



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0395-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Twin City Fan Companies, Ltd.

Manufacturer's Technical Representative: Matt Settergren

Mailing Address: 5959 Trenton Lane North, Minneapolis, MN 55442-32374

Telephone: (763) 551-7535 Email: msettergren@tcf.com

Product Information

Product Name: Roof and Wall Exhausters

Product Type: Exhaust Centrifugal Fans

Product Model Number: Varies – See Attached Tables

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

General Description: Wall hung and roof curb mounted exhaust fans available in Direct and Belt Drive configurations.

Seismic enhancements made to the test units and modifications required to address anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid base mounted and rigid wall mounted

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John P. Giuliano

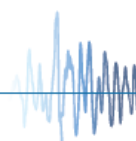
Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: 973-838-1780 Email: john.giuliano@thevmcgroup.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: 9/28/16

Title: President Company Name: The VMC Group





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY
OSH-FD-759 (REV 12/16/15)

Page 1 of 3

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

Company Name: The VMC Group

Name: Mr. Ken Tarlow California License Number: SE2851

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: 973-838-1780 Email: ken.tarlow@thevmcgroup.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): _____

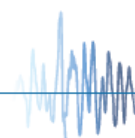
Testing Laboratory

Company Name: Twin City Fan Companies, Ltd Test Lab

Contact Name: Matt Settergren

Mailing Address: 5959 Trenton Lane North, Minneapolis, MN 55442-32374

Telephone: (763) 551-7535 Email: msettergren@tcf.com





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY
OSH-FD-759 (REV 12/16/15)

Page 2 of 3

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.5 ($S_{DS}=2.0g$, $z/h=1.0$); 1.13 ($S_{DS}=2.5g$, $z/h=0.0$)

S_{DS} (Design spectral response acceleration at short period, g) = 2.0 ($z/h=1.0$); 2.5 ($z/h=0.0$)

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

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0 ($S_{DS} = 2.0g$); 0.0 ($S_{DS} = 2.5g$)

Equipment or Component Natural Frequencies (Hz) = See Attached Tables

Overall dimensions and weight (or range thereof) = See Attached Tables

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

Design Basis of Equipment or Components (VW) = _____

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, 2015: ☐ 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, 2022

Signature: [Signature] Date: 11/3/2016

Print Name: M. R. Karim Title: SHFR

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

Condition of Approval (if applicable): _____

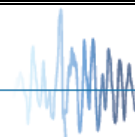


Table 1 - Certified Wall Mounted Centrifugal Exhausters

Twin City		Aerovent		Testing Scope	Max Dimensions (in)			Tested Weight (lb)	Max Weight (lb) ¹
Approved Model	Size	Approved Model	Size		Depth	Width	Height		
DCRW DCRWR	071B/072B/073B/073BE	ATDW ATDWR	071/072/073/073E	Extrapolated	26.44	22.00	22.00	---	91
	081B/082B/083B/083BE		081/082/083/083E		26.44	22.00	22.00	---	91
	091B/092B/093B/093BE		091/092/093/093E		28.13	22.00	22.00	---	111
	110B/110BE		110/110E		30.31	30.00	30.00	---	114
	120B/120BE		120/120E		29.19	30.00	30.00	---	117
	140B/140BE		140/140E	UUT 13-2	32.56	30.00	30.00	84	---
				UUT 13-1	38.56	30.00	30.00	86	---
	160B/160BE		160/160E	Interpolated	29.68	30.00	30.00	---	129
				31.81	30.00	30.00	---	160	
	180B/180BE		180/180E	UUT 14-2	39.17	36.00	36.00	138	---
UUT 14-1		39.17		36.00	36.00	150	---		
		Extrapolated	31.17	36.00	36.00	---	164		
BCRW BCRWR	110B	AWX AWXR	110	Extrapolated	30.56	30.00	30.00	---	140
	120B		120		29.19	30.00	30.00	---	145
	140B/140BHP		140/140HP		30.58	30.00	30.00	---	159
	160B/160BMP/160BHP		160/160MP/160HP	UUT 17-2	39.81	30.00	30.00	124	---
				UUT 17-1	39.81	30.00	30.00	126	---
	180B/180BMP/180BHP		180/180MP/180HP	Interpolated	31.81	30.00	30.00	---	170
					34.31	36.00	36.00	---	195
	210B/210BHP		210/210HP		37.61	45.00	45.00	---	210
	240B/240BHP		240/240HP		39.56	45.00	45.00	---	230
	300B/300BHP		300/300HP	UUT 18-2	48.25	54.00	54.00	370	---
UUT 18-1		48.25		54.00	54.00	400	---		

1. Max Weight included fan and motor only

Table 2 - Certified Roof Mounted Exhausters

Twin City				Aerovent		Testing Scope	Max Dimensions (in)			Tested Weight (lb)	Max Weight (lb) ¹
Approved Model	Size	Approved Model	Size	Depth	Width		Height				
LUD	14E4, 14E8, 14B105	BSD53	14B105	Extrapolated	21.50	21.50	46.39	---	90		
	16E4, 16E8, 16B105		24.50		24.50	47.39	---	104			
	18E4, 18E8, 18B105		26.50		26.50	48.39	---	119			
	21E4, 21E8, 21B105		21B105	UUT 23	29.50	29.50	43.11	110	---		
				Interpolated	29.50	29.50	53.11	---	121		
	24E4, 24E8, 24B105, 24Z5		24B105	UUT 1	32.50	32.50	44.99	172	---		
				Interpolated	32.50	32.50	54.99	---	187		
					40.50	40.50	58.68	---	239		
					46.50	46.50	63.61	---	329		
	42E4, 42E8, 42B304, 42Z5		42B304		52.50	52.50	74.51	---	417		
48E4, 48E8, 48B304, 48Z5	48B304	UUT 24	58.50	58.50	77.51	480	---				
		UUT 2	58.50	58.50	77.51	522	---				
		Extrapolated	58.50	58.50	77.51	---	572				
LUB	21E4, 21E8, 21B105, 21L1, 21L2	BSB53	21B105	Extrapolated	29.50	29.50	55.95	---	155		
	24E4, 24E8, 24B105, 24L1, 24L2 24Z5		24B105		32.50	32.50	57.69	---	200		
	30E4, 30E8, 30B105, 30L1, 30L2, 30Z5		30B105		40.50	40.50	62.25	---	244		
	36E4, 36E8, 36B206, 36L1, 36L2, 36Z5		36B206	UUT 25	40.50	40.50	56.25	268	---		
	42E4, 42E8, 42B304, 42L1, 42L2, 42Z5		42B304	UUT 3	46.50	46.50	53.61	242	---		
				Interpolated	46.50	46.50	66.25	---	266		
					52.50	52.50	72.23	---	448		
	48E4, 48E8, 48B304, 48L1, 48L2, 48Z5		48B304		58.50	58.50	75.23	---	483		
	60C3, 60C6, 60L1, 60L2, 60Z5		N/A	UUT 4	70.50	70.50	88.05	536	---		
	54C3, 54C6, 54B406, 54L1, 54L2, 54Z5		54B406	Interpolated	70.50	70.50	86.05	---	590		
64.50		64.50		83.05	---	527					
LUBMO LUBSH	21E4, 21E8, 21B105, 21L1, 21L2	N/A	N/A	Extrapolated	29.50	42.75	58.20	---	290		
	24E4, 24E8, 24B105, 24L1, 24L2 24Z5		N/A		32.50	45.75	59.94	---	345		
	30E4, 30E8, 30B105, 30L1, 30L2, 30Z5		N/A		40.50	55.75	64.44	---	407		
	36E4, 36E8, 36B206, 36L1, 36L2, 36Z5		N/A	UUT 5	46.50	61.75	58.44	430	---		
	42E4, 42E8, 42B304, 42L1, 42L2, 42Z5		N/A	Interpolated	46.50	71.75	68.44	---	469		
					52.50	70.00	74.42	---	849		
					58.50	76.00	77.42	---	957		
	48E4, 48E8, 48B304, 48L1, 48L2, 48Z5		N/A	64.50	83.50	81.67	---	991			
	54C3, 54C6, 54B406, 54L1, 54L2, 54Z5		N/A	UUT 6	70.50	89.50	84.67	934	---		
	60C3, 60C6, 60L1, 60L2, 60Z5		N/A	Extrapolated	70.50	89.50	84.67	---	1025		
DCRD	060B, 060BE	ACXD	060	Extrapolated	18.50	18.50	33.63	---	32		
	070B, 070BE		18.50		18.50	33.63	---	32			
	080B, 080BE		18.50		18.50	33.63	---	34			
	085B, 085BE		21.00		21.00	37.31	---	45			
	090B, 090BE		21.00		21.00	37.31	---	45			
	095B, 095BE		21.00		21.00	37.31	---	45			
	100B, 100BE		21.00		21.00	35.31	---	52			
	120B, 120BE		UUT 7		27.50	27.50	30.38	70	---		
	130B, 130BE		130	Interpolated	27.50	27.50	40.38	---	70		
					27.50	27.50	41.25	---	72		
					27.50	27.50	41.50	---	74		
					30.44	30.44	44.75	---	86		
					30.44	30.44	45.25	---	86		
					38.38	38.38	47.25	---	97		
					UUT 8	38.38	38.38	48.25	150	---	
					140B, 140BE	140					
150B, 150BE	150										
160B, 160BE	160										
170B, 170BE	170										
180B, 180BE	180										

Table 2 - Certified Roof Mounted Exhausters (Continued)

