



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

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

OFFICE USE ONLY	
APPLICATION #:	OSP – 0148

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Greenheck Fan Corporation

Manufacturer's Technical Representative: David Mayer

Mailing Address: PO Box 410, Schofield, WI 54479

Telephone: 715.355.3939 Email: David.mayer@greenheck.com

Product Information

Product Name: Spun Aluminum Exhaust Fans (G/GB/XRED/XREB;CUE/CUBE/XRUD/XRUB;CW/CWB/XSED/XSEB)

Product Type: Centrifugal Ventilation Fans OSP-0418

Product Model Number: Various (See Attachment)
(List all unique product identification numbers and/or part numbers)

General Description: Centrifugal ventilation fans. Seismic enhancements made to the test units to address anomalies observed during testing shall be incorporated into production units.

Mounting Description: Rigid base mounted on curbs and wall mounted on curbs.

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Contact Person: Galen Reid

Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

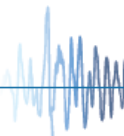
Telephone: 541-604-7225 Email: greid@structint.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: 9/5/2019

Title: Program Manager Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

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





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

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

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Name: Andrew Coughlin, SE California License Number: S6082

Mailing Address: 5215 Hellyer Ave, Suite 210, San Jose, CA 94608

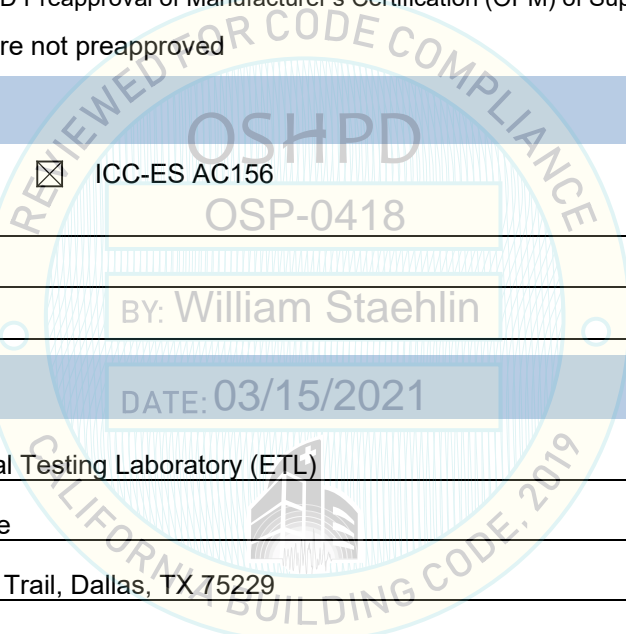
Telephone: (844) 878-0200 Email: acoughlin@structint.com

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): _____



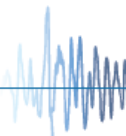
Testing Laboratory

Company Name: Environmental Testing Laboratory (ETL)

Contact Name: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas, TX 75229

Telephone: (972) 247-9657 Email: jeremy@etldallas.com





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

Seismic Parameters

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

Design Basis of Equipment or Components (Fp/Wp) = 1.5 (SDS = 2.00); 1.03 (SDS = 2.28)

SDS (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1); 2.28 (z/h = 0)

ap (In-structure equipment or component amplification factor) = 2.5

Rp (Equipment or component response modification factor) = 6.0

Omega_0 (System overstrength factor) = 2

Ip (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0 (SDS = 2.00); 0.0 (SDS = 2.28)

Equipment or Component Natural Frequencies (Hz) = See Attachment

Overall dimensions and weight (or range thereof) = See Attachment

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

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

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

SD1 (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) =

Omega_0 (System overstrength factor) = by: William Staehlin

Cd (Deflection amplification factor) =

Ip (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, 2015: [] Yes [X] No

List of Attachments Supporting Special Seismic Certification

[X] Test Report(s) [] Drawings [] Calculations [X] Manufacturer's Catalog

[X] Other(s) (Please Specify): Product Matrices

OSHPD Approval (For Office Use Only) - Approval Expires on December 31, 2025

Signature: [Handwritten Signature]

Date: 03-15-2021

Print Name: William Staehlin

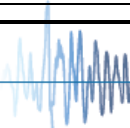
Title: Senior Structural Engineer

Special Seismic Certification Valid Up to : SDS (g) = See Above

z/h = See Above

Condition of Approval (if applicable):

[Blank lines for condition of approval]



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 1	
Model Line: G, XRED, CUE, XRUD							
Certified Product Construction Summary: All: Direct Drive; Aluminum or Composite Wheel (composite available on G 60-95); Fan Shaft; Aluminum Motor Cover; Drive Assembly Vibration Isolators; Birdscreen G: Lower Band; Curb Cap; Internal Conduit Chase; Aluminum Fan Shroud CUE: Galv. Steel Internal Supports; Leakproof Construction; Drain Trough; Lifting Points; HP (high pressure wheel)							
Certified Options Summary: All: Disconnect Switch; Curb Seal; Speed Controlles; Extended Lube Lines; Tie Down Points; UL-smoke control; UL 705 CUE: UL 762; Backdraft Dampers; Hinged Base; Grease Trap; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "G" with "XRED" or "VECD" and "CUE" with "XRUD" or "VUCD" for model number)							
Mounting Configuration: Base Mounted - Rigid on Curb up to 42" Tall Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code:		CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00 g$ $z/h=1.0$ $S_{DS} = 2.28 g$ $z/h=0.0$ $I_p = 1.5$	
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Greenheck "G"	G-060	20	20	13.5	20	UUT: 13 lbs./on 18" curb	3
	G-065	20	20	13.5	20		Interp
	G-070	20	20	13.5	22		Interp
	G-075	20	20	13.5	25		Interp
	G-080	22	22	16	35		Interp
	G-085	22	22	16	35		Interp
	G-090	22	22	16	40		Interp
	G-095	22	22	16	42		46
	G-097	25	25	34	65		Interp
	G-098	25	25	34	65		Interp
Accurex "XRED"	G-099	25	25	34	75		Interp
	G-103/G-100	25	25	30	95		Interp
Venco "VECD"	G-103HP/G-100HP	25	25	30	95		Interp
	G-123/G-120	25	25	30	105		Interp
	G-133/G-130	29	29	30	110		Interp
	G-14/G-140	29	29	36	135		Interp
	G-143HP/G-140HP	29	29	36	135		Interp
	G-163/G-160	29	29	38	165		Interp
	G-160HP	29	29	38	145		Interp
	G-183/G-180	36	36	40	180		Interp
	G-203/G-200	36	36	40	205	UUT: 229 lbs with 42" curb	19

