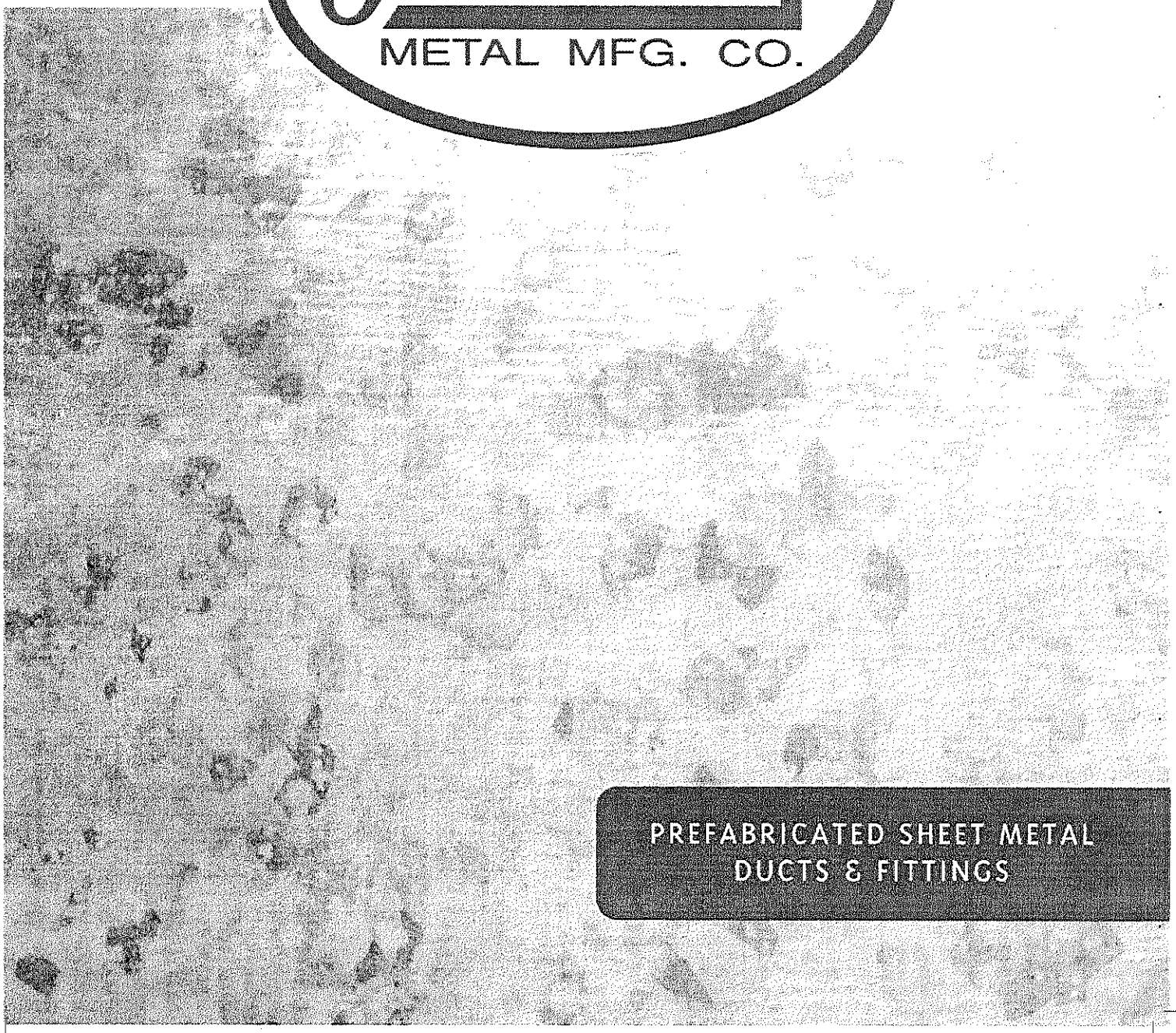
Southwark
METAL MFG. CO.



PREFABRICATED SHEET METAL
DUCTS & FITTINGS

TABLE OF CONTENTS

PRODUCT CATEGORY INDEX

Page	Description
2	Round Pipe, Elbows, Angles & Register Boots
3-4	Trunk Duct, Fittings & Installation Accessories
5	Return Air Products
6	Oval Pipe & Fittings
7	Wall Stack & Fittings
8	Sheet Metal and Ductboard Collars
9-10	Sheet Metal and Ductboard Takeoffs
11	Air-Tite Takeoffs
12	Tees, Wyes, Reducers, End Caps & Accessories
13	Insulated Ceiling Boxes and CRD Boots
14	Register Boxes and Ceiling Outlets
15	Furnace Fittings and Accessories
16	Venting Products and Mobile Home Kits
17	Black Pipe & Fittings
18	Spiral Pipe & Fittings
19-20	Product Number Index
21-22	Technical Information

Southwark METAL MFG. CO.

Call us toll-free at:

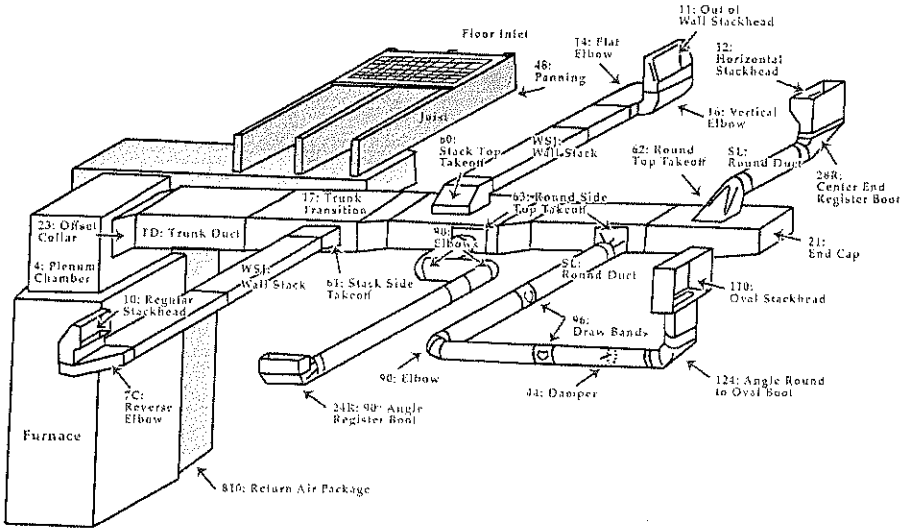
Philadelphia • (800) 523-1052
Greenville • (800) 229-2803
Indianapolis • (800) 490-7707
Mississippi • (800) 541-6706
Nebraska • (800) 801-0336
Idaho • (866) 289-9908
www.southwarkmetal.com

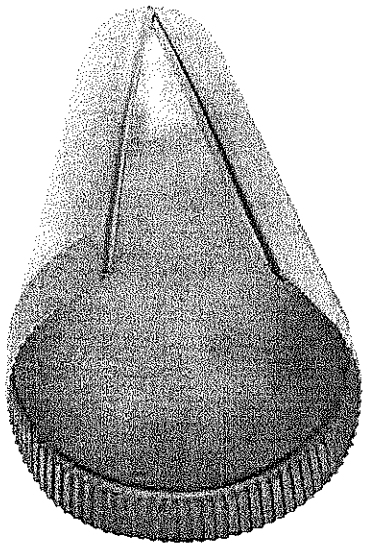
About Us

Southwark Metal Manufacturing Company is a third generation family owned company that has been manufacturing prefabricated sheet metal ducts and fittings for over 60 years.

With six manufacturing plants across the United States, we guarantee to exceed your highest expectations with our quality products and superior service.

For all products within this catalog, please check with your local customer service representative for fitting sizes, availability, pricing, and submittal information.





