



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR HCAI SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP-0200

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Cryoquip, Inc.

Manufacturer's Technical Representative: Raul Boza

Mailing Address: 25720 Jefferson Ave Murrieta, CA 92562

Telephone: (951) 677-2062

Email: RBoza@Cryoquip.com

Product Information

Product Name: Medical Gas and Vacuum Systems

Product Type: Medical Gas Systems

Product Model Number: See Attachment

General Description: Ambient air cryogenic fluid vaporizer

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates

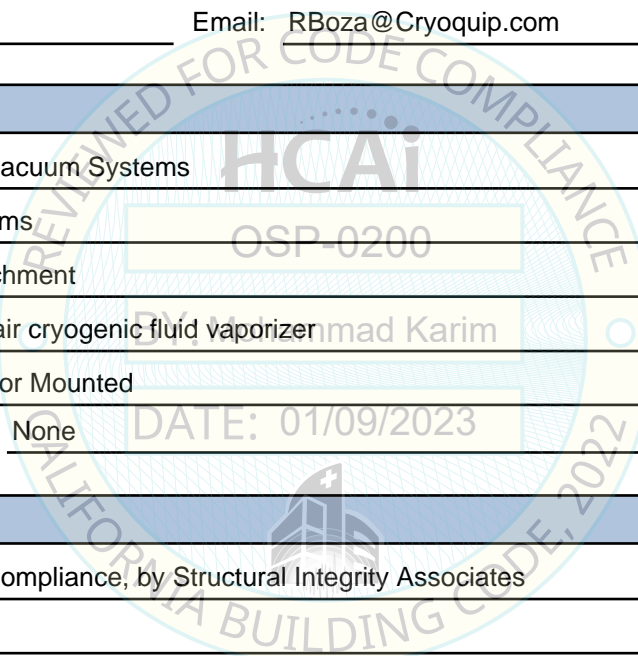
Contact Person: Daniel Zentner

Mailing Address: 233 SW Wilson Ave, Suite 101 Bend, OR 97702

Telephone: (541) 292-5839

Email: dzentner@structint.com

Title: Program Manager





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California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

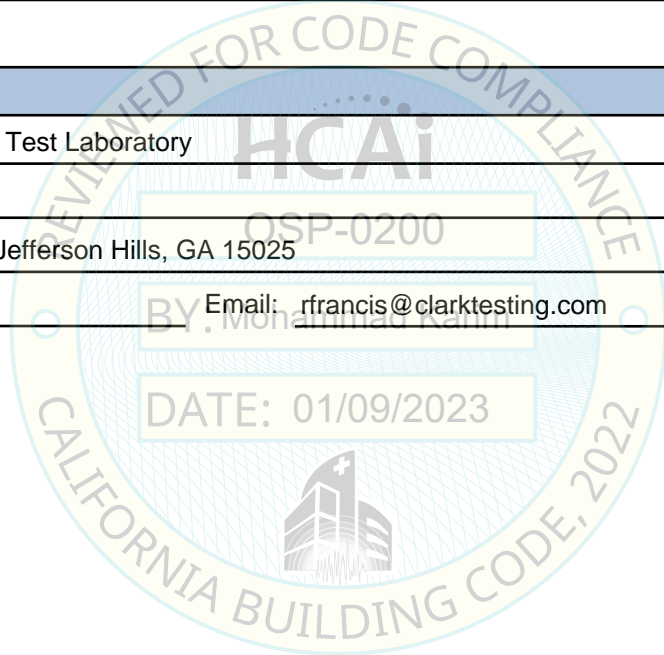
Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.
Name: Andrew Coughlin California License Number: S6082
Mailing Address: 5215 Hellyer Ave, Suite 101 San Jose, CA 951381025
Telephone: (415) 635-8461 Email: acoughlin@structint.com

Certification Method

GR-63-Core ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
 Other (Please Specify): _____

Testing Laboratory

Company Name: Clark Dynamics Test Laboratory
Contact Person: Robert Francis
Mailing Address: 1801 Route 51 Jefferson Hills, GA 15025
Telephone: (412) 387-1001 Email: rfrancis@clarktesting.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.5