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 1	
Model Line: G, XRED, CUE, XRUD							
Certified Product Construction Summary: All: Direct Drive; Aluminum or Composite Wheel (composite available on G 60-95); Fan Shaft; Aluminum Motor Cover; Drive Assembly Vibration Isolators; Birdscreen G: Lower Band; Curb Cap; Internal Conduit Chase; Aluminum Fan Shroud CUE: Galv. Steel Internal Supports; Leakproof Construction; Drain Trough; Lifting Points; HP (high pressure wheel)							
Certified Options Summary: All: Disconnect Switch; Curb Seal; Speed Controlles; Extended Lube Lines; Tie Down Points; UL-smoke control; UL 705 CUE: UL 762; Backdraft Dampers; Hinged Base; Grease Trap; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "G" with "XRED" or "VECD" and "CUE" with "XRUD" or "VUCD" for model number)							
Mounting Configuration: Base Mounted - Rigid on Curb up to 42" Tall Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code:		CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00\text{ g}$ $z/h=1.0$ $S_{DS} = 2.28\text{ g}$ $z/h=0.0$ $I_p = 1.5$	
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Greenheck "CUE"	CUE-60	19	19	16	35		Interp
	CUE-65	19	19	16	35		Interp
	CUE-70	19	19	16	36		Interp
	CUE-75	19	19	16	38		Interp
	CUE-80	21	21	17	45		Interp
	CUE-85	21	21	17	45		Interp
	CUE-90	21	21	17	50		Interp
	CUE-95	21	21	17	55	UUT: 79 lbs with 42" curb	21
	CUE-98	25	25	31.5	65		Interp
	CUE-99	25	25	31.5	75		Interp
Accurex "XRUD"	CUE-101/CUE-100	25	25	31.5	75		Interp
	CUE-101HP/CUE-100HP	25	25	31.5	95		Interp
Venco "VECD"	CUE-121/CUE-120	25	25	31.5	102		Interp
	CUE-131/CUE-130	25	25	31.5	110		Interp
	CUE-141/CUE-140	29	29	31.5	110		Interp
	CUE-161	29	29	31.5	125		Interp
	CUE-161HP/CUE-160HP	29	29	31.5	125		Interp
	CUE-180	36	36	31.5	138		Interp
	CUE-180HP	36	36	31.5	138		Interp
	CUE-200	36	36	31.5	144	UUT: 144 lbs./on 12" curb	2

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 2	
Model Line: GB, XREB, CUBE, XRUB							
Certified Product Construction Summary:							
All: Belt Drive; Al. Wheel; Fan Shaft; Al. Motor Cover; Drive Assembly Vibration Isolators; Birdscreen; HP (high pressure wheel)							
GB: Lower Band; Curb Cap; Internal Conduit Chase; Aluminum Fan Shroud							
CUBE: Galv. Steel Internal Supports; Leakproof Construction; Drain Trough; Lifting Points							
Certified Options Summary:							
All: Disconnect Switches; Vari-Green Drive; Curb Seal; Extended Lube Lines; Tie Down Points; UL-smoke control; UL 705							
GB: Steel Wheel. CUBE: UL 762; Backdraft Dampers; Hinged Base; Steel Wheel; Grease Trap; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "GB" with "XREB" or "VECB" and "CUBE" with "XRUB" or "VUCB" for model number)							
Mounting Configuration:							
Base Mounted - Rigid on Curb up to 42" Tall							
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00\text{ g}$ $z/h=1.0$		$I_p = 1.5$	
				$S_{DS} = 2.28\text{ g}$ $z/h=0.0$			
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Greenheck "GB"	GB-071/GB-097	25	25	34	49		Interp
	GB-081/GB-098	25	25	34	49		Interp
	GB-091/GB-099	25	25	34	49		Interp
	GB-101/GB-100	25	25	34	49		Interp
	GB-101HP/GB-100HP	25	25	34	49		Interp
	GB-121/GB-120	25	25	34	49		Interp
	GB-131/GB-130	29	29	36	60		Interp
	GB-141/GB-140	29	29	36	63		Interp
	GB-141HP/GB-140HP	29	29	36	63		Interp
	GB-161/GB-160	29	29	38	72		Interp
Accurex "XREB"	GB-161HP/GB-160HP	29	29	38	72		Interp
	GB-180	36	36	40	95		Interp
	GB-180HP	36	36	40	95		Interp
Venco "VECB"	GB-200	36	36	40	105		Interp
	GB-200HP	36	36	40	105		Interp
	GB-220	43	43	44	123		Interp
	GB-220HP	43	43	44	123		Interp
	GB-240	43	43	44	123		Interp
	GB-240HP	43	43	44	123		Interp
	GB-260	50	50	47	231		Interp
GB-300	50	50	47	242		Interp	
	GB-300HP	50	50	47	242		Interp
	GB-330	59	59	49	284		Interp
	GB-360	59	59	49	299		Interp

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 2	
Model Line: GB, XREB, CUBE, XRUB							
Certified Product Construction Summary:							
All: Belt Drive; Al. Wheel; Fan Shaft; Al. Motor Cover; Drive Assembly Vibration Isolators; Birdscreen; HP (high pressure wheel)							
GB: Lower Band; Curb Cap; Internal Conduit Chase; Aluminum Fan Shroud							
CUBE: Galv. Steel Internal Supports; Leakproof Construction; Drain Trough; Lifting Points							
Certified Options Summary:							
All: Disconnect Switches; Vari-Green Drive; Curb Seal; Extended Lube Lines; Tie Down Points; UL-smoke control; UL 705							
GB: Steel Wheel. CUBE: UL 762; Backdraft Dampers; Hinged Base; Steel Wheel; Grease Trap; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "GB" with "XREB" or "VECB" and "CUBE" with "XRUB" or "VUCB" for model number)							
Mounting Configuration:							
Base Mounted - Rigid on Curb up to 42" Tall							
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 2.00\text{ g}$ $z/h=1.0$		
					$S_{DS} = 2.28\text{ g}$ $z/h=0.0$		
					$I_p = 1.5$		
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Greenheck "GB" Accurex "XREB" Venco "VECB"	GB-360HP	59	59	50	299		Interp
	GB-420	66	66	55	458		Interp
	GB-480	74	74	58	560		Interp
	GB-500	83	83	61	881	UUT: 881 lbs with 30" curb	20
	GB-540	86	86	61	634	UUT: 634 lbs/on 24" curb	6
Greenheck "CUBE" Accurex "XRUB" Venco "VUCB"	CUBE-98	25	25	26.5	75	UUT: 53 lbs./on 24" curb	5
	CUBE-99	25	25	36	75		Interp
	CUBE-101/CUBE100	25	25	36	75		Interp
	CUBE-101HP/CUBE-100HP	25	25	36	80		Interp
	CUBE-121/CUBE-120	25	25	36	95		Interp
	CUBE-131/CUBE-130	25	25	36	102		Interp
	CUBE-141/CUBE-140	29	29	40	102		Interp
	CUBE-141HP/CUBE-140HP	29	29	40	125		Interp
	CUBE-161/CUBE-160	29	29	40	125		Interp
	CUBE-161HP/CUBE-160HP	29	29	40	128		Interp
	CUBE-161XP/CUBE-160XP	29	29	40	135		Interp
	CUBE-180	36	36	42	135		Interp
	CUBE-180HP	36	36	42	148		Interp
	CUBE-200	36	36	42	148		Interp
	CUBE-200HP	36	36	42	156		Interp
	CUBE-220	43	43	44	156		Interp
CUBE-240	50	50	48	185		Interp	
CUBE-240HP	50	50	48	185		Interp	
CUBE-240XP	50	50	48	190		Interp	

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)	TABLE 2
Model Line: GB, XREB, CUBE, XRUB	