Approved Model	Twin City	Approved Model	Aerovent	Testing Scope	Max Dimensions (in)			Tested Weight (lb)	Max Weight (lb) ¹
	Size		Size		Depth	Width	Height		
BCRD BCRD-E	070D	ACXD	070	Extrapolated	25.88	25.88	40.13	---	70
	075D		075		25.88	25.88	40.13	---	70
	085D		085		25.88	25.88	41.94	---	95
	100D/100DHP		100/100HP		27.50	27.50	41.94	---	107
	120D		120		30.44	30.44	46.13	---	130
	140D/140DHP		140/140HP		30.44	30.44	46.25	---	163
	160D/160DHP		160/160HP		32.63	32.63	47.00	---	173
	180D/180DHP		180/180HP		38.38	38.38	51.88	---	182
	210D/210DHP		210/210HP	UUT 9	39.54	39.54	50.06	182	---
	240D/240DHP		240/240HP	Interpolated	38.38	38.38	52.06	---	189
	300D/300DHP		300/300HP	Interpolated	43.13	43.13	53.88	---	196
	360D/360DHP		360/360HP		51.38	51.38	56.88	---	401
	420D		420		60.75	60.75	62.38	---	572
	480D		480		65.81	65.81	65.81	---	604
DCRU DCRUR	071B, 072B, 073B, 073BE	ATD ATDR	071, 072, 073	Extrapolated	74.06	74.06	68.25	588	---
	081B, 082B, 083B, 083BE		081, 082, 083		74.06	74.06	68.25	---	641
	091B, 092B, 093B, 093BE		091, 092, 093	UUT 11	22.00	22.00	42.44	---	70
	110B, 110BE		110	Interpolated	22.00	22.00	42.44	---	70
	120B, 120BE		120		22.00	22.00	44.13	---	70
	140B, 140BE		140		30.00	30.00	46.31	---	118
	160B, 160BE		160		30.00	30.00	45.19	---	127
	180B, 180BE		180		30.00	30.00	45.68	---	132
				UUT 12	30.00	30.00	47.81	---	136
				Extrapolated	36.00	36.00	47.17	128	---
BCRU BCRUR BCRUSH	110B	ATB ATBR	110	Extrapolated	36.00	36.00	47.17	---	140
	120B		120		30.00	30.00	46.56	---	153
	140B/140BHP		140/140HP		30.00	30.00	45.19	---	158
	160B/160BMP/160BHP		160/160MP/160HP	UUT 15	30.00	30.00	46.58	---	166
	180B/180BMP/180BHP		180/180MP/180HP	Interpolated	30.00	30.00	40.00	158	---
	210B/210BHP		210/210HP		30.00	30.00	47.81	---	171
	240B/240BHP		240/240HP		36.00	36.00	50.31	---	223
	300B/300BHP		300/300HP		45.00	45.00	53.61	---	252
	360B/360BHP		360/360HP		45.00	45.00	55.56	---	323
	420B		420		54.00	54.00	56.25	---	459
	480B		480		63.00	63.00	61.88	---	629
				UUT 16	69.00	69.00	64.75	---	642
				Extrapolated	75.00	75.00	57.00	598	---
				Extrapolated	75.00	75.00	67.13	---	653
DCLH DCLP	060, 060E	N/A	060	Extrapolated	26.13	24.00	32.75	---	71
	070, 070E		070		26.13	24.00	32.75	---	71
	080, 080E		080		26.13	28.00	32.75	---	76
	085, 085E		085		26.13	28.00	33.88	---	80
	090, 090E		090		26.13	28.00	33.88	---	80
	095, 095E		095		26.13	28.00	33.88	---	80
	100, 100E		100		26.13	30.00	36.88	---	94
	120, 120E		120	UUT 19	26.63	30.00	27.13	111	---
				UUT 20	28.00	28.00	36.25	122	---
				Extrapolated	28.00	30.00	37.13	---	122
BCLH BCLP	100, 100E	N/A	100	Extrapolated	38.63	28.00	37.88	---	138
	120, 120E		120		38.63	28.00	38.63	---	147
	140, 140E		140		40.00	35.00	38.88	---	185
	160, 160E		160		40.00	35.00	39.25	---	191
	180, 180E		180		51.13	40.00	42.50	---	222
	210, 210E		210	UUT 21	51.13	46.25	35.63	238	---
	240, 240E		240	Interpolated	51.13	43.00	43.13	---	238
	300, 300E		300		51.13	46.25	47.38	---	313
	360, 360E		360		63.13	52.50	47.13	---	388
	420, 420E		420		63.75	62.50	55.75	---	463
	480, 480E		480		75.13	70.63	57.13	---	538
				UUT 22	76.50	66.00	59.38	615	---
				Extrapolated	87.13	75.63	61.38	---	615

1. Max Weight included fan and motor only

Table 3 - Certified Direct Driven General Purpose Ventilator Fan Configuration

Twin City Model: LUD

Drive Type: Direct

Aerovent Model: BSD53

Ventilator	HP Motor Wt	1/4 19	1/3 21	1/2 26	3/4 32	1 54	1-1/2 60	2 63	3 92	5 114	MFR	UUT
Size 14		X	X								Twin City Fan	Extrapolated
Weight 69												
Size 16		X	X	X								
Weight 78												
Size 18			X	X	X							23
Weight 87												
Size 21				X	X	X	X					1
Weight 102												
Size 24		X	X	X	X	X	X	X	X			Interpolated
Weight 122												
Size 30				X	X	X	X	X				
Weight 176						X	X	X	X	X		
Size 36						X	X	X	X	X		2, 24
Weight 215							X	X	X	X		
Size 42							X	X	X	X		
Weight 303												
Size 48								X	X	X		
Weight 458												

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	1
		Straight Sided	23
12"	Aluminum	Self-Flashing	Interpolated
		Straight Sided	
	Galv Steel	Self-Flashing	
		Straight Sided	
18"	Aluminum	Self-Flashing	Interpolated
		Straight Sided	
	Galv Steel	Self-Flashing	
		Straight Sided	
18"	Aluminum	Self-Flashing	24
		Straight Sided	2

Windband			
Gauge	Material	Sizes	UUT
20	Galv Steel	14 - 48	1, 23
0.040	Aluminum	14 - 48	2, 24

Butterfly Dampers		
Material	Sizes	UUT
Galv Steel	14 - 48	1, 23
Aluminum	14 - 48	2, 24

Stack Caps		
Material	Sizes	UUT
Galv Steel	14 - 48	1, 23
Aluminum	14 - 48	2, 24

Table 4 - Certified Belt Driven General Purpose Ventilator Fan (w/ Motor Below Fan) Configuration

Twin City Model: LUB

Drive Type: Belt

Aerovent Model: BSB53

Ventilator	HP Motor Wt	1/4 19	1/3 21	1/2 26	3/4 32	1 54	1-1/2 60	2 63	3 92	5 114	7-1/2 176	10 204	15 255	MFR	UUT
Size 21		X	X	X	X									Twin City Fan	Extrapolated
Weight 123															
Size 24		X	X	X	X	X	X								25
Weight 140															
Size 30		X	X	X	X	X	X	X	X	X					3
Weight 200															
Size 36			X	X	X	X	X	X	X	X					Interpolated
Weight 242															
Size 42			X	X	X	X	X	X	X	X	X				26
Weight 405															
Size 48				X	X	X	X	X	X	X	X	X			4
Weight 415															
Size 54					X	X	X	X	X	X	X	X	X		
Weight 497															
Size 60					X	X	X	X	X	X	X	X	X		
Weight 585															

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	3
		Straight Sided	
	Aluminum	Self-Flashing	Interpolated
		Straight Sided	
12"	Galv Steel	Self-Flashing	25
		Straight Sided	
	Aluminum	Self-Flashing	Interpolated
		Straight Sided	
18"	Galv Steel	Self-Flashing	Interpolated
		Straight Sided	
	Aluminum	Self-Flashing	4, 26
		Straight Sided	

Windband			
Gauge	Material	Sizes	UUT
20	Galv Steel	21 - 48	3, 25
18	Galv Steel	54 - 60	Interpolated
0.040	Aluminum	21 - 48	
0.063	Aluminum	54 - 60	4, 26

Butterfly Dampers		
Material	Sizes	UUT
Galv Steel	21 - 60	3, 25
Aluminum	21 - 60	4, 26

Stack Caps		
Material	Sizes	UUT
Galv Steel	21 - 60	3, 25
Aluminum	21 - 60	4, 26

**Table 5 - Certified Belt Driven General Purpose Exhaust & UL Smoke Control System Fan
(w/ Motor Out of Airstream) Configuration**

Twin City Model: LUBMO

Description: Motor Located Out of Airstream

Drive Type: Belt

Twin City Model: LUBSH

Description: Motor Located Out of Airstream & Specifically Design for Smoke Control

Drive Type: Belt

Ventilator	HP Motor Wt	1/4	1/3	1/2	3/4	1	1-1/2	2	3	5	7-1/2	10	15	MFR	UUT
Size 21	19													Twin City Fan	Extrapolated
Weight 258		X	X	X	X										
Size 24		X	X	X	X	X	X								
Weight 285															
Size 30		X	X	X	X	X	X	X	X	X					5
Weight 395															
Size 36			X	X	X	X	X	X	X	X					Interpolated
Weight 462															
Size 42			X	X	X	X	X	X	X	X	X				
Weight 673															
Size 48				X	X	X	X	X	X	X	X	X			6
Weight 753															
Size 54					X	X	X	X	X	X	X	X	X		
Weight 925															
Size 60					X	X	X	X	X	X	X	X	X		
Weight 1044															

Roof Curb				
Height	Material	Models	Base Style	UUT
8"	Galv Steel	LUBMO	Self-Flashing	Extrapolated
			Straight Sided	
	Aluminum	LUBSH	Self-Flashing	5
			Straight Sided	
12"	Galv Steel	LUBMO	Self-Flashing	Interpolated
			Straight Sided	
	Aluminum	LUBSH	Self-Flashing	
			Straight Sided	
18"	Galv Steel	LUBMO	Self-Flashing	Interpolated
			Straight Sided	
	Aluminum	LUBSH	Self-Flashing	
			Straight Sided	
			Self-Flashing	6
			Straight Sided	Extrapolated

Windband				
Gauge	Material	Sizes	Models	UUT
20	Galv Steel	21 - 48	LUBMO	Extrapolated
			LUBSH	5
18	Galv Steel	54 - 60	LUBMO	Interpolated
			LUBSH	
0.040	Aluminum	21 - 48	LUBMO	6
0.063		54 - 60		

Butterfly Dampers			
Material	Sizes	Models	UUT
Galv Steel	21 - 60	LUBMO	Extrapolated
		LUBSH	5
Aluminum	21 - 60	LUBMO	6

Stack Caps			
Material	Sizes	Models	UUT
Galv Steel	21 - 60	LUBMO	Extrapolated
	21 - 60	LUBSH	5
Aluminum	21 - 60	LUBMO	6

Housing Panels				
Gauge	Material	Sizes	Models	UUT
18	Galv Steel	21 - 48	LUBMO	Extrapolated
			LUBSH	5
16	Galv Steel	54 - 60	LUBMO	Interpolated
			LUBSH	
0.063	Aluminum	21 - 60	LUBMO	6

Table 6 - Certified Direct Driven Downblast Roof Exhauster Fan Configuration

Twin City Model: DCRD

Drive Type: Direct

Aerovent Model: ACXD

Exhauster	HP Motor Wt	1/15	1/8	1/4	1/3	1/2	3/4	1	Mounting	UUT
Size 60			X	X					Base	Extrapolated
Weight 21										
Size 70			X	X						
Weight 21										
Size 80			X	X						
Weight 23										
Size 85			X	X						
Weight 34										
Size 90			X	X						
Weight 34										
Size 95			X	X						
Weight 34										
Size 100		X	X	X	X					
Weight 39										
Size 120		X	X	X	X	X				7
Weight 41										Interpolated
Size 130				X			X			
Weight 54								X		
Size 140				X			X			
Weight 56										
Size 150				X				X		
Weight 66										
Size 160				X		X		X		
Weight 66										
Size 170				X		X		X		
Weight 77										
Size 180						X		X		8
Weight 80										

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	Extrapolated
		Straight Sided	7
12"	Aluminum	Self-Flashing	Interpolated
		Straight Sided	
	Galv Steel	Self-Flashing	
		Straight Sided	
18"	Aluminum	Self-Flashing	Interpolated
		Straight Sided	
	Galv Steel	Self-Flashing	
		Straight Sided	
	Aluminum	Straight Sided	8

Outer Construction			
Component	Material	Sizes	UUT
Top Cover	.032 Aluminum	60-180	7,8
Motor Housing Band	.040 Aluminum	60-180	7,8
Shroud	.063 Aluminum	60-180	7,8