SDS (Design spectral response acceleration at short period, g) = 2.5

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 2.5

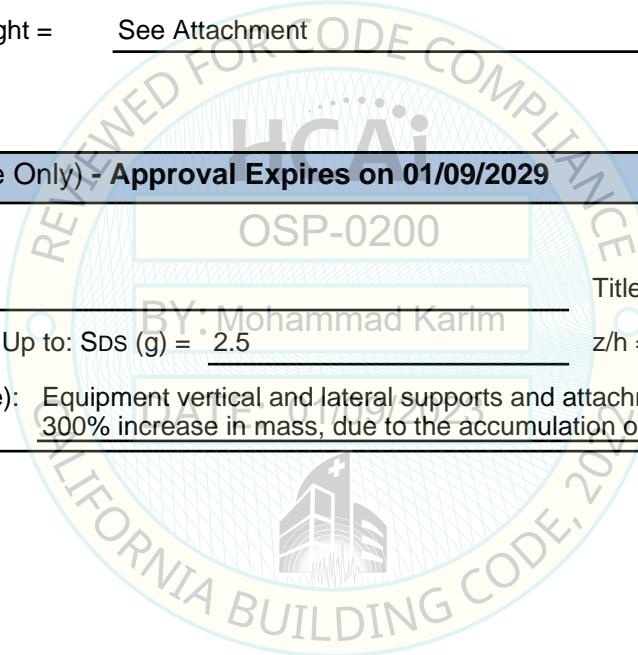
Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment



HCAI Approval (For Office Use Only) - Approval Expires on 01/09/2029

Date: 1/9/2023

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = 2.5 z/h = 0

Condition of Approval (if applicable): Equipment vertical and lateral supports and attachments must be designed for a 300% increase in mass, due to the accumulation of ice during use.



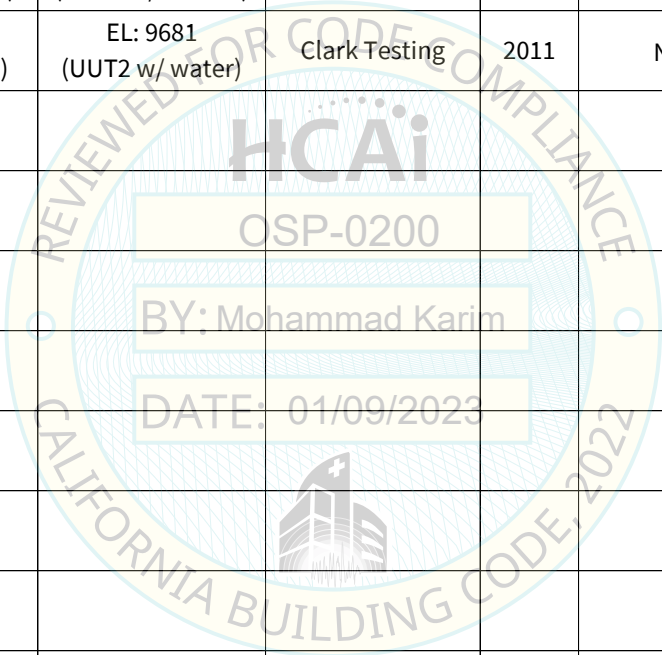
UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2200959



Manufacturer: Cryoquip, Inc.
Model Line: Ambient Vaporizer

UUT	Unit Description	Report Number	Testing Lab	Year Tested	ISO 17025 Accredited?	S _{DS}	z/h	I _P
1A	VAI-1208-FBL15 (w/o Operational Load)	EL: 9681 (UUT1 w/o water)	Clark Testing	2011	No ¹	2.5	0.0	1.5
1B	VAI-1208-FBL15 (w/ Operational Load)	EL: 9681 (UUT1 w/ water)	Clark Testing	2011	No ¹	2.5	0.0	1.5
2A	VAI-H48-FBL15-SP (w/o Operational Load)	EL: 9681 (UUT2 w/o water)	Clark Testing	2011	No ¹	2.5	0.0	1.5
2B	VAI-H48-FBL15-SP (w/ Operational Load)	EL: 9681 (UUT2 w/ water)	Clark Testing	2011	No ¹	2.5	0.0	1.5



Notes:
1. Clark was not ISO 17025 accredited at the time of testing but have been reviewed by TRU Compliance and found to meet the requirements for ICC-ES AC156 testing. Review form is on file with TRU Compliance.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2200959



Manufacturer: Cryoquip, Inc.	UUT 1A
Model Line: Ambient Vaporizer	
Model Number: VAI-1208-FBL15	
Serial Number: 43008-2-1	