Certified Product Construction Summary:
All: Belt Drive; Al. Wheel; Fan Shaft; Al. Motor Cover; Drive Assembly Vibration Isolators; Birdscreen; HP (high pressure wheel)
GB: Lower Band; Curb Cap; Internal Conduit Chase; Aluminum Fan Shroud
CUBE: Galv. Steel Internal Supports; Leakproof Construction; Drain Trough; Lifting Points

Certified Options Summary:
All: Disconnect Switches; Vari-Green Drive; Curb Seal; Extended Lube Lines; Tie Down Points; UL-smoke control; UL 705
GB: Steel Wheel. **CUBE:** UL 762; Backdraft Dampers; Hinged Base; Steel Wheel; Grease Trap; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "GB" with "XREB" or "VECB" and "CUBE" with "XRUB" or "VUCB" for model number)

Mounting Configuration:
 Base Mounted - Rigid on Curb up to 42" Tall
 Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.00\text{ g}$ $z/h=1.0$ $I_p = 1.5$
 $S_{DS} = 2.28\text{ g}$ $z/h=0.0$

Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Greenheck "CUBE"	CUBE-300	50	50	48	295		Interp
	CUBE-300HP	50	50	48	295		Interp
	CUBE-300XP	50	50	51	351		Interp
Accurex "XRUB"	CUBE-360	59	59	51	425		Interp
	CUBE-360HP	59	59	51	428		Interp
	CUBE-360XP	59	59	51	460		Interp
Venco "VUCB"	CUBE-420	66	66	51	526		Interp
	CUBE-480	76	76	51	603	UUT: 603 lbs./on 18" curb	1

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 3		
Model Line: CW, XSED, CUE, XRUD								
Certified Product Construction Summary: Direct Drive; Al or Composite Wheel (composite available on CW 60-95); Neoprene Pads between Drive System & Housing; Fan Shaft; Al Motor Cover; Galv. Steel Internal Supports; Leakproof Construction; Lifting Points; HP (high pressure wheel)								
Certified Options Summary: All: Disconnect Switches; Speed Controllers; Curb Seal; UL 705 & 762; Extended Lube Lines; Birdscreen; Backdraft Dampers CW: Galv. Mounting Plate; Heat Baffle. CUE: Drain Trough; Tie Down Points; Hinged Base; Grease Trap; Grease Containment Pan; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "CW" with "XSED" or "VWCD" and "CUE" with "XRUD" or "VUCD" for model number)								
Mounting Configuration: CUE: Wall Mounted - Rigid on Curb up to 12"; CW: Wall Mounted - Rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.								
Building Code:		CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00\text{ g}$ $z/h=1.0$ $S_{DS} = 2.28\text{ g}$ $z/h=0.0$ $I_p = 1.5$		
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT	
		Depth	Width	Height				
Greenheck "CW"	CW-60	16	16	13.3	20	UUT: 17 lbs.	10	
	CW-65	19	19	13.3	20		Interp	
	CW-70	19	19	13.3	20		Interp	
	CW-75	19	19	13.3	20		Interp	
	CW-80	21	21	17	30		Interp	
	CW-85	21	21	17	30		Interp	
	CW-90	21	21	17	30		Interp	
	CW-95	21	21	17	30		Interp	
	CW-98	25	25	30	61		Interp	
	CW-99	25	25	30	61		Interp	
	Accurex "XSED"	CW-101	25	25	30	61		Interp
		CW-101HP	25	25	30	61		Interp
		CW-121	25	25	30	73		Interp
	Venco "VWCD"	CW-131	25	25	30	73		Interp
		CW-141	29	29	30	93		Interp
		CW-141HP	29	29	30	93		Interp
		CW-161	29	29	30	93		Interp
		CW-161HP	29	29	30	93		Interp
		CW-180	36	36	30	140		Interp
CW-180HP		36	36	30	140		Interp	
CW-200	36	36	30	148	UUT: 148 lbs.	7		
"CUE"	CUE-60	19	19	16	35		Interp	
"XRUD"	CUE-65	19	19	16	35		Interp	
"VUCD"	CUE-70	19	19	16	36		Interp	

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 3		
Model Line: CW, XSED, CUE, XRUD								
Certified Product Construction Summary: Direct Drive; Al or Composite Wheel (composite available on CW 60-95); Neoprene Pads between Drive System & Housing; Fan Shaft; Al Motor Cover; Galv. Steel Internal Supports; Leakproof Construction; Lifting Points; HP (high pressure wheel)								
Certified Options Summary: All: Disconnect Switches; Speed Controllers; Curb Seal; UL 705 & 762; Extended Lube Lines; Birdscreen; Backdraft Dampers CW: Galv. Mounting Plate; Heat Baffle. CUE: Drain Trough; Tie Down Points; Hinged Base; Grease Trap; Grease Containment Pan; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "CW" with "XSED" or "VWCD" and "CUE" with "XRUD" or "VUCD" for model number)								
Mounting Configuration: CUE: Wall Mounted - Rigid on Curb up to 12"; CW: Wall Mounted - Rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.								
Building Code:		CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00 g$ $z/h=1.0$ $S_{DS} = 2.28 g$ $z/h=0.0$ $I_p = 1.5$		
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT	
		Depth	Width	Height				
Greenheck "CUE"	CUE-75	19	19	16	38		Interp	
	CUE-80	21	21	17	45		Interp	
	CUE-85	21	21	17	45		Interp	
	CUE-90	21	21	17	50		Interp	
	CUE-95	21	21	17	55	UUT22: 54 lbs. w/ 12" curb; UUT47: 50.5 lbs. w/ 12" curb; UUT48: 29.5 w/2" bracket	22,47,48	
	CUE-98	25	25	31.5	65		Interp	
	CUE-99	25	25	31.5	75		Interp	
	Accurex "XRUD"	CUE-101/CUE-100	25	25	31.5	75		Interp
		CUE-101HP/CUE-100HP	25	25	31.5	95		Interp
	Venco "VUCD"	CUE-121/CUE-120	25	25	31.5	102		Interp
CUE-131/CUE-130		25	25	31.5	110		Interp	
CUE-141/CUE-140		29	29	31.5	110		Interp	
CUE-161/CUE-160		29	29	31.5	125		Interp	
CUE-161HP/CUE-160HP		29	29	31.5	125		Interp	
CUE-180		36	36	31.5	138		Interp	
	CUE-180HP	36	36	31.5	138		Interp	
	CUE-200	36	36	31.5	144	UUT: 204 lbs with 12" curb	23	

