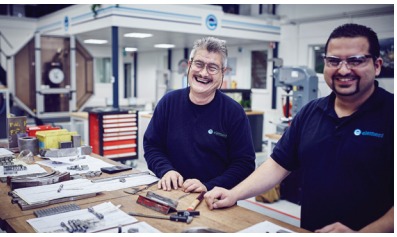
element | NTS

LOS ANGELES



FACILITY CAPABILITIES/SERVICES

THERMAL VACUUM CHAMBERS

- TV-25 (El Segundo Facility)
  - 15' Diameter 25' long (without LN2 cold shroud)
  - 13.5' Diameter 24' long (with LN2 cold shroud)
  - Vacuum level: 10-7 Torr
  - Temperature range: -1700C* to +2000C (-2740F* to 3920F)
  - Four 48" Cryogenic pumps
  - One oil less 1650 liter per second turbo molecular pump.
  - Two IR lamp arrays with total 336 IR lamps
  - Diffuser box designed for reflector thermal vacuum tests
  - 56 zones for heater control
  - Eleven 12" by 12" LN2 cold plates
  - RGA Equipped
  - TQCM compatible (all electrical and plumbing in place)
  - 256 data channels (expandable)
  - Two control rooms for NTS and customer
  - 10K cleanroom in front of chamber
  - 100K cleanroom for specimen inspection and pre-assembly
  - Ten Douglas 24255 feed through with 550 single conductors (expandable)

- TV-14
  - 7.5' Diameter 14' long
  - Vacuum level: 10-7 Torr
  - Temperature range: -1700C* to +2000C (-2740F* to 3920F)
  - Ten 3' by 4' Hot/cold plates (individually controlled)
  - Two 12" by 12" cold plates
  - One 3' by 2' Hot/cold plates
  - One 4' by 8' Hot plate
  - Oil less rough pump
  - Two 20" Cryogenic pumps
  - One oil less turbo molecular pump.
  - RGA Equipped
  - TQCM compatible
  - 100 data channels (expandable)
  - Five Douglas 24255 feed through with 275 single conductors (expandable)

- TVAC-1
  - 7' Diameter 12' long.
  - Vacuum level: 10-7 Torr
  - Temperature range: -1700C* to +2000C (-2740F* to 3920F)
  - Eight 3' by 4' Hot/cold plates
  - One 3' by 2' Hot/cold plate
  - One 4' by 8' Hot plate
  - One 12" by 12" LN2 cold plates
  - Oil-less rough pump
  - Two 20" Cryogenic pumps
  - One oil-less 1600 liter per second turbo molecular pump.
  - TQCM compatible
  - Sixty data channels (expandable).
  - Two hundred single conductor feed through
  - Sixteen DB25 male to male feed through
  - Numerous other electrical feed through up to 400A
  - Numerous fluid feed throughs
  - 10K cleanroom in front of chamber

- TVAC-2
  - 4' Diameter 8' long
  - Vacuum level: 10-7 Torr
  - Temperature range: -1700C* to +2000C (-2740F* to 3920F)
  - 3' by 3' by 18" shroud (+200°C to -180°C). This unit is split and can be expanded to height of 36". Six sided control to allow heat on one side and cooling on the other (used for solar panel simulation)
  - One 3' by 2' Hot/cold plates (+200°C to -170°C)
  - 12" by 12" cold plate
  - Oil less rough pump
  - One 10" Cryogenic pump
  - One oil less 1600 liter per second turbo molecular pump.
  - TQCM compatible
  - Sixty data channels (expandable).
  - Numerous power and fluid feed through

THERMAL CHAMBERS

- TVAC-3
  - 18” Diameter 18” long.
  - Vacuum level: 10-6 Torr
  - Temperature range: -170oC* to +200oC (-274oF* to 392oF)
  - Oil less rough pump
  - One 8” Cryogenic pump
  - Sixty data channels (expandable).

- TVAC-4
  - 30” Diameter 43” long.
  - One oil less (magnetic levitation) 1600 liter per second turbo molecular pump.
  - 18” by 18” by 2” hot/cold plate -170oC* to +350oC (-274oF* to 662oF)
  - Component testing to 15°K (-258°C/-433°F)
  - TQCM compatible (all electrical and plumbing in place)
  - Sixty data channels (expandable).

- TVAC-5
  - 25” Diameter 28” long.
  - Oil less roughing pump
  - Vacuum level: 10-6 Torr
  - Temperature range -170oC* to +200oC (-274oF* to 392oF)
  - Sixty data channels (expandable).

- TVAC-10
  - 5.5’ Diameter 10’ long
  - Vacuum level: 10-6 Torr
  - Temperature range: -170oC* to +200oC (-274oF* to 392oF)
  - 12” by 12” cold plate
  - One 10” Cryogenic pump
  - 1600 liter per second turbo molecular pump.
  - TQCM compatible
  - Sixty data channels (expandable).
  - Numerous power and fluid feed through

  * Note: A -180°C (-292°F) lower limit is achievable under some test configurations.

- TC-24 (El Segundo Facility)
  - Interior Dimensions 22.5 ft wide by 22.5 ft deep by 14 ft high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Thermal distortion test with photogrammetry measurement.
  - Maximum ramp rate +/-5.5°C/min (+/-10°F/min) per minute.
  - Sixty data channels (expandable).

- C-1
  - Interior dimensions 12 ft wide by 14 ft 6in deep by 11ft 8 in high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Thermal distortion test with photogrammetry measurement.
  - Maximum ramp rate +/-5.5°C/min (+/-10°F/min) per minute.
  - Sixty data channels (expandable).

- C-2
  - Interior dimensions 36 in wide by 42 in deep by 95 in high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Maximum ramp rate +/-100°C (+/-180°F).
  - Sixty data channels (expandable).