Table 7 -Certified Belt Driven Downblast Roof Exhauster Fan Configuration

Twin City Model: BCRD

Description: Aluminum Spun Outer Construction

Drive Type: Belt

Aerovent Model: ACXD

Twin City Model: BCRD-E

Description: EndurexTM Polymeric Outer Construction

Drive Type: Belt

Exhauster	HP	1/4	1/3	1/2	3/4	1	1-1/2	2	3	5	7-1/2	Model Availability	Mounting	UUT
	Motor Wt	19	21	26	32	54	60	63	92	114	176			
Size 70		X										BCRD	Base	Extrapolated
Weight 51												BCRD-E		
Size 75		X										BCRD		
Weight 51												BCRD-E		
Size 85		X										BCRD		
Weight 76												BCRD-E		
Size 100		X	X	X								BCRD		
Weight 81												BCRD-E		
Size 100 Hi Pr		X	X	X								BCRD		
Weight 81												BCRD-E		
Size 120		X	X	X								BCRD		
Weight 104												BCRD-E		
Size 140		X	X	X	X	X						BCRD		
Weight 109												BCRD-E		
Size 140 Hi Pr		X	X	X	X	X						BCRD		
Weight 109												BCRD-E		
Size 160		X	X	X	X	X						BCRD		
Weight 119												BCRD-E		
Size 160 Hi Pr		X	X	X	X	X						BCRD		
Weight 119												BCRD-E		
Size 180		X	X	X	X	X	X	X				BCRD		
Weight 138												BCRD-E		
Size 180 Hi Pr		X	X	X	X	X	X	X				BCRD		
Weight 138												BCRD-E		
Size 210		X	X	X	X	X	X	X	X			BCRD	Base	Interpolated
Weight 160												BCRD-E		
Size 210 Hi Pr		X	X	X	X	X	X	X	X			BCRD		
Weight 160												BCRD-E		
Size 240		X	X	X	X	X	X	X	X			BCRD		
Weight 208												BCRD-E		
Size 240 Hi Pr		X	X	X	X	X	X	X	X			BCRD		
Weight 208												BCRD-E		
Size 300		X	X	X	X	X	X	X	X	X		BCRD		
Weight 287												BCRD		
Size 300 Hi Pr		X	X	X	X	X	X	X	X	X		BCRD		
Weight 287												BCRD		
Size 360			X	X	X	X	X	X	X	X	X	BCRD		
Weight 396												BCRD		
Size 360 Hi Pr			X	X	X	X	X	X	X	X	X	BCRD		
Weight 396												BCRD		
Size 420				X	X	X	X	X	X	X	X	BCRD		
Weight 494												BCRD		
Size 480				X	X	X	X	X	X	X	X	BCRD		
Weight 508												BCRD		

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	Extrapolated
		Straight Sided	
	Aluminum	Self-Flashing	
12"	Galv Steel	Straight Sided	9
		Self-Flashing	27
	Aluminum	Straight Sided	Interpolated
18"	Galv Steel	Self-Flashing	
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	10

Outer Construction			
Component	Material	Model / Sizes	UUT
Top Cover	.032 Aluminum	BCRD / 70-240	Extrapolated
	.040 Aluminum	BCRD / 300-480	10, 27
	.150 Endurex	BCRD-E / 070-240	9
Motor Housing Band	.040 Aluminum	BCRD / 70-480	10, 27
Shroud	.063 Aluminum	BCRD / 70-240	Extrapolated
	.080 Aluminum	BCRD / 300-360	
	.090 Aluminum	BCRD / 420-480	10, 27
	.150 Endurex	BCRD-E / 70-240	9

Table 8 - Certified Base Mounted Direct Driven Upblast Roof Exhauster Fan Configuration

Twin City Model: DCRU

Description: Base Mounted General Exhaust (Clean Air)

Drive Type: Direct

Aerovent Model: ATD

Twin City Model: DCRUR

Description: Base Mounted Kitchen Exhaust (Grease-Laden Air)

Drive Type: Direct

Aerovent Model: ATDR

Exhauster	HP	1/8	1/4	1/3	1/2	3/4	1	Mounting	UUT
	Motor Wt	9	11	13	16	18	20		
Size 71-73		X	X					Base	Extrapolated
Weight 91									
Size 81-83		X	X	X					
Weight 91									
Size 91-93		X	X	X					11
Weight 111									Interpolated
Size 110		X			X				
Weight 114									
Size 120		X	X			X			
Weight 117									
Size 140		X			X		X		
Weight 129									
Size 160			X		X		X		
Weight 160									
Size 180					X		X		12
Weight 164									

Motor Cooling Tubes				
MFR	Tube Diameter	Tube Material	Tube Qty	UUT
TCF	4"	Aluminum	1	11,12

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	Extrapolated
		Straight Sided	
	Aluminum	Self-Flashing	Interpolated
		Straight Sided	
12"	Galv Steel	Self-Flashing	
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	
18"	Galv Steel	Self-Flashing	
		Straight Sided	
	Aluminum	Self-Flashing	12
		Straight Sided	Extrapolated

Construction			
Component	Material	Sizes	UUT
Top Cover	.032 Aluminum	71-180	11,12
Motor Housing Band	.040 Aluminum	71-180	11,12
Shroud	.063 Aluminum	71-180	11,12
Curb Cap	.063 Aluminum	71-180	11,12

Table 9 - Certified Wall Mounted Direct Driven Centrifugal Exhausters Fan Configuration

Twin City Models: DCRW, DCRWR

Aerovent Models: ATDW, ATDWR

Motors	HP	1/8	1/4	1/3	1/2	3/4	1	Mounting	UUT
	Motor Wt	9	11	13	16	18	20		
Size 71-73		X	X					Wall	Extrapolated
Weight 91									
Size 81-83		X	X	X					
Weight 91									
Size 91-93		X	X	X					13-1, 13-2
Weight 111									
Size 110		X			X				
Weight 114									
Size 120		X	X			X			
Weight 117									
Size 140		X			X		X		
Weight 129									Interpolated
Size 160			X		X		X		
Weight 160								14-1, 14-2	
Size 180					X		X		
Weight 164									

Motor					
MFR	Phase	Voltage	Type	HP	UUT
McMillan	1	115	EC	1/2	13-1
					14-1
Twin City Fan	1	115	PSC	1	13-2
					14-2

Description: Wall Mounted Exhaust

Construction			
Component	Material	Sizes	UUT
Top Cover	.032 Aluminum	71-180	13-1, 13-2, 14-1, 14-2
Motor Housing Band	.040 Aluminum	71-180	13-1, 13-2, 14-1, 14-2
Shroud	.063 Aluminum	71-180	13-1, 13-2, 14-1, 14-2
Curb Base*	.063 Aluminum	71-180	13-1, 13-2, 14-1, 14-2

* Curb Base is a wall mounted component

Motor Cooling Tubes			
Tube Diameter	Tube Material	Tube Qty	UUT
4"	Aluminum	1	13-1, 13-2, 14-1, 14-2

All Components manufactured by Twin City Fan

Mounting Adapter		
Length	Material	UUT
4"	0.160" Aluminum	13-2
10"	0.160" Aluminum	13-1, 14-1, 14-2

Table 10 - Certified Wall Mounted Belt Driven Centrifugal Exhauster Fan Configuration

Twin City Models: BCRW, BCRWR

Aerovent Models: AWX, AWXR

Motors	HP	1/4	1/3	1/2	3/4	1	1-1/2	2	3	5	Mounting	UUT
	Motor Wt	19	21	26	32	54	60	63	92	114		
Size 110		X	X	X							Wall	Extrapolated
Weight 114												
Size 120		X	X	X								
Weight 119												
Size 140		X	X	X	X	X						
Weight 127												
Size 140 Hi Pr		X	X	X	X	X						
Weight 127												
Size 160		X	X	X	X	X						17-1, 17-2
Weight 132												Interpolated
Size 160 Md Pr		X	X	X	X	X						
Weight 132												
Size 160 Hi Pr		X	X	X	X	X						
Weight 132												
Size 180		X	X	X	X	X	X	X				
Weight 140												
Size 180 Md Pr		X	X	X	X	X	X	X				
Weight 140												
Size 180 Hi Pr		X	X	X	X	X	X	X				
Weight 147												
Size 210		X	X	X	X	X	X	X				
Weight 147												
Size 210 Hi Pr		X	X	X	X	X	X	X				
Weight 147												
Size 240		X	X	X	X	X	X	X				
Weight 167												
Size 240 Hi Pr		X	X	X	X	X	X	X	X	X		
Weight 167												
Size 300		X	X	X	X	X	X	X	X	X		
Weight 258												
Size 300 Hi Pr		X	X	X	X	X	X	X	X	X		
Weight 258												18-1, 18-2

Description: Wall Mounted Exhaust

Construction			
Component	Material	Sizes	UUT
Top Cover	.032 Aluminum	110-300	17-1, 17-2, 18-1, 18-2
Motor Housing Band	.040 Aluminum	110-300	17-1, 17-2, 18-1, 18-2
Shroud	.063 Aluminum	110-180	17-1, 17-2
	0.080 Aluminum	210-240	Interpolated
	0.125 Aluminum	300	18-1, 18-2
Curb Base	.063 Aluminum	110-160	17-1, 17-2
	.080 Aluminum	180-300	18-1, 18-2

* Curb Base is a wall mounted component

Motor Cooling Tubes				
MFR	Tube Diameter	Tube Material	Tube Qty	UUT
TCF	4"	Aluminum	1 (Up to Size 240)	17-1, 17-2
			2 (Size 300)	18-1, 18-2

All Components manufactured by Twin City Fan

Motor				
MFR	Phase	Voltage	Type	UUT
Baldor	3	230	Induction	17-1
		460		18-2
TECO	3	230	Induction	17-2
		460		18-1

Table 11 - Certified Base Mounted Belt Driven Upblast Roof Exhauster Fan Configuration

Twin City Model: BCRU

Description: Base Mounted General Exhaust (Clean Air)

Twin City Model: BCRUR

Description: Base Mounted Kitchen Exhaust (Grease-Laden Air)

Twin City Mode: BCRUSH

Description: Base Mounted Smoke & Heat Exhaust

Drive Type: Belt

Aerovent Model: ATB

Drive Type: Belt

Aerovent Model: ATBR

Exhauster	HP	1/4	1/3	1/2	3/4	1	1-1/2	2	3	5	7-1/2	Mounting	UUT
	Motor Wt	19	21	26	32	54	60	63	92	114	176		
Size 110		X	X	X								Base	Extrapolated
Weight 127													
Size 120		X	X	X									
Weight 132													
Size 140		X	X	X	X	X							
Weight 141													
Size 140 Hi Pr		X	X	X	X	X							
Weight 141													
Size 160		X	X	X	X	X							
Weight 151													
Size 160 Md Pr		X	X	X	X	X							
Weight 151													
Size 160 Hi Pr		X	X	X	X	X							
Weight 151													
Size 180		X	X	X	X	X	X	X					
Weight 160													
Size 180 Md Pr		X	X	X	X	X	X	X					
Weight 160													
Size 180 Hi Pr		X	X	X	X	X	X	X					
Weight 160													
Size 210		X	X	X	X	X	X	X					
Weight 189													
Size 210 Hi Pr		X	X	X	X	X	X	X					
Weight 189													
Size 240		X	X	X	X	X	X	X				Interpolated	
Weight 209													
Size 240 Hi Pr		X	X	X	X	X	X	X	X	X			
Weight 209													
Size 300		X	X	X	X	X	X	X	X	X			
Weight 345													
Size 300 Hi Pr		X	X	X	X	X	X	X	X	X			
Weight 345													
Size 360		X	X	X	X	X	X	X	X	X			
Weight 515													
Size 360 Hi Pr		X	X	X	X	X	X	X	X	X			
Weight 515													
Size 420		X	X	X	X	X	X	X	X	X	X		
Weight 533													
Size 480		X	X	X	X	X	X	X	X	X	X	16	
Weight 647													

