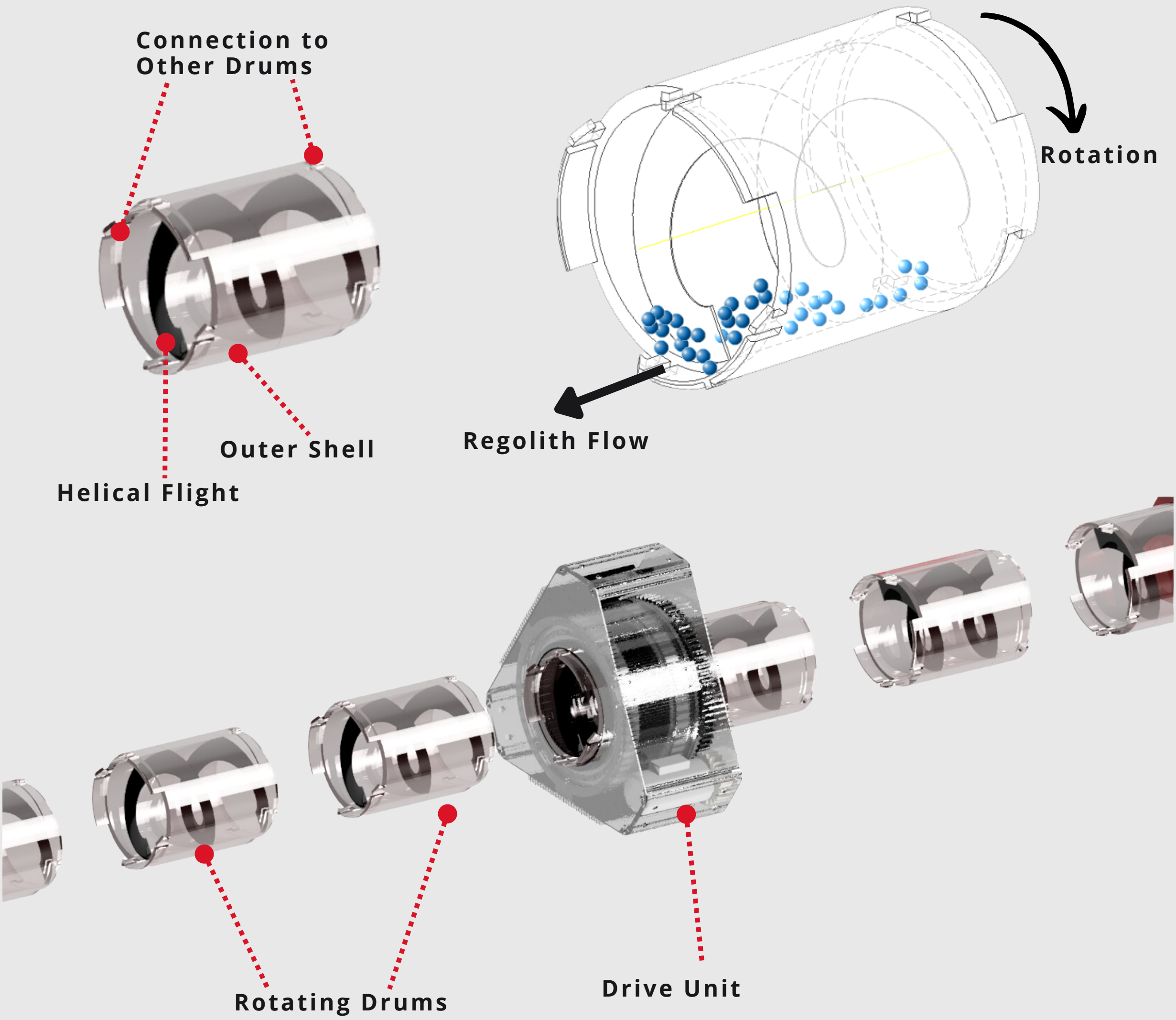


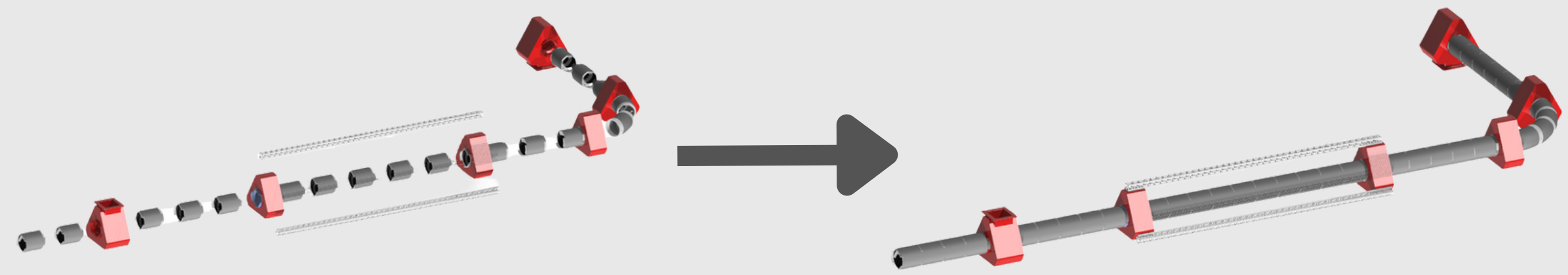
INTRODUCTION

The core component of the conveyor system comprises interconnectable rotating drums shaped like short pipes. These drums are distinct from ordinary augers as they feature helical flights attached to their inner surface. As the drums rotate, the helical flights effectively propel bulk material along the axis of rotation. By connecting multiple drums together, a long pipeline is formed, enabling the material to be conveyed along any desired route while rotating around its own axis.

