



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0440

OSHPD Special Seismic Certification Preapproval (OSP)

Type: [ ] New [X] Renewal

Manufacturer Information

Manufacturer: Vycon, Inc.

Manufacturer's Technical Representative: Lance Wooley

Mailing Address: 16323 Shoemaker Avenue, Cerritos, CA 90703

Telephone: (562) 282-5507

Email: lwooley@calnetix.com

Product Information

Product Name: UPS and Batteries

Product Type: Flywheel Energy Storage Systems

Product Model Number: VDC-XES, VDC-XXES, VDC-XXT

General Description: Flywheel DC energy storage system.

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

DATE: 10/06/2020

Applicant Information

Applicant Company Name: Structural Integrity Associates, Inc.

Contact Person: Galen Reid

Mailing Address: 233 SW Wilson Suite 101, Bend, OR 92201

Telephone: (844) 878-0200

Email: greid@structint.com

Title: Manager





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

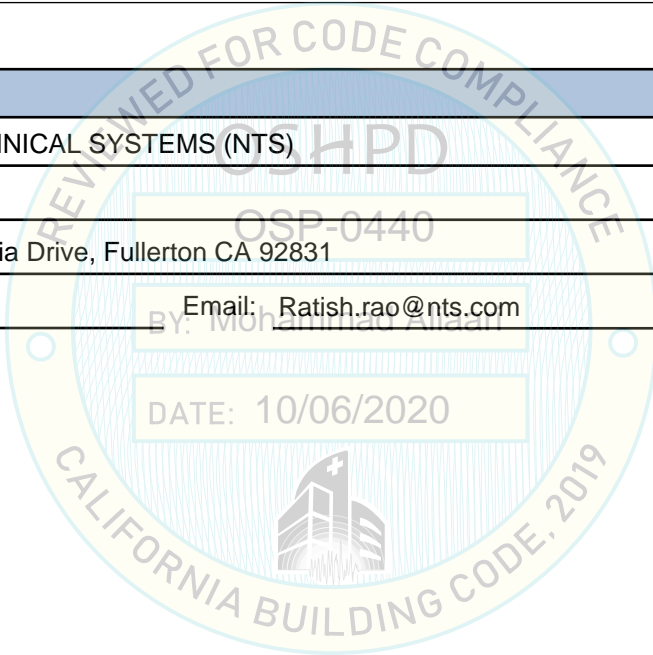
Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.
Name: Andrew Coughlin California License Number: S6082
Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 951381025
Telephone: (415) 635-8461 Email: acoughlin@structint.com

Certification Method

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

Testing Laboratory

Company Name: NATIONAL TECHNICAL SYSTEMS (NTS)
Contact Person: Ratish Rao
Mailing Address: 1536 East Valencia Drive, Fullerton CA 92831
Telephone: (800) 677-2687 Email: Ratish.rao@nts.com





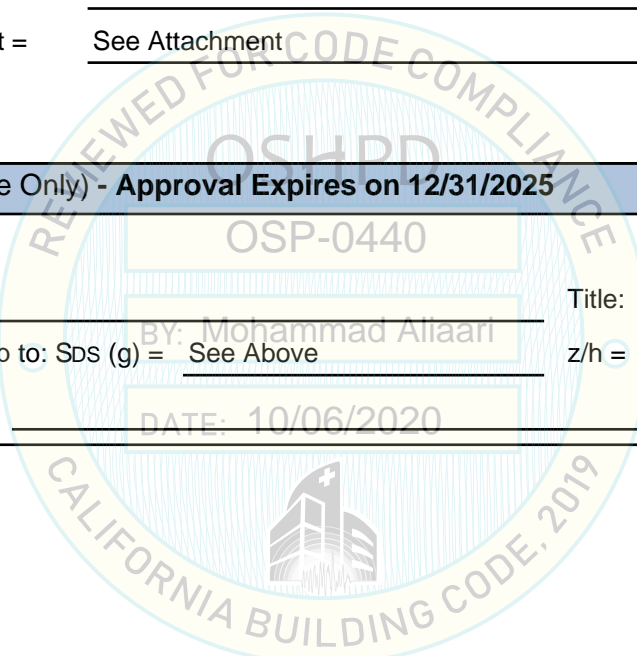
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**Seismic Parameters**

Design Basis of Equipment or Components ( $F_p/W_p$ ) =	<u>1.44</u>
SDS (Design spectral response acceleration at short period, g) =	<u>2.0g @ z/h=1; 3.2g @ z/h=0</u>
$a_p$ (Amplification factor) =	<u>1.0</u>
$R_p$ (Response modification factor) =	<u>2.5</u>
$\Omega_0$ (System overstrength factor) =	<u>2.0</u>
$I_p$ (Importance factor) =	<u>1.5</u>
z/h (Height ratio factor) =	<u>1 and 0</u>
Natural frequencies (Hz) =	<u>See Attachment</u>
Overall dimensions and weight =	<u>See Attachment</u>

**OSHPD Approval (For Office Use Only) - Approval Expires on 12/31/2025**

Date:	<u>10/6/2020</u>		
Name:	<u>Mohammad Aliaari</u>	Title:	<u>Senior Structural Engineer</u>
Special Seismic Certification Valid Up to: SDS (g) =	<u>See Above</u>	z/h =	<u>See Above</u>
Condition of Approval (if applicable):	<u>DATE: 10/06/2020</u>		





# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1701583-CR-001 R0



<b>Manufacturer:</b> Vycon Inc. <b>Model Line:</b> VDC Flywheel		<b>Table Description:</b> Active Subcomponents			<b>TABLE 2</b>	
<b>Building Code:</b> CBC 2019		<b>Seismic Certification Limits:</b>			$S_{DS} = 2.0g \quad z/h = 1.0$ $S_{DS} = 3.2g \quad z/h = 0.0$	
					$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT	
Frame	Fabcon	2200413-00	Seismic frame	Frame, inner door, flywheel brace, c-channels & cross members	1,2,3	
Flywheel	Calnetix	1200232-10	HVDC XXE, 240-290 VDC	Similar to 1200232-20	Extrap.	
		1200232-20	VDC XXE/VDC XE, 400-600 VDC		1,2	
		1200232-40	HVDC2 XXE, 360-400 VDC	Identical to 1200232-20	Interp.	
		1200251-20	VDC-XXT, 500-600 VDC		3	
Electronic Assembly	Calnetix	2200472-00	Bi-directional converter, IDBT	(3) installed	1,2,3	
Electronic Assembly	Calnetix	2200581-20	1400A Stackassy, IPM-6, 1400A IGBT		3	
Electronic Assembly	Calnetix	206-25645	MBC3600	Magnetic bearing controller	1,2,3	
Electronic Assembly	Calnetix	2200611-00	HV Panel		1,2	
		2200654-10	HV Panel		3	
Electronic Assembly	Calnetix	2200609-00	LV Panel		1,2,3	
Panel PC	Premio	CPS0104E001	10.4" Display	Touch screen computer	1,2,3	
Vacuum Pump	Pfeiffer	PKD62707	Duo 10		1,2	
	Edwards	A652-0-906			3	
Inductor	Pacific Transformer	25170 MOD4	310 $\mu$ H	(6) installed	1,2,3	
Transformer	Pacific Transformer	9310009-00	2 KVA		1,2,3	
		9310014-00	1700 VA, 300/250V		1,2,3	



# UNIT UNDER TEST (UUT) SUMMARY SHEET



1701583-CR-001 R0

<b>Manufacturer:</b> Vycon Inc.	<b>UUT 1</b>
<b>Model Line:</b> VDC Flywheel	
<b>Model Number:</b> US6CHCTWJ733000 (VDC-XXES) <b>Serial Number:</b> U2000906	

**Product Construction Summary:**  
Painted carbon steel enclosure. Galvanized carbon steel frame and base.

**Options/Subcomponent Summary:**  
Model number uniquely identifies subcomponents.  
**Frame:** 2200413-00; **Flywheel:** 1200232-20; **Electronic Assembly:** 2200472-00, 206-25645, 2200611-00, 2200609-00; **Panel PC:** CPS0104E001; **Vacuum Pump:** PKD62707; **Inductor:** 25170 MOD4; **Transformer:** 9310009-00, 9310014-00.

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,887	30.0	30.0	74.0	7.8	7.8	>33

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	2.13	0.85
		3.2	0.0	1.5				

**Test Mounting Details:**



Rigid base mounted with (4) 5/8" grade 8 bolts  
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



1701583-CR-001 R0

<b>Manufacturer:</b> Vycon Inc.	<b>UUT 2</b>
<b>Model Line:</b> VDC Flywheel	
<b>Model Number:</b> US6CHCTWJ733000 (VDC-XXES) <b>Serial Number:</b> U2000907	

**Product Construction Summary:**  
Painted carbon steel enclosure. Galvanized carbon steel frame and base.

**Options/Subcomponent Summary:**  
Model number uniquely identifies subcomponents.  
**Frame:** 2200413-00; **Flywheel:** 1200232-20; **Electronic Assembly:** 2200472-00, 206-25645, 2200611-00, 2200609-00; **Panel PC:** CPS0104E001; **Vacuum Pump:** PKD62707; **Inductor:** 25170 MOD4; **Transformer:** 9310009-00, 9310014-00.

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1,886	30.0	30.0	74.0	7.4	6.9	>33

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	2.13	0.85
		3.2	0.0	1.5				

**Test Mounting Details:**



Rigid base mounted with (4) 5/8" grade 8 bolts  
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



1701583-CR-001 R0

<b>Manufacturer:</b> Vycon Inc.	<b>UUT 3</b>
<b>Model Line:</b> VDC Flywheel	
<b>Model Number:</b> US7CHTTBJ737108 (VDC-XXT) <b>Serial Number:</b> U201010021	

**Product Construction Summary:**  
Painted carbon steel enclosure. Galvanized carbon steel frame and base.

**Options/Subcomponent Summary:**  
Model number uniquely identifies subcomponents.  
**Frame:** 2200413-00; **Flywheel:** 1200251-20; **Electronic Assembly:** 2200661-00, 206-25645, 2200654-00, 2200655-10; **Panel PC:** CPS0104E001; **Vacuum Pump:** VRD-4; **Inductor:** 25170 MOD4; **Transformer:** 9310009-00, 9310014-00.

**UUT Properties**

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2,048	30.0	30.0	74.0	8.0	6.8	12.6

**UUT Highest Passed Seismic Run Information**

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>P</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	2.13	0.85
		3.2	0.0	1.5				

**Test Mounting Details:**



Rigid base mounted with (4) 5/8" grade 5 bolts, torqued to 120 ft-lbs.  
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.  
Contents were included in testing per operating conditions.