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	Extrapolated
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	
12"	Galv Steel	Self-Flashing	Interpolated
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	
18"	Galv Steel	Self-Flashing	Interpolated
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	

Construction			
Component	Material	Sizes	UUT
Top Cover	.032 Aluminum	110-300	15
	.040 Aluminum	360-480	16
Motor Housing Band	.040 Aluminum	110-480	15,16
Shroud	.063 Aluminum	110-180	15
	0.080 Aluminum	210-240	Interpolated
	0.125 Aluminum	300-480	16
Curb Cap	.063 Aluminum	110-160	15
	.080 Aluminum	180-360	Interpolated
	.100 Aluminum	420-480	16

MFR	Tube Diameter	Motor Cooling Tubes		
		Tube Material	Tube Qty	UUT
TCF	4"	Aluminum	1 (BCRU/R 110 - 240)	Extrapolated
			2 (BCRU/R 300 - 480)	16
			3 (BCRUSH 110 - 240)	15
			4 (BCRUSH 300 - 480)	Extrapolated

Table 12 - Certified Direct Driven Low Profile Centrifugal Roof Exhauster Fan Configuration

Twin City Model: DCLH

Drive Type: Direct

Twin City Model: DCLP

Drive Type: Direct

Exhauster	HP	1/15	1/8	1/4	1/3	1/2	Mounting	Enclosure Style	UUT
	Motor Wt	8	9	11	13	16			
Size 60			X	X			Base	Hooded	Extrapolated
Weight 46									
Size 70			X	X					
Weight 46									
Size 80			X	X					
Weight 50									
Size 85			X	X					
Weight 53									
Size 90			X	X					
Weight 53									
Size 95			X	X					
Weight 53									
Size 100		X	X	X	X		Base	Penthouse	Extrapolated
Weight 62									
Size 120		X	X	X	X	X			
Weight 65									
Size 60			X	X					
Weight 30									
Size 70			X	X					
Weight 30									
Size 80			X	X					
Weight 31									
Size 85			X	X					
Weight 34									
Size 90			X	X					
Weight 34									
Size 95			X	X					
Weight 34									
Size 100		X	X	X	X				
Weight 37									
Size 120		X	X	X	X	X			
Weight 43									20

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	Extrapolated
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	
12"	Galv Steel	Self-Flashing	15
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	
18"	Galv Steel	Self-Flashing	Interpolated
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	

Outer Construction				
Component	Material	Sizes	Enc. Style	UUT
Enclosure	22-Gauge Galv Steel	60-120	Hooded	19
	.081 Aluminum		Penthouse	20
Framework	16-Gauge Galv Steel	60-120	Hooded Penthouse	19,20
Curb Cap	.063 Aluminum	60-120	Hooded Penthouse	19,20

Table 13 - Certified Hooded Style Belt Driven Low Profile Centrifugal Roof Exhuaster Fan Configuration

Twin City Model: BCLH

Drive Type: Belt

Twin City Model: BCLP

Drive Type: Belt

Exhauster	HP	1/4	1/3	1/2	3/4	1	1-1/2	2	3	5	7-1/2	Mounting	Enclosure Style	UUT
	Motor Wt	19	21	26	32	54	60	63	92	114	176			
Size 100		X	X									Base	Hooded	Extrapolated
Weight 89														
Size 120		X	X	X										
Weight 92														
Size 140		X	X	X	X	X								
Weight 94														
Size 160		X	X	X	X	X								
Weight 99														
Size 180		X	X	X	X	X	X	X						
Weight 114														
Size 210		X	X	X	X	X	X	X						
Weight 125														
Size 240		X	X	X	X	X	X	X						
Weight 145														
Size 300		X	X	X	X	X	X	X	X	X				
Weight 193														
Size 360			X	X	X	X	X	X	X	X				
Weight 249														
Size 420				X	X	X	X	X	X	X	X			
Weight 312														
Size 480				X	X	X	X	X	X	X	X			
Weight 379														
Size 100		X	X									Base	Penthouse	Extrapolated
Weight 66														
Size 120		X	X	X										
Weight 68														
Size 140		X	X	X	X	X								
Weight 69														
Size 160		X	X	X	X	X								
Weight 75														
Size 180		X	X	X	X	X	X	X						
Weight 96														
Size 210		X	X	X	X	X	X	X						
Weight 106														
Size 240		X	X	X	X	X	X	X						
Weight 123														
Size 300		X	X	X	X	X	X	X	X	X				
Weight 163														
Size 360			X	X	X	X	X	X	X	X				
Weight 198														
Size 420				X	X	X	X	X	X	X	X			
Weight 266														
Size 480				X	X	X	X	X	X	X	X			
Weight 314														

Roof Curb			
Height	Material	Base Style	UUT
8"	Galv Steel	Self-Flashing	Extrapolated
	Aluminum	Straight Sided	21
12"	Galv Steel	Self-Flashing	Interpolated
		Straight Sided	
	Aluminum	Self-Flashing	
		Straight Sided	
18"	Galv Steel	Self-Flashing	22
		Straight Sided	
	Aluminum	Straight Sided	Extrapolated

Outer Construction				
Component	Material	Sizes	Enc. Style	UUT
Enclosure	22-Gauge Galv Steel	100-480	Hooded	21
	.081 Aluminum	100-480	Penthouse	22
Framework	16-Gauge Galv Steel	100	Hooded Penthouse	Extrapolated
	14-Gauge Galv Steel	120-360	Hooded Penthouse	21
	12-Gauge Galv Steel	420-480	Hooded Penthouse	22
Curb Cap	.063 Aluminum	100-160	Hooded Penthouse	Extrapolated
	.080 Aluminum	180-360	Hooded Penthouse	21
	.100 Aluminum	420-480	Hooded Penthouse	22

Table 14 - Certified Subcomponents: Wall Mounted Exhausters Miscellaneous Components

Description	Available Models	Material	Manufacturer	UUT
NEMA 1 Disconnect Switch	DCRW, DCRWR, BCRW, BCRWR	Galvanized Steel	Carling, McGill	17-1, 17-2
NEMA 3R Disconnect Switch	DCRW, DCRWR, BCRW, BCRWR	Steel	GE, Levitin, Hubbell	13-1, 13-2
NEMA 4 Disconnect Switch	DCRW, DCRWR, BCRW, BCRWR	Polycarbonate	Salzer	14-1, 14-2
NEMA 7/9 Disconnect Switch	DCRW, DCRWR, BCRW, BCRWR	Cast Aluminum	Killark	18-1, 18-2
Speed Controller	DCRW, DCRWR	Galvanized Steel	Belimo, K/B Electronics	13-1, 13-2
Galvanized Steel Bird Screen	DCRW, DCRWR, BCRW, BCRWR	Galvanized Steel	TCF	13-1, 18-1, 18-2
Aluminum Bird Screen	DCRW, DCRWR, BCRW, BCRWR	Aluminum	TCF	13-2, 14-1, 14-2, 17-1, 17-2
Aluminum Insect Screen	DCRW, DCRWR, BCRW, BCRWR	Aluminum	TCF	14-1, 14-2
Motor & Drive Assembly Rubber Isolators	DCRW, DCRWR, BCRW, BCRWR	Neoprene	TCF	13, 14, 17, 18
Stainless Steel Shaft	DCRW, DCRWR, BCRW, BCRWR	Stainless Steel	TCF	18-1, 18-2
Stainless Steel Hardware	DCRW, DCRWR, BCRW, BCRWR	Stainless Steel	TCF	13-2, 18-1, 18-2
Performance Baffle	DCRW, DCRWR, BCRW, BCRWR	Aluminum	TCF	14-1, 14-2
Motorized Backdraft Dampers	DCRW, DCRWR, BCRW, BCRWR	Galvanized Steel Frame / Aluminum Damper Blades	Air Conditioning Products	14-1, 14-2, 17-1, 17-2
Automatic Backdraft Dampers	DCRW, DCRWR, BCRW, BCRWR	Galvanized Steel Frame / Aluminum Damper Blades	Air Conditioning Products	13-1, 18-1, 18-2

Table 15 - Certified Subcomponents: Wall Mounted Exhausters Wheels

Model	Drive	Arrangement	Size	Wheel Diameter	Material	Manufacturer	Shaft Diameter	UUT
DCRW DCRWR ATDW ATDWR	Direct	4	71	8.38	Aluminum	TCF	N/A	Extrapolated
			72	8.38				
			73	8.38				
			81	8.52				
			82	8.52				
			83	8.52				
			91	11.23				
			92	11.23				
			93	11.23				
			110	12.25				
			120	13.50				
			140	15.00				
			160	16.50				
			180	18.25				
BCRW BCRWR AWX AWXR	Belt	9	110	12.25	Aluminum	TCF	0.75	Extrapolated
			120	13.50			0.75	
			140	15.00			0.75	
			160	16.75			0.75	17-1, 17-2
			180	19.44			0.75	Interpolated
			210	25.06			0.75	
			240	28.25			0.75	
			300	31.81			1.19	18-1, 18-2
			360	39.81			1.44	Extrapolated
			420	44.56			1.44	
			480	50.06			1.44	

Table 16 - Certified Subcomponents: Curb Mounted Exhausters Miscellaneous Components