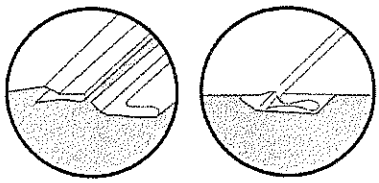
SNAPLOCK PIPE

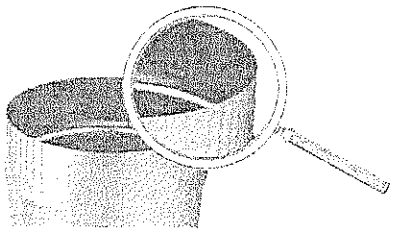
No tools required for assembly!
Simply start at one end and easily snap pipe together. One person can quickly assemble up to 10 ft. lengths.

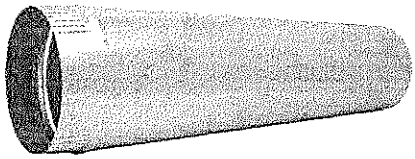
The male end's **self-starting crimp** is knurled sufficiently so that the crimp "falls in" and yet, once assembled, completes a rigid, leak-proof connection that meets +2" w.g. pressure.

- Available in 2ft, 3ft, 4ft, 5ft, and 10ft lengths
- Available in 30Ga, 28Ga, 26Ga, and 24Ga steel.

Open view Closed view

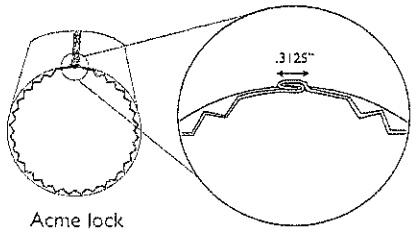




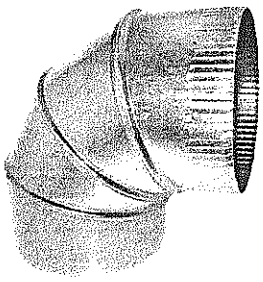


MU120
Conductor Pipe

- *Available in 30Ga, 28Ga, and 26Ga*
- *10 ft in length*
- *3" and 4" diameters only*
- *Acme type lock, shipped closed*



Acme lock

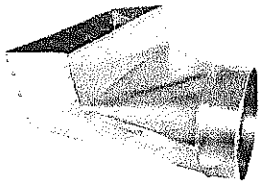


90° ADJUSTABLE ELBOW

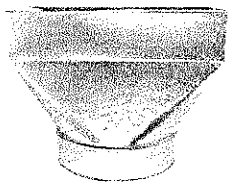
Featuring:
- 4 pc. assembly for diameters 3" - 20"
- 5 pc. assembly for diameters 22" - 24"
- Crimp and bead male connection and straight female connection
- Meets +/- 2" w.g. pressure overall

45° ADJUSTABLE ANGLE

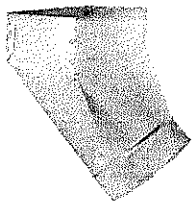
REGISTER BOOTS



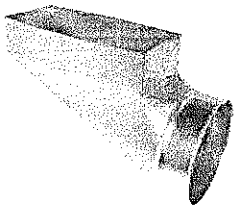
24R
90° Register Boot



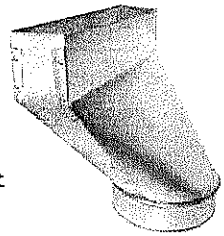
27R
Straight Register Boot



26R
45° Register Boot

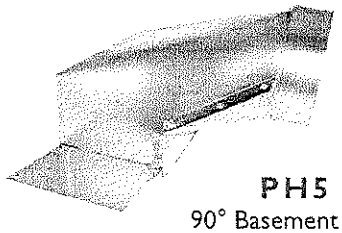


28R
Center End Register Boot
No. 28RL Left
No. 28RR Right



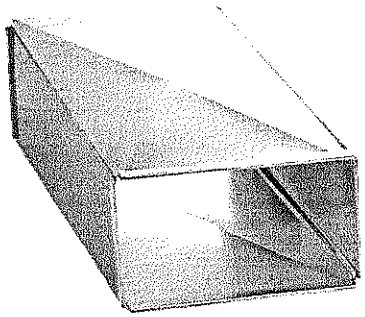
29RO
2" Offset Register Boot

17CR
Offset Adjustable Register Boot



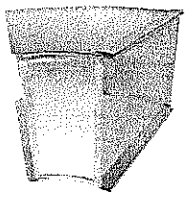
PH5
90° Basement Boot

TRUNK DUCT

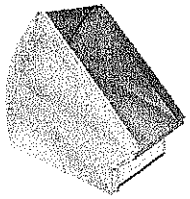


Featuring:

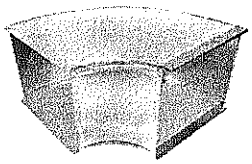
- Available in 12", 30", 36", 48", 60" and 96" lengths
- Furnished in button snap-lock with s-cleat and drive connections
- Cross broken for extra stiffening strength
- E-lock duct also available
- Beaded duct also available



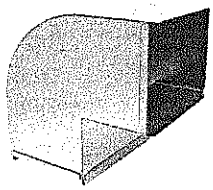
13
45° Flat (Broadway) Angle Radius Throat



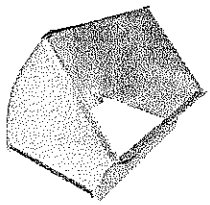
13S
45° Flat (Broadway) Angle Square Throat



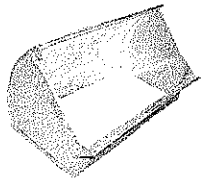
14
90° Flat (Broadway) Elbow Radius Throat



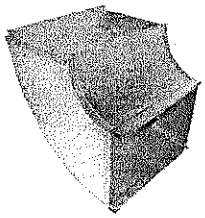
14S
90° Flat (Broadway) Elbow Square Throat



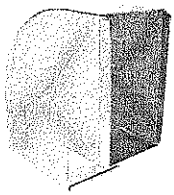
15
45° Vertical (Shortway) Angle Radius Throat



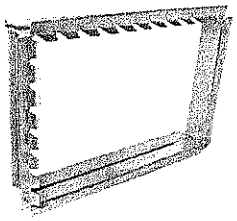
15S
45° Vertical (Shortway) Angle Square Throat



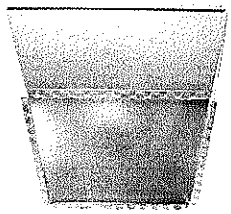
16
90° Vertical (Shortway) Elbow Radius Throat



16S
90° Vertical (Shortway) Elbow Square Throat



20
Straight Collar

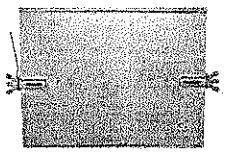


23AT
Transition Collar

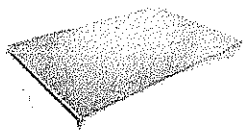
Duct Size	Plenum Opening
14 x 8	12 x 10
16 x 8	12 x 11
18 x 8	12 x 12
20 x 8	12 x 14
22 x 8	12 x 15
24 x 8	12 x 16
26 x 8	14 x 15
28 x 8	14 x 16
30 x 8	16 x 15
32 x 8	16 x 16

1109
Transition Collar

Duct Size	Plenum Opening
8 x 8	8 x 10
10 x 8	8 x 10
12 x 8	10 x 10
14 x 8	10 x 12
16 x 8	10 x 12
18 x 8	10 x 14
20 x 8	10 x 16
22 x 8	10 x 18
24 x 8	10 x 20
26 x 8	12 x 18
28 x 8	12 x 18
30 x 8	12 x 20
32 x 8	14 x 20

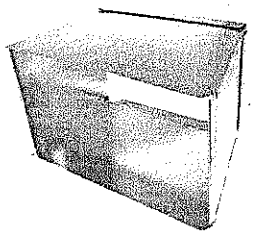


42
Volume Damper

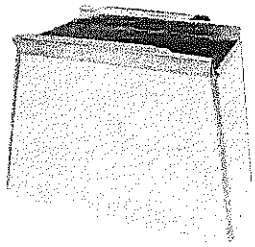


21
End Cap

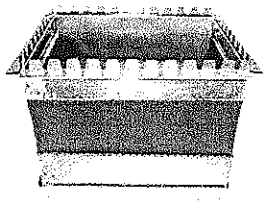
23
Offset Collar



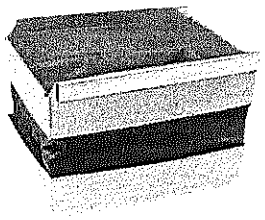
17
Trunk Transition (tapered to one side)



