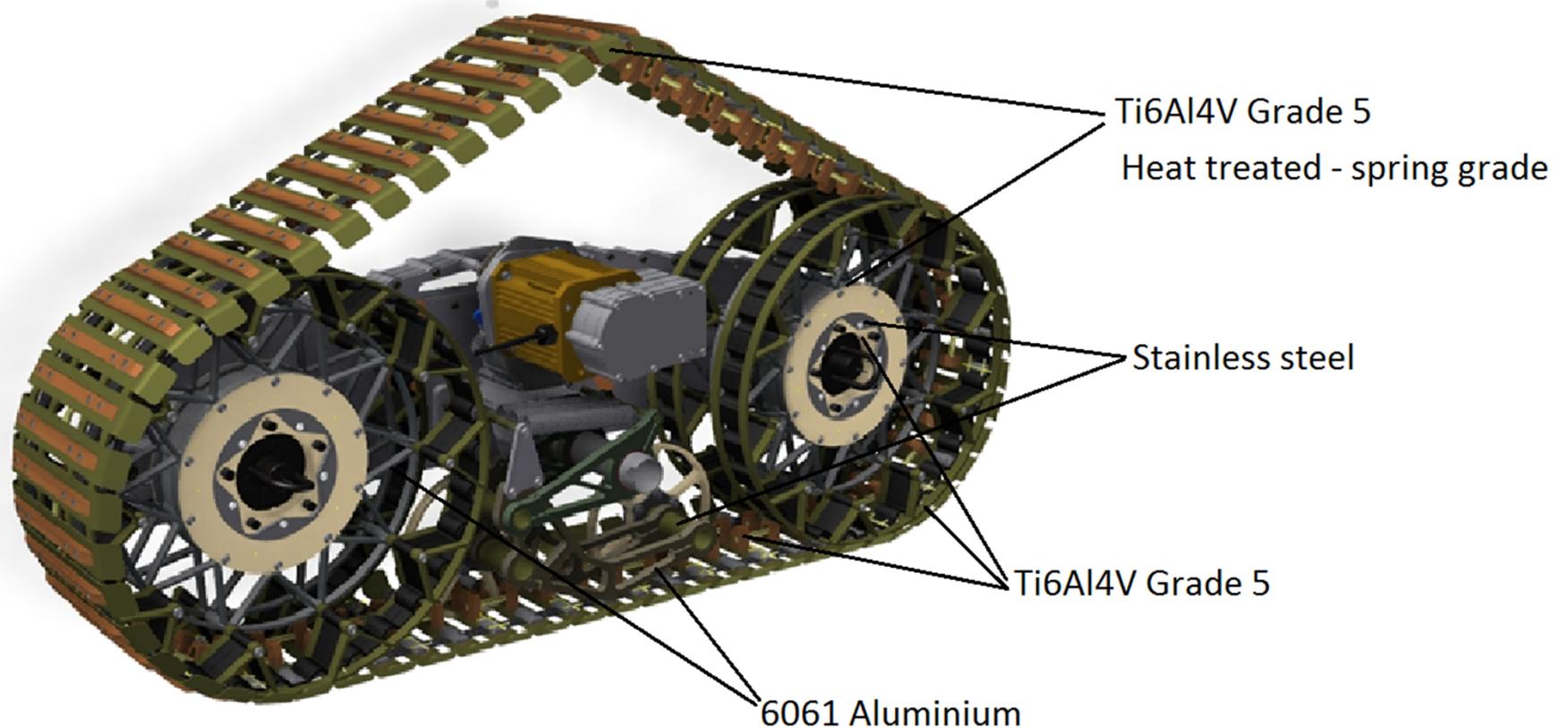
TWACS Evolution – Gen III

- Reduced mass
  - **20.4 kg** per track (down from 27.3 kg)
  - Total Gen II track system mass – 147 kg
  - Total Gen III track system mass – **112 kg**
  - Baseline wheels – 65 kg
- Increased resistance to derailment and durability
  - Raised height of central track lug guides
  - Increased alignment pin contact area.
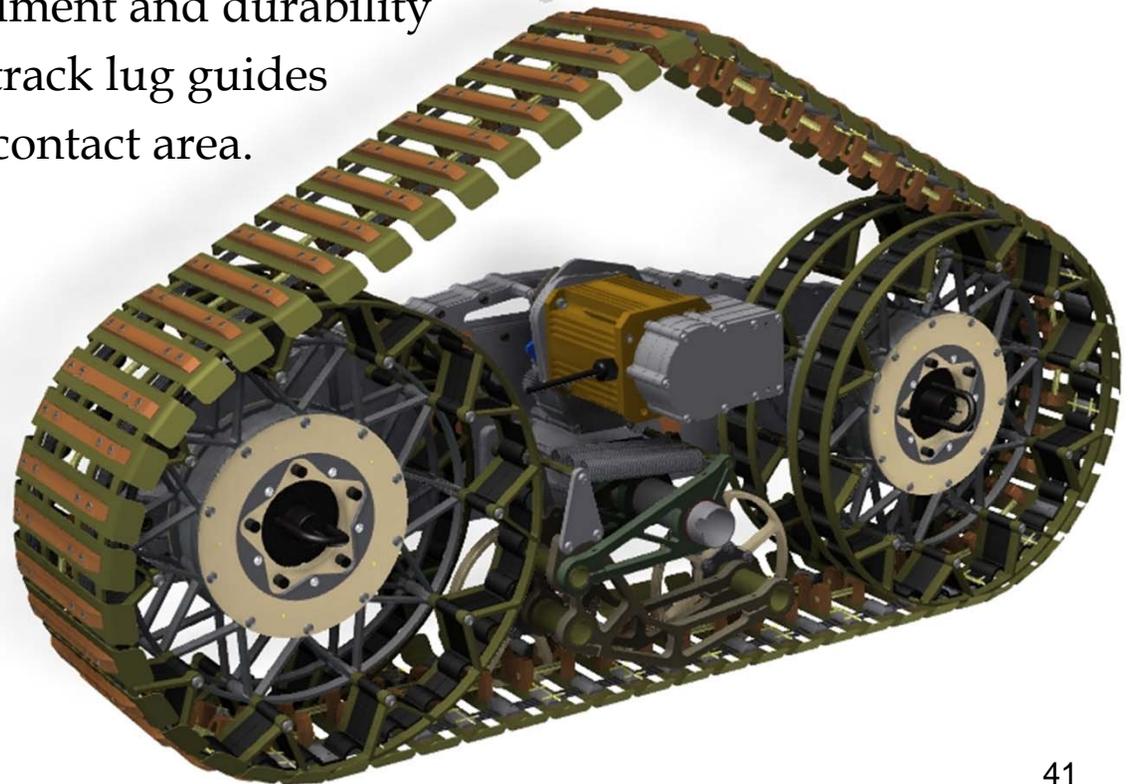
Maiden Voyage Gen III Tracks

Future work

➤ Mobility Testing

  ➤ Traction testing – sand, rocks, slopes, etc.

  ➤ Field tests at analogue site

➤ Durability Testing

  ➤ ODG proving grounds

  ➤ Analogue site

➤ Track over wheel design

  ➤ Increased redundancy

Fin

Questions??

Acknowlegments:

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The Most Versatile Off-Road Vehicle in the World