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 4		
Model Line: CWB, XSEB, CUBE, XRUB								
Certified Product Construction Summary: Belt Drive; Aluminum Wheel; Neoprene Pads between Drive System & Housing; Fan Shaft; Aluminum Motor Cover; Galv. Steel Internal Supports; Leakproof Construction; Lifting Points; HP (high pressure wheel)								
Certified Options Summary: All: Disconnect Switches; Curb Seal; UL 705 & 762; Extended Lube Lines; Birdscreen; Backdraft Dampers. CWB: Galv. Mounting Plate; Heat Baffle. CUBE: Steel Wheel; Drain Trough; Tie Down Points; Hinged Base; Grease Containment Pan; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "CWB" with "XSEB" or "VWCB" and "CUBE" with "XRUB" or "VUCB" for model number)								
Mounting Configuration: CUBE: Wall Mounted - Rigid on Curb up to 12"; CWB: Wall Mounted - Rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.								
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 2.00 g$ $z/h=1.0$	$I_P = 1.5$		
					$S_{DS} = 2.28 g$ $z/h=0.0$			
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT	
		Depth	Width	Height				
Greenheck "CWB"	CWB-98	26	26	25	60	UUT: 53 lbs	8	
	CWB-99	26	26	36	60		Interp	
	CWB-101	26	26	36	60		Interp	
	CWB-101HP	26	26	36	60		Interp	
	CWB-121	26	26	36	75		Interp	
	CWB-131	26	26	36	75		Interp	
	CWB-141	29	29	39	90		Interp	
	CWB-141HP	29	29	39	90		Interp	
	Accurex "XSEB"	CWB-161	29	29	39	97		Interp
		CWB-161HP	29	29	39	97		Interp
	Venco "VWCB"	CWB-180	36	36	39	138		Interp
		CWB-180HP	36	36	39	138		Interp
		CWB-200	36	36	39	156		Interp
		CWB-200HP	36	36	39	156		Interp
		CWB-220	43	43	39	194		Interp
		CWB-220HP	43	43	39	194		Interp
	Venco "VWCB"	CWB-240	43	43	39	210		Interp
		CWB-240HP	43	43	39	210		Interp
CWB-300		51	51	39	328	UUT: 328 lbs	9	
"CUBE" "XRUB" "VUCB"		CUBE-98	25	25	36	75		Interp
		CUBE-99	25	25	36	75		Interp
		CUBE-101/CUBE-100	25	25	36	75		Interp
	CUBE-101HP/CUBE-100HP	25	25	36	80		Interp	
	CUBE-121/CUBE-120	25	25	36	95		Interp	

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)						TABLE 4	
Model Line: CWB, XSEB, CUBE, XRUB							
Certified Product Construction Summary: Belt Drive; Aluminum Wheel; Neoprene Pads between Drive System & Housing; Fan Shaft; Aluminum Motor Cover; Galv. Steel Internal Supports; Leakproof Construction; Lifting Points; HP (high pressure wheel)							
Certified Options Summary: All: Disconnect Switches; Curb Seal; UL 705 & 762; Extended Lube Lines; Birdscreen; Backdraft Dampers. CWB: Galv. Mounting Plate; Heat Baffle. CUBE: Steel Wheel; Drain Trough; Tie Down Points; Hinged Base; Grease Containment Pan; Cleanout Port. Fans are also sold under Accurex and Venco Brands (replace "CWB" with "XSEB" or "VWCB" and "CUBE" with "XRUB" or "VUCB" for model number)							
Mounting Configuration: CUBE: Wall Mounted - Rigid on Curb up to 12"; CWB: Wall Mounted - Rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00 g$ $z/h=1.0$		$I_P = 1.5$	
				$S_{DS} = 2.28 g$ $z/h=0.0$			
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Greenheck "CUBE"	CUBE-131/CUBE-130	25	25	36	102		Interp
	CUBE-141/CUBE-140	29	29	40	102		Interp
	CUBE-141HP/CUBE-140HP	29	29	40	125		Interp
	CUBE-161/CUBE-160	29	29	40	125		Interp
	CUBE-161HP/CUBE160HP	29	29	40	128		Interp
	CUBE-161XP/CUBE-160XP	29	29	40	135		Interp
Accurex "XRUB"	CUBE-180	36	36	42	135		Interp
	CUBE-180HP	36	36	42	148		Interp
	CUBE-200	36	36	42	148		Interp
	CUBE-200HP	36	36	42	156		Interp
Venco "VUCB"	CUBE-220	43	43	44	156		Interp
	CUBE-240	50	50	48	185		Interp
	CUBE-240HP	50	50	48	185		Interp
	CUBE-240XP	50	50	48	190		Interp
	CUBE-300	50	50	48	295		Interp
	CUBE-300HP	50	50	48	295		Interp
	CUBE-300XP	50	50	48	341	UUT: 355 lbs with 12" curb	24

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex) Table Description: Fan Wheels Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB		TABLE 5			
Building Code: CBC 2019 Seismic Certification Limits:		$S_{DS} = 2.00 g \quad z/h=1.0$ $S_{DS} = 2.28 g \quad z/h=0.0$		$I_P = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT
Fan Wheels (Base mounted models)	Greenheck	8" Composite	Composite, Backward curved		Extrap.
		11" Composite	Composite, Backward curved		46
		8" Al. Riveted	Aluminum, Backward curved		Interp
		8.25" Al. Riveted	Aluminum, Backward curved		3
		11" Al. Riveted	Aluminum, Backward curved		21
		18" Al. Riveted	Aluminum, Backward inclined		Interp
		21" Al. Riveted	Aluminum, Backward inclined		2
		25" Al. Riveted	Aluminum, Backward inclined		Interp
		31" Al. Riveted	Aluminum, Backward inclined		Interp
		36" Al. Riveted	Aluminum, Backward inclined		Interp
		43" Al. Riveted	Aluminum, Backward inclined		Interp
		49" Al. Riveted	Aluminum, Backward inclined		Interp
		55" Al. Riveted	Aluminum, Backward inclined		6, 20
		10" Al. Welded	Aluminum, Backward inclined		5
		12" Al. Welded	Aluminum, Backward inclined		Interp
		14" Al. Welded	Aluminum, Backward inclined		Interp
		16" Al. Welded	Aluminum, Backward inclined		Interp
		18" Al. Welded	Aluminum, Backward inclined		Interp
		21" Al. Welded	Aluminum, Backward inclined		19
		10" St. Riveted	Carbon Steel, Backward inclined		Interp
12" St. Riveted	Carbon Steel, Backward inclined		Interp		
14" St. Riveted	Carbon Steel, Backward inclined		Interp		
16" St. Riveted	Carbon Steel, Backward inclined		Interp		

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)		Table Description: Fan Wheels			TABLE 5
Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB					
Building Code: CBC 2019		Seismic Certification Limits:		$I_p = 1.5$	
		$S_{DS} = 2.00 g \quad z/h=1.0$			
		$S_{DS} = 2.28 g \quad z/h=0.0$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Fan Wheels (Base mounted models)	Greenheck	18" St. Riveted	Carbon Steel, Backward inclined		Interp
		21" St. Riveted	Carbon Steel, Backward inclined		Interp
		25" St. Riveted	Carbon Steel, Backward inclined		Interp
		31" St. Riveted	Carbon Steel, Backward inclined		Interp
		36" St. Riveted	Carbon Steel, Backward inclined		Interp
		43" St. Riveted	Carbon Steel, Backward inclined		Interp
		49" St. Riveted	Carbon Steel, Backward inclined		1
Fan Wheels (Wall mounted models)	Greenheck	8" Composite	Composite, Backward curved		Extrap.
		11" Composite	Composite, Backward curved		47,48
		8" Al. Riveted	Aluminum, Backward curved		10
		8.25" Al. Riveted	Aluminum, Backward curved		Interp
		11" Al. Riveted	Aluminum, Backward curved		22
		18" Al. Riveted	Aluminum, Backward inclined		Interp
		21" Al. Riveted	Aluminum, Backward inclined		7
		25" Al. Riveted	Aluminum, Backward inclined		Interp
		31" Al. Riveted	Aluminum, Backward inclined		9
		10" Al. Welded	Aluminum, Backward inclined		8
		12" Al. Welded	Aluminum, Backward inclined		Interp
		14" Al. Welded	Aluminum, Backward inclined		Interp
		16" Al. Welded	Aluminum, Backward inclined		Interp
		18" Al. Welded	Aluminum, Backward inclined		Interp
		21" Al. Welded	Aluminum, Backward inclined		23
25" Al. Welded	Aluminum, Backward inclined		Interp		

