

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



CITY OF PORTLAND BUILDING PERMIT

This is to certify that 80-90 CORP LLC

Located At 80 MIDDLE ST

Job ID: 2011-10-2380-HVAC

CBL: 029- L-004-001

has permission to Install 1 exterior & 1 interior Grease Duct Exhaust, with new rooftop power ventilators, hoods existing provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

Fire Prevention Officer

[Signature] 12/20/11

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No: 2011-10-2380-HVAC	Date Applied: 9/28/2011	CBL: 029- L-004-001	
Location of Construction: 80 MIDDLE ST	Owner Name: 80-90 Corp LLC	Owner Address: 100 Silver St., Portland, ME 04101	Phone:
Business Name:	Contractor Name: HVAC Services Inc	Contractor Address: 73 Bradley DR WESTBROOK MAINE 04092	Phone: () - 854-4822
Lessee/Buyer's Name:	Phone:	Permit Type: HVAC	Zone: B-3
Past Use: 1 st floor retail & restaurant food service along Middle St.	Proposed Use: Same: 1 st floor retail & restaurant food service – to install grease exhaust duct in 78 & 88 Middle Street	Cost of Work: \$27,000.00	CEO District:
		Fire Dept: <input checked="" type="checkbox"/> Approved w/conditions <input type="checkbox"/> Denied <input type="checkbox"/> N/A	Inspection: Use Group: A-2/B Type: Type 2 Existing duct hoods Signature: <i>[Signature]</i> 10/20/11
Proposed Project Description: Install a Grease Exhaust Duct and roof top unit		Pedestrian Activities District (P.A.D.)	

Permit Taken By: planning	Zoning Approval		
<p>1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.</p> <p>2. Building Permits do not include plumbing, septic or electrical work.</p> <p>3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.</p>	Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetlands <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan <input type="checkbox"/> Maj <input type="checkbox"/> Min <input type="checkbox"/> MM Date: <i>OK with conditns</i> <i>[Signature]</i> 10/6/11	Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date:	Historic Preservation <input checked="" type="checkbox"/> Not in Dist or Landmark <input type="checkbox"/> Does not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date: <i>[Signature]</i>
	CERTIFICATION		

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

1. Close In Elec/Plmb/Frame prior to insulate or gyp

2. Final Inspection

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.



PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life • www.portlandmaine.gov

Director of Planning and Urban Development
Penny St. Louis

Job ID: 2011-10-2380-HVAC

Located At: 80 MIDDLE ST

CBL: 029- L-004-001

Conditions of Approval:

Zoning

1. This B-3 zone has maximum noise allowances. The City of Portland strictly enforces the level of sound generated on the property. Any verified noise violations shall require the owner to take mitigating measures to bring the property and the noise it generates into compliance.

Building

1. Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.
2. Separate permits are required for any electrical, plumbing, sprinkler, fire alarm, HVAC systems, heating appliances, including pellet/wood stoves, commercial hood exhaust systems and fuel tanks. Separate plans may need to be submitted for approval as a part of this process.
3. This permit approves the installation of duct, exhaust and makeup air systems to existing hoods.
4. The 3M grease duct wrap product shall be installed per manufacturer's specifications including sealing of penetrations of rated walls and floors and required access panels.

Fire

1. Installation shall comply with City Code Chapter 10.
2. All construction shall comply with City Code Chapter 10.
3. This permit is being approved on the basis of the plans submitted. Any deviation from the plans would require amendments and approval.
4. Install shall comply with NFPA 96. A compliance letter is required.
5. Install shall comply with all manufacture's specifications.
6. Hood suppression system shall comply with NFPA 17A, 96, and UL 300. Activation of the suppression system shall activate the fire alarm system if available. A letter of compliance will be required at the time of final inspection stating: the date the system was tested for operation, fuel gas shut off, and fire alarm connection if applicable. The Class K fire extinguisher and proper signage should be located at the suppression system pull station.

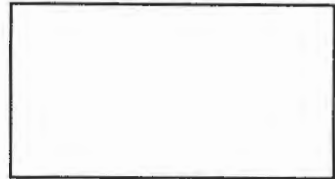


029-L-004

FILL IN AND SIGN WITH INK

RECEIVED

APPLICATION FOR PERMIT HEATING OR POWER EQUIPMENT



SEP 28 2011

S-3: H-stone
NOT in H-stone

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL 78 & 88 Middle St Use of Building Commercial Date 9/26/2011
 Name and address of owner of appliance 80-90 CORP LLC
Congress St. Portland, Me
 Installer's name and address HVAC SERVICES INC Brent Steve
73 BRADLEY DRIVE WESTBROOK Telephone 207-854-4822

Location of appliance:

- Basement
- Floor
- Attic
- Roof

Type of Fuel:

- Gas
- Oil
- Solid

Appliance Name:

U.L. Approved Yes No

Will appliance be installed in accordance with the manufacture's installation instructions? Yes No

IF NO Explain: _____

The Type of License of Installer:

- Master Plumber # _____
- Solid Fuel # _____
- Oil # _____
- Gas # _____
- Other _____

Type of Chimney:

- Masonry Lined
Factory built

- Metal

Factory Built U.L. Listing # Grease exhaust duct KGA welded

- Direct Vent
Type _____ UL# _____

Type of Fuel Tank

- Oil
- Gas

Size of Tank _____

Number of Tanks _____

Distance from Tank to Center of Flame _____ feet.

Cost of Work: \$ 26,430⁰⁰

Permit Fee: \$ 290

NOT HVAC
Grease
10.5.11

Approved

Fire: _____
 Ele.: _____
 Bldg.: _____

Approved with Conditions

- See attached letter or requirement

Inspector's Signature _____

Date Approved _____

Signature of Installer _____

Codes and Certifications

Applications: General Clean Air



Codes and Certifications

UL 705 - Power Ventilators

Intended to assure the buyer of the safety of electrical components and connections within power ventilators and duct fans. Limited to fans connected to permanently installed wiring that meet NFPA 70 and the National Electric Code. Tests under this standard relate to extremes of current, temperature, fuses, motor windings, bearing temperatures, and water that a fan could be subject to.