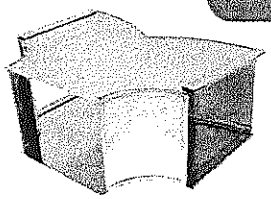
17C
Trunk Reducer (tapered to center)



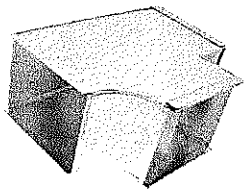
18
Connector
Plenum to Trunk



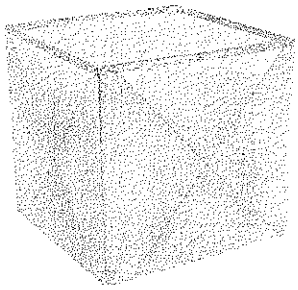
47
Connector
Furnace to Plenum



14TT
Trunk Tee



17TT
Trunk Tee



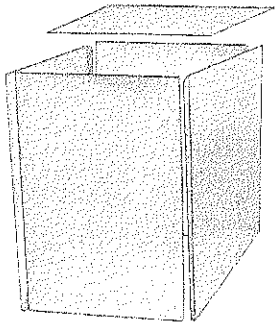
4
Plenum Chamber
- Custom Sizes
- Shipped knocked down or made-up by request
- "B" style available with flange

ADJUSTABLE PLENUMS

Please note: Actual plenum height is 2" less than listed size.

TO INSTALL:

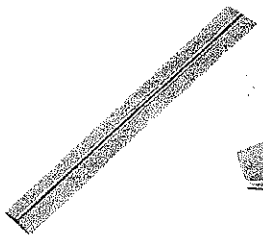
1) Cut raw edges of side panels to desired width and height.
2) Trim top to desired width and depth.
3) Assemble 3 sides, slide top into side panel pockets, then position fourth side.
4) To complete, secure assembly with sheet metal screws.



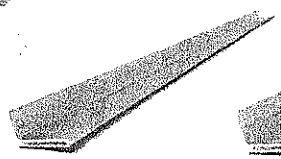
49T
Adjustable Plenum Top

49P
Adjustable Plenum Side

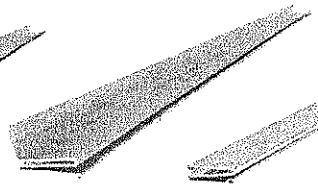
49C
Complete Adjustable Plenum



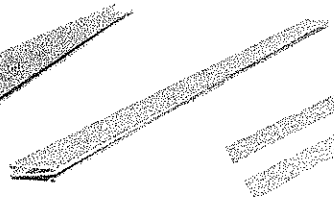
8D
Drive Cleat
8" and 10" available



37
½" Leg
Rigid S-Cleat

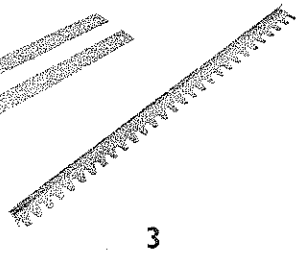


135
1" Leg
Rigid S-Cleat

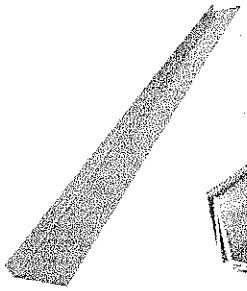


6S
S-Cleat

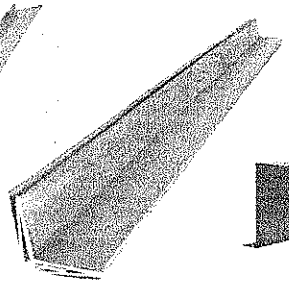
5
Duct Hanger
10" and 12" available



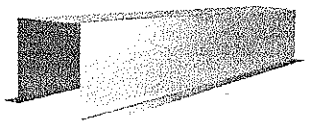
3
Fiberglass Extension



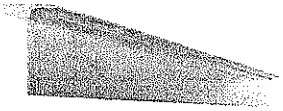
1106
Cold Air Frame



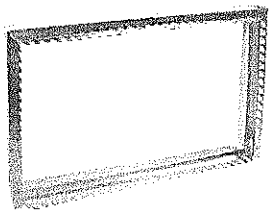
1112
Plenum Corner



133
Line Cover



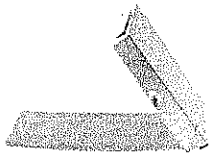
134
Can Stock



FR
Filter Rack

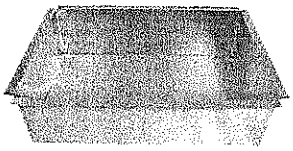
RETURN AIR PRODUCTS

35
Trunk Reducer



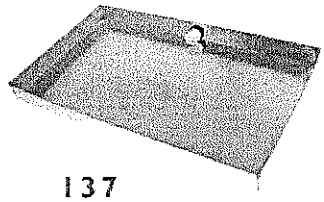
35A
Trunk Reducer

48
Panning Material

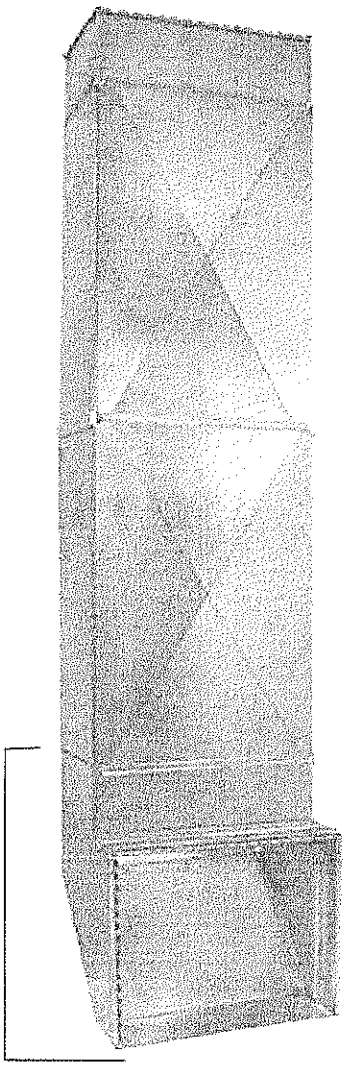


170
Return Air Pan

31
Return Air Frame



137
Drain Pan
¾" Slip Fitting



COLD AIR BOOT

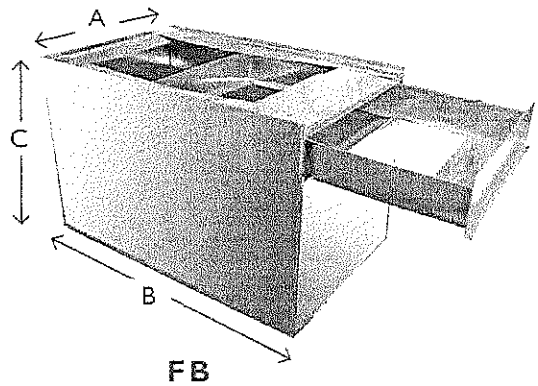
RETURN AIR PACKAGE

Complete package consisting of:

- 1 - #20 Starting collar
- 2 - 30" duct sections
- 1 - return air plenum with 1" filter rack
- 6 - 10" drive straps

Shipped knocked down in one carton

Return Air Pkg	Duct Size Range	Boot Only
810	20x10 - 20x16	810B
811	25x10 - 25x16	811B
812	20x10 - 20x14	812B
813	25x10 - 25x14	813B
814	20x8 - 20x16	814B
815	24x8 - 24x16	815B
816	20x8 - 20x14	816B
817	24x8 - 24x14	817B

