



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

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

OFFICE USE ONLY

APPLICATION #: OSP-0327-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Multistack, LLC

Manufacturer's Technical Representative: Rachel Bible

Mailing Address: 1065 Maple Avenue, P.O. Box 510

Telephone: (608) 366-2400 Email: RBible@multistack.com

Product Information

Product Name: ASP Air Cooled Modular Packaged Water Chillers

Product Type: Mechanical equipment

Product Model Number: See attachments

(List all unique product identification numbers and/or part numbers)

General Description: 10 to 30 ton chillers. Seismic enhancement made to the test units and modifications
required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid base mount

Applicant Information

Applicant Company Name: DYNAMIC CERTIFICATION LABORATORIES

Contact Person: JOSEPH L. LA BRIE, S.E., PRESIDENT / CEO

Mailing Address: 1315 GREG STREET, SUITE 109, SPARKS, NV 89431

Telephone: (775) 358-5085 Email: LABRIE@MAKEITRIGHT.NET

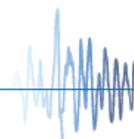
I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant:  Date: 3/26/13

Title: PRESIDENT / CEO Company Name: DYNAMIC CERTIFICATION LABORATORIES

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY
OSH-FD-759 (REV 1/24/13)



osHPD

Page 1 of 3



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

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

Company Name: DYNAMIC CERTIFICATION LABORATORIES

Name: DR. AHMAD ITANI, S.E. California License Number: SE-5220

Mailing Address: 1315 GREG STREET, SUITE 109, SPARKS, NV 89431

Telephone: (775) 358-5085 Email: ITANI@SHAKETEST.COM

Supports and Attachments Preapproval

- Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

Certification Method

- Testing in accordance with: ICC-ES AC156
- Other (Please Specify): _____
- _____
- _____

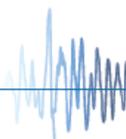
Testing Laboratory

Company Name: DYNAMIC CERTIFICATION LABORATORIES

Contact Name: AUSTIN BROWN, LABORATORY MANAGER

Mailing Address: 1315 GREG STREET, SUITE 109, SPARKS, NV 89431

Telephone: (775) 358-5085 Email: AUSTIN@SHAKETEST.COM





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: Yes No

Design Basis of Equipment or Components (F_p/W_p) = 1.39

S_{DS} (Design spectral response acceleration at short period, g) = 1.93

a_p (In-structure equipment or component amplification factor) = 1.0

R_p (Equipment or component response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = SEE ATTACHMENTS

Overall dimensions and weight (or range thereof) = SEE ATTACHMENTS

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: Yes No

Design Basis of Equipment or Components (V/W) = _____

S_{DS} (Design spectral response acceleration at short period, g) = _____

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

Tank(s) designed in accordance with ASME BPVC, 2010: Yes No

List of Attachments Supporting Special Seismic Certification

Test Report(s) Drawings Calculations Manufacturer's Catalog

Other(s) (Please Specify): _____

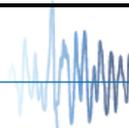
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2019

Signature:  Date: 4/17/13

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to : S_{DS} (g) = 1.93 z/h = 1.0

Condition of Approval (if applicable): _____



**Special Seismic Certification
Certified Units**



Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Tested Product Construction:

Powder-coated carbon steel frame

Tested Options:

10 to 30 ton capacity, Copeland Scroll (ZP) compressors, single refrigerant circuit, 460V, direct electrical connection, air cooled units, standard ambient, brazed stainless steel evaporator, copper tube with aluminum fin condenser, standard fan configuration with R410A refrigerant.

Tested Mounting Description:

Rigid Base mount

UUT	Model Number	Description	Dimensions (inches)			Weight (lb)	Sds (g), z/h=1
			Length	Width	Height		
UUT2	ASP010X	10 Ton Chiller	58	32	75	1,120	1.93
Interpolated	ASP015X	15 Ton Chiller	58 to 84	32 to 36	75 to 88	1,120 to 2,030	1.93
Interpolated	ASP020X	20 Ton Chiller					1.93
UUT5	ASP030X	30 Ton Chiller	84	36	88	2,030	1.93

Model Number Nomenclature

Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Multistack ASP Model Number Chart

A B C D E F G H I J K L M N O P - Q

Variable	Definition	Allowable Value	Allowable Value Description
A	Series	ASP	Air Cooled Modular
B	Module Nominal Capacity	010	10 Tons
		015	15 Tons
		020	20 Tons
		030	30 Tons
C	Compressor Type	A	Copeland Scroll (ZR)
		X	Copeland Scroll (ZP)
		N	None
D	AHRI Certified	C	Certified
		N	Not Certified
E	No. of Refrigerant Circuits	1	Single
		2	Dual
F	Frame Designation	1	32" x 58"
		2	36" x 72"
		3	36" x 84"
G	Voltage	A	208/3/60
		L	230/3/60
		H	460/3/60
H	Power Connection	1	Direct Connection
		2	Multiple Module Connections
I	Application	A	Air Cooled
		C	Remote Condenser
		D	Cond Unit
		H	Heat Recovery
J	Ambient	S	Standard
		H	High
K	AHRI Version	1	Standard
L	Evaporator	A	Brazed SS
		B	Brazed SMO
		N	None
M	Condenser	A	Cu Tube Al Fin
N	Condenser Coating	B	Bronzeglow
		H	Heresite
		E	Electrofin
		-	N/A
O	Fan Configuration	S	Standard
		H	High Static
		L	Low Sound
P	Auxiliary Condenser	-	N/A
Q	Refrigerant	-410A	R-410A
		-134A	R-134A