- C-3
  - Interior dimensions 36 in wide by 42 in deep by 95 in high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Maximum ramp rate +/-100°C (+/-180°F) per minute.
  - Sixty data channels (expandable).
  - Low Oxygen environment, Less than 100PPM
  - Dew Point below -50°C

- C–4
  - Interior Dimensions 48 in wide by 48 in deep by 48 in high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Maximum ramp rate +/-75°C (+/-135°F) per minute.
  - Sixty data channels (expandable).
  - Low Oxygen environment, Less than 100PPM
  - Dew Point below -50°C

- C–5
  - Interior dimensions 54 in wide by 72 in deep by 60 in high.
  - Temperature range +177°C/-184°C (+350°F/-300°F).
  - Maximum ramp rate +/-55°C (+/-100°F) per minute.
  - Sixty data channels (expandable).

- C–6
  - Interior dimensions 40 in wide by 44 in deep by 35 in high.
  - Temperature range +177°C/-184°C (+350°F/-300°F).
  - Maximum ramp rate +/-55°C (+/-100°F) per minute.
  - Sixty data channels (expandable).
  - Low Oxygen environment, Less than 100PPM
  - Dew Point below -50°C
  - One Sun Illumination compatible.

- C–7
  - Interior dimensions 16 ft wide by 17.5 ft deep by 16ft high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Thermal distortion test with photogrammetry measurement.
  - Maximum ramp rate +/-5.5°C/min (+/-10°F/min) per minute.
  - Sixty data channels (expandable).

- C-8
  - Interior dimensions 3 ft wide by 3 ft 6in deep by 5ft high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Maximum ramp rate +/-125°C (+/-225°F) per minute.
  - Sixty data channels (expandable).
  - Low Oxygen environment, Less than 100PPM
  - Dew Point below -50°C

- C-9
  - Interior dimensions 10 ft wide by 7 ft deep by 6ft high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Maximum ramp rate +/-15°C (+/-27°F) per minute.
  - Sixty data channels (expandable).

- C-10
  - Interior dimensions 2.5 ft wide by 2.5 ft deep by 3ft high.
  - Temperature range +163°C to -184°C (+325°F to -300°F).
  - Maximum ramp rate +/-55°C (+/-100°F) per minute.
  - Sixty data channels (expandable).
  - Low Oxygen environment, Less than 100PPM
  - Dew Point below -50°C

- C–14
  - Interior dimensions 12 in wide by 12 in deep by 18 in high.
  - Temperature range +149°C/-184°C (+300°F/-300°F).
  - Maximum ramp rate +/-55°C (+/-100°F) per minute.
  - Sixty data channels (expandable).

- C–15
  - Interior Dimensions 24 in wide by 24 in deep by 24 in high.
  - Temperature range +325°C to -184°C (+617°F to -300°F)
  - Maximum ramp rate ±10°C (±20°F) per minute.
  - Sixty data channels (expandable).

VIBRATION SYSTEMS

- Ling Dynamic Systems 340B
  - 36,000 force pounds of sine, random or shock.
  - 100g peak, bare table acceleration, 70 in/sec velocity, 1.0" in displacement.
  - A 60-inch by 60-inch by 3-inch slip table supported by five TEAM oil film hydrostatic bearings. The bolt patterns available are a 4-inch by 4-inch grid and the standard Unholtz-Dickie STAR – all ½"-13 thread
  - Static loads of up to 3,000 pounds can be supported in the vertical orientation.

- Ling Dynamic Systems 964
  - 18,000 force pounds for sine, random or shock.
  - 100g peak, bare table acceleration, 70 in/sec velocity, 1.0" in displacement.
  - A 36-inch by 36-inch by 2-inch slip table on two (2) KIMBALL Industries journal bearings. The bolt patterns available are a 4-inch by 4-inch grid and the standard Unholtz-Dickie STAR pattern – all ½"-13 thread
  - Static loads of up to 2,000 pounds can be supported in the vertical orientation.

- Unholtz-Dickie 208
  - 3000 force pounds for sine testing.
  - 24" by 24" slip table
  - 150 pounds payload.

- Unholtz-Dickie T-2000
  - 2" allowable stroke with force rating of 20,000 force pounds
  - 20,000 force pounds for sine testing.
  - 48" by 48" by 2-inch slip table on two (2) Kimball Industries journal bearings. The bolt patterns available are a 4-inch by 4-inch grid and the standard Unholtz-Dickie STAR pattern – all ½"-13 thread
  - Shaker payloads determined by test type and field supply configuration

PRESSURE TEST CAPABILITIES

- Cryogenic testing up to 9,000 PSI with liquid nitrogen.
  - 8-feet diameter by 12-feet deep.
- Proof testing up to 20,000 PSI with nitrogen.
- Proof/burst testing up to 40,000 PSI with distilled water.
- Helium leak testing up to 9,000 PSI with leak rate measurements from 1.0 e-5 to 1.0 e-8 sccs.

PRECISION CLEANING

- Fuel and oxidizer systems
- Cryogenic, liquid, and gas systems
- Hydraulic systems
- Breathing and process air systems

INSPECTION

- Ultraviolet
- Particulate analysis
- Nonvolatile residue measurement

PRE-CLEANING

- Ultrasonic
- Solvent
- Aqueous detergent

ADDITIONAL SERVICES

- Component disassembly/reassembly
- Valve cleaning
- Vacuum oven dry
- Dryness verification (dew point meter)
- Cleanroom rental
- Nitrogen gas purge

PICKLING AND PASSIVATION

- Nitric and citric acid passivation
- Nitric and hydrofluoric acid pickle
- Hydrofluoric acid etching
- Aluminum deoxidation