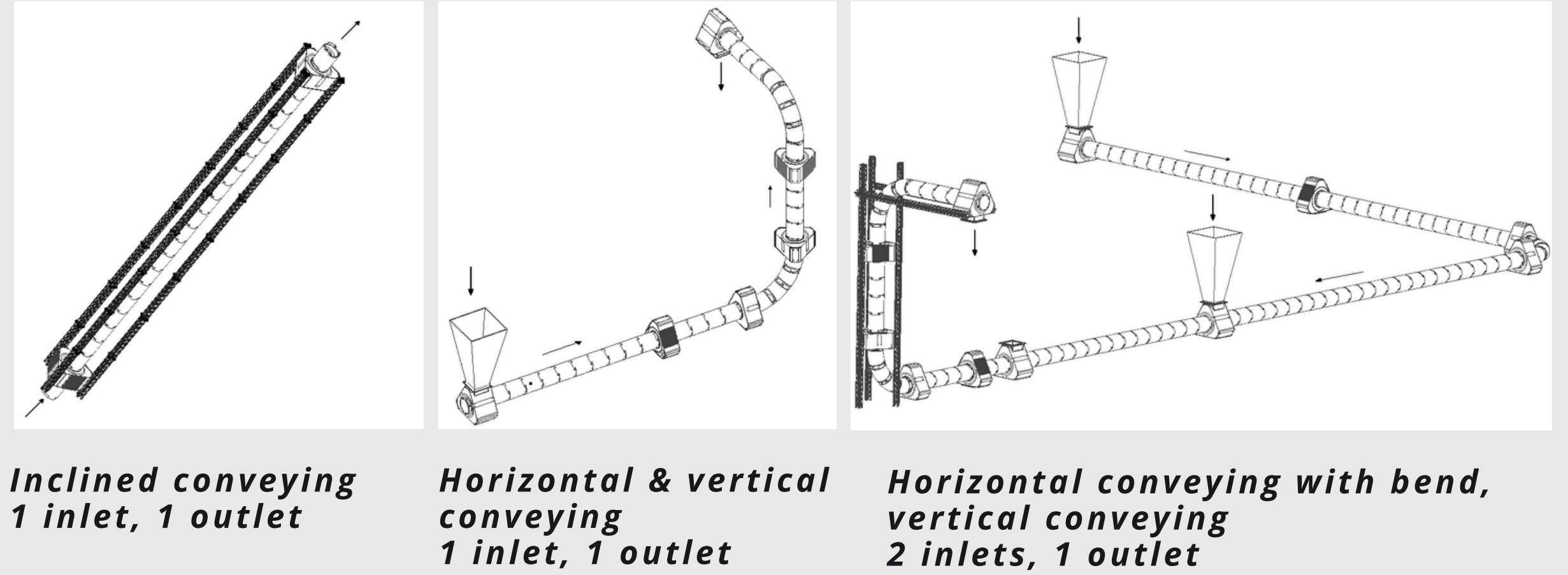


With a modular design similar to building blocks, conveying system is easily configured, assembled, and disassembled with respect to process needs, making it an ideal solution for a wide range of regolith transport applications.