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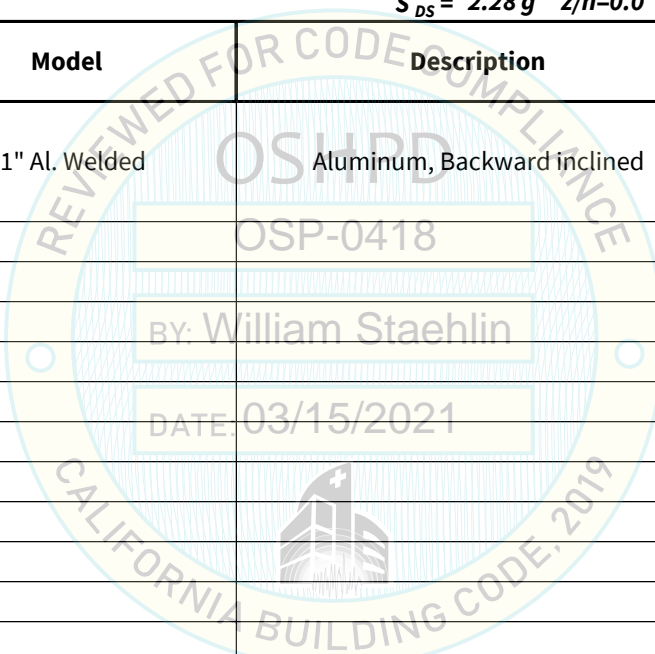
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**SPECIAL SEISMIC CERTIFICATION
CERTIFIED SUBCOMPONENT MATRIX**

TRU PROJECT NO. 1900532



Manufacturer: Greenheck (Accurex)		Table Description: Fan Wheels		TABLE 5	
Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB					
Building Code: CBC 2019		Seismic Certification Limits:		$I_p = 1.5$	
		$S_{DS} = 2.00 g \quad z/h=1.0$			
		$S_{DS} = 2.28 g \quad z/h=0.0$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Fan Wheels (Wall mounted models)	Greenheck	31" Al. Welded	Aluminum, Backward inclined		24



SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex) Table Description: Motors Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB		TABLE 6			
Building Code: CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00 g \quad z/h=1.0$ $S_{DS} = 2.28 g \quad z/h=0.0$	
Component Type	Manufacturer	Model	Description	Notes	UUT
Motors (Base mounted models)	Baldor	48/56	1/30HP, 115 - 460V; Carbon steel frame		Interp
			1/3 HP, 115V - 460V; Carbon steel frame		21
		143T	2 HP, 115V - 460V; Carbon steel frame		19
		182T	5HP, 208-600V; Carbon steel frame		Interp
		184T	7.5HP, 208-600V; Carbon steel frame		Interp
		213T	10HP, 208-600V; Carbon steel frame		Interp
	215T	15HP, 208-600V; Carbon steel frame		20	
	Vari-Green	48	1/6 HP, 115V, EC; Carbon steel frame		46
Motors (Wall mounted models)	Vari-Green	48	1/6 HP, 115V, EC; Carbon steel frame		47,48
	Baldor	48/56	1/30HP, 115 - 460V; Carbon steel frame		22
			1/3 HP, 115V - 460V; Carbon steel frame		Interp
		143T	2 HP, 115V - 460V; Carbon steel frame		23
		182T	5HP, 208-600V; Carbon steel frame		Interp
	184T	7.5HP, 208-600V; Carbon steel frame		24	

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX



TRU PROJECT NO. 1900532

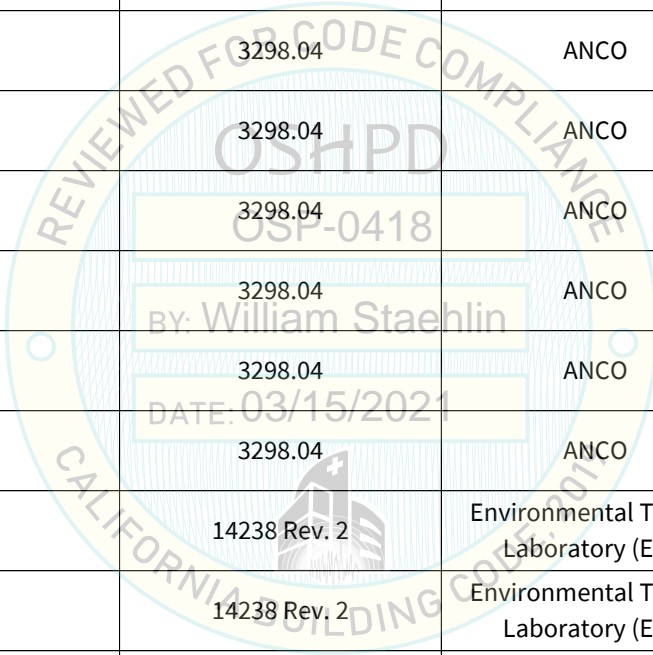
Manufacturer: Greenheck (Accurex) Table Description: Misc Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB		TABLE 7			
Building Code: CBC 2019		Seismic Certification Limits:		$S_{DS} = 2.00 g \quad z/h=1.0$ $S_{DS} = 2.28 g \quad z/h=0.0$	
				$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT
Disconnect Switches (Base mt. models)	Square-D Disconnect	NEMA-1	Carbon steel enclosure		19,20
		NEMA-3R/4	Carbon steel enclosure		20
Disconnect Switches (Wall mt. models)	Square-D Disconnect	NEMA-1	Carbon steel enclosure		22,23,24, 47, 48
		NEMA-3R/4	Carbon steel enclosure		24
Speed Controllers (Base mt. models)	Raffel Systems	6A	6 Amp controller in single gang box		21
		8A	8 Amp controller in single gang box		Interp
		10A	10 Amp controller in single gang box		19
Speed Controllers (Wall mt. models)	Raffel Systems	6A	6 Amp controller in single gang box		22,47,48
		8A	8 Amp controller in single gang box		Interp
		10A	10 Amp controller in single gang box		23
Vari-Green Drive (Base mt. models)	Greenheck	208 - 230V	NEMA 4X		20
		460V	NEMA 4X		Interp.
Vari-Green Drive (Wall mt. models)	Greenheck	208 - 230V	NEMA 4X		Interp.
		460V	NEMA 4X		24