Description	Available Models	Manufacturer	Test Unit
Inlet Safety Guard	LUD, LUB, LUBMO, LUBSH	TCF	1, 5, 25
Fusible Link Assembly	LUD, LUB, LUBMO, LUBSH	Reed Air Products	5, 24, 25
Magnetic Damper Latches	LUD, LUB, LUBMO, LUBSH	TCF	3, 24, 25
Belt Tube	LUBMO, LUBSH	TCF	5
Motor Cover	LUBMO, LUBSH	TCF	5, 6
Extended Lube Lines	BCRD, BCRD-E, BCRU/R/SH, BCLH/P, LUB, LUBMO, LUBSH	TCF	3, 25, 26
Curb Hinge	BCRD, BCRD-E, BCRU/R/SH, BCLH/P, LUB, LUD	TCF	11
Retaining Chain	BCRD, BCRD-E, BCRU/R/SH, BCLH/P, LUB, LUD	TCF	11
Security Hasp	BCRD, BCRD-E, BCRU/R/SH, BCLH/P, LUB, LUD	TCF	11
Variable Speed Controller	DCRD, DCRU, DCRUR, DCLH, DCLP	KB Electronics, Belimo	7, 8, 11, 12, 20
2-Speed Switch	BCRD, BCRD-E, BCRU, BCRUR, BCLH, BCLP, LUB, LUBMO, LUBSH	Malloy	10, 16, 22
Firestat	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P	Johnson Controls	9, 11, 21
NEMA 1 Disconnect Switch	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	Carling, McGill	5, 7, 11, 16, 19, 22, 27
NEMA 3R Disconnect Switch	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	GE, Levitin, Hubbell	1, 2, 3, 6, 8, 12, 15, 20, 23, 24, 25, 26
NEMA 4 Disconnect Switch	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	Salzar	9, 21
NEMA 7/9 Disconnect Switch	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	Killark	10
Galvanized Steel Bird Screen	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	TCF	2, 7, 8, 10, 11, 14, 16, 19, 20, 21, 22, 23, 26, 27
Aluminum Bird Screen	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	TCF	9
Aluminum Insect Screen	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P	TCF	6, 10, 21
Motor & Drive Assembly Rubber Isolators	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P	TCF	7, 8, 9, 10, 11, 12, 15, 16, 19, 20, 21, 22, 27
Stainless Steel Shaft	BCRD, BCRD-E, BCRU/R/SH, BCLH/P, LUB, LUBMO, LUBSH	TCF	10, 22, 27
Automatic Belt Tensioner	BCRD, BCRD-E, BCRU/R/SH, BCLH/P, LUB, LUBMO, LUBSH	Fenner	10, 15, 21
Stainless Steel Hardware	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P	TCF	10, 20, 27
Tie Down Brackets	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	TCF	4, 8, 12, 24, 25
Performance Baffle	DCRD, BCRD, BCRD-E, DCRU, BCRU	TCF	7, 20
Aluminum Nameplate	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	Retterbush	1, 15, 21, 24
Stainless Steel Nameplate	DCRD, BCRD, BCRD-E, DCRU/R, BCRU/R/SH, DCLH/P, BCLH/P, LUB, LUD, LUBMO, LUBSH	Retterbush	2, 10
Drain Connection	DCRUR, BCRUR	TCF	12
Motorized Backdraft Dampers	DCRD, BCRD, BCRD-E, DCRU, BCRU, DCLH/P, BCLH/P	Air Conditioning Products	8, 10, 12, 15, 19, 22
Automatic Backdraft Dampers	DCRD, BCRD, BCRD-E, DCRU, BCRU, DCLH/P, BCLH/P	Air Conditioning Products	9, 11, 16, 20, 21
2-Groove Drive	BCRD, BCRD-E, BCRU/R/SH, BCLH/P, LUB, LUBMO, LUBSH	TCF	5, 15

Table 17 - Certified Subcomponents: Curb Mounted Exhausters Wheels

Model	Drive	Arrangement	Reference Tables	Size	Propeller Diameter	Material	Manufacturer	Shaft Diameter	UUT
LUD	Direct	4	1	14	14.00	Aluminum	TCF	N/A	Extrapolated
				16	16.00	Aluminum			
				18	18.00	Aluminum			
				21	21.00	Aluminum			23
				24	24.00	Aluminum			Interpolated
						Carbon Steel			1
				30	30.00	Aluminum			Interpolated
						Carbon Steel			
				36	36.00	Aluminum			
						Carbon Steel			
				42	42.00	Aluminum			
						Carbon Steel			
LUB LUBMO LUBSH	Belt	9	2 & 3	48	48.00	Aluminum			2,24
						Carbon Steel			Extrapolated
				21	21.00	Galvanized Steel		0.75	Extrapolated
						Aluminum		1.00	
				24	24.00	Galvanized Steel		0.75	
						Aluminum		1.00	
						Carbon Steel		1.00	
						Galvanized Steel		0.75	
				30	30.00	Galvanized Steel		1.00	25
						Aluminum		1.00	Interpolated
						Carbon Steel		0.75	3
				36	36.00	Galvanized Steel		1.00	Interpolated
						Aluminum		1.00	
						Carbon Steel		1.00	5
				42	42.00	Galvanized Steel		1.00	Interpolated
						Aluminum		1.19	
						Carbon Steel		1.19	
				48	48.00	Galvanized Steel		1.19	
						Aluminum		1.19	
						Carbon Steel		1.44	
						Galvanized Steel		1.44	
				54	54.00	Galvanized Steel		1.00	
						Aluminum		1.19	
						Carbon Steel		1.44	26
				60	60.00	Galvanized Steel		1.44	Interpolated
						Aluminum		1.19	
						Carbon Steel		1.50	6
						Aluminum		1.69	4
						Carbon Steel		1.69	Extrapolated

Table 17 (Continued) - Certified Subcomponents: Curb Mounted Exhausters Wheels

Model	Drive	Arrangement	Reference Tables	Size	Propeller Diameter	Material	Manufacturer	Shaft Diameter	UUT
DCRD	Direct	4	4	60	8.38	Aluminum	TCF	N/A	Extrapolated
				70	8.38	Aluminum		N/A	
				80	8.52	Aluminum		N/A	
				85	11.23	Aluminum		N/A	
				90	11.23	Aluminum		N/A	
				95	11.23	Aluminum		N/A	
				100	12.06	Aluminum		N/A	7
				120	12.70	Aluminum		N/A	
				130	14.22	Aluminum		N/A	
				140	14.86	Aluminum		N/A	
				150	16.26	Aluminum		N/A	
				160	17.21	Aluminum		N/A	Interpolated
				170	18.36	Aluminum		N/A	
				180	19.80	Aluminum		N/A	
BCRD BCRD-E	Belt	9	5	70	8.63	Aluminum		0.75	Extrapolated
				75	8.63	Aluminum		0.75	
				85	10.50	Aluminum		0.75	
				100	12.25	Aluminum		0.75	
				100HP	10.50	Aluminum		0.75	
				120	13.50	Aluminum		0.75	
				140	15.00	Aluminum		0.75	
				140HP	10.50	Aluminum		0.75	
				160	16.50	Aluminum		0.75	9
				160HP	13.50	Aluminum		0.75	
				180	22.78	Aluminum		0.75	
				180HP	16.50	Aluminum		0.75	Interpolated
				210	25.06	Aluminum		0.75	
				210HP	25.06	Aluminum		0.75	
				240	28.25	Aluminum		0.75	27
				240HP	28.25	Aluminum		0.75	
				300	31.81	Aluminum		1.19	
				300HP	31.81	Aluminum		1.19	Interpolated
				360	39.81	Aluminum		1.44	
				360HP	39.81	Aluminum		1.44	
				420	44.56	Aluminum		1.44	10
				480	50.06	Aluminum		1.44	

Table 17 (Continued) - Certified Subcomponents: Curb Mounted Exhausters Wheels

Model	Drive	Arrangement	Reference Tables	Size	Wheel Diameter	Material	Manufacturer	Shaft Diameter	UUT
DCRU DCRUR DCRW DCRWR	Direct	4	6, 7	71-73	8.38	Aluminum	TCF	N/A	Extrapolated
				81-83	8.52	Aluminum		N/A	
				91-92	11.23	Aluminum		N/A	
				93	11.23	Aluminum		N/A	11
				110	12.25	Aluminum		N/A	Interpolated
				120	13.50	Aluminum		N/A	
				140	15.00	Aluminum		N/A	13
				160	16.50	Aluminum		N/A	Interpolated
BCRU BCRUR BCRW BCRWR BCRUSH	Belt	9	8, 9	180	18.25	Aluminum		N/A	12, 14
				110	12.25	Aluminum, Carbon Steel		0.75	Extrapolated
				120	13.50	Aluminum, Carbon Steel		0.75	
				140	15.00	Aluminum, Carbon Steel		0.75	
				160	12.25	Aluminum, Carbon Steel		0.75	15
					16.75	Aluminum, Carbon Steel		0.75	17
				180	19.44	Aluminum, Carbon Steel		0.75	Interpolated
				210	25.06	Aluminum, Carbon Steel		0.75	
				240	28.25	Aluminum, Carbon Steel		0.75	
				300	31.81	Aluminum, Carbon Steel		1.19	18
				360	39.81	Aluminum, Carbon Steel		1.44	Interpolated
				420	44.56	Aluminum, Carbon Steel		1.44	
				480	50.06	Aluminum, Carbon Steel		1.44	16
DCLH DCLP	Direct	4	10	60	8.38	Aluminum		N/A	Extrapolated
				70	8.38	Aluminum		N/A	
				80	8.52	Aluminum		N/A	
				85	11.23	Aluminum		N/A	
				90	11.23	Aluminum		N/A	
				95	11.23	Aluminum		N/A	
				100	12.06	Aluminum		N/A	
				120	12.70	Aluminum		N/A	19, 20
BCLH BCLP	Belt	9	11	70	8.63	Aluminum		0.75	Extrapolated
				75	8.63	Aluminum		0.75	
				85	10.50	Aluminum		0.75	
				100	12.25	Aluminum		0.75	
				120	13.50	Aluminum		0.75	
				140	15.00	Aluminum		0.75	
				160	16.50	Aluminum		0.75	
				180	22.78	Aluminum		0.75	
				210	25.06	Aluminum		0.75	21
				240	28.25	Aluminum		0.75	Interpolated
				300	31.81	Aluminum		1.19	
				360	39.81	Aluminum		1.44	
				420	44.56	Aluminum		1.44	
				480	50.06	Aluminum		1.44	
								1.44	22

Table 18 - Certified Subcomponents: Wall Mounted Exhaust Fan Motors

Motor Drive Configuration	HP	Voltage (V)	Weight (lbs.)	Manufacturer	UUT
Belt	1	230	54	Baldor	17-1
	5	460	114		18-2
	1	230	54	TECO	17-2
	5	460	114		18-1
Direct	1/2	115	16	McMillan	13-1
	1	115	20		14-1
	1/2	115	16	Twin City Fan	13-2
	1	230	20		14-2

Table 19 - Certified Subcomponents: Roof Curb Mounted Exhaust Fan Motors

Motor Drive Configuration	HP	Voltage (V)	Weight (lbs.)	Manufacturer	UUT
Belt	1	115	54	Baldor	15
	1 1/2	230	60		27
	7 1/2	460	176		10
	15	460	255		6
	1	230	54	TECO	3
	7 1/2	230	176		16
	15	460	255		26
	1	115	54	Twin City Fan	21
	2	460	63		9
	1	230	54	Marathon	5
	5	230	114		25
	5	460	114		4
	7 1/2	230	176		22
Direct	1	115	32	Baldor	1
	5	230	114		24
	1/2	115	16	TECO	19
	5	460	114		2
	1/2	115	26	Marathon	23
	1/2	115	16	McMillan	20
	1/3	115	13		7
	1	115	20		12
	1	115	20	Twin City Fan	8
	1/3	230	13		11

