



Cascade Engineering Services, Inc.

Equipment for Environmental and Reliability Testing

| | |
|---------------------------------|---------------------------------------|
| Centrifuge System | Temperature-Humidity Chambers |
| Drop Tester | Thermal Shock Chamber |
| Electro-Dynamic Shaker | Tumble Tester |
| HALT (HASS) Chambers | Walk-in Chamber |
| Mechanical Shock System | Data Acquisition System |
| Vacuum Chamber | Instron Mechanical Test System |
| Over-Pressure Chamber | Fatigue Life Testers |
| Rain and Spray Tester Apparatus | Dynamic & Thermal Mechanical Analyzer |
| Salt Fog Chamber | Adhesive Pull & Peel System |
| Settling Dust Chamber | |

Equipment for Failure Analysis, Reliability Eng, and Mechanical & Material Characterization

Instron Universal Mechanical Test Machine
Dynamic Mechanical Analyzer
Thermo Mechanical Analyzer
Scanning Electron Microscope
X-Ray: 2D and 3D Capabilities
Cross-Sectioning Capabilities
Dye and Pry Capabilities
Optical Microscope with Stitching Capability



Application

Simulates constant acceleration. Direction of Applied Force: Up, Down, Right, Left, Forward and Aft ($\pm X$, $\pm Y$ & $\pm Z$).

Centrifuge System Spec.

| | |
|--|------------------------------------|
| Model: | CENT-1 |
| Manufacturer: | Cascade Engineering Services, Inc. |
| Maximum Acceleration: | 20 g |
| Maximum Test Load: | 200 lbs |
| Work Space Dimensions: | 24" x 24" |
| Radius (Platform centre to rotation centre): | 0.95m |

Centrifuge Base Table Hole Pattern (Modifiable)

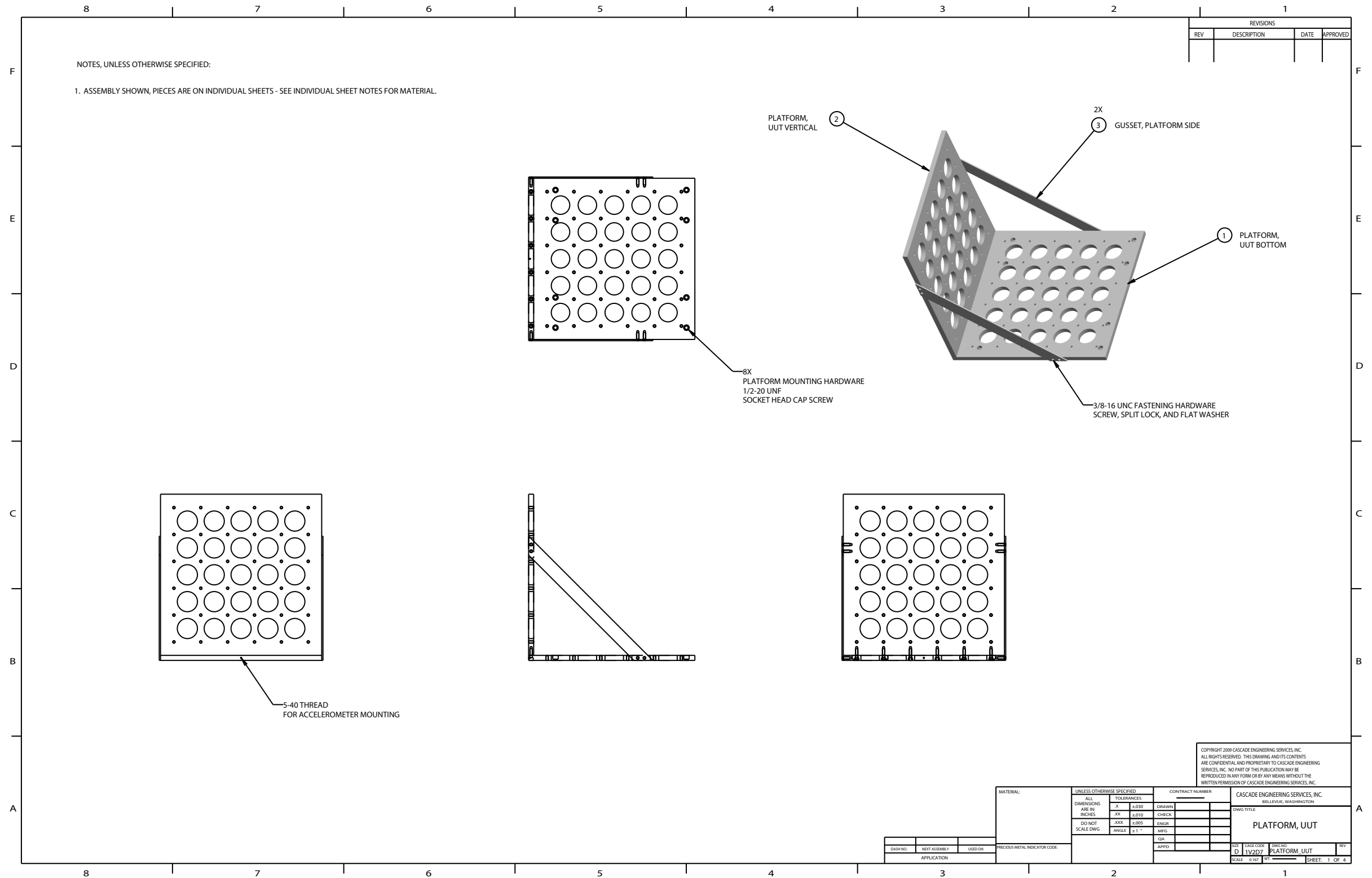
[Drawing 01](#)

[Drawing 02](#)

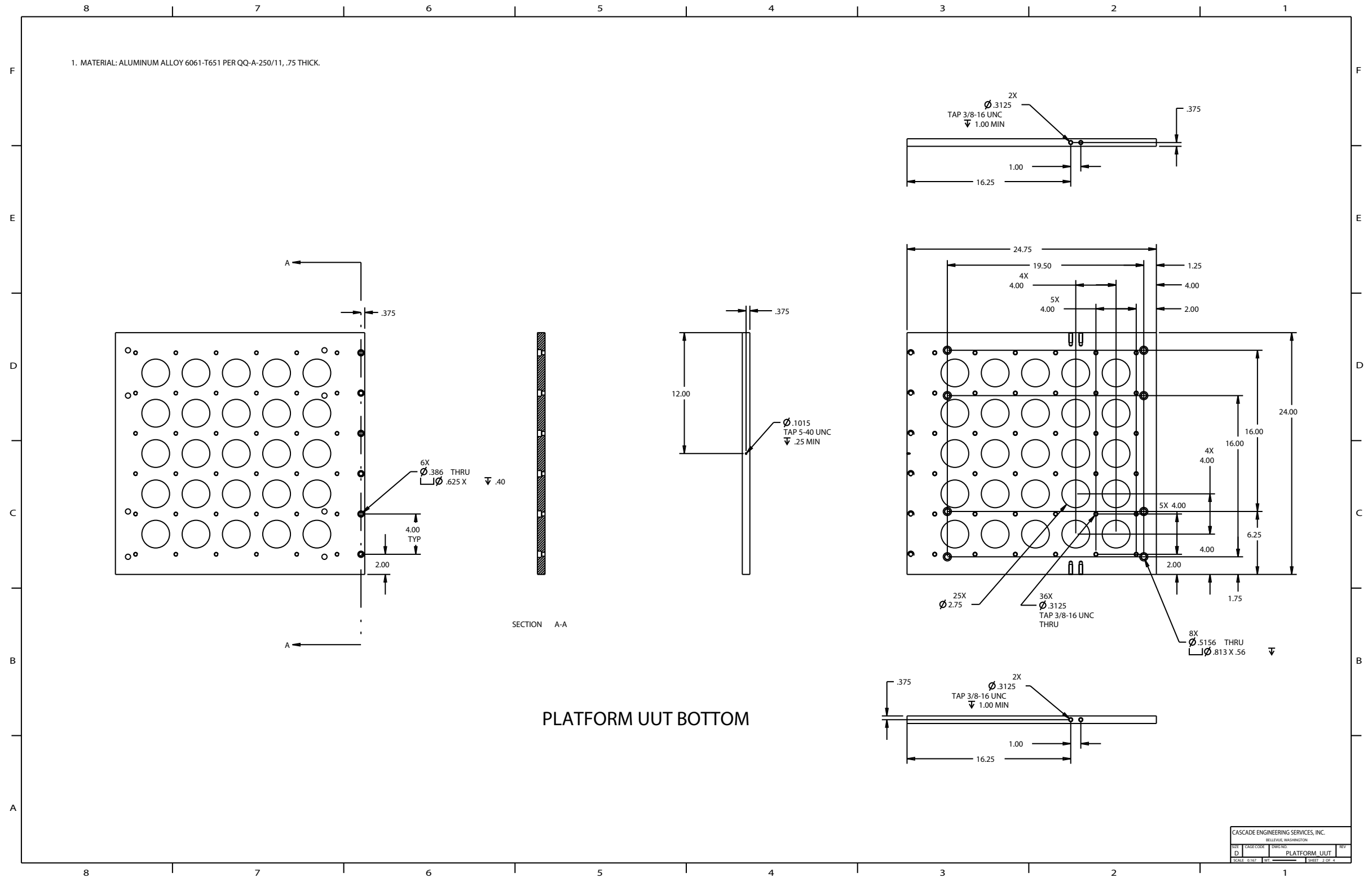
[Drawing 03](#)

[Drawing 04](#)

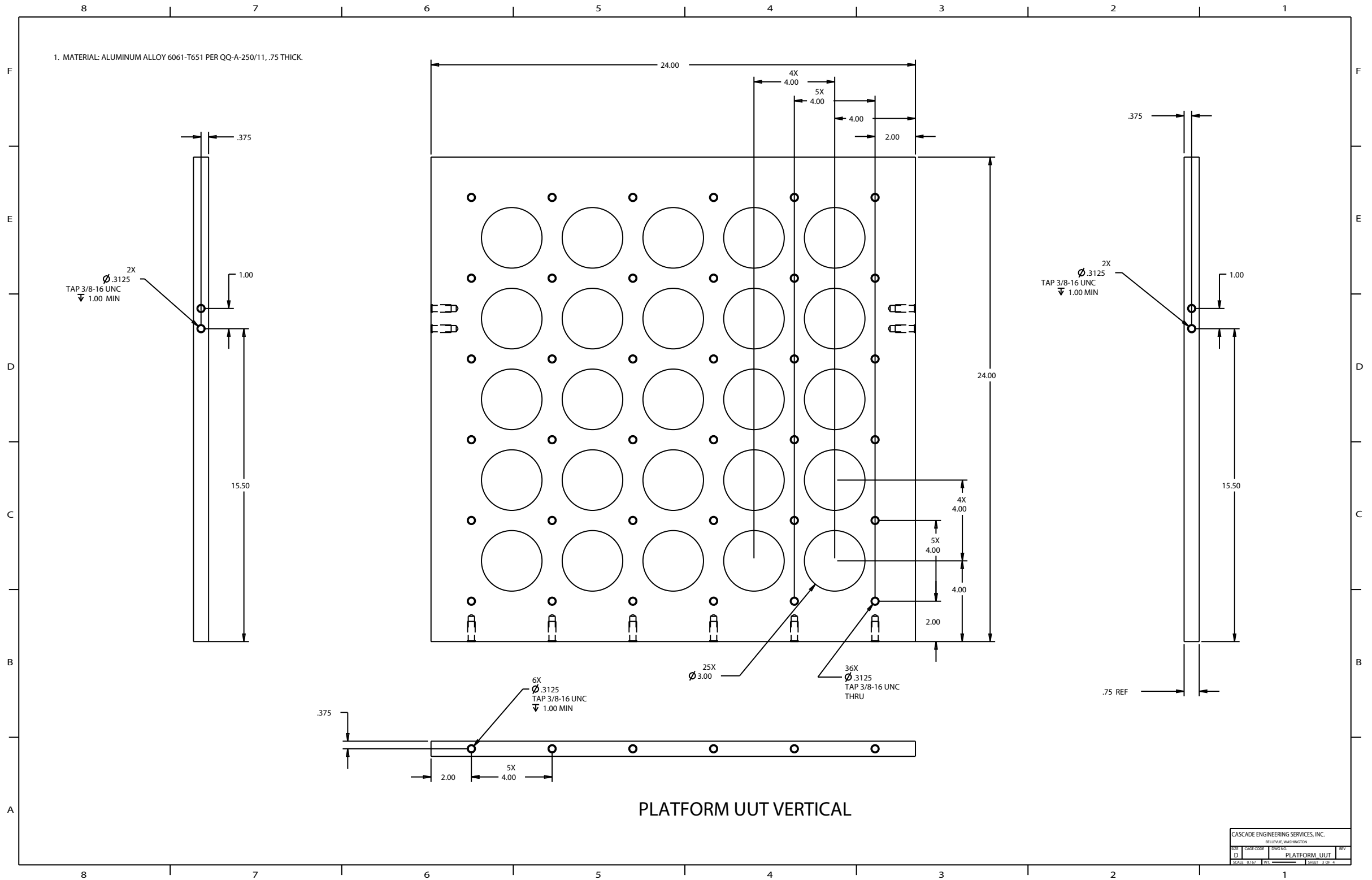
Centrifuge Base Table Hole Pattern (Modifiable) Drawing 01