SMART ASSEMBLY

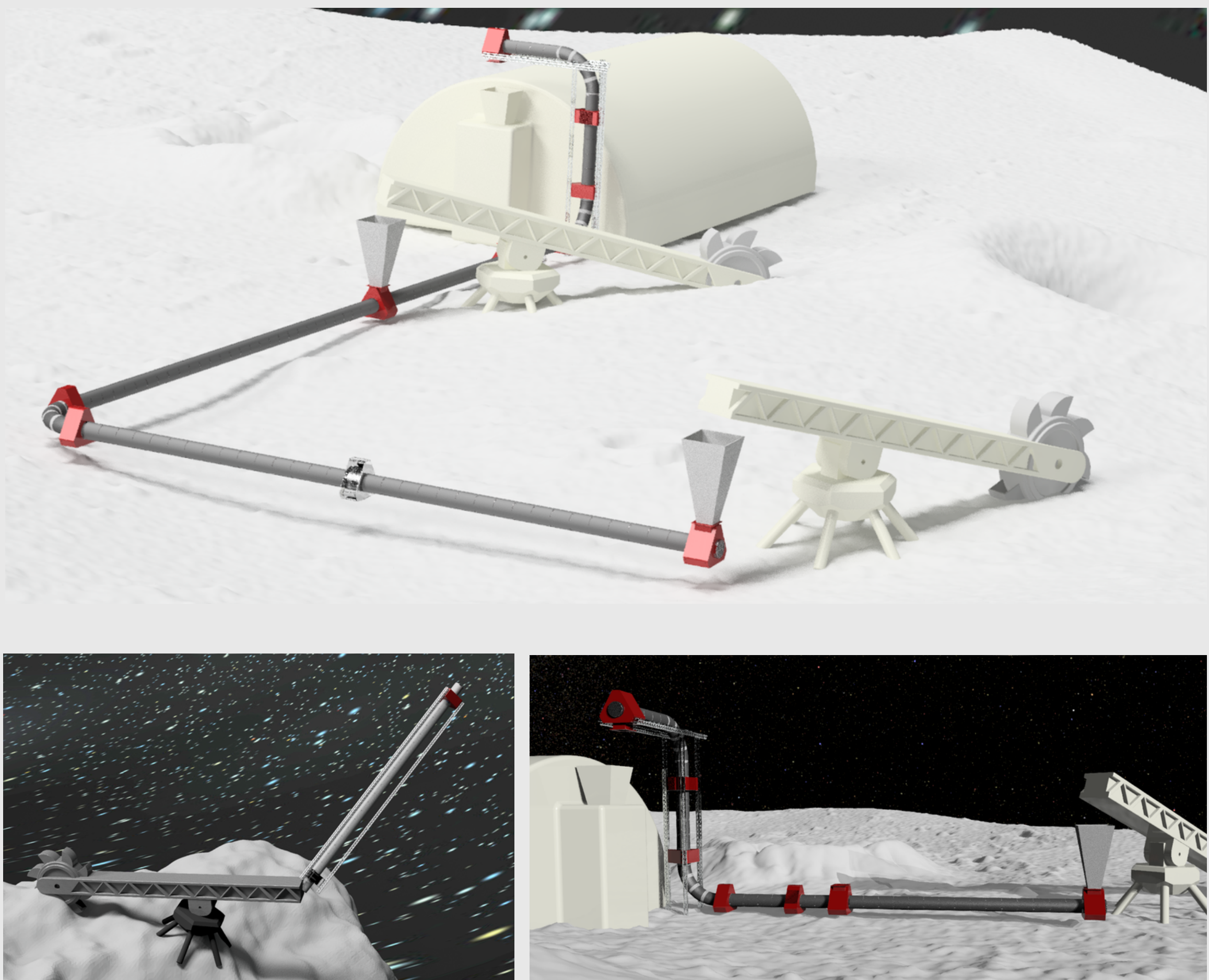


INFINITE CONFIGURATIONS



KEY FEATURES

- ✓ Designed for regolith conveying in lunar, martian, asteroid and space environment.
- ✓ Unique modular design for endless configurations and easy assembly.
- ✓ At least 50% of the parts can be built and sourced from extraterrestrial raw materials.
- ✓ Minimized abrasion due to rolling effect of regolith particles instead of sliding and forcing on surfaces.
- ✓ Fully contained conveying minimizes dust emission. Also minimizes contact to bearing and motors.



MAIN COMPONENTS

Linear Rotating Drum: Made of solid raw materials such as metals, plastics or even regolith. Used to transport material through single axis.