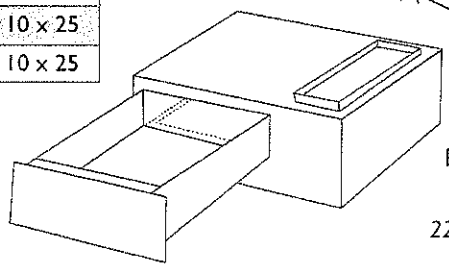


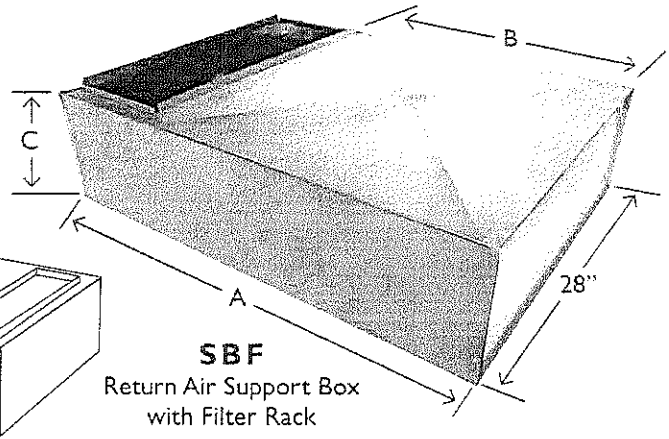
FB
Furnace Box with Filter Drawer
Also available with Hinged Door

Part No.	A	B	C	Filter Size
FB1428	14¾"	28½"	18½"	14x25
FB1728	17¾"	28½"	18½"	16x25
FB2128	21¾"	28½"	18½"	20x25
FB2428	24¾"	28½"	18½"	20x25

Part No.	'A'	'B'	'C'	Return Duct Size
SB30	30"	20"	10"	8 x 24
SB38	38"	26"	15"	10 x 25
SBF30	30"	22"	15"	8 x 24
SBF32	32"	22"	15"	8 x 24
SBF36	36"	26"	15"	10 x 25
SBF38	38"	28"	15"	10 x 25

SB
Return Air Support Box



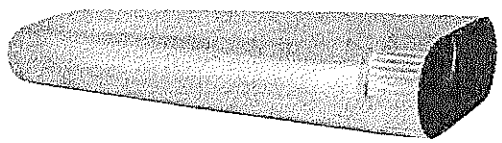


SBF
Return Air Support Box with Filter Rack

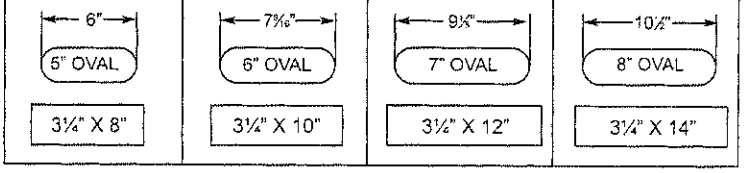
22 x 28 drawer accommodates 1", 4" and 5" 20x25 filters

OVAL PIPE

Pipe Size	Height	Circumference	Area	CFM Capacity at .10 WC
5"	2 ½"	15.7"	17.2 sq in	60 CFM
6"	2 7/8"	18.8"	22.2 sq in	78 CFM
7"	3"	22.0"	27.3 sq in	104 CFM
8"	3 1/16"	25.1"	32.2 sq in	190 CFM

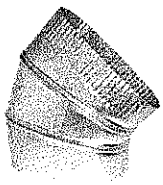


WALL STACK VS. OVAL PHYSICAL COMPARISON

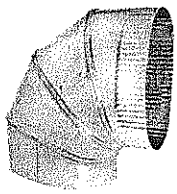


All oval pipe is made from 30Ga galvanized steel.

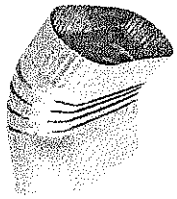
No. 160 60" Oval Pipe Joint
No. 100 100" Oval Pipe Joint
No. 112 112" Oval Pipe Joint
No. 113 113" Oval Pipe Joint
No. 114 114" Oval Pipe Joint



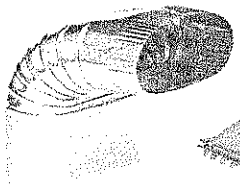
113
45° Flat (Broadway) Oval Angle



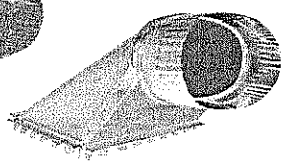
114
90° Flat (Broadway) Oval Elbow



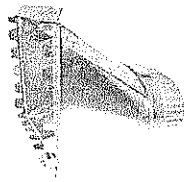
115
45° Vertical (Shortway) Oval Angle



116
90° Vertical (Shortway) Oval Elbow

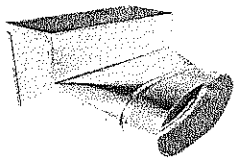


162
Top Oval Takeoff

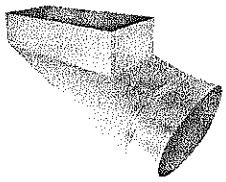


163
Side Oval Takeoff

127R
Straight Oval Register Boot



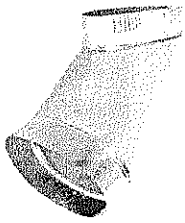
124R
90° Oval Register Boot



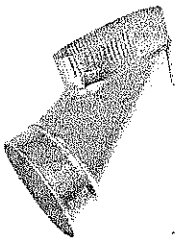
128R
End Oval Register Boot

127
Oval to Round Straight Boot

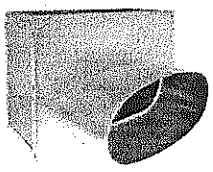
124
Oval to Round 90° Boot



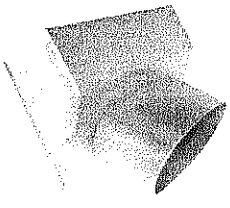
128
Oval to Oval Reverse Boot



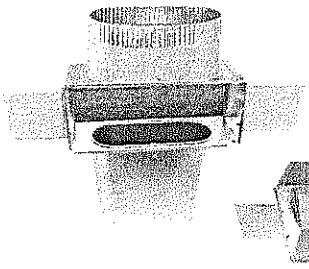
106
Oval to Round Reverse Boot



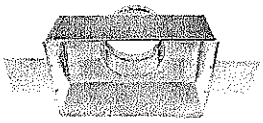
355
Straight Oval Register Box



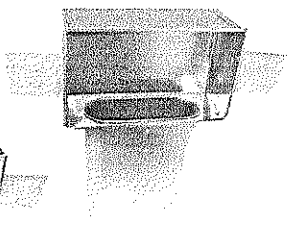
360
Angle Oval Register Box



150
Oval Stackhead with Collar

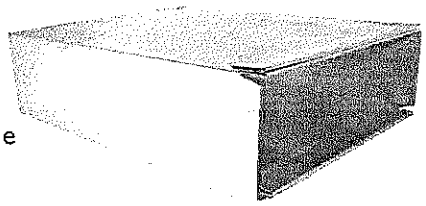


111
Register Outlet



110
Oval Stackhead

WALL STACK



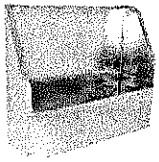
Featuring:

- 12", 24", 30" , 60", 96", 100" and 113" lengths available
- Two pieces per section
- Furnished in button snaplock
- No tools and no indentations, just snap it and it's closed!