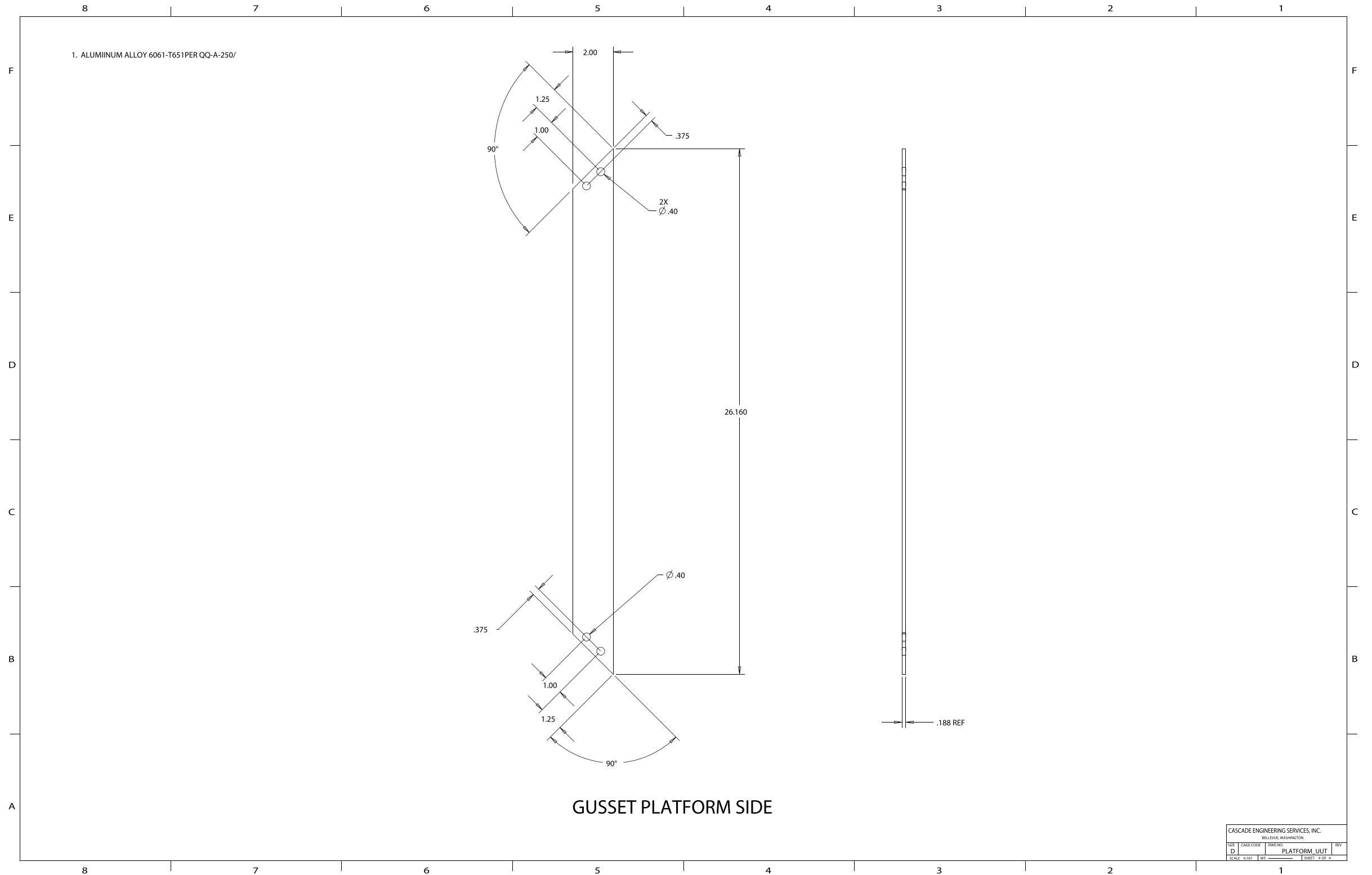
Centrifuge Base Table Hole Pattern (Modifiable) Drawing 02

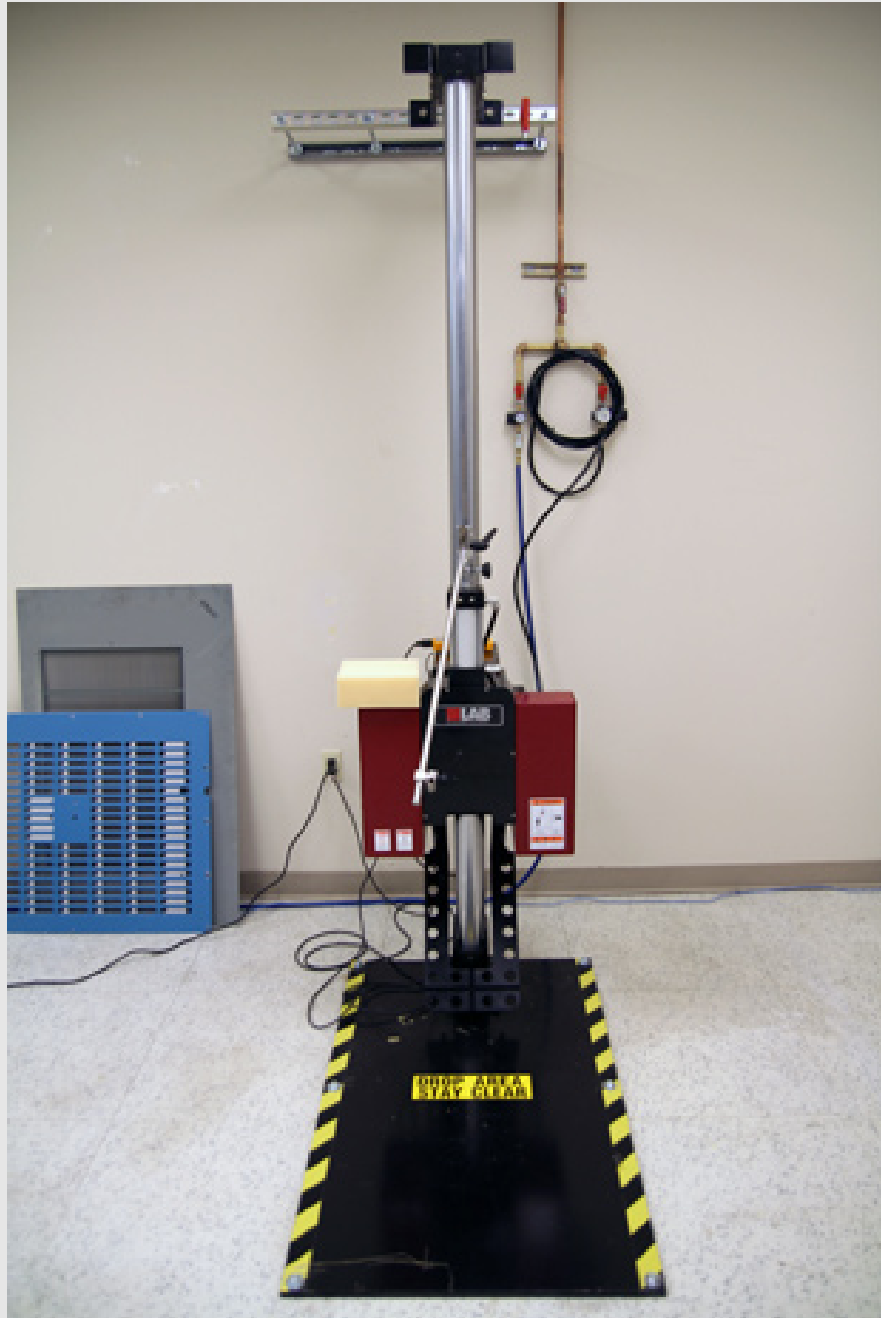


Centrifuge Base Table Hole Pattern (Modifiable) Drawing 03



Centrifuge Base Table Hole Pattern (Modifiable) Drawing 04





Application

Simulates accidental drops.

Centrifuge System Spec.

| | |
|---------------------------|----------------------------|
| Model: | AD-160A |
| Manufacturer: | L.A.B Equipment, Inc. |
| Drop Height: | 15" to 72" |
| Maximum Package Size: | 32" |
| Maximum Payload Capacity: | 160 lbs |
| Accessories: | Corner / Edge Drop Holders |
| Impact Surface: | 30" x 32" steel |



Application

A single axis Shaker which accelerates the product in 1 direction (X,Y or Z orientation) for component and system level testing. Simulates loose cargo transportation and truck / trailer transportation.