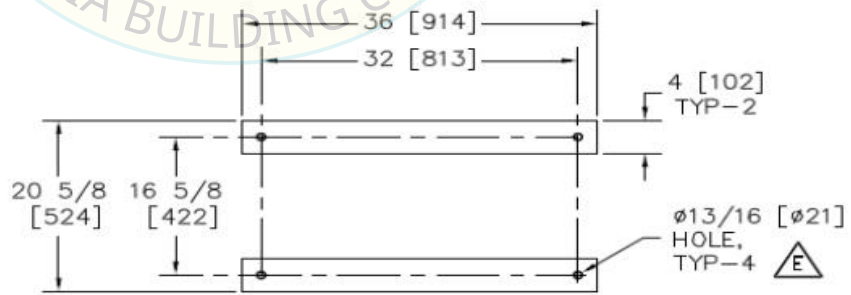
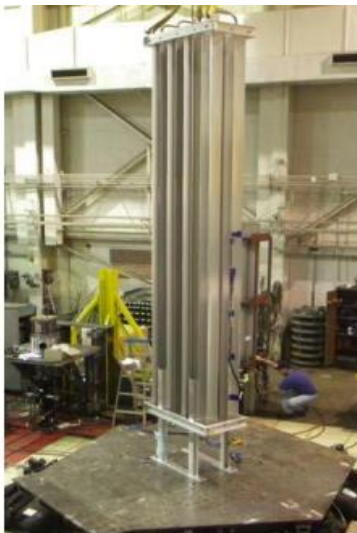
Product Construction Summary:
Aluminum base frame that holds "spar" link plates which are arranged vertically and connect to vaporizer tubing via standard crimping detail. Tubing is aluminum with stainless steel lining.

Options/Subcomponent Summary:
This test was conducted without operational load.

<i>UUT Properties</i>						
Weight (lb.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
575	22.6	44.9	209.3	4.9	5.5	>33.3

<i>UUT Highest Passed Seismic Run Information</i>									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2022	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.67	0.67	

Test Mounting Details: (Test Report: EL: 9681 (UUT1 without water))



ANCHOR BOLT PATTERN

UUT1 was base mounted - rigid using four (4) 3/4"-10 hex head 316 stainless steel bolts with flat and lock washers. Torqued to 150 ft-lbs.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2200959



Manufacturer: Cryoquip, Inc.	UUT 1B
Model Line: Ambient Vaporizer	
Model Number: VAI-1208-FBL15	
Serial Number: 43008-2-1	

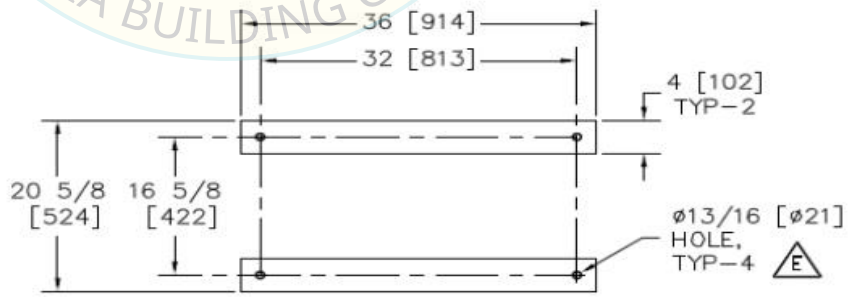
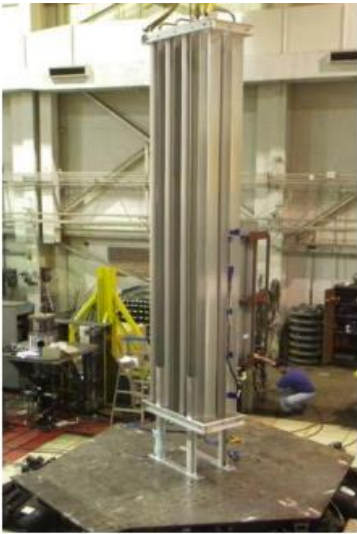
Product Construction Summary:
Aluminum base frame that holds "spar" link plates which are arranged vertically and connect to vaporizer tubing via standard crimping detail. Tubing is aluminum with stainless steel lining.

Options/Subcomponent Summary:
This test was conducted with operational load.

