

ENVIRONMENTAL CONTROL AND LIFE SUPPORT SYSTEMS

ENABLING HUMANKIND TO LIVE, WORK AND PLAY IN SPACE

Home away from Earth

From Apollo to Orion and beyond

For decades, Collins has enabled humanity's exploration via reliable environmental control systems. We provided the life support enabling Neil Armstrong's first steps on the moon, then evolved those systems for use in Low Earth Orbit. Our systems are operational on the International Space Station, Orion and CST-100. Our next step is introducing these systems to commercial customers with higher flexibility and maintainability, at lower cost.

Modular and extensible

From basic, essential environmental control and life support systems (ECLSS) solutions scaling up to industry-leading closed loop systems, Collins can tailor our technology to fit your needs and budget. If you need just the essentials – we can do that. Need to scale to accommodate more visitors? We're on it. Once you're settled, if you want to further close the loop to reduce your cost of resupply – we've got you covered.

Customizable ECLSS

We offer a flexible hardware portfolio tailored to you and your budget – but we know that's not enough. Collins has distilled decades of ECLSS experience into an extensible commercial offering that grows how you need it, when you need it.



KEY FEATURES & BENEFITS

- Proven reliable systems
- Over 50 years of experience
- Scalable closed or open loop systems
- Mix and match cost-saving stages for loop-closure priority of choice
- Service models for support and upgrades

Collins ECLSS: Mix and match to close your priority loop in stages

Collins stands ready to provide more life support in space. We're removing barriers to commercial entry by offering customizable cost-saving blocks for building up to the closed loop system in stages.

STAGED LOOP CLOSURE OPTION THAT ACCOMPLISHES 95% RECYCLING OF WATER

Block 1

- CO2, temperature and humidity control
- Humidity condensate capture, storage and processing
- Trace contaminant control
- Universal waste management system
- Urine storage
- Atmospheric monitoring
- Fire detection

Block 2

- Add:
 - O2 generator
 - CO2 compression and storage
 - CO2 reduction
- Benefits:
 - O2 generation reduces launch mass of oxygen and tanks by 2.4 metric tons per year
 - CO2 reduction reduces launch mass of water and tanks by 0.9 metric tons per year

Block 3

- Add:
 - Urine processor
 - Add brine processor
- Benefit:
 - Reclamation of water in urine reduces launch mass of water and tanks by 3.1 metric tons per year

FEATURES

- Exceeds 15-year life
- Space rated EEE parts
- Multi-mission capable
- Scalable for varying crew size
- Serviceable

KEY PARAMETERS

- Loop closure >95%
- CO2 < 2 mm Hg
- Operates in space or gravity environments



HEPA filter



Bacterial filter assembly



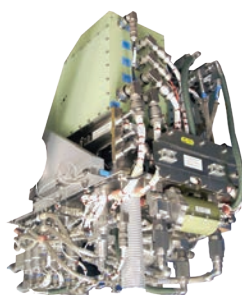
Common cabin air assembly



Thermal amine CO2 removal system



Universal waste management system



Sabatier



O2 generator



Water processor

Platforms

EXTRAVEHICULAR MOBILITY UNIT (EMU)