E.D. Shaker Spec. (Bare Table)

| | |
|-----------------------|---------------------------|
| Model: | V3544 |
| Manufacturer: | Data Physics |
| Controller: | Data Physics, Signal Star |
| Capacity Force: | 8000 lbs |
| Frequency Range: | 2 to 2500 Hz |
| Maximum Velocity: | 1.8 m / s |
| Maximum Displacement: | 51 mm (2 in) |
| Bare Table Random: | 15 to 20 g rms |
| Bare Table Sine: | 10 to 20 g peak |
| Bare Table Shock: | Up to 70 g peak |
| Accelerometer DAQ: | 6 Channels |

Vibration Capability

- ✓ Sine Sweep & Sine Dwell
- ✓ Random
- ✓ Sine-on-Random
- ✓ Random-on-Random
- ✓ SRS

Shock Capability

- ✓ Half Sine
- ✓ Rectangle
- ✓ Symmetrical Triangle
- ✓ Non-Symmetrical Triangle
- ✓ Initial Sawtooth
- ✓ Terminal Sawtooth
- ✓ Trapezoid
- ✓ Sine Burst
- ✓ Double Sine

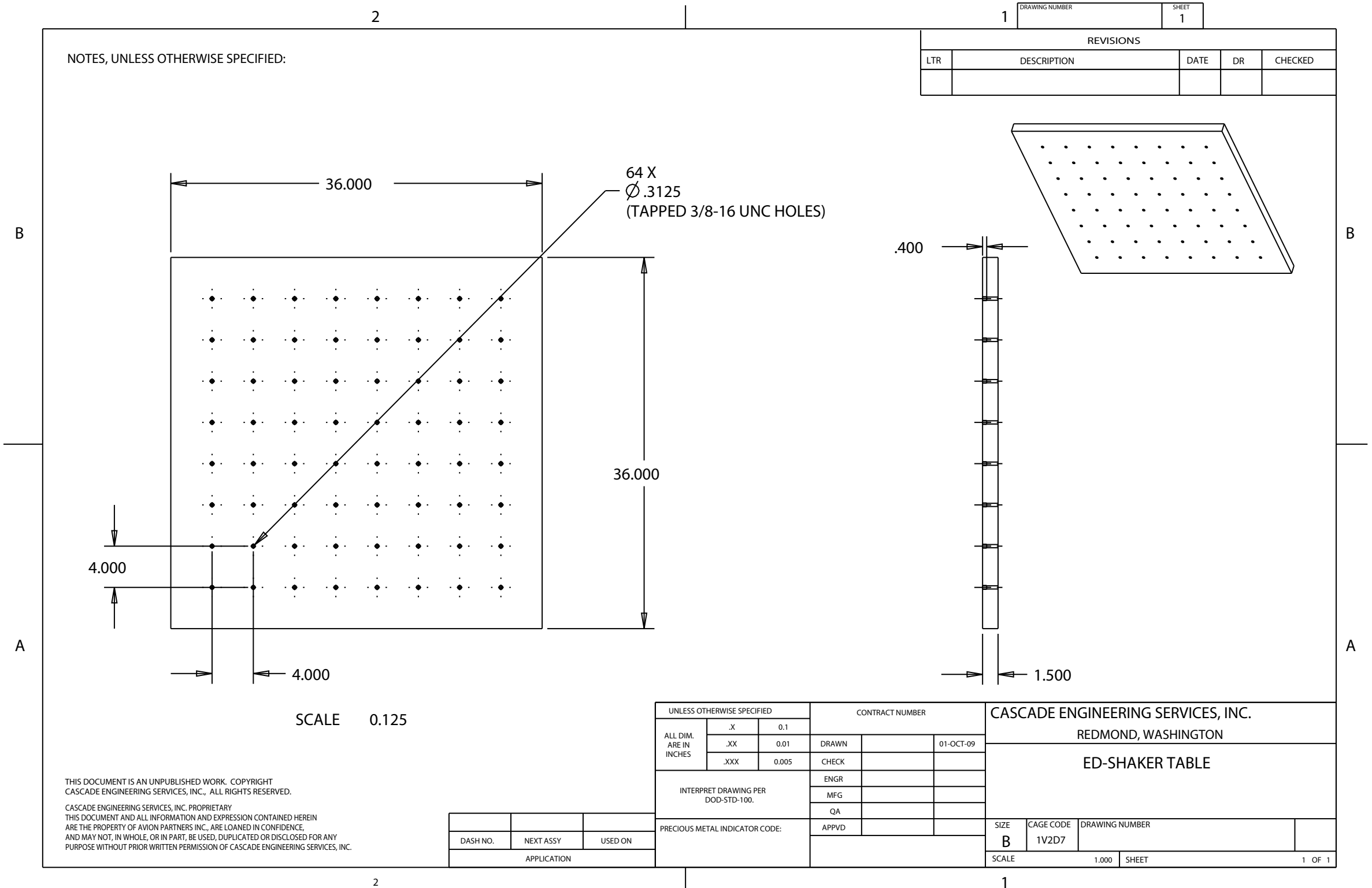
Shaker Table Hole Patterns & Drawing Files

[Table Hole Pattern \(X & Y Axis Orientation\)](#)

[Big Head Expander \(Z Axis Orientation\)](#)

[Small Head Expander \(Z Axis Orientation\)](#)

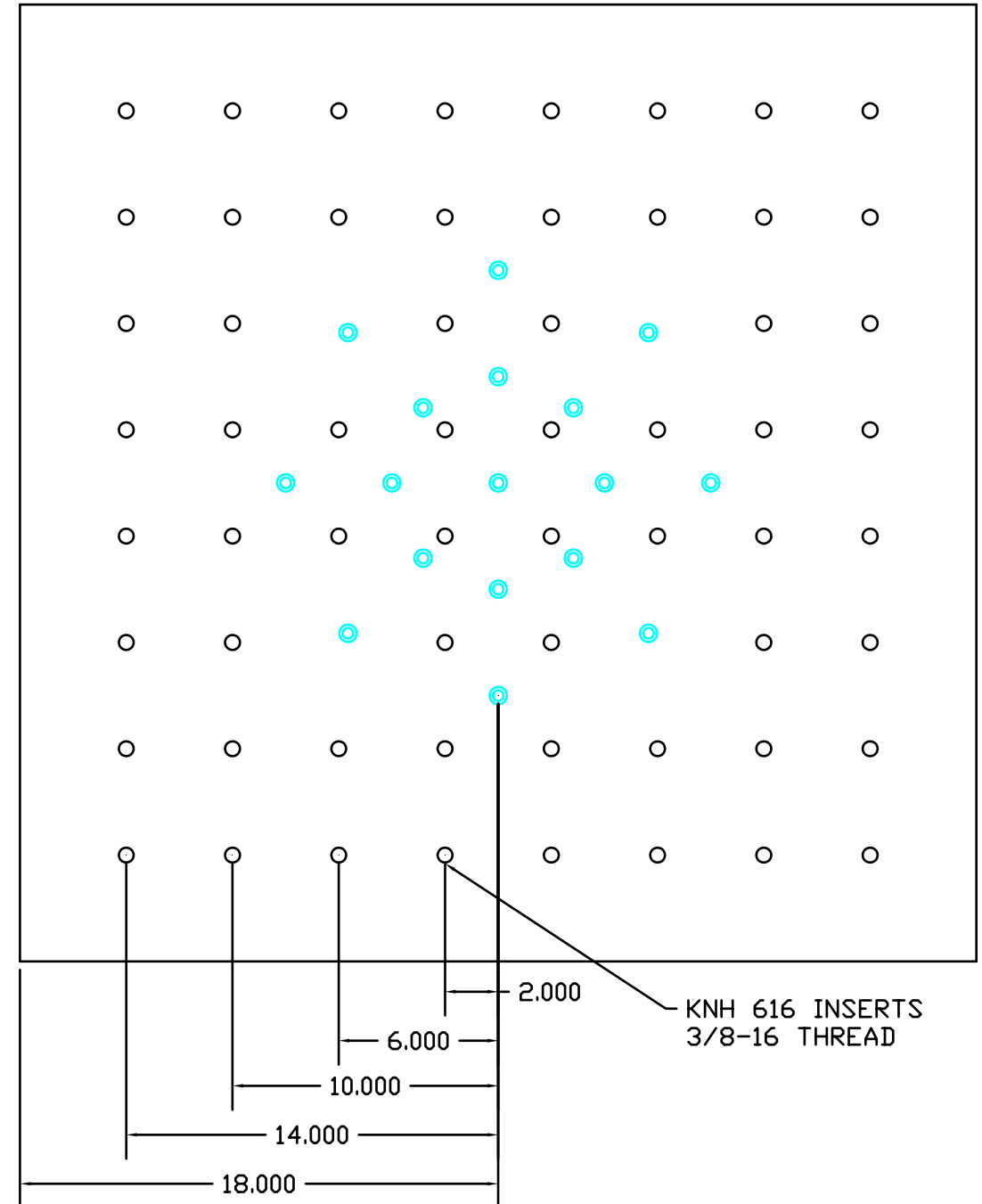
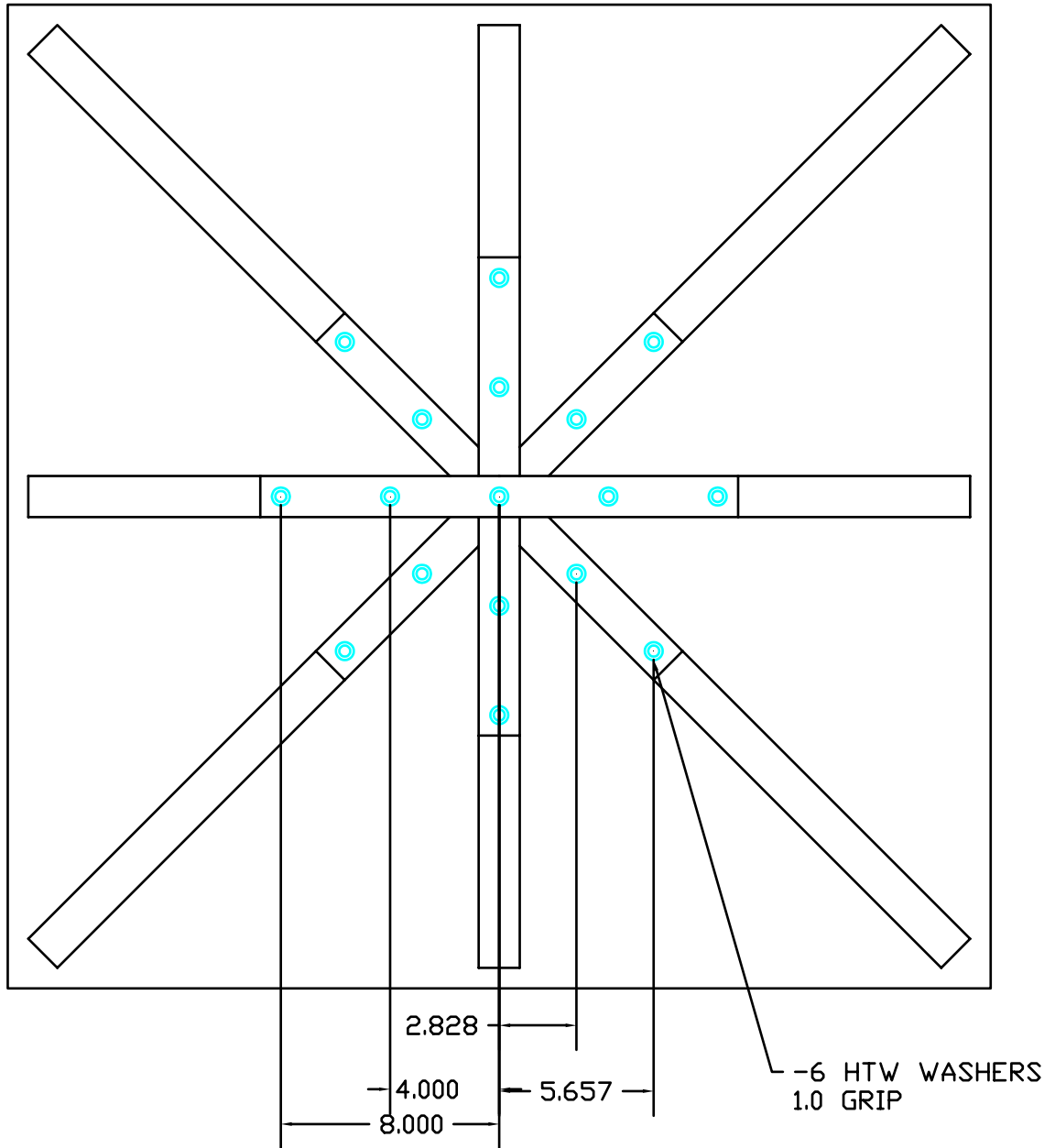
Table Hole Pattern (X & Y Axis Orientation)



