FRONTIER BY LACO TECHNOLOGIES

TVAC TESTING & BAKE-OUT SYSTEMS FOR SMALLSAT

Perform pre-launch test requirements in-house and on schedule with Frontier's Standard TVAC Bake-Out and Thermal Cycling Test Systems. Designed and built by the industry leaders in space simulation testing, our TVAC systems meet NASA GSFC-STD-7000 standards for vacuum bake-out, temperature margins, thermal cycling, soak time performance, and pressure.

Perfect for CubeSats and other space-bound components, our budget-friendly TVAC systems provide integrated, automated control of your testing process.

TVAC BAKE-OUT SYSTEM

- Achieve successful compliance of pre-launch bake-out requirements and specifications
- Outgas contaminants and impurities to ensure product viability and success
- Collect test data efficiently for pre-launch reports
- Integrate optional chiller for convenient thermal cycling system upgrade

TVAC THERMAL CYCLING SYSTEM

- Get all the TVAC Bake-Out functionality, plus thermal cycling testing capabilities
- Test products for qualification, acceptance, pre-launch requirements, and in-orbit environment viability
- Replicate the extreme pressure and temperature environments of launch and orbit sequences
- Use for performance verification, component qualification, or material research

- Avoid testing delays with the control and convenience of in-house testing
- Get a budget-friendly system with the shortest lead times in the industry
- Eliminate the guesswork, time, and labor of building your own custom TVAC system
- Avoid overpaying for expensive, custom thermal vacuum testing systems

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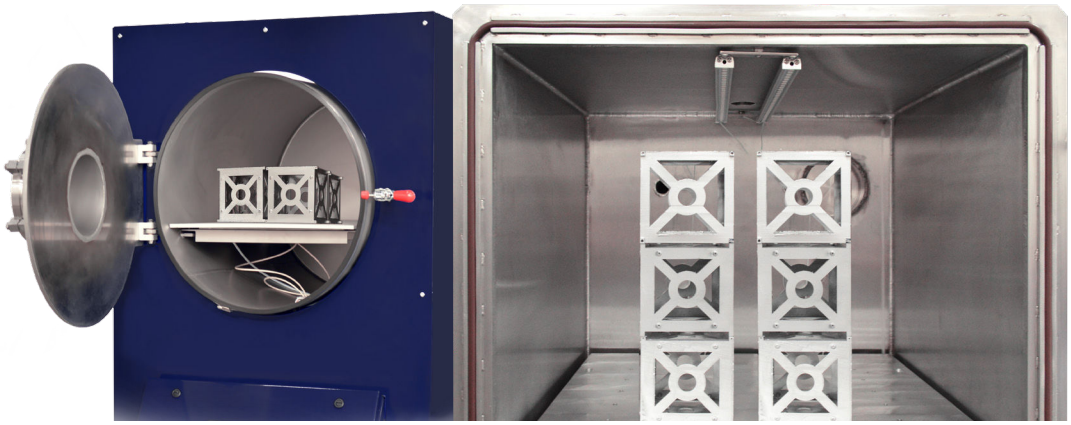
MORE INFO

Available options include additional feedthroughs, radiant heating and cooling shrouds, emissivity coating, platen mounting inserts, and chillers.



LACO STANDARD TVAC TEST SYSTEM SPECIFICATIONS

	TVAC BAKE-OUT SYSTEMS		TVAC THERMAL CYCLING SYSTEMS	
PART NUMBER	FSB-1824 (cylindrical)	FSB-2020 (cube)	FST-1824 (cylindrical)	FST-2020 (cube)
CHAMBER DIMS (INSIDE)	17.5 DIA x 24 D in 44.5 DIA x 61 D cm	20 W x 20 H x 20 D in 51 W x 51 H x 51 D cm	17.5 DIA x 24 D in 44.5 DIA x 61 D cm	20 W x 20 H x 20 D in 51 W x 51 H x 51 D cm
WORKING DIMS (INSIDE)	16 DIA x 22 D in 40.6 DIA x 56 D cm	19.1 W x 15.3 H x 19 D in 49.3 W x 38.9 H x 48.3 D cm	16 DIA x 22 D in 40.6 DIA x 56 D cm	19.1 W x 15.3 H x 19 D in 49.3 W x 38.9 H x 48.3 D cm
TEMPERATURE RANGE	Ambient to 150° C (300° F)		−40° C (-40° F) to 150° C (300° F)	
THERMAL CONTROL	Single-zone conduction electrical heating via platen. (Platen includes internal cooling channels for optional chiller upgrade)		Single-zone conduction electrical heating via platen for bake-out. Thermal cycling cooling/heating via dedicated chiller unit.	
WATTAGE	Electric heater: 3000W		Electric heater: 3000W Chiller: 3500W at 150° C to 0° C and 1500W at −40° C	
POWER	System: 208-240V, 60HZ (single phase), 20 AMPS		System: 208-240V, 60Hz (single phase), 20 AMPS Chiller: 208-240V, 60Hz (three phase), 30 AMPS	
UPGRADE OPTIONS	Chiller, feedthroughs, thermal shrouds, emissivity coating, platen mounting inserts	Chiller, feedthroughs, platen mounting inserts	Thermal shrouds, emissivity coating, feedthroughs, platen mounting inserts	Feedthroughs, platen mounting inserts

STANDARD SPECIFICATIONS FOR BAKE-OUT AND THERMAL CYCLING SYSTEMS

TEST CAPACITY	Capacity up to 6U—appropriate for testing nano, CubeSat, FlatSat, and small satellites	VALVE CONTROL (PNEUMATIC)	Auto and manual control valves−manual mode with turbo pump valve sequencing to protect turbo pump
VACUUM LEVEL	Capable of vacuum levels in the 10^{-6} Torr range	RECIPES	Vacuum, vent, hold and heat (up to 20 recipe configurations)
PUMPING SYSTEM	Dry scroll pump: 9 CFM Turbomolecular pump: 1 X 10^{-6} Torr, 290 l/sec N2	DATA STORAGE	Ethernet, internal microSD card, USB drive
SPARE PORTS	CF 2.75 / ISO 100 / NW40 / NW16	TEMPERATURE CONTROL	Setpoint PID, 1 Zone
CONTROLLER	LACO's HVC-3500 thermal vacuum controller. 7-inch color touchscreen with graphical display of vacuum system, vacuum pressure, and temperature	TEMPERATURE MEASUREMENT	3 each additional RTD probes