UL Power Ventilators for Smoke Control Systems

Ventilators or duct fans have been investigated with respect to their operation during exposure to elevated temperatures. Installed as part of a smoke control system and in accordance NFPA 92A and 92B. Requirements also include UL 705 and if applicable UL 793. Meets the IRI and SBCCI "Standard Fire Prevention Code" requirements.

UL 762 - Power Ventilators for Restaurant Exhaust Appliances

UL 762 is for exhausting grease in the airstream as found in restaurant or kitchen applications. Basic testing is the same as for UL 705 and additional testing includes operating the fan in a high temperature airstream without warpage,

deterioration or damage that would cause the fan to operate unsafely plus grease flare-up tests. Greenheck products with UL 762 include most centrifugal roof upblast and centrifugal sidewall fans, utility fans and housed centrifugal fans.

AMCA Certified Ratings Program

Ensures that all data is accurate. The 211 seal for air performance certifies that the fan has been tested to the appropriate AMCA standards in a licensed test facility and that the air performance displayed in catalogues and selection software is accurate. The 311 seal for air and sound performance certifies that the fan has been tested to the appropriate AMCA sound standards in a licensed facility and that the sound performance displayed in catalogues and selection software is accurate. The AMCA Certified Ratings Program is designed to ensure that the products perform as stated and that a third-party organization has verified all published data for accuracy and consistency.

NFPA 96

Standard for Ventilation Control and Fire Protection of Cooking Operations. This standard outlines the appropriate installation methods and required equipment to ensure a safe and effective kitchen or cooking installation of HVAC equipment.

Clean Air Applications

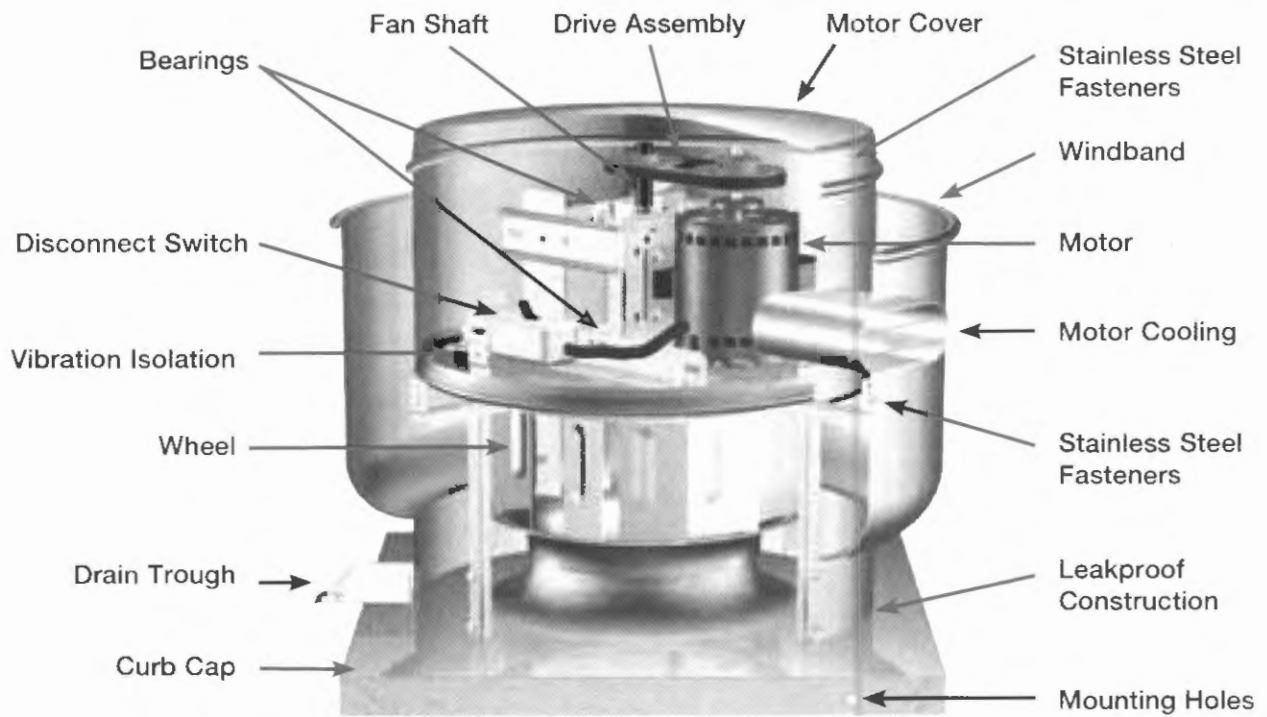
Models CUBE, CUE, CWB, and CW

These spun aluminum fans are specifically designed for roof mounted or wall mounted applications. General clean or lightly contaminated exhaust air can be discharged directly upward, away from the roof surface or discharged out and away from building walls.

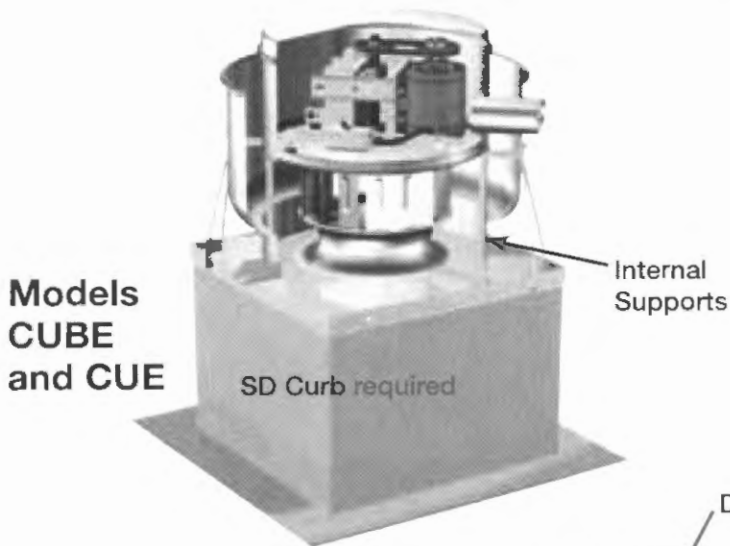
- Most advanced motor cooling of any fan in its class.
- Greenheck pioneered leakproof construction for the entire life of the fan utilizing a one-piece windband continuously welded to the curb cap.
- Performance as cataloged is assured. All fan sizes are tested in our AMCA Accredited Laboratory and all models are licensed to bear the AMCA Sound and Air Performance seal.
- Greenheck subjects these products to extensive life testing, assuring you the fans will provide many years of reliable performance.