Table 20 - UUT Overview
Special Seismic Certification Test Units


Manufacturer: Twin City Fan Companies, Ltd.							
Product Line: Axial Upblast Roof Ventilators, Centrifugal Roof Exhausters & Centrifugal Wall Exhausters							
Certified Product Line Construction: Axial Upblast Aluminum and Carbon Steel Wheel, Aluminum and Carbon Steel Housing, Direct and Belt Drive, Single Vertical Inlet, Vertical Shaft Orientation Centrifugal Roof Aluminum and Carbon Steel Wheel, Aluminum and Carbon Steel Housing, Direct and Belt Drive, Single Vertical Inlet, Vertical Shaft Orientation Centrifugal Wall Aluminum Wheel, Spun Aluminum Housing, Direct and Belt Drive, Single Horizontal Inlet, Horizontal Shaft Orientation							
Certified Options: Nema 1,3R, 4, and 7/9 disconnect Switches / / Speed Controller Aluminum and Zinc Coated Birdscreen / Aluminum Backdraft Damper / Aluminum Motorized Damper / Performance Baffle / Aluminum Insect Screen / Stainless Steel Hardware / Stainless Steel Shaft / Inlet Safety Guard / Aluminum & Galvanized Carbon Steel Self-Flashing & Straight Sided Roof Curbs / Tie Down Brackets / Drain Connection / Aluminum & Stainless Steel Nameplate / Magnetic Damper Latch / Extended Lube Lines / Belt Tube / Motor Cover / 2-Groove Drive / Fusible Link / Miami-Dade Hurricane Construction / UL Smoke & Heat Construction / UL 762 Restaurant Construction / UL 705 Construction / AMCA Spark B Resistant Construction / Firestat / Automatic Belt Tensioner / Retaining Chain / Security Hasp / Curb Hinge / 2-Speed Switch / McMillan, TCF, Baldor, Marathon and Teco-Westinghouse motors							
Certified Mounting Description: Axial Upblast The fans were secured to roof curbs which were fastened to test structure using lag bolts. Centrifugal Roof The fans were secured to roof curbs which were fastened to test structure using lag bolts. Centrifugal Wall The fans were secured to the plywood constructed wall mount using the optional extended mounting bracket secured in 8 mounting locations using lag bolts. SEOR to specify curb, mounting of unit to curb and mounting of curb to structure with similar configuration and equivalent strength & stiffness to the tested units.							
Product Line	Model Tested	Dimensions (inches)			Weight (lbm)	Notes:	UUT ID:
		Depth	Width	Height			
Axial Upblast	24Z5 LUD	32.50	32.50	44.99	172 lbs.		UUT 1
Axial Upblast	48E4 LUD	58.50	58.50	77.51	522 lbs.		UUT 2
Axial Upblast	36L2 LUB	46.50	46.50	53.61	242 lbs.		UUT 3
Axial Upblast	60C6 LUB	70.50	70.50	88.05	536 lbs.		UUT 4
Axial Upblast	36Z5 LUBSH	46.50	61.75	58.44	430 lbs.		UUT 5
Axial Upblast	60L2 LUBMO	70.50	89.50	84.67	934 lbs.		UUT 6
Centrifugal Roof	120BE DCRD	27.50	27.50	30.38	70 lbs.		UUT 7
Centrifugal Roof	180B DCRD	38.38	38.38	48.25	150 lbs.		UUT 8
Centrifugal Roof	180DHP BCRD-E	39.54	39.54	50.06	182 lbs.		UUT 9
Centrifugal Roof	480D BCRD	74.06	74.06	68.25	588 lbs.		UUT 10
Centrifugal Roof	093B DCRU	22.00	22.00	34.13	64 lbs.		UUT 11
Centrifugal Roof	180B DCRUR	36.00	36.00	47.17	128 lbs.		UUT 12
Wall Exhauster	140BE DCRW	38.56	30.00	30.00	86 lbs.		UUT 13-1
Wall Exhauster	140B DCRWR	32.56	30.00	30.00	84 lbs.		UUT 13-2
Wall Exhauster	180BE DCRWR	39.17	36.00	36.00	150 lbs.		UUT 14-1
Wall Exhauster	180B DCRWR	39.17	36.00	36.00	138 lbs.		UUT 14-2
Centrifugal Roof	160BHP BCRUSH	30.00	30.00	47.81	158 lbs.		UUT 15
Centrifugal Roof	480B BCRU	75.00	75.00	67.13	598 lbs.		UUT 16
Wall Exhauster	160B BCRWR	39.81	30.00	30.00	126 lbs.		UUT 17-1
Wall Exhauster	160B BCRWR	39.81	30.00	30.00	124 lbs.		UUT 17-2
Wall Exhauster	300BHP BCRW	48.25	54.00	54.00	400 lbs.		UUT 18-1
Wall Exhauster	300BHP BCRW	48.25	54.00	54.00	370 lbs.		UUT 18-2
Centrifugal Roof	120 DCLH	26.63	30.00	27.13	111 lbs.		UUT 19
Centrifugal Roof	120E DCLP	28.00	28.00	36.25	122 lbs.		UUT 20
Centrifugal Roof	210 BCLH	51.13	46.25	35.63	238 lbs.		UUT 21
Centrifugal Roof	480B BCLP	76.50	66.00	59.38	615 lbs.		UUT 22
Axial Upblast	21B105 BSD53	29.50	29.50	43.11	110 lbs.		UUT 23
Axial Upblast	48B304 BSD53	58.50	58.50	77.51	480 lbs.		UUT 24
Axial Upblast	30B105 BSB53	40.50	40.50	56.25	268 lbs.		UUT 25
Axial Upblast	54B406 BSB53	64.50	64.50	83.05	672 lbs.		UUT 26
Centrifugal Roof	240DHP BCRD	34.00	34.00	47.88	178 lbs.		UUT 27

UUT 1**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	LUD 24Z5
Product Construction Summary:	Carbon Steel Wheel, Galvanized Carbon Steel Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Inlet Safety Guard, 8" Galvanized Carbon Steel Self-Flashing Roof Curb, NEMA 3R Disconnect Switch, Aluminum Nameplate, UL 705 Construction, 1 HP Baldor Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
32.50	32.50	44.99	172 lbs	16.07	16.07	16.70

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 2**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	LUD 48E4
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Discharge Birdscreen, 18" Aluminum Straight Sided Roof Curb, NEMA 3R Disconnect Switch, Stainless Steel Nameplate, UL 705 Construction, 5 HP Teco-Westinghouse Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
58.50	58.50	77.51	522 lbs	8.36	8.53	8.70

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (4) 1/4" x 1 1/4" ungraded lag screws per side, (16) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 3**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	LUB 36L2
Product Construction Summary:	Galvanized Carbon Steel Wheel, Galvanized Carbon Steel Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Magnetic Damper Latch, 8" Galvanized Carbon Steel Self-Flashing Roof Curb, NEMA 3R Disconnect Switch, Extended Lube Lines, UL 705 Construction, 1 HP Teco-Westinghouse Motor

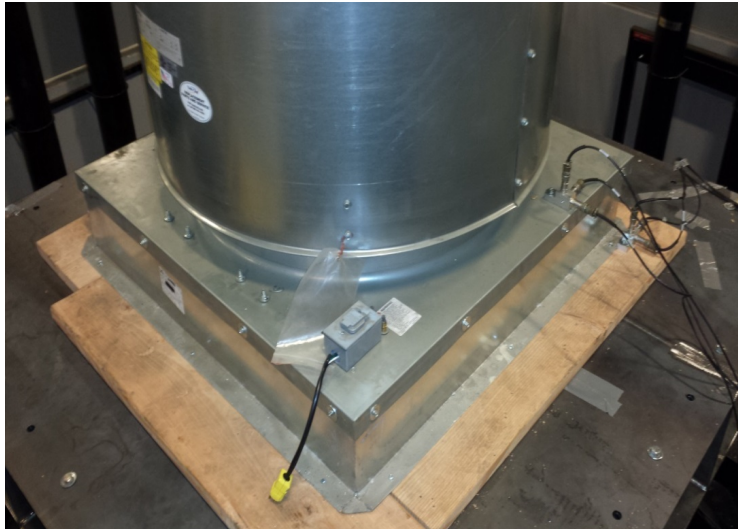
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
46.50	46.50	53.61	242 lbs	11.50	7.57	11.94

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 4**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	LUB 60C6
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Tie Down Brackets, 18" Aluminum Self-Flashing Roof Curb, NEMA 4 Disconnect Switch, UL 705 Construction 5 HP Marathon Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
70.50	70.50	88.05	536 lbs.	15.44	10.00	12.90

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (5) 1/4" x 1 1/4" ungraded lag screws per side, (20) total. Fan mounted to roof curb using (6) 5/16" x 1 1/4" ungraded lag screws per side, (24) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 5**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	LUBSH 36Z5
Product Construction Summary:	Painted Carbon Steel Wheel, Galvanized Carbon Steel Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Belt Tube, Motor Cover, 8" Galvanized Carbon Steel Self-Flashing Roof Curb, 2-Groove Drive, Fusible Link, NEMA 1 Disconnect Switch, Inlet Safety Guard, UL Smoke & Heat Construction, 1 HP Marathon Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
46.50	61.75	58.44	430 lbs	8.20	7.88	7.73

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (6) 5/16" x 1 1/4" ungraded lag screws per side, (24) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 6**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	LUBMO 60L2
Product Construction Summary:	Steel Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Motor Cover, 18" High Aluminum Self-Flashing Roof Curb, NEMA 3R Disconnect Switch, Aluminum Insect Screen, UL 705 Construction, 15 HP Baldor Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
70.50	89.50	84.67	934 lbs.	6.09	7.13	6.46

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (5) 1/4" x 1 1/4" ungraded lag screws per side, (20) total. Fan mounted to roof curb using (6) 5/16" x 1 1/4" ungraded lag screws per side, (24) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 7

Unit Under Test (UUT) Summary Sheet



Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	DCRD 120BE
Product Construction Summary:	Aluminum Wheel, Aluminum Steel Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Backdraft Damper, 8" Galvanized Carbon Steel Self-Flashing Roof Curb, NEMA 1 Disconnect Switch, , 'Speed Controller, 'Performance Baffle, UL 705 Construction, '1/2 HP McMillan Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
27.50	27.50	30.38	70 lbs.	12.17	13.18	13.18

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 8**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	DCRD 180B
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Motorized Backdraft Damper, 18" Aluminum Straight Sided Roof Curb, NEMA 3R Disconnect Switch, Tie Down Brackets, Speed Controller, Miami-Dade Hurricane Construction, UL 705 Construction, 1 HP TCF Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
38.38	38.38	48.25	150 lbs	5.00	6.46	5.19

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 9**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	BCRD-E 180DHP
Product Construction Summary:	Aluminum Wheel, Endurex Polymeric Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Aluminum Birdscreen, Backdraft Damper, AMCA B Spark Resistant Construction, 12" Galvanized Carbon Steel Self-Flashing Roof Curb, NEMA 4 Disconnect Switch, Firestat, UL 705 Construction, 2 HP TCF Motor

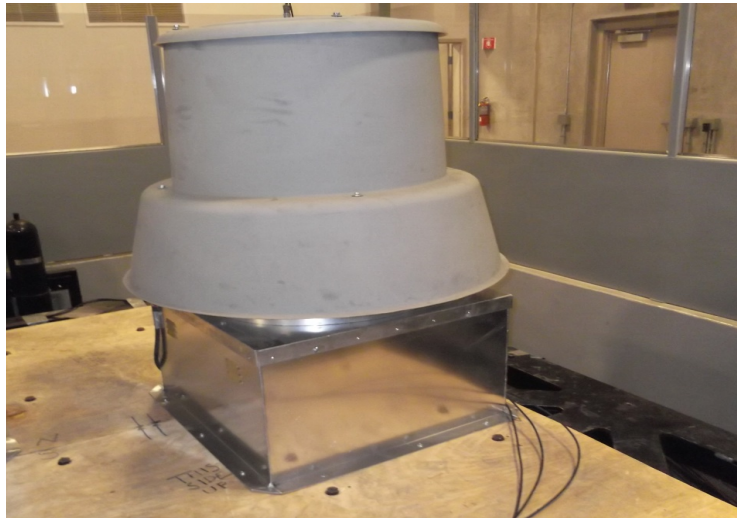
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
39.54	39.54	50.06	182 lbs.	5.85	6.21	6.09