INTERNATIONAL SPACE STATION



CST-100 STARLINER



ORION SPACECRAFT

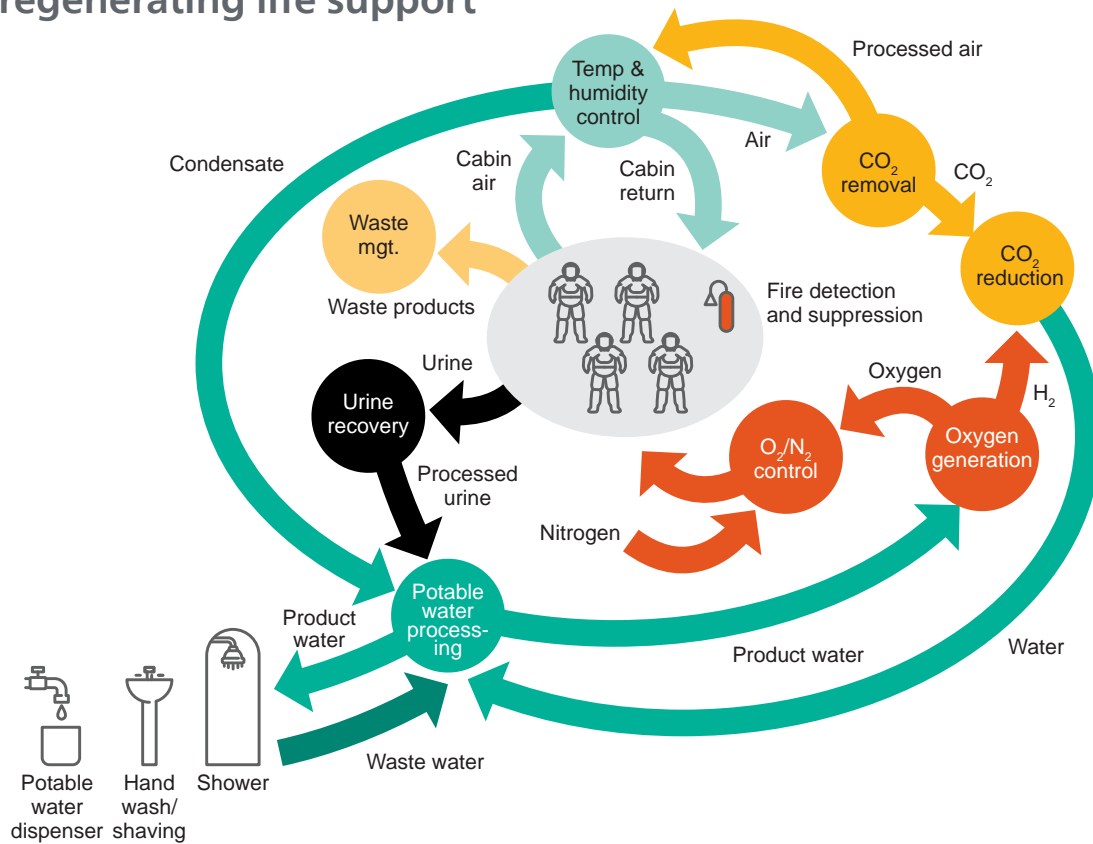


We offer complete ECLSS solutions

Collins flight-proven products go through a rigorous design, manufacturing and qualifying process – enabling some to perform for over 15 years.

SUBSYSTEM	BENEFIT
CO2 removal	
Temperature & humidity control	
Trace contaminant control	Essential for human habitation
Waste collection	
Smoke detection	
Atmospheric monitoring	
Pressure control	
Thermal control	
Water processor	1150 kg/crew-year reduction in launch mass of water
Oxygen generator	600 kg/crew-year reduction in launch mass of O ₂ & tanks
CO2 compression, storage & reduction	150 kg/crew-year reduction in launch mass of water
Urine processing	710 kg/crew-year reduction in launch mass of water
Brine processing	70 kg/crew-year reduction in launch mass of water
Trash compactor	360 kg/year reduction in launch mass of water
	80% reduction in trash volume

Reliable, regenerating life support



Designed to suit your unique needs

From orbiting stations to landers to habitation systems on other planets, our Civil Space and Sea Systems (CS&SS) location in Windsor Locks, CT, has the experience to design, analyze and test different ECLSS subsystems to address your needs.

Our Windsor Locks campus features more than 25,000 square feet of assembly and test cells including:

- Proof/burst/leak chambers
- Thermal vacuum chambers
- Launch vibration tables
- Electrical qualification testing
- EMI/EMC test facilities
- Analytical chemistry labs
- Functional performance test rigs

Workforce growth since 2019:

- Engineers added: 150+
- Technicians increased by 66%
- Production resources increased by 30%
- Suppliers added: 15+

Special fluids that we work with include:

- Anhydrous ammonia
- Glycols
- Refrigerants
- Liquid H2
- High pressure O2

Specifications subject to change without notice.



COLLINS AEROSPACE

800.321.2223 | +1.319.295.5100
 fax: +1.319.378.1172
 ECLSS@collins.com
 collinsaerospace.com/Space