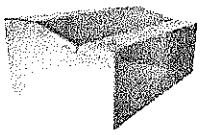
132
Adjustable
"A" Adapter
Available in
2¼ x 10,
2¼ x 12, or
2¼ x 14

133
Adjustable
"B" Adapter
Available in
4x10 - 3¼x10,
4x10 - 3¼x12, or
4x10 - 3¼x14

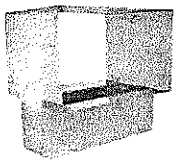
STACKHEADS



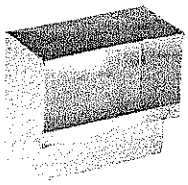
WS11
Projection
Stackhead



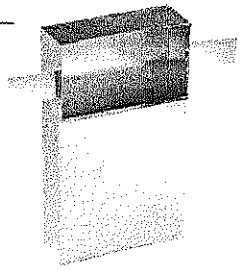
WS12
Horizontal
Stackhead



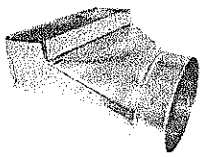
WS9
Double
Stackhead



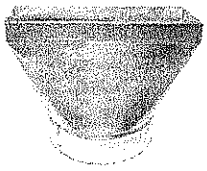
WS10
Stackhead



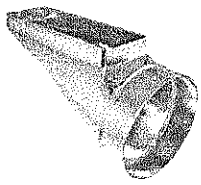
WS10X
Long Throat
Stackhead with Ears



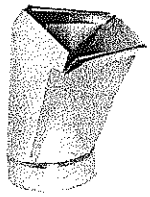
24
90° Stack Boot



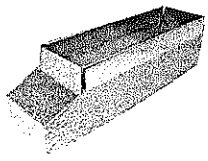
27
Straight
Stack Boot



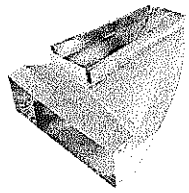
28
End Stack Boot



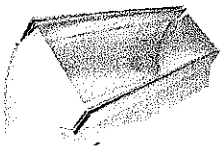
26
45° Stack Boot



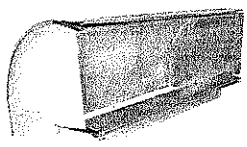
WS17
Stack Transition



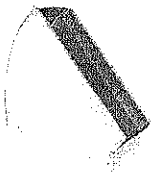
WS7C
Reverse Stack
Elbow (Center)
No.WS7L Left
No.WS7R Right



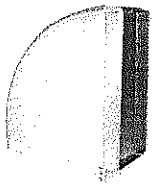
WS15
45° Vertical
(Shortway)
Stack Angle



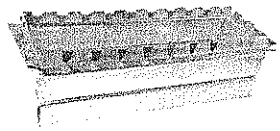
WS16
90° Vertical
(Shortway)
Stack Elbow



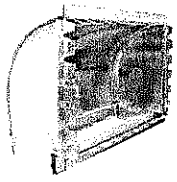
WS13
45° Flat
(Broadway)
Stack Angle



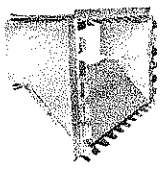
WS14
90° Flat
(Broadway)
Stack Elbow



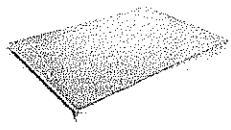
WS20
Straight Stack
Collar



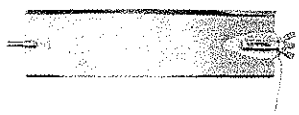
WS60
Top Stack
Takeoff



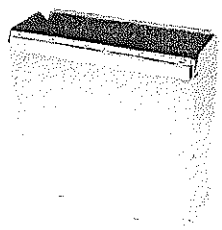
WS61
Side Stack
Takeoff



WS21
Stack
End Cap

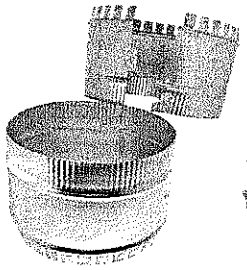


WS45
Stack Damper



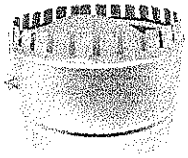
PHEXT
PH Extension
10" long

SHEET METAL COLLARS



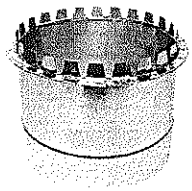
120SC
Snap Collar

97
Collar
97NC
No Crimp



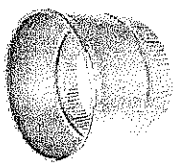
97LS
Long Collar
97LSWD
with Damper

1051
Collar
1050
No Crimp

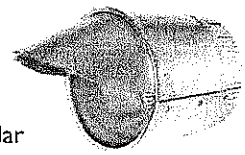


1150
Long Collar
1149
With Damper

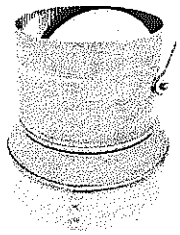
SHEET METAL SPIN COLLARS

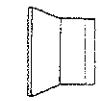


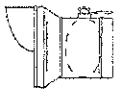
156
Spin Collar



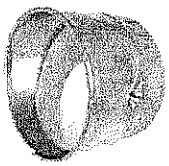
156S
Spin Collar
with Scoop



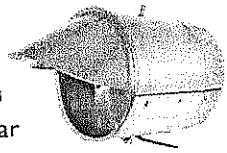




156BM
Bellmouth
Spin Collar
156DBM
with Damper
156SDBM
with Scoop and
Damper

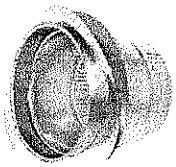


156D
Spin Collar
with Damper



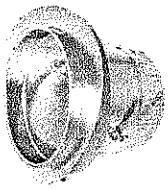
156SD
Spin Collar
with Scoop
and Damper

DUCTBOARD SPIN COLLARS

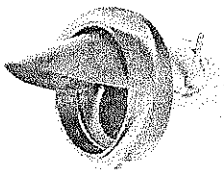


97FG
Spin Collar

98
Spin Collar
with Scoop



97FGWD
Spin Collar
with Damper



98WD
Spin Collar
with Scoop
and Damper

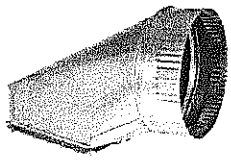
DUCTBOARD COLLARS

84ST
Ductboard Collar
84STWD
with Damper

122SC
Snap Collar
1½" or 2"
Ductboard

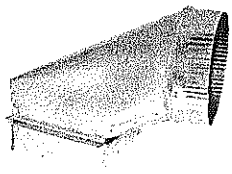
121SC
Snap Collar
1" or 1½" Ductboard

SHEET METAL and DUCTBOARD TAKEOFFS



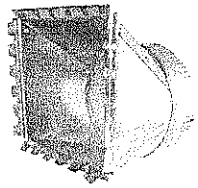
62
Top Takeoff
(Metal)

Pipe Size	Base Opening
4"	4 x 6
5"	5 x 6
6"	6 x 6
7"	7 x 7
8"	8 x 8
9"	10 x 10
10"	10 x 10
12"	12 x 12
14"	14 x 14



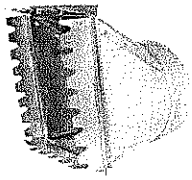
62FG
Top Takeoff
(Ductboard)

Pipe Size	Base Opening
4"	4 x 6
5"	5 x 6
6"	6 x 6
7"	7 x 7
8"	8 x 8
9"	10 x 10
10"	11½ x 10
12"	12 x 12
14"	14 x 14



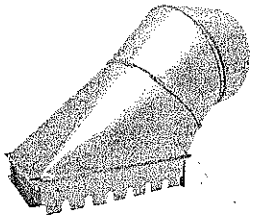
63
Side Takeoff
(Metal)

Pipe Size	Base Opening
4"	6 x 6
5"	6 x 6
6"	6 x 6
7"	6 x 8
8"	6 x 10
9"	7 x 12
10"	7 x 14
12"	8 x 18
14"	8 x 20
16"	10 x 21



63FG
Side Takeoff
(Ductboard)

Pipe Size	Base Opening
4"	6 x 6
5"	6 x 6
6"	6 x 6
7"	6 x 8
8"	6 x 10
9"	7 x 12
10"	7 x 14
12"	8 x 18
14"	8 x 20