UNIT UNDER TEST (UUT) SUMMARY SHEET



TRU PROJECT NO. 1900532

Manufacturer:		Greenheck (Accurex)				
Model Line:		G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB				
UUT	Unit Description	Report Number	Testing Laboratory	S _{DS}	z/h	I _p
1	S-CUBE-480-75-F	3298.04	ANCO	2.28	1	1.5
2	CUE-200-B	3298.04	ANCO	2.28	1	1.5
3	G-060-D	3298.04	ANCO	2.28	1	1.5
5	CUBE-098-4	3298.04	ANCO	2.28	1	1.5
6	GB-540-150	3298.04	ANCO	2.28	1	1.5
7	CW-200-B	3298.04	ANCO	2.28	1	1.5
8	CWB-098-4	3298.04	ANCO	2.28	1	1.5
9	CWB-300-30	3298.04	ANCO	2.28	1	1.5
10	CW-060-D	3298.04	ANCO	2.28	1	1.5
19	G-203-B	14238 Rev. 2	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
20	GB-500-150	14238 Rev. 2	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
21	CUE-095-E	14238 Rev. 2	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
22	CUE-095-E	14238 Rev. 2	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
23	CUE-200-B	14238 Rev. 2	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
24	CUBE-300XP-75	14238 Rev. 2	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
46	G-095-V6-6-X	15332 Rev. 1	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
Notes:						



**UNIT UNDER TEST (UUT)
SUMMARY SHEET**

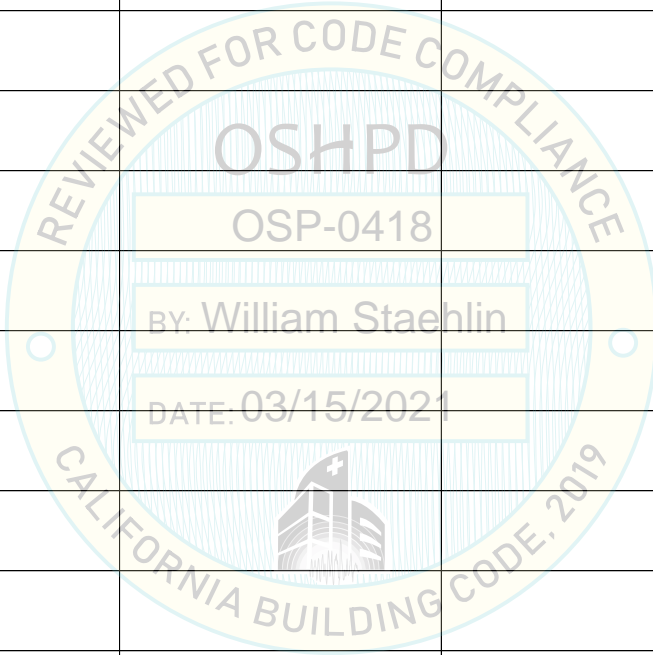


TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)

Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB

UUT	Unit Description	Report Number	Testing Laboratory	S _{Ds}	z/h	I _p
47	CUE-095-US-6-X	15332 Rev. 1	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5
48	CUE-095-U6-6-X	15332 Rev. 1	Environmental Testing Laboratory (ETL)	2.0 3.2	1 0	1.5



Notes:

UNIT UNDER TEST (UUT) SUMMARY SHEET



TRU PROJECT NO. 1900532

Manufacturer: Greenheck (Accurex)	UUT 1
Model Line: S-CUBE	
Model Number: S-CUBE-480-75-F Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, steel wheel, belt drive upblast exhaust fan

Options/Subcomponent Summary:
Dual drives; UL-listed power vents for smoke control systems (500F/4 hrs + 100f/15 min); NEMA 3R junction box with switch; Heat baffle; Bearings w/grease fittings (L10 life of 100,000 hours - L50 average life 500,000 hours)

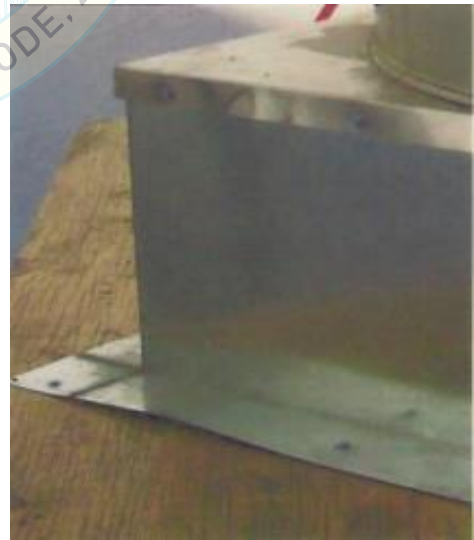
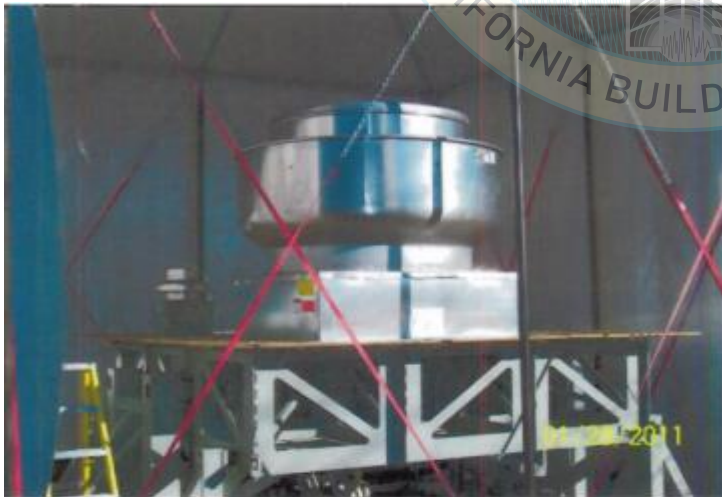
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
603	76	76	51	3.8	3.5	5.8

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Base mounted rigid on GPF57-G18, 18" roof curb using ungraded 1/4" sheet metal screws (10 per side) or at 1/2 the spacing specified in Greenheck installation manual (required upgrade). Roof curb mounted to table using 1/4" ungraded sheet metal screws at 16" o.c. 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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 2
Model Line: CUE	
Model Number: CUE-200-B Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, direct drive upblast exhaust fan

Options/Subcomponent Summary:
NEMA 1 junction box with switch

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
144	36	36	31.5	7.8	8.3	13.8

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Base mounted rigid on GPF30-G12, 12" roof curb using ungraded 1/4" sheet metal screws (10 per side) or at 1/2 the spacing specified in Greenheck installation manual (required upgrade). Roof curb mounted to table using 1/4" ungraded sheet metal screws at 16" o.c. 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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 3
Model Line: G	
Model Number: G-060-D Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, direct drive downblast fan.