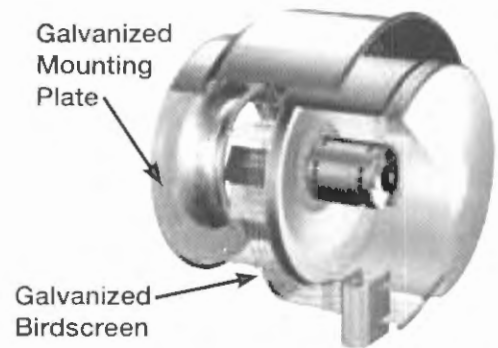
Standard Construction Features



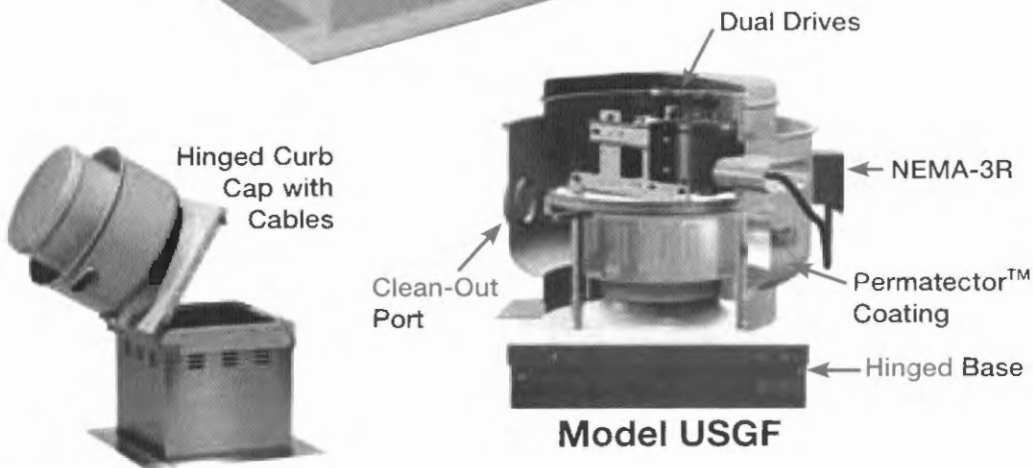
Models CUBE and CUE



Models CUBE and CUE



Models CWB & CW



Model USGF



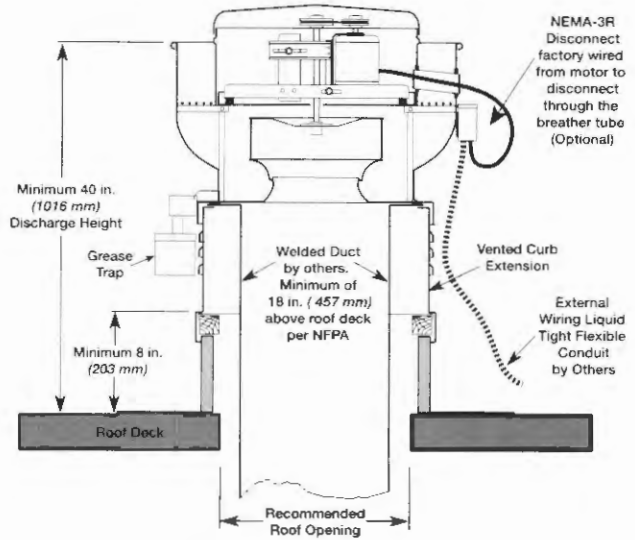
Typical Installations by Application



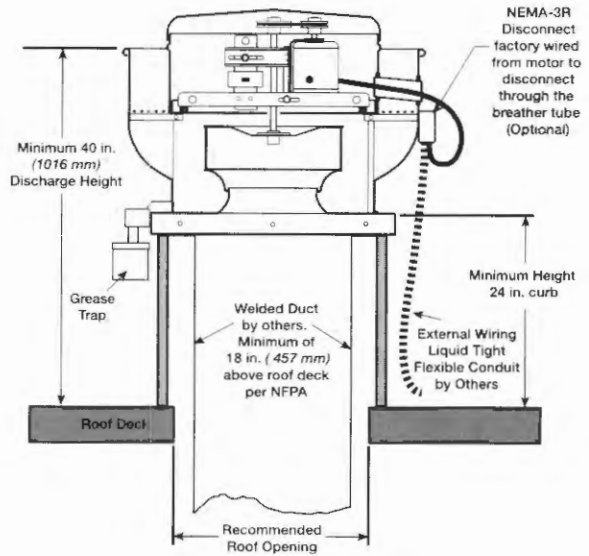
Commercial Kitchen (Grease)

Models CUBE, CUE, CWB and CW, and sizes 098 and larger and all USGF fans are designed to meet restaurant and food service applications. These fans are UL/cUL Listed for grease removal and have been tested under high temperature [400°F (204°C)] and abnormal flare-up [600°F (316°C)] conditions.

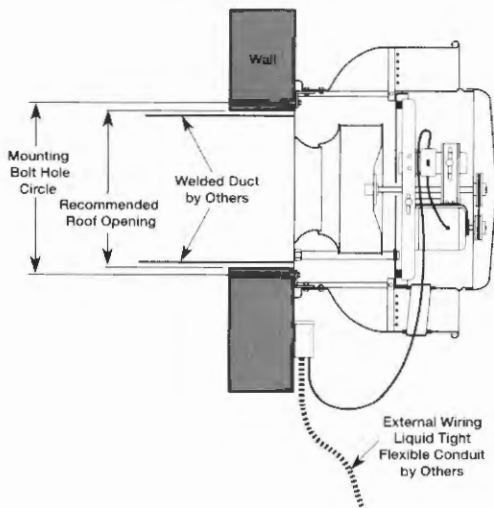
- Due to high temperatures and grease-laden airstreams in commercial kitchen ventilation, system designers must be aware of governing codes and guidelines. The National Fire Protection Association (NFPA) is the primary source which governs many codes for commercial kitchen ventilation. Selected information from NFPA 96 is shown below. Local code authorities should be consulted before proceeding with any kitchen ventilation project.
- Exhaust fans used in kitchen ventilation applications must have external wiring. (Wiring must not be installed in the airstream).
- Installation must include a means for inspecting, cleaning and servicing the exhaust fan. Greenheck offers a Hinged Curb Cap option for upblast exhaust fans and the Hinged Base is standard on model USGF.
- No dampers are to be installed in the system.