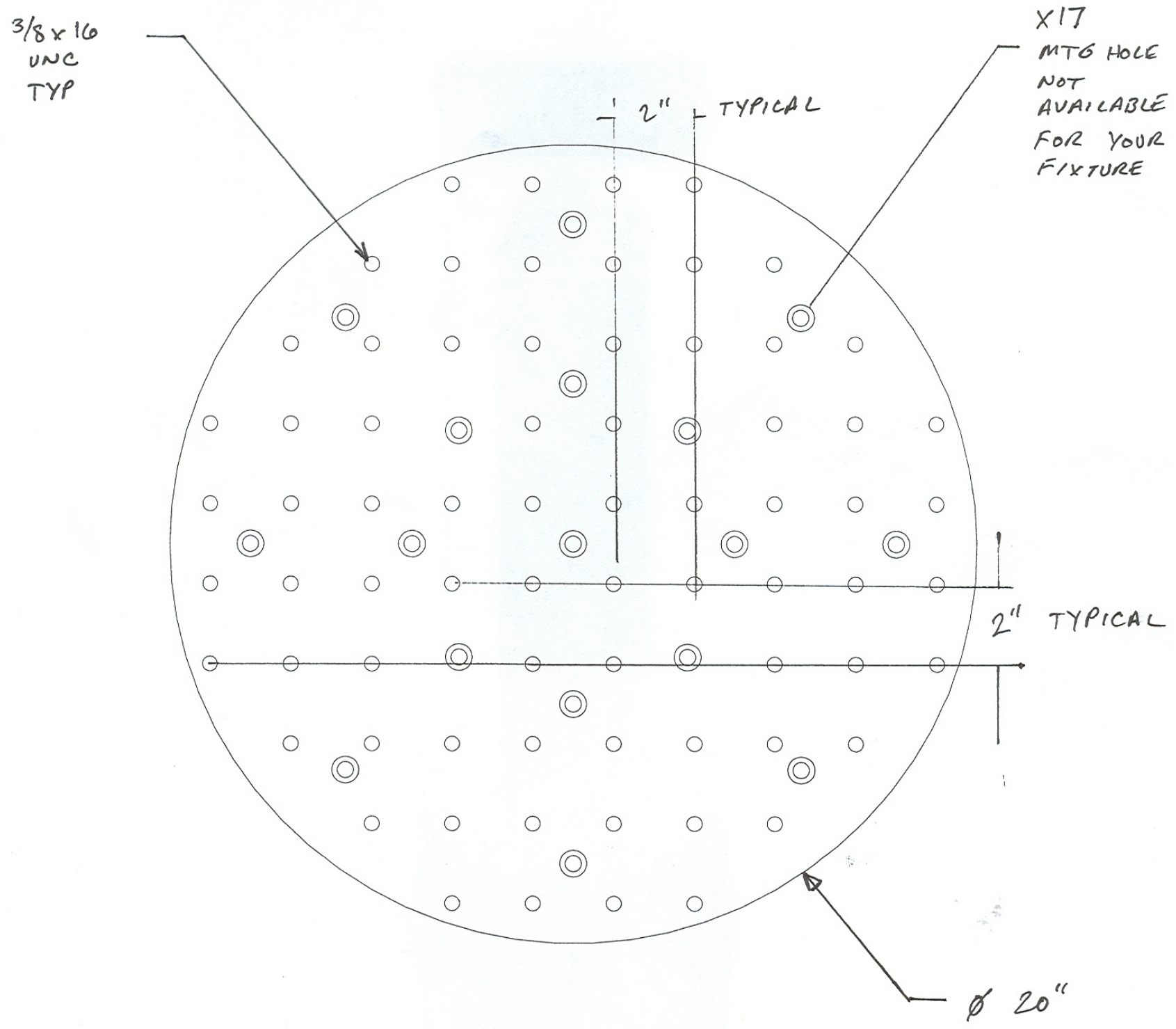
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Big Head Expander (Z Axis Orientation)



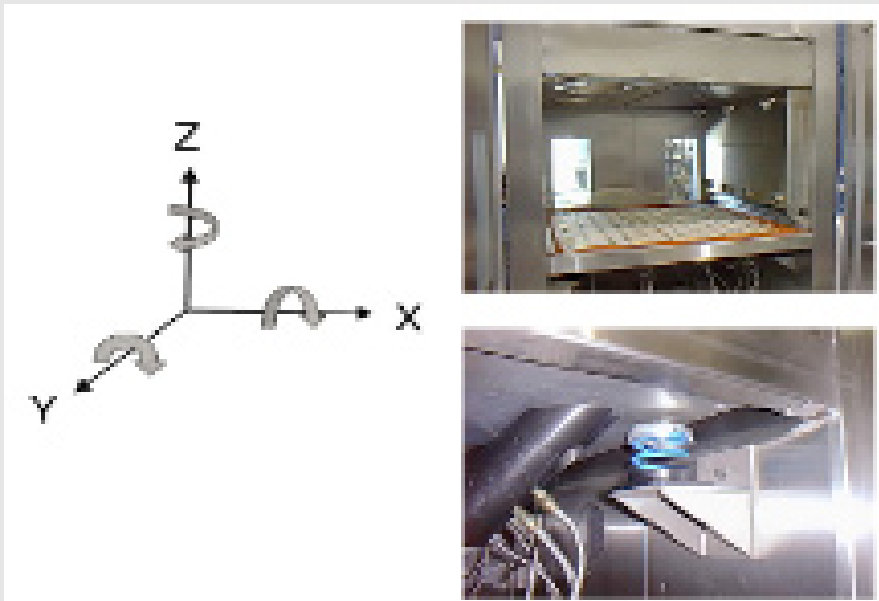
Small Head Expander (Z Axis Orientation)



HALT (HASS) Chambers



High Vibration Stresses: Six axis (3 linear & 3 rotational)



Application

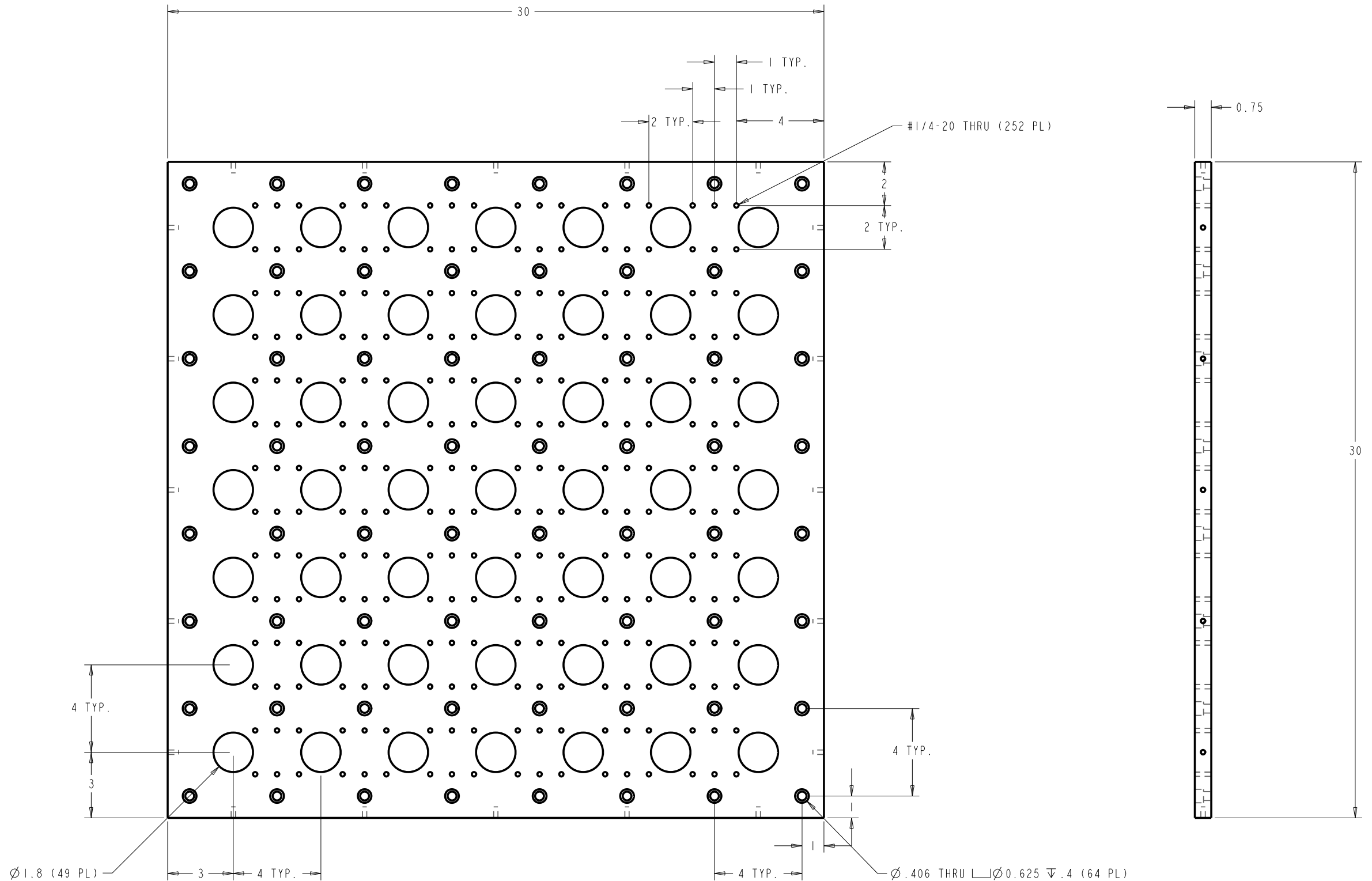
Provides simultaneous Temperature - Vibration loads for Accelerated testing, Highly Accelerated Life Testing (HALT) and Highly Accelerated Stress Screening (HASS). This testing is useful for product margin testing. The Chamber is Liquid Nitrogen equipped for rapid temperature ramp changes.

HALT Chamber Spec. (Bare Table)

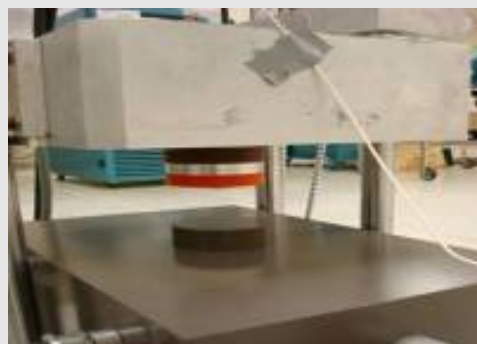
| | |
|--------------------------------|---|
| Models: | AST-35-LN2 & TVC-2.3 |
| Manufacturers: | Thermotron & Hanse |
| Vibration axis: | 6 DOF excitation |
| Frequency Range: | Up to 10 kHz |
| Temperature Range: | -87 °C to +191 °C |
| Max Temperature Ramp Rate: | 70 °C / min |
| Maximum Acceleration: | Up to 50 g rms |
| Workspace Dimensions: | 42" W x 42" D x 40" H |
| Table Size : | 30" x 30" |
| Chamber Temp Monitor Channels: | 5 Channels |
| Chamber Accelerometer DAQ : | 3 Channels |
| Additional Options: | External DAQs available for both Temp & acceleration monitoring |

HALT Table Hole Pattern

[Table Hole Pattern](#)



Mechanical Shock System



Elastomer
(open and closed combination)



Gasket and Felt

Application

Performs programmable shock tests / materials impact evaluation for component, PCBA and System level testing.