Flexible Rotating Drum: Made of space grade flexible materials such as rubber. Used to change direction of conveying.

Drive Unit: Provides rotational motion by using electrical power supply. Several drive units can be coupled for long distance conveying.

Inlet Unit: Regolith inlet port can be installed anywhere on the conveying system. Several inlets can be used at the same time.

Outlet Unit: Regolith outlet port can be installed anywhere on the conveying system. Several outlets can be used at the same time.

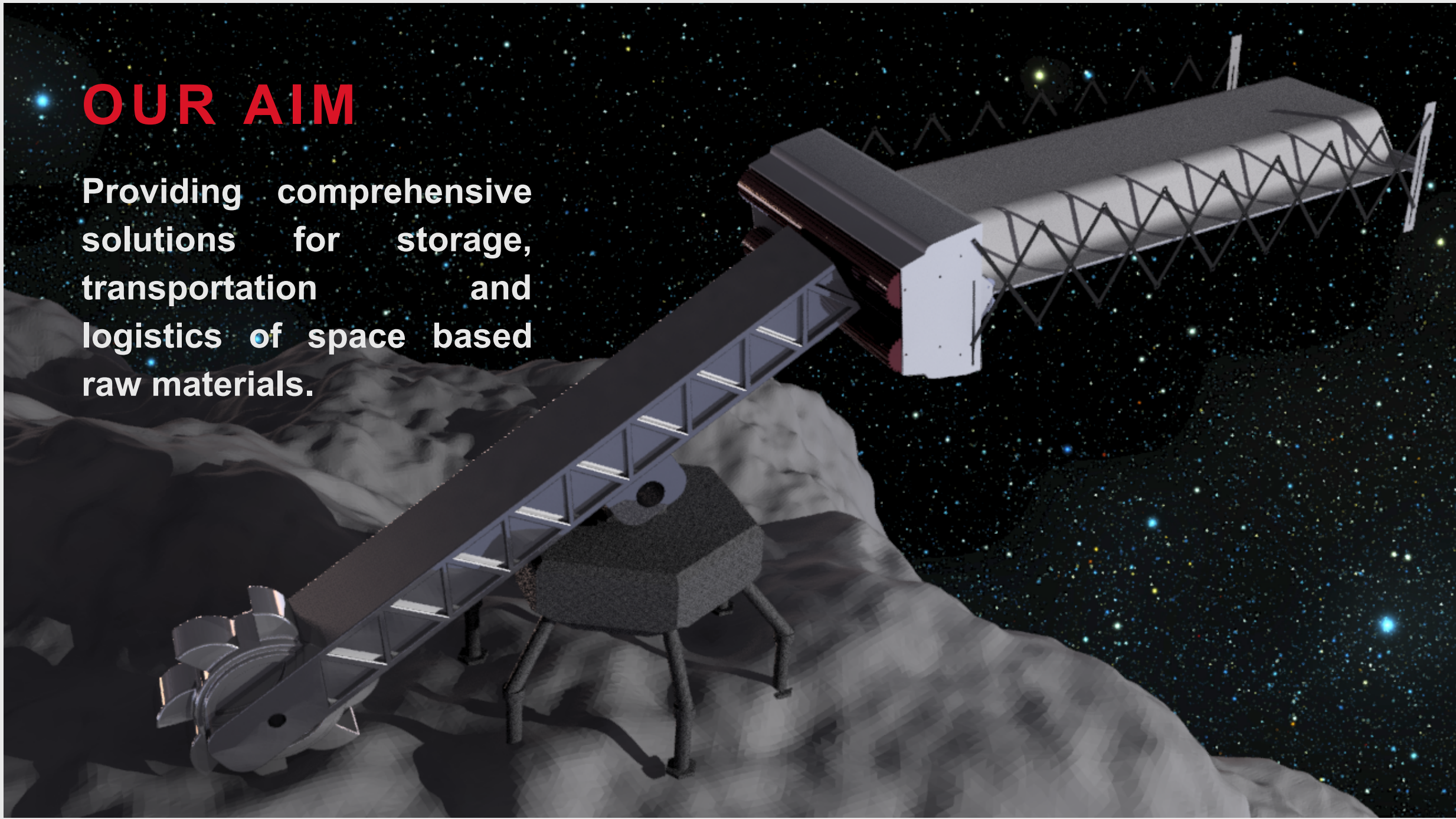
COMPARISON TABLE OF BULK MATERIAL CONVEYING SYSTEMS AND THEIR POSSIBLE USE IN REGOLITH HANDLING