Models CUBE & CUE
Vented Installation



Models CUBE & CUE
Fire Wrapped Installation

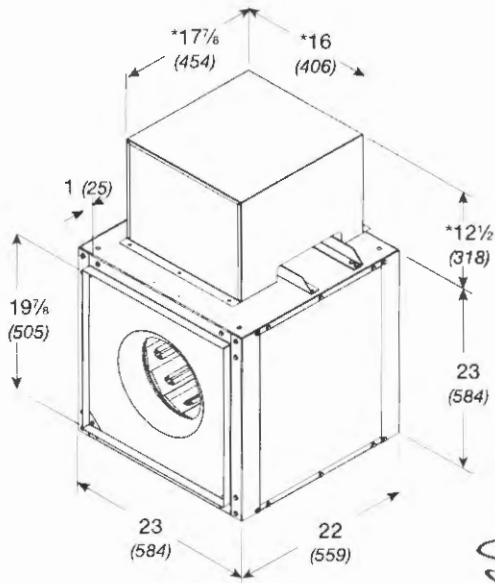


Models CWB & CW

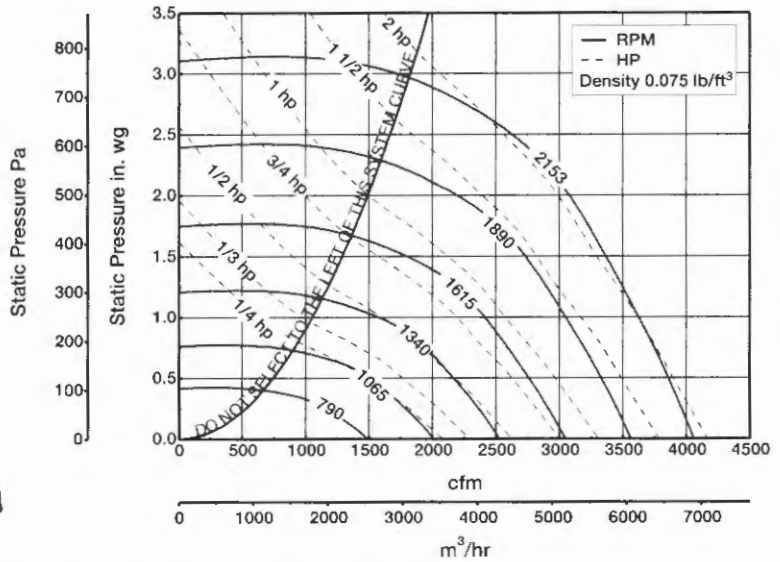
Note: The typical installations shown on these two pages are recommendations based on national codes. Local authority may supersede these recommendations.



BSQ 140 - Belt Drive



SF-1



Damper size = 20 x 20 (508 x 508)
 Unit weight** = 111 (50)
 Housing thickness = 18 ga

Dimensions shown in inches (millimeters) and weight is shown in pounds (kilograms).
 *Motor cover is optional. Size may be greater depending on motor.
 **Weight shown is largest cataloged Open Drip Proof motor.

Model Number	Motor HP	Fan RPM	CFM / Static Pressure in Inches wg																			
			0.125	0.250	0.500	0.750	1.000	1.500	1.750	2.000	2.500	2.750										
BSQ-140-4	1/4	800	CFM	1362	1185																	
			BHP	0.10	0.11																	
			Sones	6.3	6.7																	
		1076	CFM	1927	1810	1538																
			BHP	0.24	0.25	0.26																
			Sones	10.7	10.7	10.2																
BSQ-140-3	1/3	1185	CFM	2142	2039	1807	1463															
			BHP	0.32	0.33	0.35	0.34															
			Sones	12.1	11.9	12.0	10.6															
		1271	CFM	2311	2217	2006	1741	1199														
			BHP	0.39	0.41	0.43	0.43	0.39														
			Sones	13.3	13.0	13.1	13.0	12.7														
BSQ-140-5	1/2	1356	CFM	2476	2392	2197	1979	1636														
			BHP	0.48	0.49	0.51	0.52	0.51														
			Sones	14.2	13.9	13.8	13.8	13.8														
		1553	CFM	2858	2787	2626	2449	2253	1447													
			BHP	0.71	0.73	0.75	0.78	0.79	0.70													
			Sones	16.2	16.0	16.0	15.6	15.3	13.9													
BSQ-140-7	3/4	1631	CFM	3008	2941	2790	2625	2446	1865													
			BHP	0.82	0.84	0.86	0.89	0.91	0.87													
			Sones	17.1	16.9	16.9	16.6	16.1	14.8													
		1709	CFM	3159	3094	2953	2798	2635	2177	1752												
			BHP	0.95	0.96	0.99	1.02	1.05	1.03	0.97												
			Sones	18.2	18.0	17.9	17.7	17.2	16.1	15.1												
BSQ-140-10	1	1956	CFM	3633	3576	3461	3330	3193	2894	2705	2457											
			BHP	1.41	1.43	1.47	1.49	1.53	1.57	1.57	1.55											
			Sones	24	23	24	24	23	22	21	20											
		2055	CFM	3822	3769	3662	3537	3410	3136	2982	2777	2168										
			BHP	1.63	1.66	1.70	1.73	1.75	1.82	1.82	1.81	1.70										
			Sones	27	26	28	27	26	25	24	23	21										
BSQ-140-15	1 1/2	2055	CFM	4009	3958	3856	3741	3622	3365	3225	3078	2627	2260									
			BHP	1.88	1.90	1.95	1.98	2.00	2.08	2.10	2.10	2.05	1.95									
			Sones	30	30	31	31	30	28	28	27	25	23									
		2153	CFM	4009	3958	3856	3741	3622	3365	3225	3078	2627	2260									
			BHP	1.88	1.90	1.95	1.98	2.00	2.08	2.10	2.10	2.05	1.95									
			Sones	30	30	31	31	30	28	28	27	25	23									