Mechanical Shock Spec.

| | |
|-----------------------------|---|
| Model: | 23 with LDS DAQ |
| Manufacturer: | Lansmont |
| Drop Height: | 3" to 75" |
| Maximum Acceleration: | 5000 g |
| Maximum Velocity Change : | Up to 36 ft / sec |
| Maximum Specimen Weight: | 80 lbs |
| Shock Pulse Duration Range: | 0.20 msec to 60 msec |
| Input Wave Type: | Half Sine / Trapezoidal / Terminal peak sawtooth |

Shock Table Hole Pattern

[Table Hole Pattern](#)



Screw Type Accelerometer to Monitor
Table g-level

Shock Table Hole Pattern

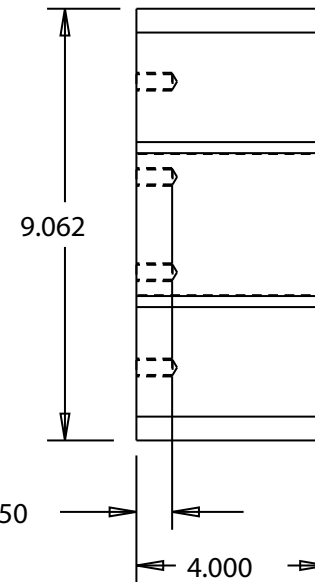
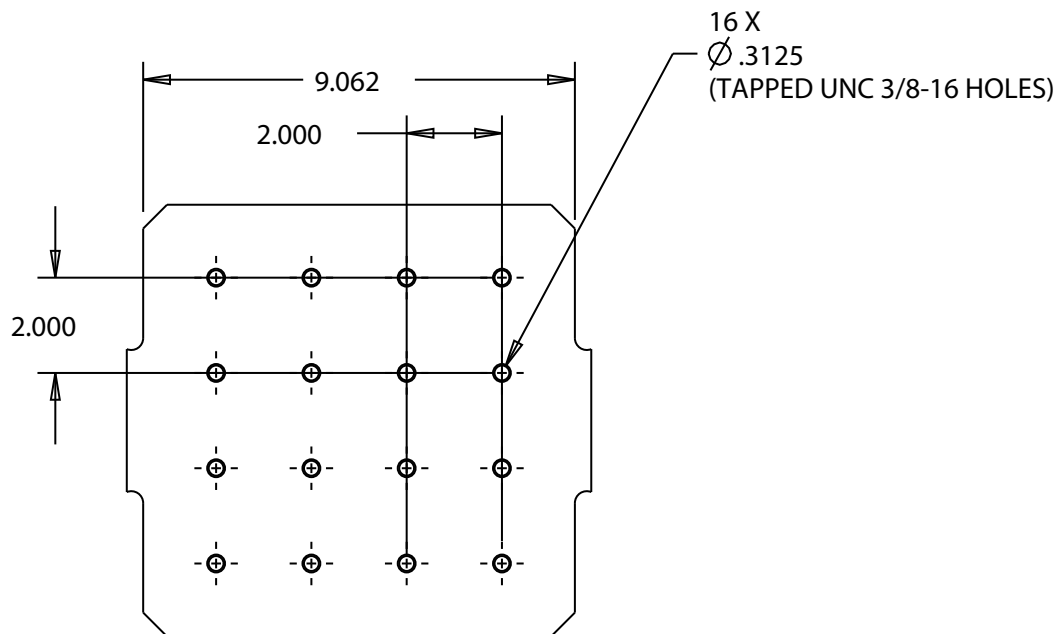
1 DRAWING NUMBER SHEET 1

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| APPLICATION | | |

| UNLESS OTHERWISE SPECIFIED | | | CONTRACT NUMBER | | | CASCADE ENGINEERING SERVICES, INC. | | |
|------------------------------------|------|-------|-----------------|--|--|------------------------------------|-----------|----------------|
| ALL DIM. ARE IN INCHES | .X | 0.1 | DRAWN | | | REDMOND, WASHINGTON | | |
| | .XX | 0.01 | CHECK | | | CES_Shock_Table | | |
| | .XXX | 0.005 | ENGR | | | SIZE | CAGE CODE | DRAWING NUMBER |
| INTERPRET DRAWING PER DOD-STD-100. | | | MFG | | | B | 1V2D7 | |
| PRECIOUS METAL INDICATOR CODE: | | | QA | | | SCALE | 1.000 | SHEET |
| | | | APPVD | | | 1 OF 1 | | |

Vacuum Chamber



14 PIN Connectors (Interior /Exterior Chamber)



Application

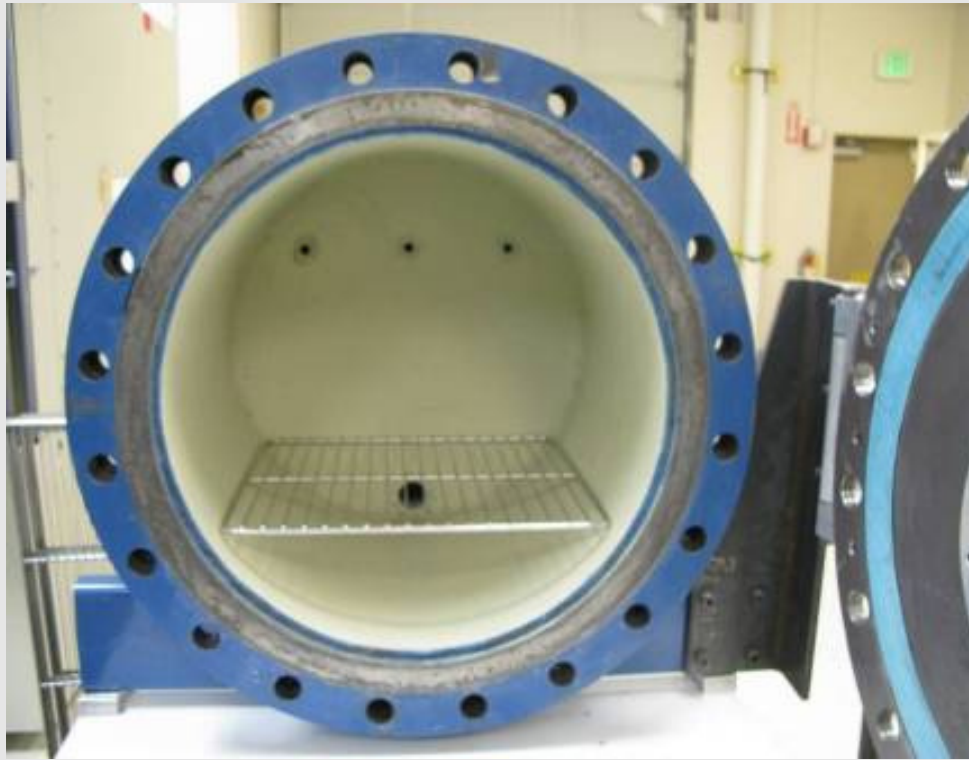
Altitude and Decompression Chamber that Simulates altitude and rapid decompression for avionic system testing.

Vacuum Chamber Spec.

| | |
|------------------------|---|
| Model: | 3003 |
| Manufacturer: | LR Environmental Equipment Company |
| Altitude Range: | 75,000 ft |
| Rapid Decompressions : | 8,000 ft to 55,000 ft within 15 seconds |
| Work Space Dimensions: | 18" W x 23.5" D x 18" H |
| Electrical Interface: | 14 PIN Bulkhead Connectors |



Over-Pressure Chamber



Application

Simulates over-pressure conditions.

Over-Pressure Chamber Spec.

| | |
|------------------------|----------------------------|
| Model: | 100 |
| Manufacturer: | Industrial Resources, Inc. |
| Pressure Range: | 95 psi |
| Work Space Dimensions: | 23" Diameter x 20" Depth |

Rain and Spray Tester Apparatus



Drip Plate



Spray Nozzle

Application

Drip Plate:

This system is used for drip / rain tests.

Spray Nozzle:

Water Ingression can be simulated by using this apparatus.

Drip Plate Spec.

| | |
|------------------------|------------------------------------|
| Manufacturer: | Cascade Engineering Services, Inc. |
| Volume of Water: | > 30 mL / min |
| Drip hole diameter: | 0.33 mm on a 25 mm pattern |
| Work Space Dimensions: | 33.5" x 21.5" |

Spray Nozzle Spec.

| | |
|------------------|------------------------------------|
| Manufacturer: | Cascade Engineering Services, Inc. |
| Nozzle Diameter: | 6.3 mm |
| Nozzle Diameter: | 12.0 mm |

Flow Meter Spec.

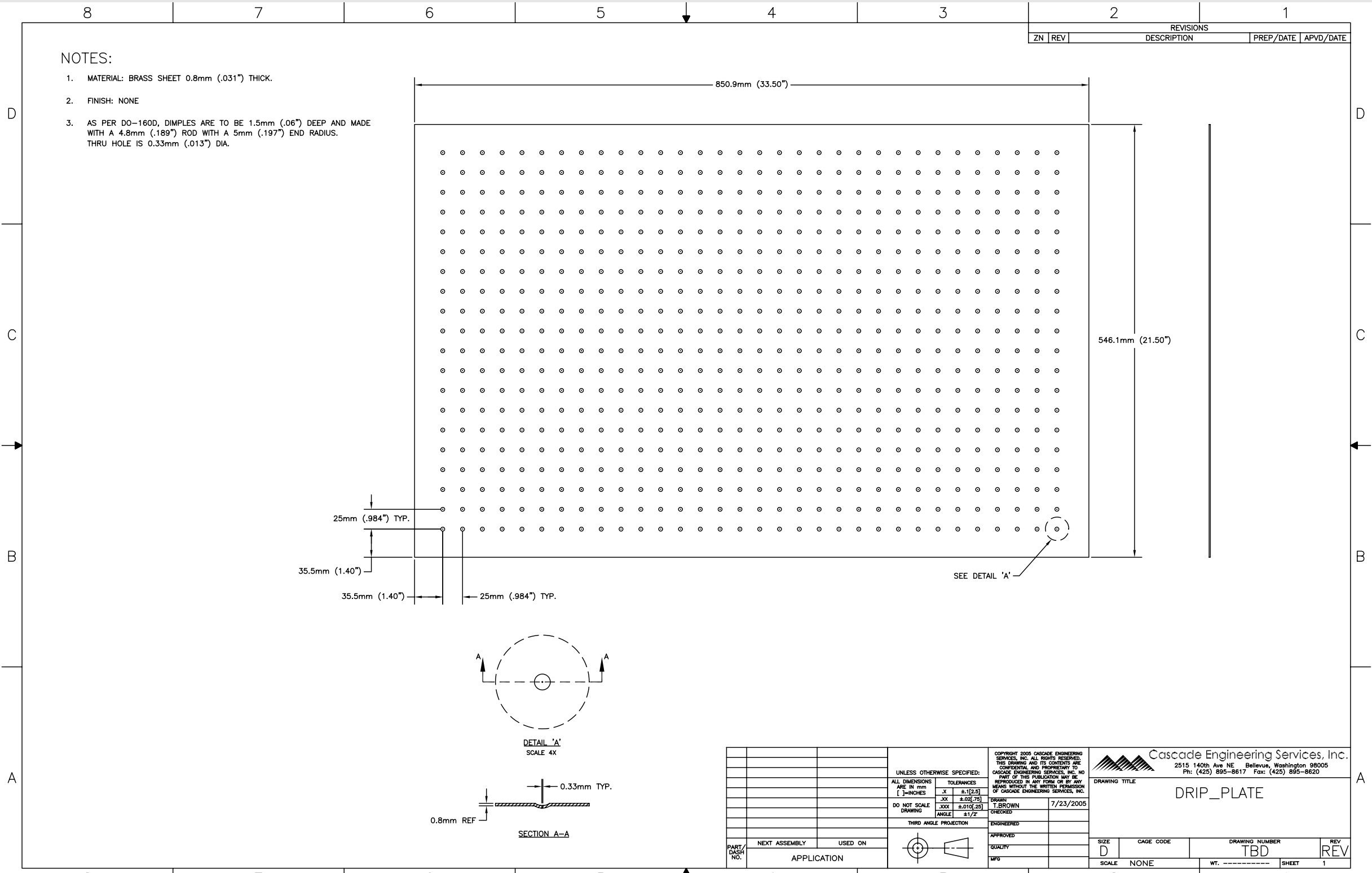
| | |
|------------------|-------------|
| Manufacturer: | INSITE |
| Water Flow Rate: | Up to 5 GPM |