2016
Adjustable Takeoff
(Ductboard)

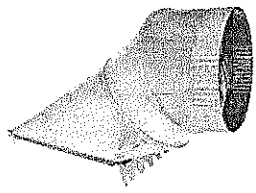
Pipe Size	Base Opening
4"	4 x 6
5"	5 x 6
6"	6 x 7
7"	7 x 8
8"	7 x 10
9"	9 x 11
10"	10 x 12
12"	12 x 16
14"	14 x 19

34PLF
Adjustable Takeoff
(Ductboard)

Pipe Size	Base Opening
5"	5 x 6
6"	6 3/8 x 6 3/8
7"	7 x 8
8"	6 3/8 x 10

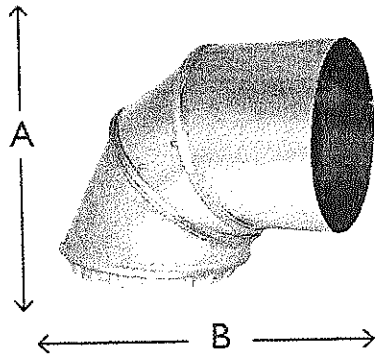
63A
Adjustable Takeoff
(Metal)

Pipe Size	Base Opening
4"	4 x 6
5"	5 x 6
6"	6 x 7
7"	7 x 8
8"	7 x 10,
9"	9 x 11
10"	10 x 12
12"	12 x 16
14"	14 x 19
16"	14 x 18
18"	18 x 18



63AFG
Adjustable Takeoff
(Ductboard)

Pipe Size	Base Opening
4"	4 x 6
5"	5 x 6
6"	6 x 7
7"	7 x 8
8"	7 x 10
9"	9 x 11
10"	10 x 12
12"	12 x 16
14"	14 x 19



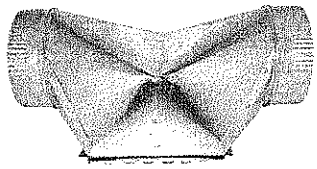
EP15
Full Tab Takeoff (Metal)

Pipe Size	Base Opening	A	B
4"	6 3/8"	7¼"	9¼"
5"	6 3/8"	7¼"	9¼
6"	7"	7½"	11"
7"	8"	8½"	12½"

Features ¾" tabs, tapered collar, and no crimp. 1 7/8" rise when installed.

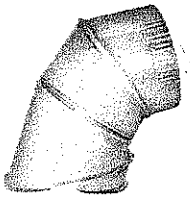
HT15
Half-Tab Takeoff (Metal)

Pipe Size	Base Opening
4"	6 3/8"
5"	6 3/8"
6"	7"
7"	8"



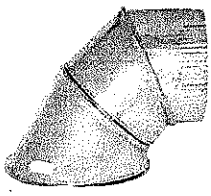
64
Double Top Takeoff (Metal)

Pipe Size	Base Opening
5"	6 x 10
6"	7 x 10
7"	7 x 14
8"	8 x 14



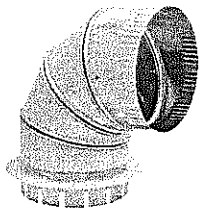
S5
Pivot Takeoff (Metal)

Pipe Size	Base Opening
5"	6"
6"	7"
7"	8"



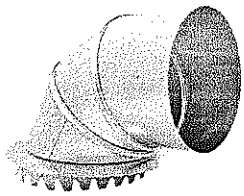
87
Lever Lock Takeoff (Metal)

Pipe Size	Base Opening
5"	6"
6"	7"
7"	8"



2015
Round Takeoff Elbow (Ductboard)

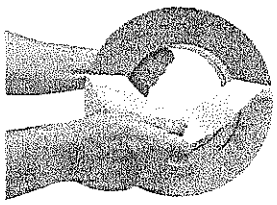
Pipe Size	Base Opening
5"	6"
6"	7"
7"	8"
8"	9"



2022
Round Takeoff (Ductboard)

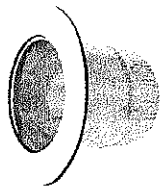
Pipe Size	Base Opening
5"	6"
6"	7"
7"	8"
8"	9"

AIR-TITE TAKEOFFS

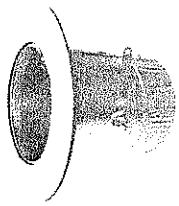


Featuring:

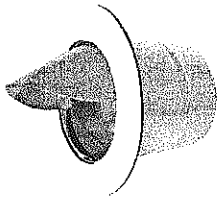
- 1½" wide and ⅛" thick gasket, made with high tack adhesive-coated neoprene foam -- just peel and stick for easy installation
- Gasket includes 4 ⅛" pre-drilled holes for sheet metal screws attachment
- RL-2 rivet seam (+/- 4" w.g.) with ½" overlap, using ⅛" rivets
- Dampers available for ¼" and ⅜" square and round bearings; also available ⅜" continuous rod damper (*by request*)
- Damper fittings available with 1½" or 2" standoffs (*by request*)



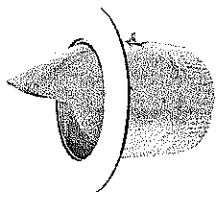
ATT
Airtite Takeoff



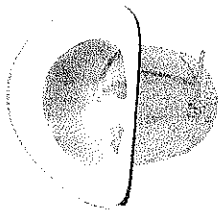
ATD
Airtite Takeoff
with Damper



ATS
Airtite Takeoff
with Scoop

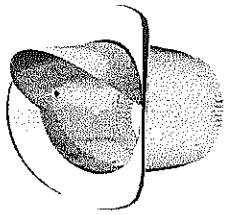


ATSD
Airtite Takeoff
with Scoop
and Damper



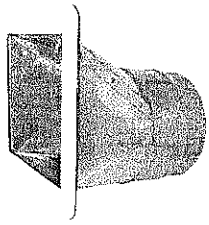
ATTRP
Round Pipe
Takeoff

ATDRP
with Damper



ATSRP
Round Pipe Takeoff
with Scoop

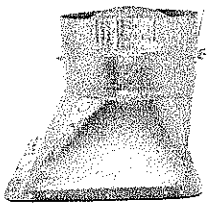
ATSDRP
with Scoop
and Damper



AT63
Rectangular
Airtite Takeoff

AT63WD
with Damper

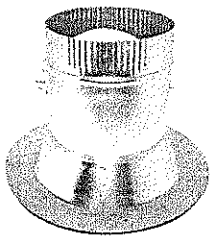
Pipe Size	Base Opening
4"	6 x 6
5"	6 x 6
6"	6 x 6
7"	6 x 8
8"	6 x 10
9"	7 x 12
10"	7 x 14
12"	8 x 18
14"	8 x 20



ATHE
High Efficiency
Airtite Takeoff

ATHEWD
with Damper

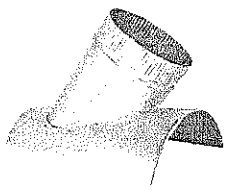
Pipe Size	Base Opening
4"	5 x 10
5"	5 x 10
6"	6 x 12
7"	6 x 12
8"	6 x 12
9"	6 x 15
10"	6¾ x 16
12"	8½ x 18
14"	9½ x 20
16"	14 x 22



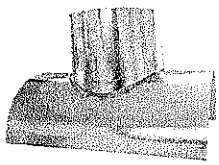
ATTBM
Bellmouth
Airtite Takeoff

ATDBM
with Damper

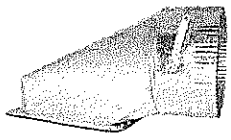
Collar Size	Bellmouth Size
6"	8"
7"	9"
8"	10"
10"	12"
12"	14"
14"	16"
16"	18"



ATTRP45
45° Saddle
Airtite Takeoff



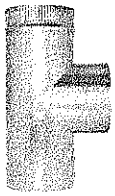
ATTRP90
90° Saddle
Airtite Takeoff



AT62
Airtite Top Takeoff

AT62WD
with Damper

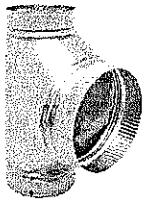
AT63A
Adjustable
Airtite Takeoff



TEE
No. 53 24" Long
No. 54 15" Long
Available in 26Ga or 24Ga

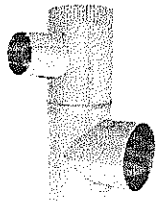
1060
Free Flow Tee
Available in 30Ga, 26Ga, and 24Ga