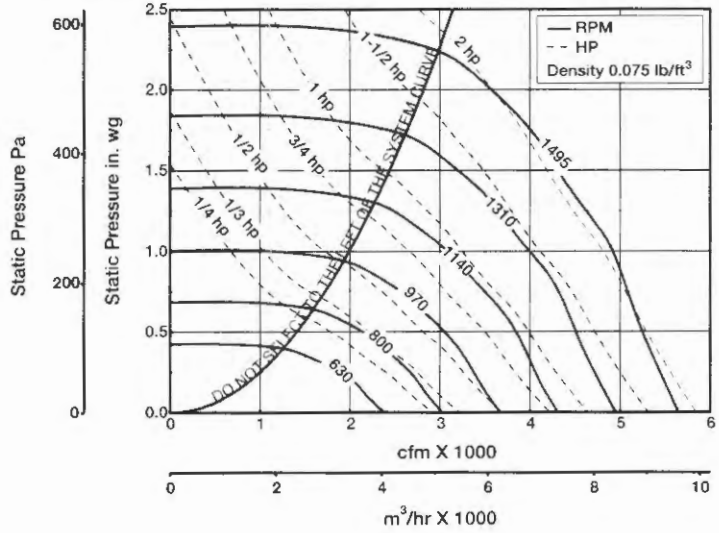
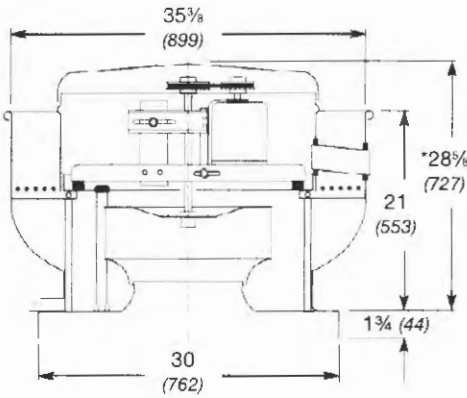
Performance certified is for installation type B: Free inlet, Ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

Power rating (Bhp) does not include transmission losses.

The sound ratings shown are loudness values in fan sones at 1.5 m (5 feet) in a hemispherical free field calculated per AMCA Standard 301.

Values shown are for installation type B: free inlet hemispherical fan sone levels.

Roof Upblast - Belt Drive Size-180: CUBE • USGF



EF-1

CUBE

Damper Size = 18 x 18 (457 x 457)
 Roof Opening = 20 1/2 x 20 1/2 (521 x 521)
 Windband Thickness = 0.064 (1.6)
 Motor Cover Thickness = 0.040 (1.0)
 Curb Cap Thickness = 0.064 (1.6)
 ^Approximate Unit Weight = 126 lb (57 kg)

USGF

Roof Opening = 20 1/2 x 20 1/2 (521 x 521)
 Windband Thickness = 0.051 (1.3)
 Motor Cover Thickness = 0.040 (1.0)
 Curb Cap Thickness = 0.064 (1.6)
 ^Approximate Unit Weight = 190 lb (86 kg)

All dimensions in inches (millimeters). *May be greater depending on motor. ^Weight shown is largest cataloged Open Drip-Proof motor. For specification information and image of each model, please see pages 82-87.

Model Size	Motor HP	Fan RPM	CFM / Static Pressure in Inches wg																			
			0	0.125	0.25	0.5	0.75	1	1.25	1.5	1.75	2										
180-4	1/4	630	CFM	2380	2154	1861																
			BHP	0.13	0.15	0.16																
			Sones	7.1	6.4	5.5																
		745	CFM	2815	2617	2448	1763															
			BHP	0.22	0.24	0.26	0.25															
			Sones	9.2	8.6	8.1	7.1															
180-3	1/3	820	CFM	3098	2916	2759	2257															
			BHP	0.30	0.32	0.34	0.34															
			Sones	11.2	10.4	10.0	9.0															
		940	CFM	3551	3389	3243	2879	2363														
			BHP	0.45	0.47	0.49	0.52	0.50														
			Sones	13.8	13.5	13.1	12.4	11.2														
180-7	3/4	1010	CFM	3816	3664	3526	3242	2799	2105													
			BHP	0.56	0.58	0.61	0.65	0.64	0.58													
			Sones	15.4	15.2	14.9	14.7	13.7	11.8													
		1075	CFM	4061	3919	3786	3554	3141	2652													
			BHP	0.67	0.70	0.73	0.78	0.78	0.75													
			Sones	16.5	16.2	15.8	15.5	14.7	13.3													
180-10	1	1185	CFM	4477	4348	4224	4005	3703	3336	2841												
			BHP	0.90	0.93	0.96	1.01	1.04	1.04	0.99												
			Sones	18.5	17.9	17.1	16.5	16.0	15.2	14.4												
		1275	CFM	4817	4697	4578	4369	4163	3799	3437	2930											
			BHP	1.12	1.15	1.19	1.24	1.30	1.30	1.28	1.22											
			Sones	21	20	19.5	18.7	18.2	17.5	16.7	15.9											
180-15	1 1/2	1360	CFM	5138	5026	4913	4710	4532	4232	3912	3537	3023										
			BHP	1.36	1.39	1.43	1.49	1.56	1.58	1.58	1.54	1.46										
			Sones	23	23	22	21	21	20	19.2	18.3	17.3										
		1430	CFM	5402	5296	5189	4993	4819	4593	4270	3968	3567	3001									
			BHP	1.58	1.62	1.66	1.72	1.79	1.83	1.83	1.83	1.76	1.66									
			Sones	25	25	25	24	23	22	22	21	19.5	18.2									
180-20	2	1495	CFM	5648	5546	5443	5254	5082	4921	4598	4313	3983	3564									
			BHP	1.80	1.84	1.89	1.96	2.02	2.10	2.10	2.10	2.06	1.99									
			Sones	28	27	27	26	25	25	24	23	22	21									