Drip Plate Table Hole Pattern

[Table Hole Pattern](#)

Rain and Spray Tester Apparatus

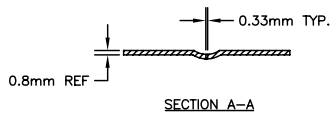
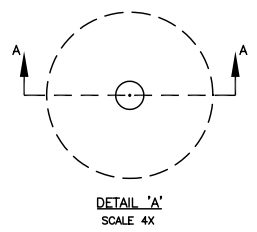
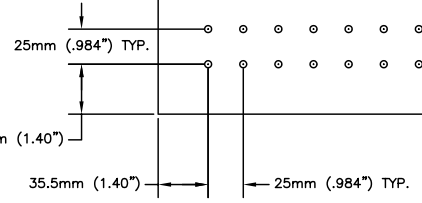
Drip Plate Table Hole Pattern

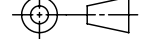


NOTES:

1. MATERIAL: BRASS SHEET 0.8mm (.031") THICK.
2. FINISH: NONE
3. AS PER DO-160D, DIMPLES ARE TO BE 1.5mm (.06") DEEP AND MADE WITH A 4.8mm (.189") ROD WITH A 5mm (.197") END RADIUS. THRU HOLE IS 0.33mm (.013") DIA.

| REVISIONS | | | | |
|-----------|-----|-------------|-----------|-----------|
| ZN | REV | DESCRIPTION | PREP/DATE | APVD/DATE |
| | | | | |



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| ALL DIMENSIONS ARE IN mm []=INCHES | .X | ±.1[2.5] | XX | ±.02[.75] | DRAWN: I. BROWN 7/23/2005 CHECKED: _____ ENGINEERED: _____ APPROVED: _____ QUALITY: _____ MFG: _____ |
| DO NOT SCALE DRAWING | XXX | ±.010[.25] | ANGLE | ±1/2° | DRAWING TITLE: DRIP_PLATE SIZE: D CAGE CODE: _____ SCALE: NONE DRAWING NUMBER: TBD REV: _____ WT. _____ SHEET: 1 |
| THIRD ANGLE PROJECTION | |  | | CASCADE ENGINEERING SERVICES, Inc. 2515 140th Ave NE Bellevue, Washington 98005 Ph: (425) 895-8617 Fax: (425) 895-8620 | |
| PART/DASH NO. | NEXT ASSEMBLY | USED ON | APPLICATION | DRAWING NUMBER: _____ SHEET: 1 | |

Salt Fog Chamber



Application

Accelerated corrosion atmospheres can be simulated in this chamber.

Salt Fog Chamber Spec.

| | |
|------------------------|-----------------------|
| Model: | SCCH21 |
| Manufacturer: | Singleton Corporation |
| Volume: | 18 ft ³ |
| Temperature Range: | 32 °F to 140 °F |
| Work Space Dimensions: | 36" x 24" x 36" |

Settling Dust Chamber



Application

This system can be used to simulate settling dust testing.

Dust Chamber Spec.

| | |
|-----------------------|--------------------------|
| Model: | T-27-D |
| Volume: | 27 ft ³ |
| Dust Quantity: | 3 kg to 5 kg |
| Workspace Dimensions: | 35.75" x 35.75" x 35.75" |

Temperature-Humidity Chambers



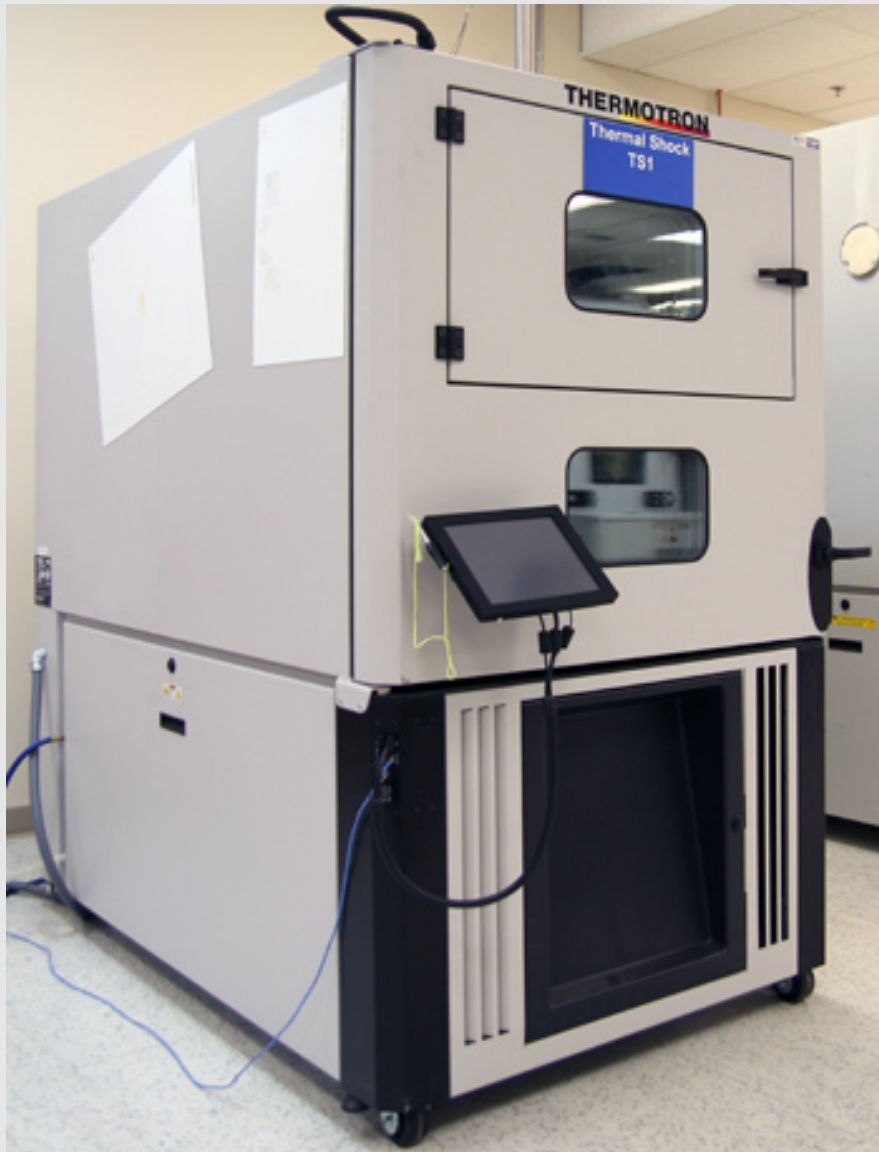
Application

Performs Temp-Humidity soaks, Temp Cycling & Low Temp - Humidity tests.

Temp-Humidity Chambers Spec.

| | |
|---------------------------|---|
| Manufacturers: | CSZ / Thermotron / Espec |
| # of Chambers Available: | >10 |
| Temperature Range : | -70 °C to 190 °C |
| Temperature Ramp Rate: | 3 to 4 °C/ min & 10 to 15 °C/ min |
| Humidity Range: | 5 % to 98 % |
| Workspace Dimensions: | 20"x20"x20" to 48"x56"x48" |
| Live Load Wattage Rating: | Up to 2500 Watts @ -40 °C Up to 2100 Watts @ -54 °C Up to 1000 Watts @ -68 °C |
| Additional Options: | LN2 usage for higher ramp rates Product Temperature Control Low Temp Humidity Control |

Thermal Shock Chamber



Application

Used for rapid temperature change loading conditions and thermal shock tests. Transfers the Product Under Test from a cold environment to a hot environment in less than 20 seconds.

Thermal Shock Chamber Spec.

| | |
|------------------------|-----------------------------|
| Model: | ATSS-130-6-6 |
| Manufacturer: | Thermotron |
| Temperature Range : | -73 °C to 215 °C |
| Temperature Ramp Rate: | 12 °C / min |
| Workspace Dimensions: | 25" x 23" x 14.5" |
| Max Specimen weight: | 85 lbs |
| Additional Options: | Product Temperature Control |



Application

Simulates a normal customer use case with repetitive freefalls.

Tumble Tester Spec.

| | |
|---------------|------------------------------|
| Model: | TB-1010 |
| Manufacturer: | SAFQ |
| Drop Height: | 500 mm / 1000mm |
| Speed : | 5 ± 0.5 rpm (10 falls / min) |
| Test Surface: | Steel or Wood |



Application

This chamber supports either batch processing (high volume projects) or large test systems.

Walk-in Temperature - Humidity Chamber

| | |
|---------------------------|--------------------------------------|
| Model: | EWSX499-30CA |
| Manufacturer: | Espec |
| Temperature Range : | -65 °C to 150 °C |
| Temperature Ramp Rate: | 4 °C / min |
| Humidity Range: | 10% to 95% |
| Workspace Dimensions: | 85" x 108" x 94", 499 ft3 |
| Live Load Wattage Rating: | 4,000 to 30,000 W @ -40 °C to 150 °C |



Data Acquisition System (Measurement)

Application

Data Acquisition System (Measurement): Signal-analysis devices used to Measure/Monitor/Record g-levels or accelerations, strains, temperature, voltage, current & resistance changes of the unit under test.

Data Acquisition Systems

| | |
|---|--|
| Accelerometer | LDS Dactron FOCUS II : 8-Channel Photon II : 4-Channel Max Sampling Rate : 96kS/sec |
| Accelerometer | Data Physics : 4-Channel Max Sampling Rate : 204.8kHz |
| Accelerometer (Shock Analysis) | Lansmont Test Partner 4-Channel Max Sampling Rate : 1MHz |
| Strain Gage | Vishay Strain Smart 6100 16-Channel DAQ Max Sampling Rate:10,000scans/sec |
| Temperature / Voltage Resistance / Current | Agilent 34970A Data Logger 240-Channels Max Sampling Rate:60ch/sec |

Instron Mechanical Test System



Application

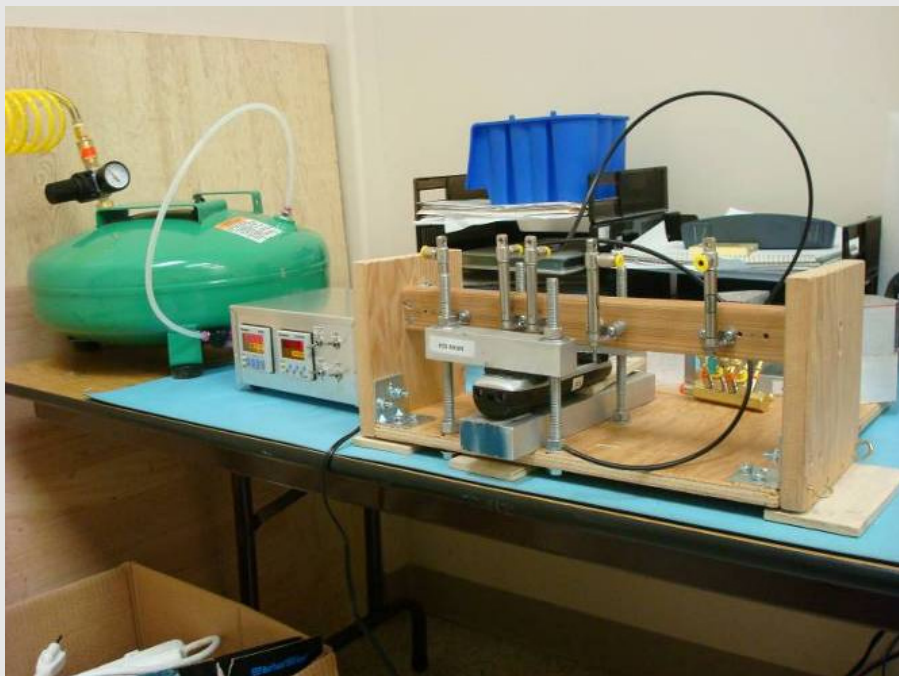
Instron: Helpful in Material characterization (Stress/strain curves, Tensile/Flexure strengths, strain measurements etc..) & Product design limit evaluation.