Options/Subcomponent Summary:
NEMA 1 junction box with switch

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
13	20	20	13.5	16.5	16.5	15.3

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Base mounted rigid on GPR17-G18, 18" roof curb using ungraded 1/4" sheet metal screws at spacing specified in Greenheck installation manual. Roof curb mounted to table using 1/4" ungraded sheet metal screws at 16" o.c.
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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 5
Model Line: CUBE	
Model Number: CUBE-098-4 Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, belt driven upblast exhaust fan

Options/Subcomponent Summary:
NEMA 1 junction box with switch

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
53	25	25	26.5	7.1	4.9	15.3

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Base mounted rigid on GPFV-19-G24, 24" roof curb using ungraded 1/4" sheet metal screws at spacing specified in Greenheck installation manual. Roof curb mounted to table using 1/4" ungraded sheet metal screws at 16" o.c.
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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 6
Model Line: GB	
Model Number: GB-540-150 Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, belt drive downblast fan

Options/Subcomponent Summary:
NEMA 1 junction box with switch; Bearings with grease fittings (L10 life of 100,000 hours - L50 average life of 500,000 hours)

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
634	86	86	61	4.1	3.6	4.8

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Base mounted rigid on SDCurb-64-S24, 24" roof curb using ungraded 1/4" sheet metal screws at spacing specified in Greenheck installation manual. Roof curb mounted to table using 1/4" ungraded sheet metal screws at 16" o.c.
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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 7
Model Line: CW	
Model Number: CW-200-B Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, direct drive wall mount exhaust fan

Options/Subcomponent Summary:
NEMA 1 junction box with switch; Birdscreen (galvanized)

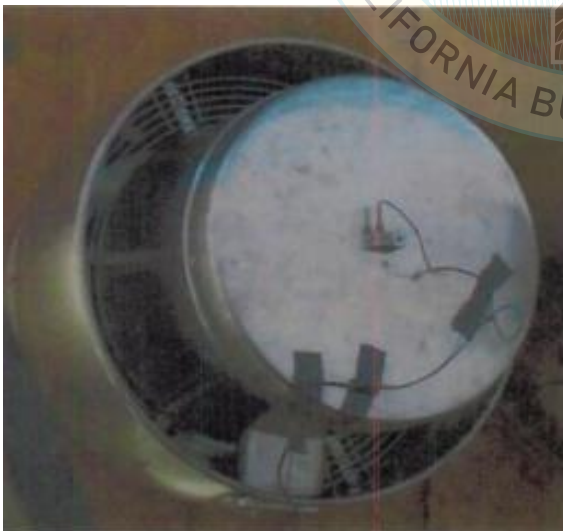
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
148	36	36	30	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Wall mounted rigid using (6) 1/4" lag screws into plywood at locations per Greenheck installation manual. Unit mounted to rigid simulated wall fixture.

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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 8
Model Line: CWB	
Model Number: CWB-098-4 Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, belt drive wall mount exhaust fan

Options/Subcomponent Summary:
NEMA 1 junction box with switch, Birdscreen (galvanized)

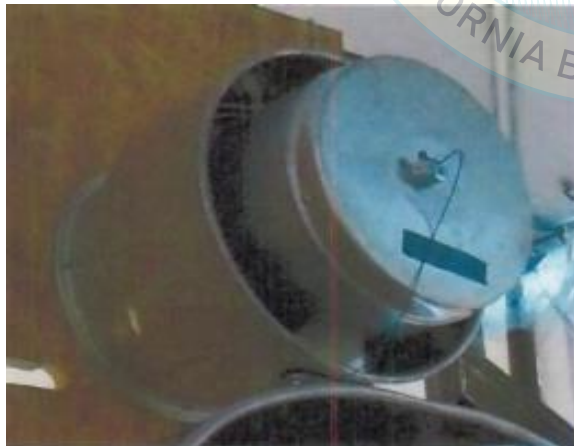
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
53	26	26	25	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Wall mounted rigid using (4) 1/4" lag screws into plywood at locations per Greenheck installation manual. Unit mounted to rigid simulated wall fixture
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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 9
Model Line: CWB	
Model Number: CWB-300-30 Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, belt drive wall mount exhaust fan

Options/Subcomponent Summary:
NEMA 1 junction box with switch, Birdscreen (galvanized), Bearings with grease fittings (L10 life of 100,000 hours - L50 average life of 500,000 hours)

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
328	51	51	39	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information								
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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:




Wall mounted rigid using (6) 1/4" lag screws into plywood at locations per Greenheck installation manual. Unit mounted to rigid simulated wall fixture.
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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 10
Model Line: CW	
Model Number: CW-060-D Serial Number: N/A	

Product Construction Summary:
Spun aluminum housing, aluminum wheel, direct drive wall mount exhaust fan

Options/Subcomponent Summary:
NEMA 1 junction box with switch, Birdscreen (galvanized)

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
17	15.8	15.8	13.3	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61

Test Mounting Details:



Wall mounted rigid using (4) 1/4" lag screws into plywood at locations per Greenheck installation manual. Unit mounted to rigid simulated wall fixture.

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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 19
Model Line: G	
Model Number: G-203-B Serial Number: N/A	

Product Construction Summary:
Aluminum housing; Backward inclined wheel; Aluminum curb cap with prepunched mounting holes; Birdscreen; Ball bearing motors (sizes 100-180); Sleeve bearing motors (sizes 60-95); Motor isolated on shock mounts; Corrosion resistant fasteners

Options/Subcomponent Summary:
Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPI-30-G42, Under sized 1.5"; Hinged base (attached); Foam curb seal (attached).

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
228.5	36	36	70	7.3	11.8	7.3

UUT Highest Passed Seismic Run Information									
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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85	
		3.2	0.0						

Test Mounting Details:



Base mounted rigid on 42" Roof Curb using (24) 1/4" self-tapping screws to attach fan to curb & (16) 5/16" Grade 8 bolts to attach curb to curb mount.
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. 1900532

Manufacturer:	Greenheck (Accurex)	UUT 20
Model Line:	GB	
Model Number:	GB-500-150	
Serial Number:		N/A

Product Construction Summary:
Aluminum housing; Backward inclined aluminum wheel; Curb cap with prepunched mounting holes; Motor and drives isolated on shock mounts; Birdscreen; Ball bearing motors; Adjustable motor pulley; Adjustable motor plate; Fan shaft mounted in ball bearing pillow blocks; Bearings meet or exceed temperature rating of fan; Static resistant belts; Corrosion resistant fasteners; Internal lifting lugs.

Options/Subcomponent Summary:
NEMA Premium Efficient Motor; Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPF-64-G30, Under sized 1.25"; Curb Extension-Galv., GPE-64-G12, Tray; Hood Hasps; Bearings with Grease Fittings, L10 life of 100,000 hrs.

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
881	83	83	93	30.4	29.3	>33.3

UUT Highest Passed Seismic Run Information									
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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85	
		3.2	0.0						

Test Mounting Details:



Base mounted rigid on 30" Roof Curb using (20) 1/4" self-tapping screws to attach fan to curb extension & (20) 1/4" self-tapping screws to attach curb extension to curb & (36) 5/16" self tapping screws attach curb to wood curb mount.
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. 1900532

Manufacturer:	Greenheck (Accurex)	UUT 21
Model Line:	CUE	
Model Number:	CUE-095-E	
Serial Number:		N/A

Product Construction Summary:
Aluminum housing; Backward inclined aluminum wheel; Aluminum Curb cap with prepunched mounting holes; Drain trough; Ball bearing motors (sizes 98-160), sleeve bearing motors (sizes 60-95); Motor isolated on shock mounts; Corrosion resistant fasteners.