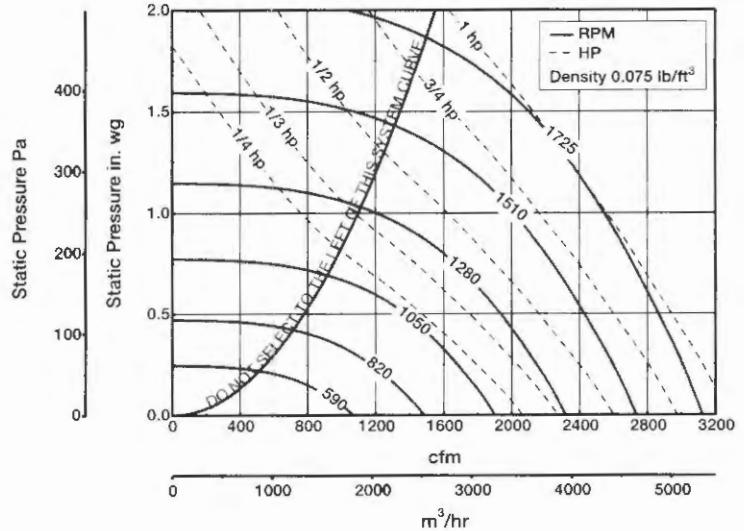
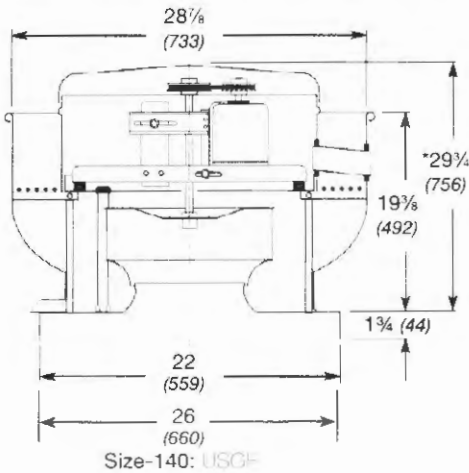
MAXIMUM BHP AT A GIVEN RPM = (RPM/1167)³
 MAXIMUM RPM = 1495
 TIP SPEED (ft/min) = RPM x 4.843
 MAXIMUM MOTOR FRAME SIZE = 184T
 AVERAGE DISCHARGE VELOCITY (FPM) = CFM/2.92

Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound ratings shown are loudness values in fan sones at 5 ft (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: Free inlet hemispherical sone levels.

Roof Upblast - Belt Drive

Size-140: USGF only

Size-141: CUBE • S-CUBE



EF-2

CUBE • S-CUBE

Damper Size = 16 x 16 (406 x 406)
 Roof Opening = 18½ x 18½ (470 x 470)
 Windband Thickness = 0.051 (1.3)
 Motor Cover Thickness = 0.040 (1.0)
 Curb Cap Thickness = 0.064 (1.6)
 ^Approximate Unit Weight = 84 lb (38 kg)

USGF

Roof Opening = 18½ x 18½ (470 x 470)
 Windband Thickness = 0.051 (1.3)
 Motor Cover Thickness = 0.040 (1.0)
 Curb Cap Thickness = 0.064 (1.6)
 ^Approximate Unit Weight = 125 lb (57 kg)

All dimensions in inches (millimeters). *May be greater depending on motor. ^Weight shown is largest cataloged Open Drip-Proof motor. For specification information and image of each model, please see pages 82-87.

Model Size	Motor HP	Fan RPM	CFM / Static Pressure in Inches wg																	
			0	0.125	0.25	0.375	0.5	0.75	1	1.25	1.5	1.75								
141-4	1/4	590	CFM	1069	851															
		BHP	0.04	0.04																
		Sones	5.0	4.5																
	715	CFM	1295	1130	885															
	BHP	0.06	0.07	0.07																
	Sones	6.0	6.0	5.1																
141-3	1/3	840	CFM	1521	1387	1217	969													
		BHP	0.10	0.11	0.11	0.11														
		Sones	7.1	7.3	6.8	6.2														
	965	CFM	1748	1635	1499	1333	1103													
	BHP	0.15	0.16	0.17	0.17	0.17														
	Sones	8.6	8.7	8.5	8.1	7.7														
141-5	1/2	1105	CFM	2001	1906	1793	1667	1515	998											
		BHP	0.23	0.24	0.25	0.26	0.26	0.23												
		Sones	10.9	10.8	10.6	10.3	10.0	9.6												
	1290	CFM	2192	2106	2006	1896	1773	1443												
	BHP	0.30	0.31	0.32	0.33	0.34	0.34													
	Sones	12.2	12.2	11.7	11.6	11.2	10.9													
141-7	3/4	1495	CFM	2337	2258	2166	2065	1957	1691	1221										
		BHP	0.36	0.38	0.39	0.40	0.41	0.42	0.37											
		Sones	13.2	13.3	12.7	12.6	12.3	12.0	11.3											
	1595	CFM	2518	2445	2362	2271	2174	1949	1643											
	BHP	0.45	0.47	0.48	0.50	0.51	0.52	0.51												
	Sones	14.9	14.7	14.2	13.2	12.9	12.1	11.0												
141-10	1	1725	CFM	2708	2640	2565	2483	2396	2202	1967	1617									
		BHP	0.56	0.58	0.60	0.61	0.62	0.64	0.65	0.61										
		Sones	17.2	16.5	16.3	15.6	13.9	12.5	12.2	10.8										
	1968	CFM	2889	2826	2757	2683	2602	2430	2225	1968	1568									
	BHP	0.69	0.70	0.72	0.74	0.75	0.77	0.79	0.78	0.72										
	Sones	20	19.0	18.5	19.5	16.1	13.3	12.3	12.6	11.6										
141-10	1	1725	CFM	3125	3066	3005	2936	2865	2711	2539	2339	2085	1704							
		BHP	0.87	0.88	0.90	0.92	0.94	0.97	0.99	1.00	0.98	0.91								
		Sones	26	23	22	24	24	15.1	13.4	14.3	13.8	13.8								

MAXIMUM BHP AT A GIVEN RPM = (RPM/1726)³
 MAXIMUM RPM = 1725
 TIP SPEED (ft/min) = RPM x 3.829
 MAXIMUM MOTOR FRAME SIZE = 145T
 AVERAGE DISCHARGE VELOCITY (FPM) = CFM/1.72

Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound ratings shown are loudness values in fan sones at 5 ft (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: Free inlet hemispherical sone levels.