Walk-in Chamber #1 Spec.

| | |
|----------------------|--|
| Model: | 5569 |
| Manufacturer: | Instron |
| Load Capacity: | Upto 50kN |
| Speed: | 0.001-500mm/min |
| Data Capture Rate: | 500Hz |
| Test Capabilities: | Tensile Compression Peel 3-pt & 4-pt Bend |
| Temperature Control: | -70 °C to 350°C |
| Accessories: | Extensometer/Deflectometer |



MODEL : Linear Abraser 5750



Pneumatic Operated Life Testers

Application

Simulates abrasion & fatigue life testing.

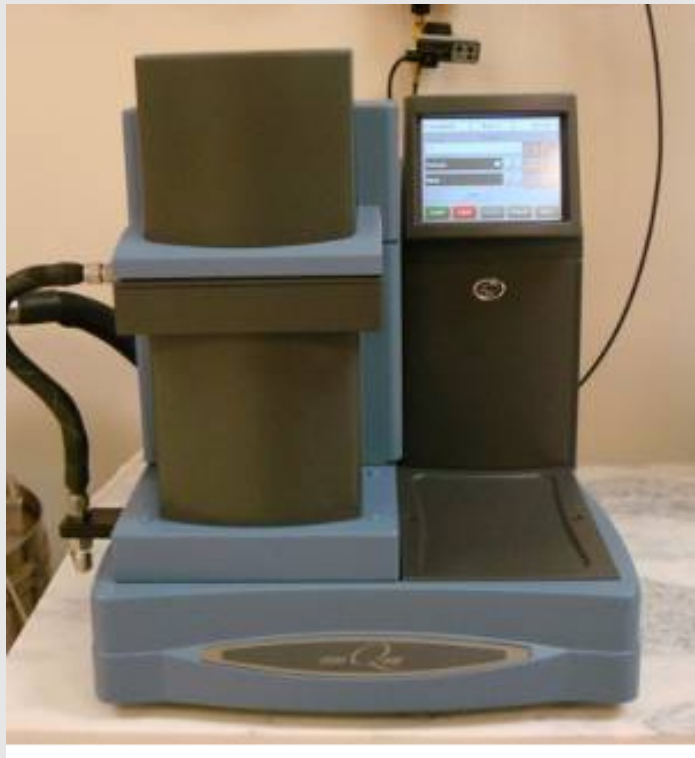
TMA Q400 Spec.

| | |
|----------------------------|---|
| Model: | DMA Q800 |
| Manufacturer: | Taber Industries |
| Load Capacity : | 3 N to 20 N |
| Operating Stroke Length : | 0.5 " to 4" |
| Operating Speed: | 2,15,25,30,40,60 cycles/min |
| Abradants / Wearersasers : | Wide selection available (CS 10 ,H18 , wearersasers) |

Fatigue Life Testers

- Custom-made Fixtures
- Max Pressure : 110psi
- Programmable Test counter
- Pneumatic cylinders of varying stroke lengths / diameters
- Flow-control valves for actuation speed control

Dynamic & Thermal Mechanical Analyzer



Application

DMA : Characterization of visco-elastic material properties as a function of time/temperature/frequency

TMA : Material property characterization : CTE, Glass-transition temperature

DMA Q800 Spec.

| | |
|----------------------------|--|
| Model: | DMA Q800 |
| Manufacturer: | TA Instruments |
| Load Capacity : | 18N |
| Frequency Range : | 0.01 to 200Hz |
| Test Fixture Capabilities: | Tensile / Single & Dual Cantilever / Shear |
| Operation Modes : | Multi-Frequency / Multi-Strain Creep / Relax Isostrain Stress-Strain Controlled |
| Temperature Control: | -145 °C to 600°C with GCS |

TMA Q400 Spec.

| | |
|----------------------------|---|
| Model: | TMA Q400 |
| Manufacturer: | TA Instruments |
| Load Capacity : | 2N |
| Test Fixture Capabilities: | Expansion Probe Macro Expansion Probe Penetration Probe |
| Temperature Control: | -150 °C to 1000°C |
| Temperature Precision: | ±1°C |

Adhesive Pull & Peel System



Application

Designed to measure the force required to peel/pull a sample from its backing material or substrate.

Adhesive Pull & Peel System Spec.

| | |
|-----------------------|--------------------------------------|
| Model: | 2820-036 |
| Manufacturer: | Instron |
| Maximum Load: | 1kN |
| Maximum Peel Length | 250mm |
| Available Test Angles | 30°, 45°, 60°, 90°, 120°, 135°, 150° |

Instron Universal Mechanical Test Machine

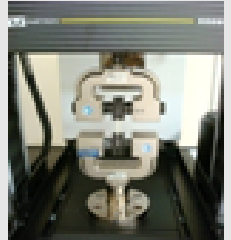


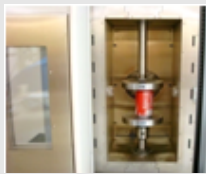
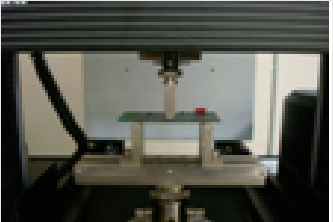

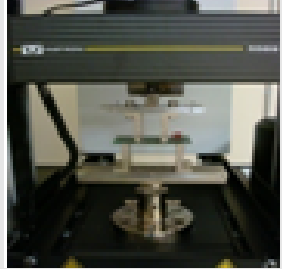

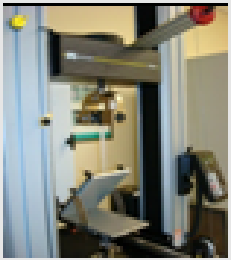


50KN Frame Capability with Chamber

Applications

Adhesives, Consumer Electronics, Automotive, Composites, Medical devices, Plastic and Rubber Products

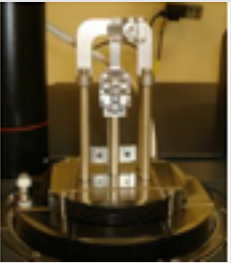
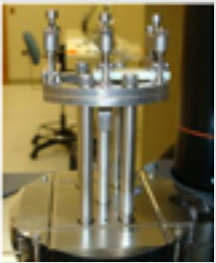


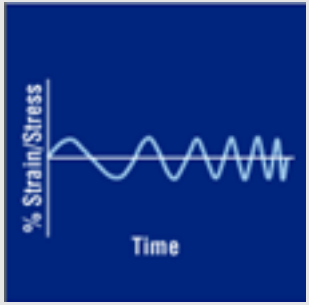
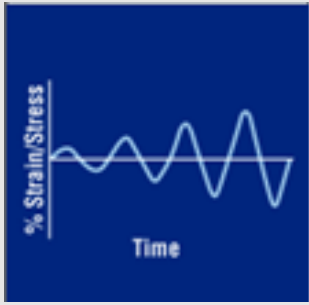
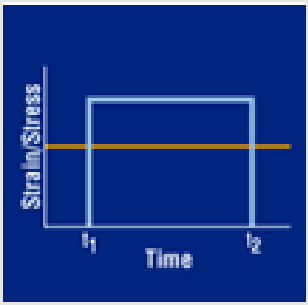
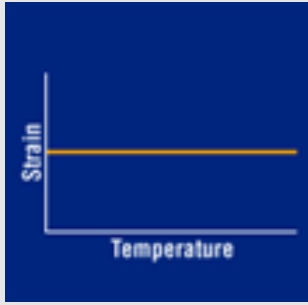
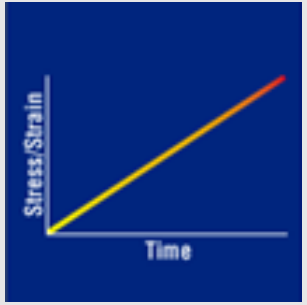
- Stress-Strain including yield, strength determination
- Evaluating effect of temperature on material properties

| Test Type | Fixture / Accessories | With Chamber | Capabilities |
|-----------------------------|--|---|--|
| Tensile |  |  | Maximum specimen thickness between jaw faces: 20mm (1.18in) Maximum Load: 10KN Maximum Torque: 80Nm Temperature Rating: -70°C to 125°C Weight: Upper Grip: 4.25Kg (9.37LB) Lower Grip: 4.65Kg(10.25LB) |
| Compression |  |  | Maximum Load: 10KN Diameter: 150mm (6in) Weight: 3.4Kg (7.5LB) Temperature Rating: -70°C to 125°C |
| Flexure-3 point bend |  |  | Load Capacity: 5KN (1000LB) Temperature Rating: -100°C to 350°C Maximum span (lower anvil): 194mm (7.64in) Maximum travel distance (upper anvil): 50mm (2.36in) Weight: Upper anvil assembly: 2.97N (0.67LB) Lower anvil assembly: 32.5N (7.24LB) |
| Flexure-4 point bend |  |  | Load Capacity: 5KN (1000LB) Temperature Rating: -100°C to 350°C Maximum span (lower anvil): 194mm (7.64in) Maximum span (upper anvil): 97mm (3.82in) Maximum travel distance (upper anvil): 50mm (2.36in) Weight: Upper anvil assembly: 1.40Kg (0.67LB) Lower anvil assembly: 3.25Kg (7.24LB) |
| Variable angle peel |  | | Maximum Load: 1KN (225LBF) Sled width: 150mm (5.9in) Maximum Peel Length: 250mm (9.84in) Maximum Substrated dimensions: Width-130mm (5.1in) Length- 250mm (9.84in) Maximum substrate thickness: 7mm(0.27in) Available angles: 30°, 45°, 60°, 90°, 120°, 135°, 150° |

Dynamic Mechanical Analyzer



DMA Q800

| Tensile | Single cantilever | Dual cantilever | Sandwich Shear | |
|--|--|--|--|--|
|  |  |  |  | |
| Multi frequency | Multi strain (stress) | Creep / Relax | Isostrain | Stress / strain controlled |
|  |  |  |  |  |

Applications

- 1) Material properties characterization:
 - Storage modulus, Loss modulus, tan delta
 - Glass transition temperature, deflection temperature under load, softening temperature, melting temperature
 - Frequency and temperature effects on storage modulus, loss modulus, tan delta
 - Frequency effect on glass transition temperature
- 2) Predicting material performance using time/temperature superposition (TTS, time-temperature superposition)
- 3) Evaluating process effects on material properties
- 4) Comparing different material candidates or different suppliers
- 5) Evaluating Shock absorption characteristics of elastomers, gaskets