Special Seismic Certification Certified Components



Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Model Number	Manufacturer	Description	Unit
Compressors			
ZPT134/ZRT136	Copeland	5 Ton Compressors	UUT2
ZPT206/ZRT216	Copeland	7.5 Ton Compressors	Interpolated
ZPT240/ZRT250	Copeland	10 Ton Compressors	
ZPT364/ZRT380	Copeland	15 Ton Compressors	UUT5

*The only difference between ZP and ZR compressors is the refrigerant. The heavier refrigerant was tested.

Condensers			
31.50" x 51.00"	n/a	3/8" Cu tubing/6 Rows/Al Fins	UUT2
29.92" x 50.62"	n/a	7 mm Cu tubing/4 Rows/Al Fins	Interpolated
29.92" x 65.00"	n/a	7 mm Cu tubing/4 Rows/Al Fins	
41.75" x 77.00"	n/a	7 mm Cu Tubing/4 Rows/Al Fins	UUT5

BPHE Evaporators			
P/F120Tx34	SWEP	20.7" x 9.6" x 4.7"	UUT2
P/F120Tx44	SWEP	20.7" x 9.6" x 5.6"	Interpolated
P/F200Tx64	SWEP	20.7" x 9.6" x 7.9"	
P/F200Tx80	SWEP	20.7" x 9.6" x 9.3"	UUT5

Expansion Valves			
SERI-D	Parker Hannifin	2-10 Ton	UUT2
SERI-G	Parker Hannifin	10-25 Ton	Interpolated
SERI-J	Parker Hannifin	25-45 Ton	UUT5

Controller / Display			
pCO3	Carel	Carel original software	UUT2, UUT5
pCO5	Carel	Carel software upgrade	Extrapolated

*Software change only.

Solenoid Valve			
3524-13	Parker Hannifin	5/8" diameter valve	UUT2
4036-13	Parker Hannifin	1 1/8" diameter valve	UUT5

Fan Motor			
A6T11NB65A	Leeson	1 HP	UUT2
C182T17FB29E	Leeson	2 HP	UUT5

VFDs			
4A0004B	Yaskawa	J1000 Drive Model CIMR-J; 3-Phase, 400V Class (4.3"Wx5.0"Hx5.4"D, 3.8 lb)	UUT2, UUT5
2A0012B	Yaskawa	J1000 Drive Model CIMR-J; 3-Phase, 200V Class (4.3"Wx5.0"Hx5.4"D, 3.8 lb)	Extrapolated*

*Within the confines of the tested options. Dimensions, weight, design and construction of extrapolated component are the same as what was tested in UUT2 and UUT5.

Fans			
24.5" Diameter	Multiwing	PPG Axial Fan	UUT2
30" Diameter	Multiwing	PPG Axial Fan	UUT5

Motorized Valve			
SY1	Belimo	2" Diameter Valve	UUT2, UUT5

UUT2

Unit Under Test Summary Sheet



Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Modular Packaged Water Chillers

Model Number: ASP010X

Product Construction Summary:

Powder-coated carbon steel frame

Options / Component Summary:

10 ton capacity, Copeland Scroll (ZP) compressors, single refrigerant circuit, 32" x 58" frame size, 460V, direct electrical connection, air cooled unit, standard ambient, brazed stainless steel evaporator, copper tube with aluminum fin condenser, standard fan configuration with R410A refrigerant.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
1,120	58	32	75	5.3	7.5	13.3

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2013	2012 ICC-ES AC156	1.93	1.0	1.5	3.09	2.32	1.29	0.51

Unit Mounting Description:



Unit base-mounted to the DCL steel shake table interface plate with four 1/2-inch diameter Grade 5 bolts. The plate was attached to the shake table with M12 threaded rod, spaced approximately 8-inches on-center.

UUT5

Unit Under Test Summary Sheet



Manufacturer: Multistack, LLC

Product Line: ASP Air Cooled Packaged Modules

Model Number: ASP030X

Product Construction Summary:

Powder-coated carbon steel frame

Options / Component Summary:

30 ton capacity, Copeland Scroll (ZP) compressors, single refrigerant circuit, 36" x 84" frame size, 460V, direct electrical connection, air cooled unit, standard ambient, brazed stainless steel evaporator, copper tube with aluminum fin condenser, standard fan configuration with R410A refrigerant.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Length	Width	Height	Front-Back	Side-Side	Vertical
2,030	84	36	88	4.3	4.5	9.8

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2013	2012 ICC-ES AC156	1.93	1.0	1.5	3.09	2.32	1.29	0.51

Unit Mounting Description:



Unit base-mounted to the DCL steel shake table interface plate with six 1/2-inch diameter Grade 5 bolts. The plate was attached to the shake table with M12 threaded rod, spaced approximately 8-inches on-center.