Grease Duct Listings for 615+

Fire Resistive Rating	Enclosure System	Duct System, Intertek (OPL)	Testing
615+			
1 or 2 hours	2 layers of 3M™ Fire Barrier Duct Wrap 615+, 3" (76mm) perimeter and 3" (76mm) longitudinal overlaps	3MU/FRD 120-18 3MU/FRD 120-19	ASTM E 2336 / ICC ES AC101

Surface Burning Characteristics (ASTM E 84 for 615+)

Product	Flame Spread	Smoke Developet
Fire Barrier Duct Wrap 615+	<25	<50

Codes & Standards for 615+, Air Duct

Standards for the Installation of Air Condition and Ventilating Systems, 2009 Ed.
 NFPA 92A Standard for Smoke-Control System Utilizing Barriers and Pressure Differences, 2006 Edition — Section 6.6.2
 NFPA 92B Standard for Smoke Management Systems in Malls, Atria, and Large Spaces, 2005 Edition — Section 7.5.2
 NFPA 101® Life Safety Code®, 2006 Edition — Section(s) 8.6.7, 18.7.7
 International Mechanical Code®, 2006 Edition — Section 513.10.2
 International Building Code®, 2006 Edition — Section 909.10.2

This is only a partial list of codes and standards. Go to 3M.com/firestop or speak to your authorized 3M distributor or sales representative at 1-800-328-1667.

Availability

Product	Roll Size	Roll/ctr.	Roll
3M™ Fire Barrier Duct Wrap 615+	*1.5" x 24" x 25' (38mm x 60.9cm x 762cm)	1	45 lbs. 20 kg.
3M™ Fire Barrier Duct Wrap 615+	*1.5" x 48" x 25' (38mm x 121.9cm x 762cm)	1	90 lbs. 40 kg.
3M™ Fire Barrier Plenum Wrap 5A	.5" x 24" x 50' (38mm x 121.9cm x 1524cm)	1	45 lbs. 20 kg.
3M™ Fire Barrier Plenum Wrap 5A	.5" x 48" x 25' (12.7mm x 121.9cm x 762cm)	2	90 lbs. 40 kg.

3M's Grease, Chemical Fume and Ventilation Air Duct listings all have affiliated Through-Penetration design listings that comply with ASTM E 814. Go to 3M.com/firestop or speak to your authorized 3M distributor or sales representative at 1-800-328-1667 for more information.

* In accordance with the tolerances in ASTM C 892 Standard Specification for High-Temperature Fiber Blanket Thermal Insulation

Product	Product Number	Description	Roll Size	UPC Number	Packaging		Price Unit
					Per Case	Per Pallet	
3M™ Fire Barrier Duct Wrap 615+	615+	3M™ Fire Barrier Duct Wrap 615+ for grease and air duct protection	24" W x 25' L	000-51115-18799-5	1	4	Roll
3M™ Fire Barrier Duct Wrap 615+	615+	3M™ Fire Barrier Duct Wrap 615+ for grease and air duct protection	48" W x 25' L	000-51115-18800-8	1	2	Roll
3M™ Fire Barrier Plenum Wrap 5A	5A	3M™ Fire Barrier Plenum Wrap 5A for plastic pipe protection	24" W x 50' L	000-51115-16513-9	1	8	Roll
3M™ Fire Barrier Plenum Wrap 5A	5A	3M™ Fire Barrier Plenum Wrap 5A for plastic pipe protection	48" W x 25' L	000-51115-16574-6	1	8	Roll



CLASSIFIED
 UL
 BATTIS AND BLANKETS
 FOR USE IN FIRE RESISTIVE DUCT
 ASSEMBLIES SEE UL FIRE RESISTANCE
 DIRECTORY 9069



LISTED
 ULC
 DUCT
 INSULATION
 9069



LISTED
 INTERTEK
 C
 US
 FIRESTOP SYSTEMS
 SEE INTERTEK DIRECTORY



LISTED
 OMEGA POINT
 LABORATORY
 US
 FIRESTOP SYSTEMS
 SEE INTERTEK DIRECTORY

Ventilation Air Duct Listings for 615+ (tested to ISO 6944)

Fire Resistive Rating	Enclosure System	Duct System	Through-Penetration System	Listing Agency
1 or 2 hours	1 layer of 3M™ Fire Barrier Duct Wrap 615+, 3" (76mm) perimeter and longitudinal overlaps	V-27 3MU/FRD-120-15	W-L-7180, W-J-7104 F-C-7054 3MU/PH 60-03, 3MU/PV 120-23, 3MU/PV 120-25	UL Intertek (OPL)

This is only a partial list of systems that use Duct Wrap 615+. For complete information visit www.3M.com/firestop.

Codes & Standards for 615+, Grease Duct

NFPA 96, 2008 Edition
 NFPA 96, 2004 Edition
 NFPA 90A, 2002 Edition
 Uniform Mechanical Code, 2006 Edition, Section 507.2.4
 International Mechanical Code®, 2003 Edition, Section 506.3.10
 International Mechanical Code®, 2006 Edition, Section 506.3.10

This is only a partial list of codes and standards. Go to 3M.com/firestop or speak to your authorized 3M distributor or sales representative at 1-800-328-1667.

3M™ Fire Barrier Duct Wrap Applications

	Product	
	615+	5A
Grease Duct	•	
Ventilation Air Duct	•	
Life Safety Duct (Stair Pressurization, Smoke, Exhaust, etc.)	•	
Plenum Applications		•

Note:
 Consult individual project plans for which codes and standards apply.