Thermo Mechanical Analyzer



TMA Q400

Deformation mode

- Expansion Probe
- Macro Expansion Probe
- Penetration Probe

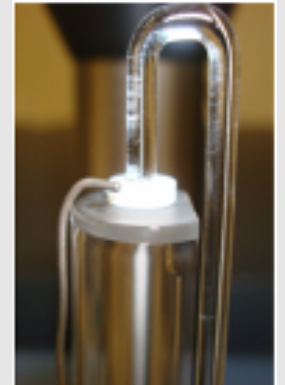
Expansion Probe



Macro Expansion Probe



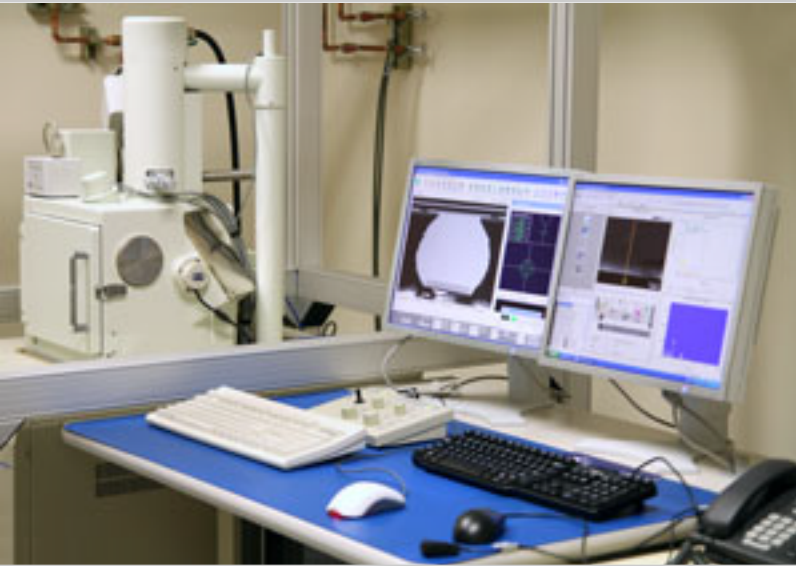
Penetration Probe



Applications

- 1) Material properties characterization:
 - CTE, Tg, Softening Temperature
 - Inputs for FA, Design Analysis (FEA) or RCA
- 2) Evaluating Process effects on material properties and reliability
- 3) Comparing different material candidates or different suppliers

Scanning Electron Microscope



Features

- Resolution
 - High Vacuum mode: 3.0nm (30kV)
 - Low Vacuum mode: 4.0nm (30kV)
- Acceleration Voltage: 0.3 to 30kV
- Magnification: 5 to 300,000
- EMI cage for AC noise reduction
- Low vacuum mode for studying non-conductive samples
- Energy Dispersive Spectrum for Elemental Analysis (Qualitative and Quantitative)
- Elemental Mapping

Applications

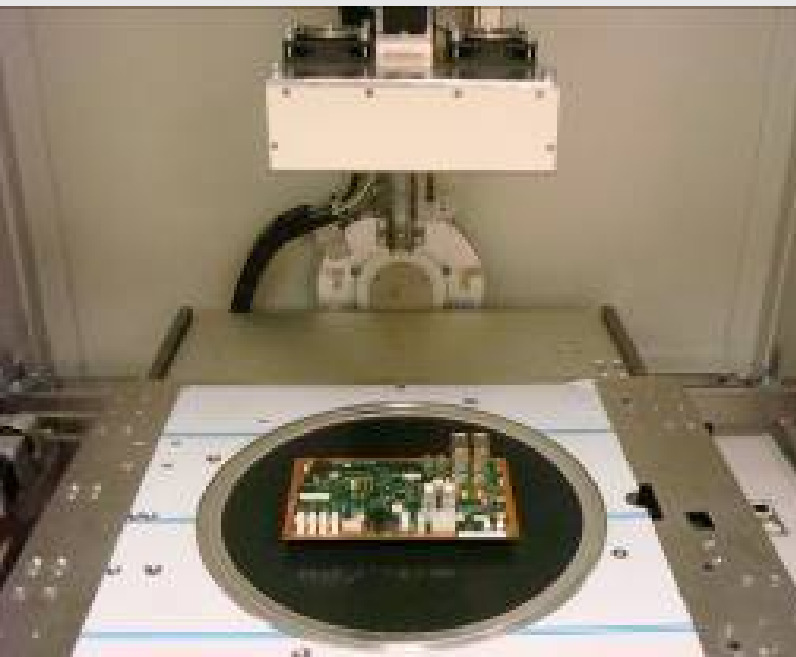
- Surface morphology imaging for all types of sample including metals, ceramics, polymers, etc...
- Conductive and non-conductive samples
- Together with cross section grinding/polishing equipments, SEM is a perfect tool to detect defects such voids, cracks, delaminations, in IC components such as solder joints in PCBs.
- Elemental analysis and elemental mapping using energy dispersive spectrum technique (EDS) in all types of sample
- Effective measurement tool for thin films, intermetallic layers, Solder joint geometry etc

X-Ray: 2D and 3D Capabilities



Features

- Multi-focus tube with High Power, Nanofocus and Microfocus Capabilities; Open tube, enabling smaller spot size and higher spatial resolution down to 0.5 μm .
- High power transmission target
- 10-160 kV
- 5-Motor driven axes
- 140+ degree oblique viewing via detector tilt
- 360 degree rotational sample table
- 2D and 3D-CT imaging
- Flat panel HD detector, 10~30 frames per second
- BGA analysis, Void calculations, Die attach analysis
- CNC capability



Applications

- Non-destructive Failure analysis tool
- Inspection of IC components & solder joints on printed circuit boards
 - Typical defects: Cracks, Opens, Bridging, Voiding, Misalignment, Missing joints etc
- Inspection of active and passive components, electronic components and hybrid modules
- Checking electromechanical components, especially those that are fully enclosed, such as sensors, relays, safety fuses, coils etc.
- Inspection of plastics, ceramics, light metals and steel
- Evaluating Process effects on product reliability
- Root cause analysis of product failures from Usage or Test conditions

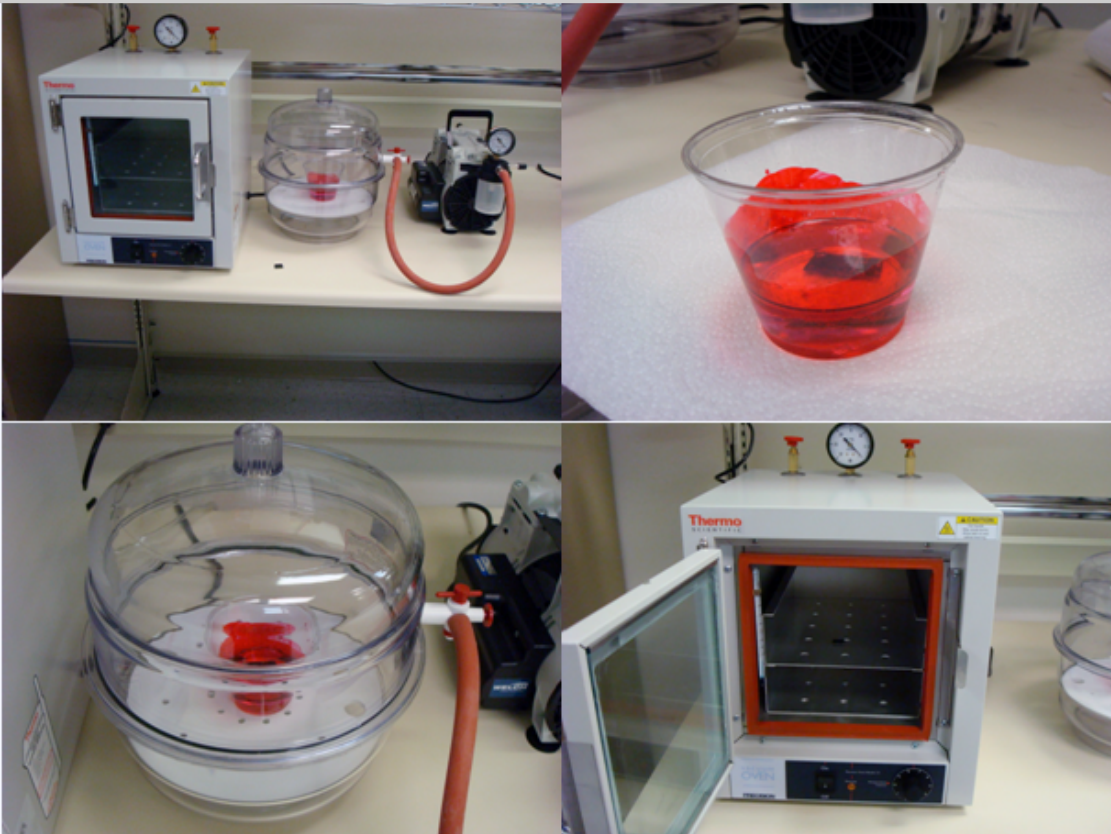
Cross-Sectioning Capabilities



Features

- 3 Grinders/Polishers for seamless and high volume needs
- Diamond and Band saw for precision cut
- Epoxy Dispenser for grinding/polishing
- Metallographic and Hi-Mag Microscopy tools with Digital photography

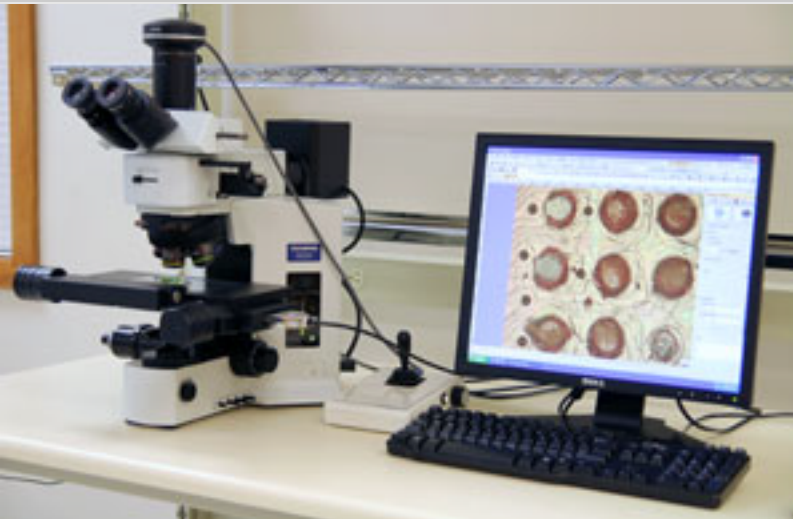
Dye and Pry Capabilities



Applications

Destructive failure analysis technique for delamination, voids or cracks in area array solder joints or other IC circuits in PCBs.

Optical Microscope with Stitching Capability



Features

- Up to 1000x
- DIC, Darkfield/Brightfield and multiple light filtering capabilities
- Olympus UC50 Camera with 4-24 fps & 5MegaPixel
- Motorized Z stage for EFI and Stacked Imaging
- Software features: Automated Z Stack Acquisition and Stitching Capability enables better resolution/focus for failed parts and assemblies

Applications

- Non-destructive Failure analysis tool
- Inspection of IC components & solder joints on printed circuit boards
 - Typical defects: Cracks, Opens, Bridging, Voiding, Misalignment, Missing joints etc
- Inspection of active and passive components, electronic components and hybrid modules
- Stacked Imaging and Stitching-good potential for composite imaging of cracked, failed, fractured surfaces