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 10**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	BCRD 480D
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Aluminum Insect Screen, Motorized Backdraft Damper, 18" Aluminum Straight Sided Roof Curb, NEMA 7/9, Disconnect Switch, Stainless Steel Shaft, Stainless Steel Nameplate, Stainless Steel Hardware, Automatic Belt Tensioner, UL 705 Construction, '7 1/2 HP Baldor Motor

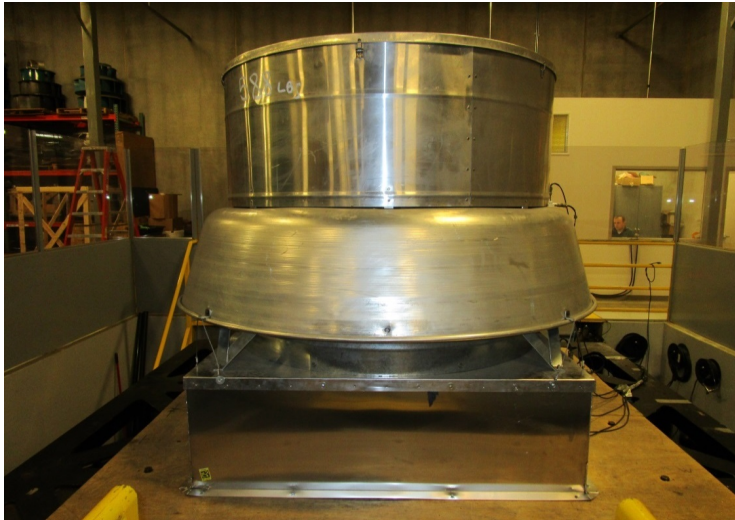
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
74.06	74.06	68.25	588 lbs.	5.10	6.20	6.95

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (4) 1/4" x 1 1/4" ungraded lag screws per side, (16) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 11**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	DCRU 093B
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Backdraft Damper, 8" Galvanized Carbon Steel Straight Sided Roof Curb, NEMA 1 Disconnect Switch, Firestat, Speed Controller, Drain, Retaining Chain, Security Hasp, Curb Hinge, UL 705 Construction, 1/3 HP TCF Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
22.00	22.00	34.13	64 lbs.	7.00	9.41	9.41

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using curb hinge with (5) 5/16" x 1 1/4" ungraded lag screws on fan and (5) on curb hinge. Opposite side of curb has security hasp and lock are riveted to curb with 3/16" rivets. All units were filled with contents and maintained structural integrity and functionality.

UUT 12**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	DCRUR 180B
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Tie Down Brackets, Backdraft Damper, 18" Aluminum Self-Flashing Roof Curb, NEMA 3R Disconnect Switch, Speed Controller,, Motorized Backdraft Damper, Miami-Dade Hurricane Construction, Drain Connection, UL 762 Construction, '1 HP McMillan Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
36.00	36.00	47.17	128	11.70	12.92	12.17

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 13-1**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Wall Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	140BE DCRW
Product Construction Summary:	Aluminum Wheel, Spun Aluminum Housing, Direct Drive, Single Horizontal Inlet, Horizontal Motor Shaft
Option / Component Summary:	Speed Controller, Nema 3R Disconnect Switch, Aluminum Backdraft Damper, Zinc Plated Carbon Steel Birdscreen, UL 705 Construction 0.160" Thick Aluminum 10" Mounting Bracket, 1/2 HP McMillan Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
38.56	30.00	30.00	86 lbs	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2.0	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 10" mounting bracket using 5/16-18 UNC grade 5 steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 13-2**Unit Under Test (UUT) Summary Sheet**

Manufacturer:

Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026

Product Line:

Centrifugal Wall Exhausters

Testing Laboratory:

Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442

Model Number:

140B DCRWR

Product Construction Summary:

Aluminum Wheel, Spun Aluminum Housing, Direct Drive, Single Horizontal Inlet, Horizontal Motor Shaft

Option / Component Summary:

Speed Controller, Nema 3R Disconnect Switch, Aluminum Birdscreen, Stainless Steel Hardware, UL 705 Construction
Type B Spark Resistant Construction, Restaurant Construction, 0.160" Thick Aluminum 4" Mounting Bracket,
1/2 HP TCF Motor

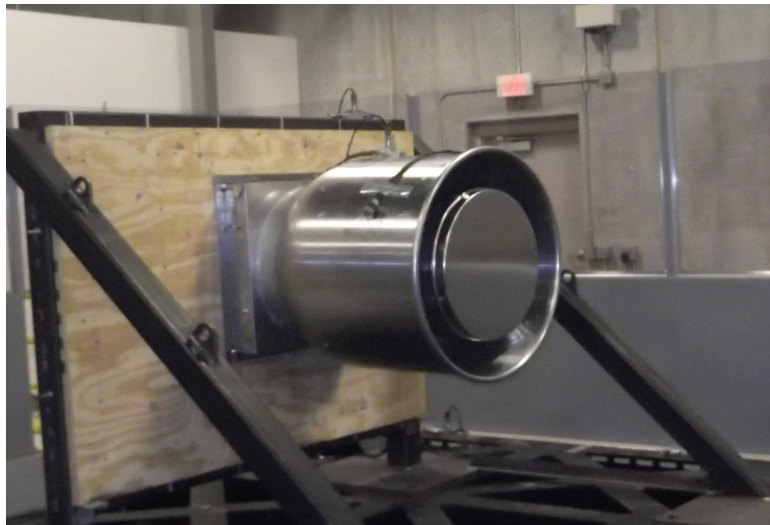
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
32.56	30.00	30.00	84 lbs	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 4" mounting bracket using 5/16-18 UNC grade 5 steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 14-1**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Wall Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	180BE DCRWR
Product Construction Summary:	Aluminum Wheel, Spun Aluminum Housing, Direct Drive, Single Horizontal Inlet, Horizontal Motor Shaft
Option / Component Summary:	Nema 4 Disconnect Switch, Motorized Aluminum Damper, Aluminum Birdscreen, Aluminum Insect Screen, Performance Baffle, 0.160" Thick Aluminum 10" Mounting Bracket, 1 HP McMillon Motor, UL 762 Restaurant Construction

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
39.17	36.00	36.00	150 lbs	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 10" mounting bracket using 5/16-18 UNC 316 stainless steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 14-2**Unit Under Test (UUT) Summary Sheet**

Manufacturer:

Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026

Product Line:

Centrifugal Wall Exhausters

Testing Laboratory:

Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442

Model Number:

180B DCRWR

Product Construction Summary:

Aluminum Wheel, Spun Aluminum Housing, Direct Drive, Single Horizontal Inlet, Horizontal Motor Shaft

Option / Component Summary:

Nema 4 Disconnect Switch, Motorized Aluminum Damper, Aluminum Birdscreen, Aluminum Insect Screen, Performance Baffle, 0.160" Thick Aluminum 10" Mounting Bracket, 1 HP TCF Motor, UL 762 Restaurant Construction

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
39.17	36.00	36.00	138 lbs	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 10" mounting bracket using 5/16-18 UNC 316 stainless steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 15**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	BCRUSH 160BHP
Product Construction Summary:	Carbon Steel Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Motorized Backdraft Damper, 12" Galvanized Carbon Steel Vented Straight Sided Roof Curb, NEMA 3R Disconnect Switch,, Two-Groove Drive, Drain, Aluminum Nameplate, Automatic Belt Tensioner, UL Smoke & Heat Construction, '1 HP Baldor Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
30.00	30.00	40.00	158 lbs.	4.92	4.43	4.70

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 16**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	BCRU 480B
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Backdraft Damper, 18" Aluminum Self-Flashing Roof Curb, NEMA 1 Disconnect Switch, Drain, Two-Speed Switch, UL 705 Construction, '7 1/2 HP Teco-Westinghouse Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
75.00	75.00	57.00	598 lbs.	5.09	4.70	4.80

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (4) 1/4" x 1 1/4" ungraded lag screws per side, (16) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 17-1**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Wall Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	160B BCRWR
Product Construction Summary:	Aluminum Wheel, Spun Aluminum Housing, Belt Drive, Single Horizontal Inlet, Horizontal Shaft
Option / Component Summary:	Nema 1 Disconnect Switch, Motorized Aluminum Damper, Aluminum Birdscreen, 0.160" Thick Aluminum 10" Mounting Bracket, 1 HP Baldor Motor, UL 762 Restaurant Construction

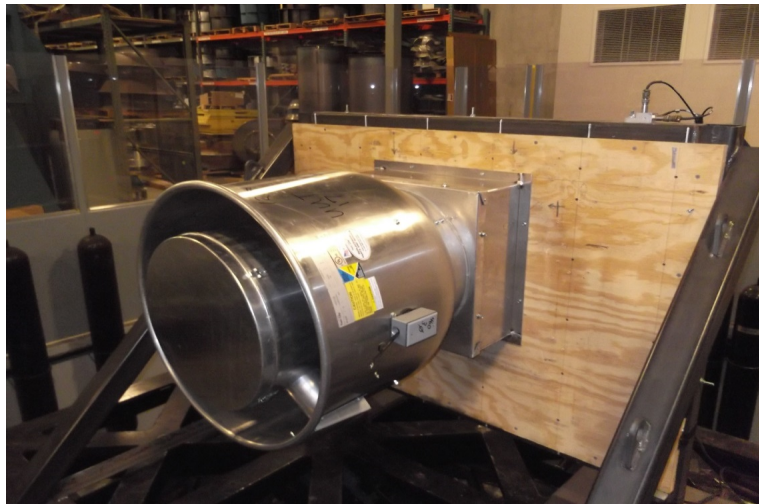
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
39.81	30.00	30.00	126 lbs	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 10" mounting bracket using 5/16-18 UNC 316 stainless steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 17-2**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Wall Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	160B BCRWR
Product Construction Summary:	Aluminum Wheel, Spun Aluminum Housing, Belt Drive, Single Horizontal Inlet, Horizontal Shaft
Option / Component Summary:	Nema 1 Disconnect Switch, Motorized Aluminum Damper, Aluminum Birdscreen, 0.160" Thick Aluminum 10" Mounting Bracket, 1 HP Teco Motor, UL 762 Restaurant Construction

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
39.81	30.00	30.00	124 lbs	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 10" mounting bracket using 5/16-18 UNC 316 stainless steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 18-1**Unit Under Test (UUT) Summary Sheet**

Manufacturer:

Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026

Product Line:

Centrifugal Wall Exhausters

Testing Laboratory:

Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442

Model Number:

300BHP BCRW

Product Construction Summary:

Aluminum Wheel, Spun Aluminum Housing, Belt Drive, Single Horizontal Inlet, Horizontal Shaft

Option / Component Summary:

Nema 7/9 Disconnect Switch, Aluminum Backdraft Damper, Mounting Bracket, 5 HP Teco Motor, Zinc Plated Birdscreen, Type B Spark Resistant Construction, Stainless Steel Shaft, Stainless Steel Hardware, UL 705 Construction, 0.160" Thick Aluminum 10" Mounting Bracket

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
48.25	54.00	54.00	400 lbs	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 10" mounting bracket using 5/16-18 UNC grade 5 steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 18-2**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Wall Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	300BHP BCRW
Product Construction Summary:	Aluminum Wheel, Spun Aluminum Housing, Belt Drive, Single Horizontal Inlet, Horizontal Shaft
Option / Component Summary:	Nema 7/9 Disconnect Switch, Aluminum Backdraft Damper, Mounting Bracket, 5 HP Baldor Motor, Zinc Plated Birdscreen,, Type B Spark Resistant Construction, Stainless Steel Shaft, Stainless Steel Hardware, UL 705 Construction, 0.160" Thick Aluminum 10" Mounting Bracket

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
48.25	54.00	54.00	370	N/A	N/A	N/A

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



The fan was mounted to the 0.160" thick aluminum 10" mounting bracket using 5/16-18 UNC grade 5 steel cap screws, 2 per side, total 8 into rivet nuts. The mounting brackets were secured using 2 per side, 8 total, 1/4" X 1 1/4" wood lag screws to double layered 3/4" plywood, 1 1/2" total thickness. The plywood was reinforced and attached to a wooden 2X4 structure with studs 12" on center. The plywood was anchored to the 2X4 structure using 3" flat plywood screws to the studs and 3" serrated-thread screws to the perimeter 2X4's. The perimeter 2X4's were anchored to a 4" X4" tubular steel wall mount structure using 10 - 3/8"-16 7" UNC grade 5 carriage bolts. The A36 tubular steel wall mount structure was secured to the table using 16 total 5/8-11 UNC Grade A326 hardware. All units were filled with contents and maintained structural integrity and functionality.