Options/Subcomponent Summary:
Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPI-19-G42, Under sized 0.5"; Solid state speed control, 6 Amp, mounted and wired; Drain connection.

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
78.5	21	21	57	17.2	16.3	31.6

UUT Highest Passed Seismic Run Information								
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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85
		3.2	0.0					

Test Mounting Details:



Base mounted rigid on 42" Roof Curb using (16) 5/16" self-tapping screws to attach fan to curb & (12) 5/16" Grade 8 bolts to attach curb to curb mount.
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. 1900532

Manufacturer:	Greenheck (Accurex)	UUT 22
Model Line:	CUE	
Model Number:	CUE-095-E	
Serial Number:		N/A

Product Construction Summary:
Aluminum housing; Backward inclined aluminum wheel; Aluminum Curb cap with prepunched mounting holes; Drain trough; Ball bearing motors (sizes 98-160), sleeve bearing motors (sizes 60-95); Motor isolated on shock mounts; Corrosion resistant fasteners.

Options/Subcomponent Summary:
Sidewall Mounting: Fan configured for wall-mounted applications; Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPF-19-G42, Under sized 0.5"; Foam Curb Seal (attached); Solid state speed control, 6 Amp, mounted and wired; Galvanized Birdscreen.

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
54	21	21	27	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85
		3.2	0.0					

Test Mounting Details:



Wall mounted rigid on 12" curb using (16) 5/16" self-tapping screws to attach fan to curb & (12) 5/16" self-tapping screws to attach curb to wood curb mount.
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. 1900532

Manufacturer:	Greenheck (Accurex)	UUT 23
Model Line:	CUE	
Model Number:	CUE-200-B	
Serial Number:		N/A

Product Construction Summary:
Aluminum housing; Backward inclined aluminum wheel; Aluminum Curb cap with prepunched mounting holes; Drain trough; Ball bearing motors (sizes 98-160), sleeve bearing motors (sizes 60-95); Motor isolated on shock mounts; Corrosion resistant fasteners.

Options/Subcomponent Summary:
Motor VFD Rated without Shaft Grounding Protection; UL/cUL 705 Listed: "Power Ventilators"; Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPF-30-G12, Under sized 1.25"; Grease Trap (PN 475538); Aluminum Birdscreen; Clean-out Port.

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
204	36	36	41	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85
		3.2	0.0					

Test Mounting Details:



Wall mounted rigid on 12" curb using (24) 1/4" self-tapping screws to attach fan to curb & (16) 5/16" self-tapping screws to attach curb to wood curb mount.
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. 1900532

Manufacturer:	Greenheck (Accurex)	UUT 24
Model Line:	CUBE	
Model Number:	CUBE-300XP-75	
Serial Number:		N/A

Product Construction Summary:
Aluminum housing; Backward inclined aluminum wheel; Curb cap with prepunched mounting holes; Motor and drives isolated on shock mounts; Drain trough; Ball bearing motors; Adjustable motor pulley; Adjustable motor plate; Fan shaft mounted in ball bearing pillow blocks; Bearings meet or exceed temperature rating of fan; Static resistant belts; Corrosion resistant fasteners; Internal lifting lugs.

Options/Subcomponent Summary:
NEMA Premium Efficient Motor; Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPF-40-G12, Under sized 0.5"; Bearings with Grease Fittings, L10 life of 100,000 hrs; Clean-out Port

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
351	50	50	48	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information								
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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85
		3.2	0.0					

Test Mounting Details:



Wall mounted rigid on 12" curb using (24) 1/4" self-tapping screws to attach fan to curb & (24) 5/16" self-tapping screws to attach curb to wood curb mount.
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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 46
Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB	
Model Number: G-095-V6-6-X Serial Number: 15924553	

Product Construction Summary:
Aluminum housing; Backward curved composite wheel; Aluminum Curb cap with prepunched mounting holes; Drain trough; Ball bearing motors (sizes 98-160), sleeve bearing motors (sizes 60-95); Motor isolated on shock mounts; Corrosion resistant fasteners.

Options/Subcomponent Summary:
Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPI-30-G42, Motor- Vari -Green EC 1/6 H

UUT Properties						
Weight* (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
67	22	22	16	15.39	15.79	24.14

UUT Highest Passed Seismic Run Information									
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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85	
		3.2	0.0						

Test Mounting Details:



Base mounted rigid on 17.5" x 17.5" x 42" curb. Curb mounted to table with sixteen (16) 5/16" Grade 8 bolts with washers. UUT curb mounted to top of curb with sixteen (24) 1/4" Tek screws.
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. 1900532

Manufacturer:	Greenheck (Accurex)	UUT 47
Model Line:	G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB	
Model Number:	CUE-095-US-6-X	
Serial Number:		15924542

Product Construction Summary:
Aluminum housing; Backward curved composite wheel; Aluminum Curb cap with prepunched mounting holes; Drain trough; Ball bearing motors (sizes 98-160), sleeve bearing motors (sizes 60-95); Motor isolated on shock mounts; Corrosion resistant fasteners.

Options/Subcomponent Summary:
Sidewall Mounting: Fan configured for wall-mounted applications; Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., GPF-19-G42, Motor- Vari -Green EC 1/6 Hp, Under sized 0.5"; Foam Curb Seal (attached); Solid state speed control, 6 Amp, mounted and wired; Galvanized Birdscreen.

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
50.5	21	21	17	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information									
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 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	2.13	0.85	
		3.2	0.0						

Test Mounting Details:



Base mounted rigid on 19" x 19" x 12" curb (PN: GPF-19-G12) to rigid wall fixture. Weight includes curb weight. Curb mounted to wall with twelve (12) 1/4" x 1" lag screws. UUT mounted to top of curb with sixteen (16) 1/4" Tek screws
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. 1900532

Manufacturer: Greenheck (Accurex)	UUT 48
Model Line: G, XRED, GB, XREB, CW, XSED, CWB, XSEB, CUE, XRUD, CUBE, XRUB	
Model Number: CUE-095-U6-6-X Serial Number: 15924547	

Product Construction Summary:
Aluminum housing; Backward curved composite wheel; Aluminum Curb cap with prepunched mounting holes; Drain trough; Ball bearing motors (sizes 98-160), sleeve bearing motors (sizes 60-95); Motor isolated on shock mounts; Corrosion resistant fasteners.

Options/Subcomponent Summary:
Sidewall Mounting: Fan configured for wall-mounted applications; Switch: NEMA-1, Toggle; Junction boxed mounted and wired; Roof Curb-Galv., Motor- Vari -Green EC 1/6 Hp, wall bracket, Under sized 0.5"; Foam Curb Seal (attached); Solid state speed control, 6 Amp, mounted and wired; Galvanized Birdscreen.

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
29	21	21	17	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information									
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 2019	ICC-ES AC156 (2015)	2.0 3.2	1.0 0.0	1.5	3.2	2.4	2.13	0.85	

Test Mounting Details:



Rigid wall mounted to wall bracket on rigid wall fixture. Bracket mounted to wall with (12) 5/16" grade 8 bolts with washer. Unit mounted to bracket with (16) 1/4" Tek screws.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.