<i>UUT Properties</i>						
Weight (lb.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
625	22.6	44.9	209.3	4.6	5.2	>33.3

<i>UUT Highest Passed Seismic Run Information</i>									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2022	ICC-ES AC156	2.5	0.0	1.5	3.20	2.40	1.67	0.67	

Test Mounting Details: (Test Report: EL: 9681 (UUT1 with water))



ANCHOR BOLT PATTERN

UUT1 was base mounted - rigid using four (4) 3/4"-10 hex head 316 stainless steel bolts with flat and lock washers. Torqued to 150 ft-lbs.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2200959



Manufacturer: Cryoquip, Inc.	UUT 2A
Model Line: Ambient Vaporizer	
Model Number: VAI-H48-FBL15-SP	
Serial Number: 43008-1-1	

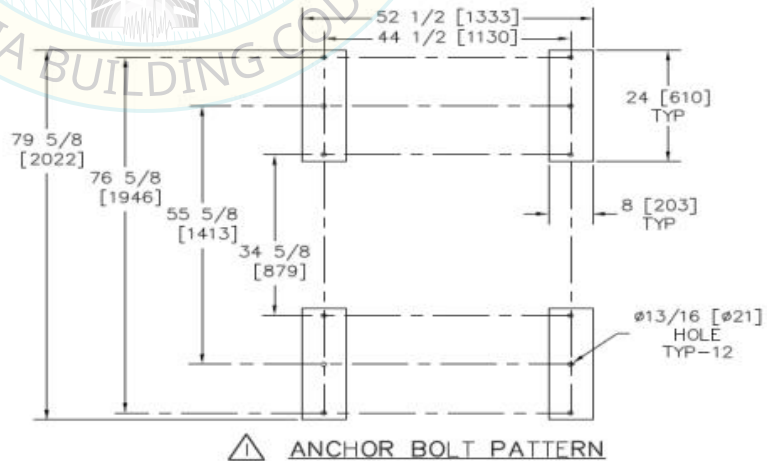
Product Construction Summary:
Aluminum base frame that holds "spar" link plates which are arranged vertically and connect to vaporizer tubing via standard crimping detail. Tubing is aluminum with stainless steel lining.

Options/Subcomponent Summary:
This test was conducted without operational load.

<i>UUT Properties</i>						
Weight (lb.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,765	100.9	67.1	221.6	4.2	4.9	>33.3

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.5	0.0	1.5	3.20	2.40	1.67	0.67

Test Mounting Details: (Test Report: EL: 9681 (UUT2 without water))



UUT2 was base mounted - rigid using twelve (12) 3/4"-10 hex head 316 stainless steel bolts with flat and lock washers. Torqued to 150 ft-lbs.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2200959



Manufacturer: Cryoquip, Inc.	UUT 2B
Model Line: Ambient Vaporizer	
Model Number: VAI-H48-FBL15-SP	
Serial Number: 43008-1-1	

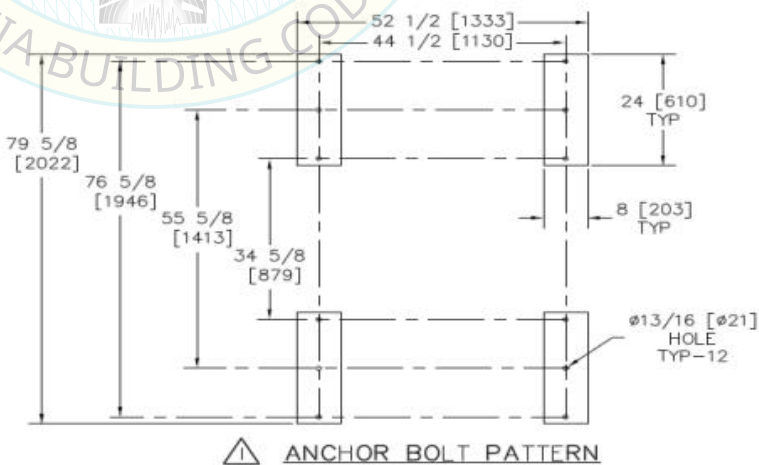
Product Construction Summary:
Aluminum base frame that holds "spar" link plates which are arranged vertically and connect to vaporizer tubing via standard crimping detail. Tubing is aluminum with stainless steel lining.

Options/Subcomponent Summary:
This test was conducted with operational load.

<i>UUT Properties</i>						
Weight (lb.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,945	100.9	67.1	221.6	3.9	4.7	>33.3

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2022	ICC-ES AC156	2.5	0.0	1.5	3.20	2.40	1.67	0.67

Test Mounting Details: (Test Report: EL: 9681 (UUT2 with water))



UUT2 was base mounted - rigid using twelve (12) 3/4"-10 hex head 316 stainless steel bolts with flat and lock washers. Torqued to 150 ft-lbs.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.