UUT 19**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	DCLH 120
Product Construction Summary:	Aluminum Wheel, Galvanized Carbon Steel Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Motorized Backdraft Damper, NEMA 1 Disconnect Switch, 8" Galvanized Carbon Steel Self-Flashing Roof Curb, UL 705 Construction 1/2 HP Teco-Westinghouse motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
26.63	30.00	27.13	111 lbs.	13.18	13.98	14.55

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 20**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	DCLP 120E
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Direct Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Backdraft Damper, NEMA 3R Disconnect Switch, 18" Aluminum Straight Sided Roof Curb, Stainless Steel Hardware, Performance Baffle, Speed Controller, UL 705 Construction 1/2 HP McMillan Motor

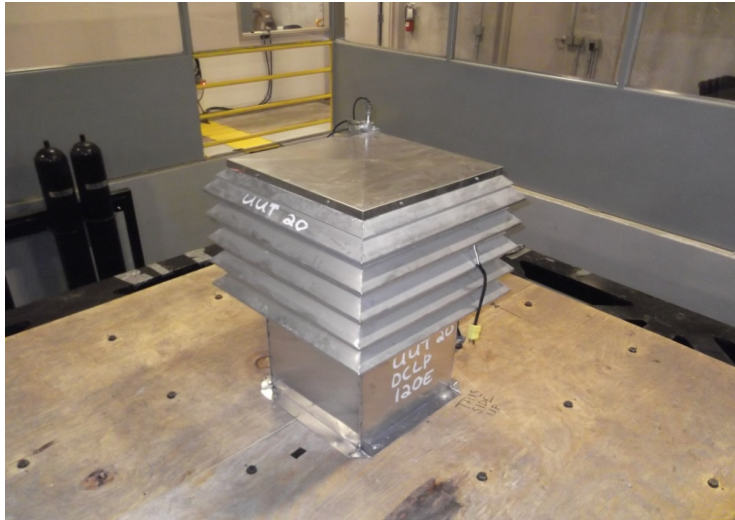
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
28.00	28.00	36.25	122 lbs.	12.18	13.44	12.92

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (2) 1/4" x 1 1/4" ungraded lag screws per side, (8) total. Fan mounted to roof curb using (3) 5/16" x 1 1/4" ungraded lag screws per side, (12) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 21**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	BCLH 210
Product Construction Summary:	Aluminum Wheel, Galvanized Carbon Steel Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Backdraft Damper, 12" Galvanized Carbon Steel Self-Flashing Roof Curb, NEMA 4 Disconnect Switch, Automatic Belt Tensioner, Aluminum Insect Sreen, Aluminum Nameplate, Firestat 1 HP TCF Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
51.13	46.25	35.63	238 lbs.	12.18	12.42	15.14

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 22**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	BCLP 480B
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, AMCA B Spark Resistant Construction, Motorized Backdraft Damper, 18" Aluminum Self-Flashing Roof Curb, NEMA 1 Disconnect Switch, Two-Speed Switch, Stainless Steel Shaft, UL 705 Construction, '7 1/2 HP Marathon Motor

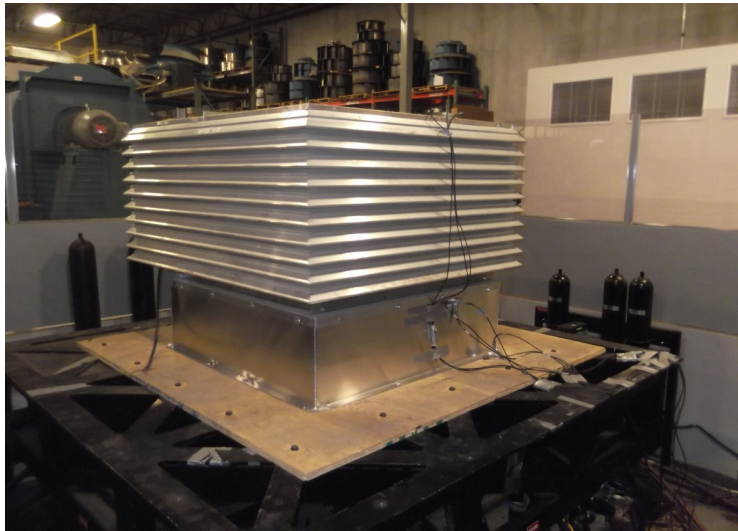
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
76.50	66.00	59.38	615 lbs.	4.90	6.21	6.33

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (4) 1/4" x 1 1/4" ungraded lag screws per side, (16) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 23**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	21B105 BSD53
Product Construction Summary:	Aluminum Wheel, Galvanized Carbon Steel Housing, Direct Drive, Single Vertical Inlet, Vertical Shaft Orientation
Option / Component Summary:	Nema 3R Disconnect Switch, Galvanized Carbon Steel Birdscreen, 8" Galvanized Carbon Steel Straight Sided Roof Curb, UL 705 Construction, 1/2 HP Marathon Motor

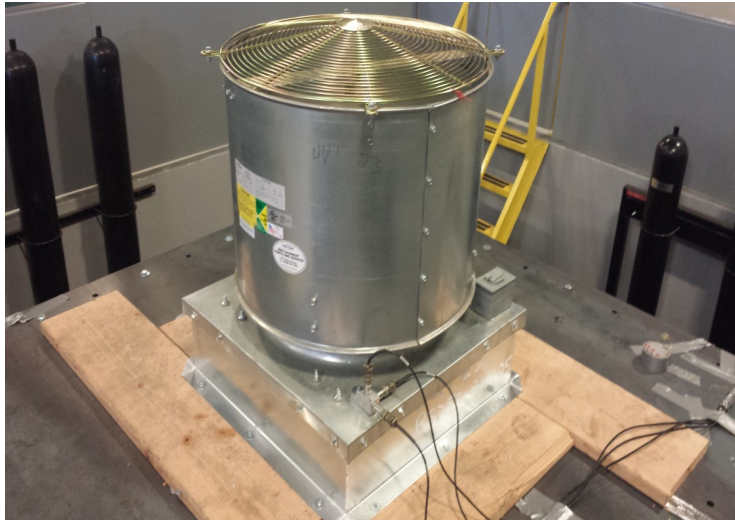
UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
29.50	29.50	43.11	110 lbs.	14.00	14.00	11.00

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 24**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	48B304 BSD53
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Direct Drive, Single Vertical Inlet, Vertical Shaft Orientation
Option / Component Summary:	Nema 3R Disconnect Switch, Tie Down Brackets, Fusible Link, Magnetic Damper Latch, Aluminum Nameplate, 18" Aluminum Self-Flashing Roof Curb, UL 705 Construction 5 HP Baldor Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
58.50	58.50	77.51	480 lbs	10.10	10.10	12.20

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (4) 1/4" x 1 1/4" ungraded lag screws per side, (16) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 25**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	30B105 BSB53
Product Construction Summary:	Aluminum Wheel, Galvanized Carbon Steel Housing, Belt Drive, Single Vertical Inlet, Vertical Shaft Orientation
Option / Component Summary:	Nema 3R Disconnect Switch, Inlet Safety Guard, Tie Down Brackets, Fusible Link, Magnetic Damper Latch External Lube Lines, 12" Galvanized Carbon Steel Straight Side Roof Curb, UL 705 Construction 5 HP Marathon Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
40.50	40.50	56.25	268 lbs	12.92	15.14	12.67

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (4) 5/16" x 1 1/4" ungraded lag screws per side, (16) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 26**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Axial Upblast Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	54B406 BSB53
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Shaft Orientation
Option / Component Summary:	Nema 3R Disconnect Switch, Galvanized Carbon Steel Birdscreen, 18" Aluminum Self-Flashing Roof Curb, UL 705 Construction, External Lube Lines, 15 HP Teco-Westinghouse Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
64.50	64.50	83.05	672 lbs.	7.87	7.13	7.87

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (4) 1/4" x 1 1/4" ungraded lag screws per side, (16) total. Fan mounted to roof curb using (6) 5/16" x 1 1/4" ungraded lag screws per side, (24) total. All units were filled with contents and maintained structural integrity and functionality.

UUT 27**Unit Under Test (UUT) Summary Sheet**

Manufacturer:	Twin City Fan Companies Elkton Facility, 201 Badger Street North, Elkton, SD 57026
Product Line:	Centrifugal Roof Exhausters
Testing Laboratory:	Twin City Fan Companies, Ltd., 5955 Trenton Lane North, Plymouth, MN 55442
Model Number:	BCRD 240DHP
Product Construction Summary:	Aluminum Wheel, Aluminum Housing, Belt Drive, Single Vertical Inlet, Vertical Motor Shaft Orientation
Option / Component Summary:	Galvanized Carbon Steel Birdscreen, Stainless Steel Shaft, Stainless Steel Hardware, 12" Aluminum Self-Flashing Roof Curb, NEMA 1 Disconnect, Switch, UL 705 Construction, 1 1/2 HP Baldor Motor

UUT PROPERTIES

Dimensions (inches)			Weight	Lowest Natural Frequencies (Hz) +/-		
Depth	Width	Height		Front-Back (Horizontal X)	Side-Side (Horizontal Y)	Up-Down (Vertical Z)
34.00	34.00	47.88	178 lbs.	7.10	7.80	7.50

SEISMIC PARAMETERS (refer to ASCE 7-10 Supplement)

Building Code	Test Criteria	Sds (g)	Z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2016	ICC-ES AC156	2.5	0.0	1.5	2.50	1.00	1.68	0.68
		2	1.0	1.5	3.20	2.40	1.34	0.54

Unit Mounting Description / Configuration:



Roof curb mounted to table using (3) 1/4" x 1 1/4" ungraded lag screws per side, (12) total. Fan mounted to roof curb using (2) 5/16" x 1 1/4" ungraded lag screws per side, (8) total. All units were filled with contents and maintained structural integrity and functionality.