3M™ Fire Barrier Duct Wrap Performance Characteristics

Test	Product	
	615+	5A
ASTM C 518	•	•
ASTM C 1338	•	•
ASTM E 84	•	•
ASTM E 119	•	•
ASTM E 136	•	•
ASTM E 814	•	•
ASTM E 2336	•	•
NFPA 252 (910)	•	•
UL 1887	•	•
ISO 6944	•	•



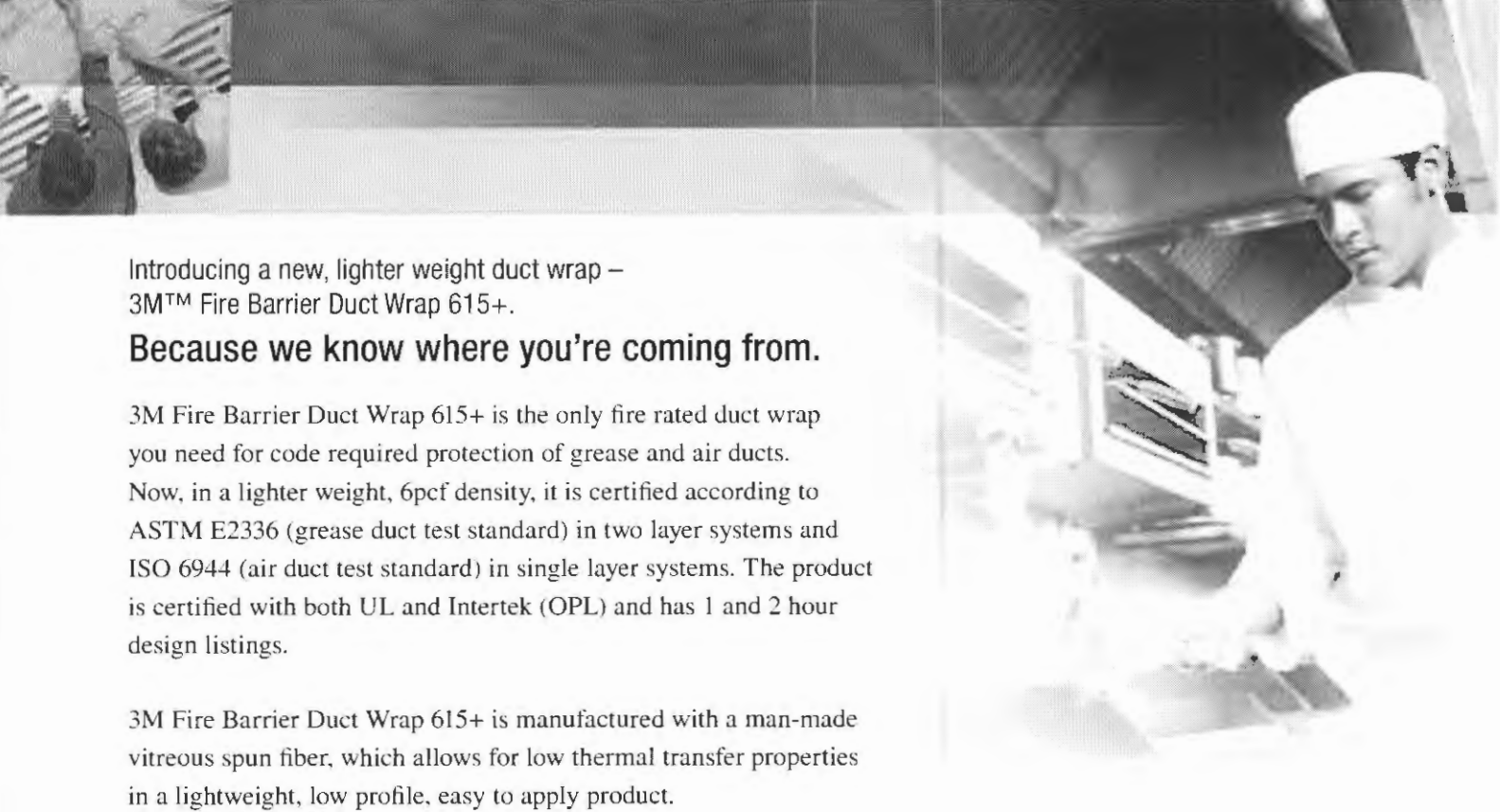
Building and Commercial Services Division

3M Center, Building 223-2N-21
 St. Paul, MN 55144-1000
 Ph. 800-328-1667
3M.com/firestop

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 City of Portland



Introducing a new, lighter weight duct wrap –
3M™ Fire Barrier Duct Wrap 615+.

Because we know where you're coming from.

3M Fire Barrier Duct Wrap 615+ is the only fire rated duct wrap you need for code required protection of grease and air ducts. Now, in a lighter weight, 6pcf density, it is certified according to ASTM E2336 (grease duct test standard) in two layer systems and ISO 6944 (air duct test standard) in single layer systems. The product is certified with both UL and Intertek (OPL) and has 1 and 2 hour design listings.

3M Fire Barrier Duct Wrap 615+ is manufactured with a man-made vitreous spun fiber, which allows for low thermal transfer properties in a lightweight, low profile, easy to apply product.

Features and Advantages

- Lightweight (6 lbs per cu ft) and thin (1.5" *) for easier application
- 2 hour fire protection
- Third party certified to ASTM E2336 (grease ducts test standard) and ISO 6944 (air duct test standard)
- Supports maximum temperatures of up to 2192°F (1200°C)
- Apply in 2 layers for grease ducts
- Apply in 1 layer for air ducts

* In accordance with the tolerances in ASTM C 892 Standard Specification for High-Temperature Fiber Blanket Thermal Insulation



Kitchen Exhaust Ducts

615+ is approved for use on kitchen exhaust ducts, per ASTM E2336 providing 1 and 2 hour protection with a 2-layer system.



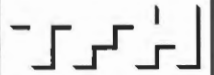
3M™ Fire Barrier
Duct Wrap 615+

Stair Pressurization and Life Safety Ventilation Ducts

615+ is tested to ISO 6944 and can be used on stair pressurization ducts and other life safety air ducts, providing 2 hour protection with a 1 layer system.

NEW PLAZA & FACADE RENOVATIONS

80-90 MIDDLE STREET
PORTLAND, MAINE



TFH ARCHITECTS
80 MIDDLE STREET
PORTLAND MAINE 04101
TELEPHONE 207 775 6141
ARCHITECTURE PLANNING

DATE: 19 OCTOBER 2011

PROJECT No. 1013

DRAWN BY: DSM

CHECKED BY: TST

SCALE: 3/4"=1'-0"

SHEET TITLE:
1 HOUR SHAFT
ENCLOSURE AT
NEW EXHAUST
DUCT

ASK 18

5/8" TYPE X GWB ON METAL STUDS

NEW EXHAUST DUCT
WRAPPED IN TWO LAYERS
OF 3M 615 FIRE BARRIER

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City of Portland Maine