200
Trunk Tee



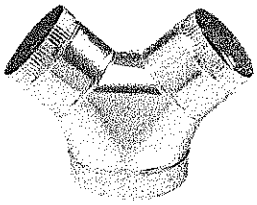
201
Straight-Thru Tee

202
Reducing Tee

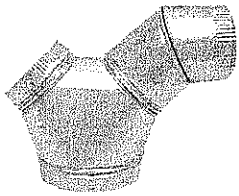


54SW
Swivel Tee

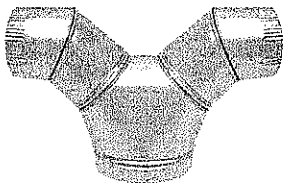
SMOKE WYE
No. 50 15" Long
No. 51 24" Long



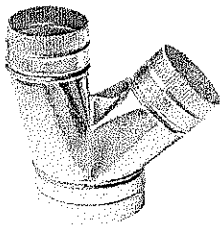
78
Wye Branch



78-1
One-Way
Adjustable Wye

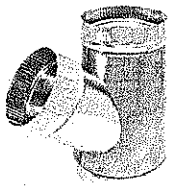


78-2
Two-Way
Adjustable Wye



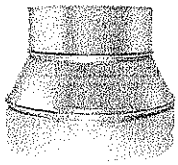
715
Splitter Wye

52
Flue Wye

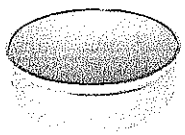


203S
Stub Wye

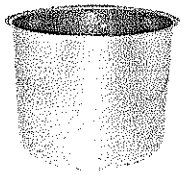
582
2 pc Reducer



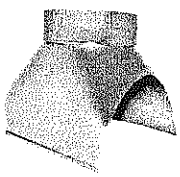
58
3 pc Reducer
Available Crimped



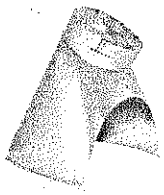
55
End Cap
Available Crimped, With/Without Handle



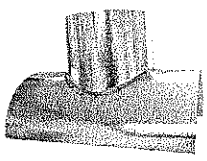
117
Flue Thimble



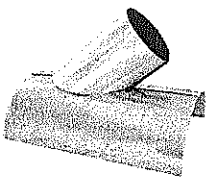
207QT
90° Saddle Tee



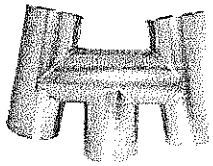
208QY
45° Saddle Wye



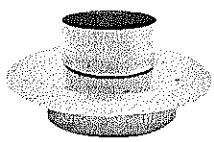
207
90° Vent Saddle



208
45° Vent Saddle



199
H-Vent

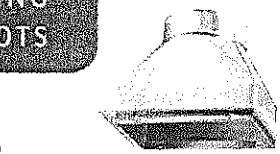


64FR
Flue Reducer

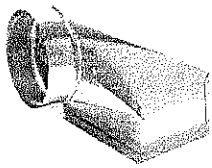
INSULATED CEILING BOXES and CRD BOOTS

31PF
Plaster Frame

MR
Mounting Rails
Available in 24" or 26"

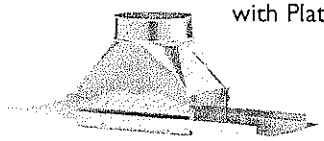


51F
Straight Ceiling Box
with Flange

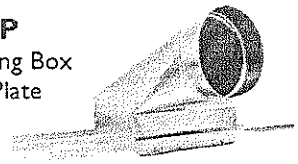


59F
90° Ceiling Box
with Flange

51P
Straight Ceiling Box
with Plate

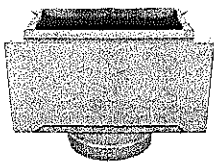


59P
90° Ceiling Box
with Plate

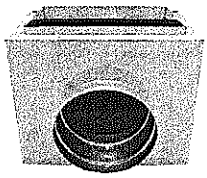


INSULATED CEILING BOXES

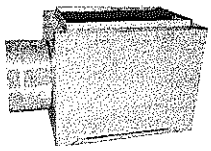
Liner is available in R4 (1"), R6 (1½"), or R8 (2") insulation.



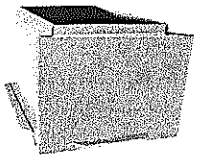
83
Top Outlet,
No Flange



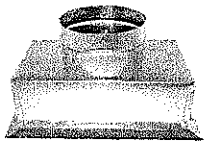
83S
Side Outlet,
No Flange



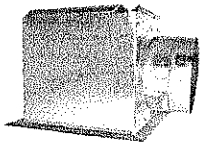
83E
End Outlet,
No Flange



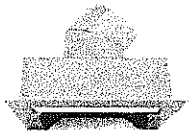
83TF
Top Flange
with Outlet



85
Bottom Flange
and Top Outlet



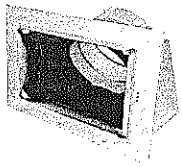
85S
Bottom Flange
and Side Outlet



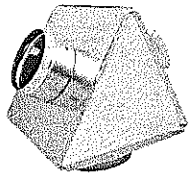
85A
Bottom Flange,
Angle Attached

85DB
Bottom Flange
with Outlet
(Ductboard)

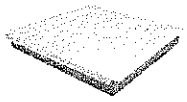
84DB
Bottom Flange
No Outlet
(Ductboard)



86
Slant Top
with Flange



577
Insulated Wye

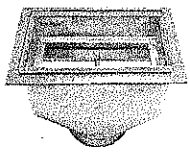


577P
Insulated Wye
Panels

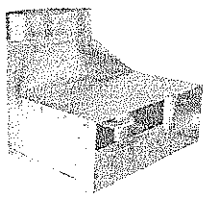
CEILING RADIATION DAMPER BOOTS

Boots are non-insulated. Features rectangular radiation damper, butterfly-type, UL Classified 555C (3-hr rating), 212° easy access fusible link. Damper is attached with matching rivets and mounting brackets on all four sides; position in throat varies fitting to fitting.