Challenge	Modular Drum Conveyor	Auger	Robot Trucks	Belt Conveyor	Pipe Conveyor	Vibrating Feeder	Bucket Elevator	Chain Conveyor	Pneumatic Transport
Low Gravity	●●●	●●●	●●●	●●○	●●●	●●○	●●○	●●●	●●●
Zero Gravity	●●●	●●●	○○○	○○○	●○○	○○○	○○○	○○○	●●●
Vertical Conveying	●●●	●●●	○○○	○○○	○○○	●●●	●●●	●○○	●●●
Changing Route Direction	●●●	●○○	●●●	●●○	●●●	●○○	○○○	●○○	●●●
Vacuum Environment	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●○○*
Extreme Temperatures	●○○	●○○	●○○	●○○	●○○	●○○	●○○	●○○	●○○
Abrasion	●●●	○○○	●●●	●●○	●●○	●○○	●○○	○○○	○○○
Efficiency (kW/kg)	●○○	○○○	●○○	●○○	●○○	●○○	●○○	○○○	○○○
Launch Weight Limitations	●○○	●○○	●○○	○○○	○○○	●○○	○○○	○○○	●○○
Dust Containment	●●●	●●●	●○○	○○○	●●●	●○○	●○○	●○○	●●●
Static Electricity	●○○	●○○	●○○	○○○	○○○	●○○	●○○	●○○	●○○
Reliability	●●●	●○○	●●●	●○○	●○○	●●●	●○○	○○○	●●●
Reconfiguration for New Routes	●●●	●○○	●●●	●○○	○○○	●○○	○○○	○○○	●○○
InSitu Production of Parts	●○○	●○○	○○○	○○○	○○○	○○○	○○○	○○○	●○○
Multiple Inlets/Outlets	●●●	●○○	●●●	●○○	○○○	●○○	○○○	●○○	●○○

* Closed-loop pneumatic conveying systems can operate in a vacuum environment.
PS: This table compares conveying systems for regolith handling. It gives a general overview and does not account for all possible technologies and variations. The suitability of each method may change with new developments.

FUTURE WORK

- Finding suppliers of space grade motor & gearbox
- Testing with regolith simulants
- Improving design for simpler assembly
- 3D printing of parts with molten regolith
- Zero gravity testing
- Collaboration with related companies and institutes
- Testing on moon



OUR AIM

Providing comprehensive solutions for storage, transportation and logistics of space based raw materials.

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Süleyman Salihler
ssalihler@polimak.com



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