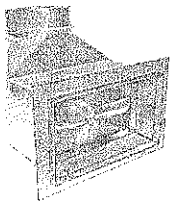
51CRD
Straight
CRD Boot



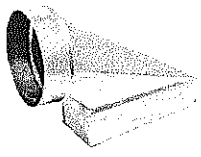
51FCRD
Straight
CRD Boot
with Flange



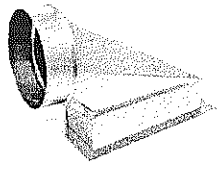
59CRD
90° CRD Boot



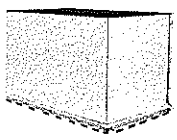
59FCRD
90° CRD Boot
with Flange



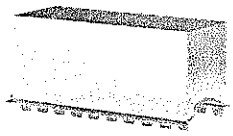
58CRD
Center End
CRD Boot



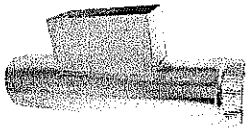
58FCRD
Center End
CRD Boot
with Flange



19RC
Register Collar



70
Register Takeoff

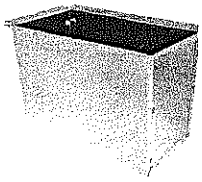


71
Register Tee

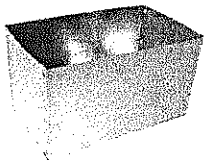
74
Register Cap

81
Ceiling Outlet

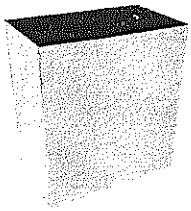
81D
with Damper



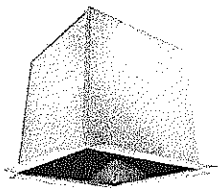
75
Register Box
7" Deep



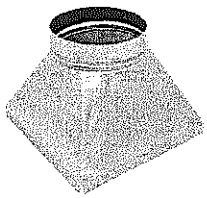
90
Floor Register Box
5" or 6" Deep



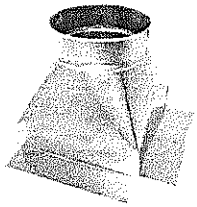
91
Floor Register Box
10" or 11" Deep



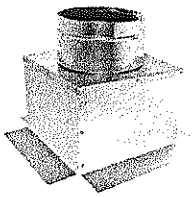
73
Square
Diffuser Box



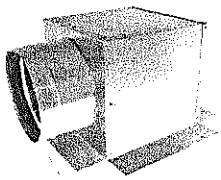
73C
Square to Round
Transition Outlet



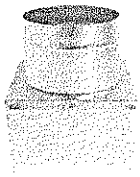
77
Square to Round
Diffuser Box



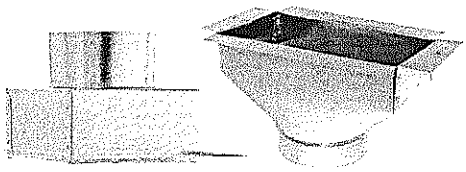
177
Ceiling Outlet



177S
Side Outlet

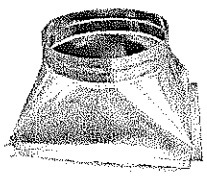


277
Square to Round
Diffuser Outlet,

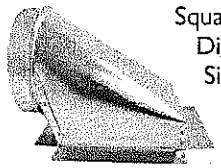


277F
Square to Round
Diffuser Outlet,
with Flange

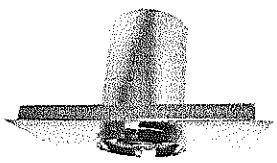
92
Funnel Register
Box with Flange



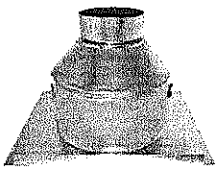
92B
Funnel Register Box
B-Box Style



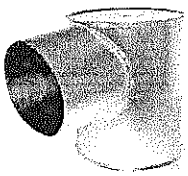
77S
Square to Round
Diffuser Box,
Side Outlet



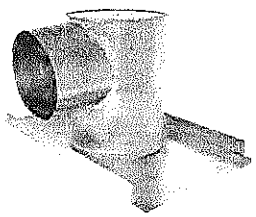
66WF
Ceiling Diffuser
Outlet



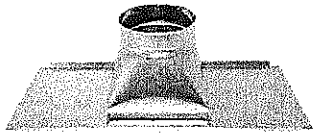
58WF
Diffuser Outlet
with Flange



72
Diffuser Tee

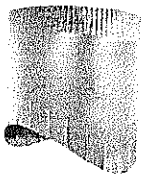


72WF
Diffuser Tee
with Flange

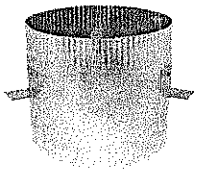


77WF
Diffuser Funnel with Flange

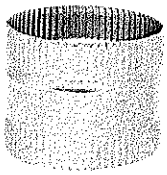
FURNACE FITTINGS and ACCESSORIES



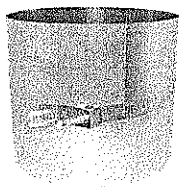
83PC
Branch Connector



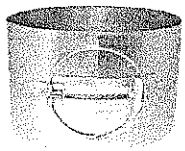
86SC
Sleeve Connector



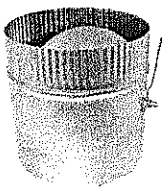
97FC
Flex Connector



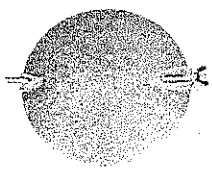
96
Drawband



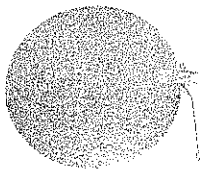
S75
Snap Drawband



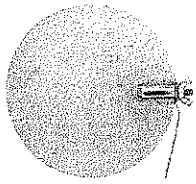
40
Damper Section



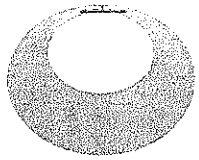
44
Two Quad Damper



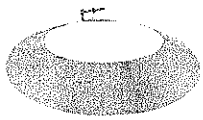
44S
Damper Fixed Hardware



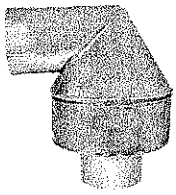
44-1
One Quad Damper



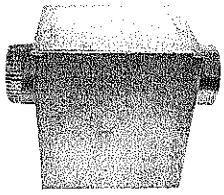
63FC
Ceiling Collar



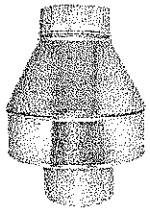
142
Storm Collar



93
Elbow Draft Vent

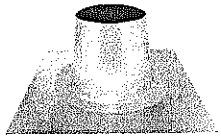


94
Horizontal Draft Vent



95
Vertical Draft Vent

140
Adjustable Roof Flashing



141
Tall Cone Flashing

RJ
Roof Jack

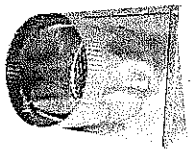
WALL CAP

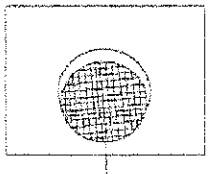
36
Wall Cap

36AL
Aluminum Wall Cap

39
Wall Cap with Damper

39AL
Aluminum Wall Cap with Damper

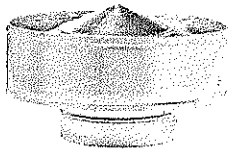




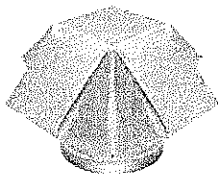
Mesh covering opening

Available with and without ¼" galvanized wire birdscreen mesh covering interior tube opening.

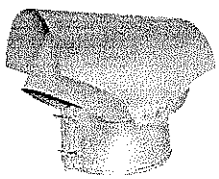
99
Chimney Cap



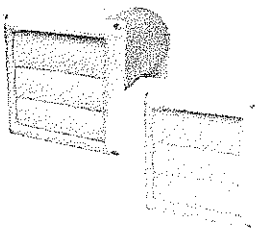
99A
Chimney Cap



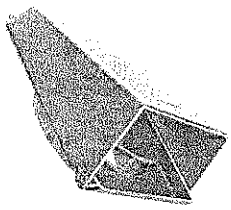
99VC
Vent Cap



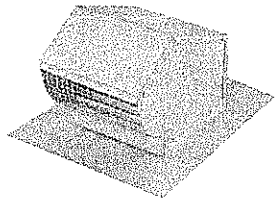
99LD
Lo-Draft Chimney Cap



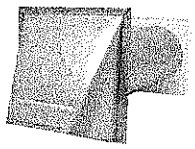
390WP
White Louver Hood with Tail
391WP
Face Only



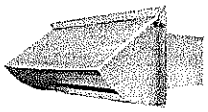
39GP
Gray Plastic Wall Cap with Damper
39WP
White Plastic



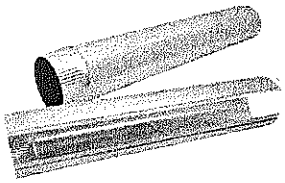
ROOF CAP
Aluminum with Damper and Screen
No. 239 Fits 4" round
No. 240 Up to 7" round
No. 241 Up to 10" round



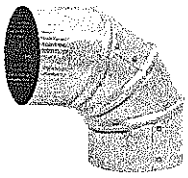
SVH
Aluminum Vent Hood
SVHBP
Brown Plastic
SVHWP
White Plastic



201VH
Aluminum Wall Cap
201VHWP
White Plastic Wall Cap

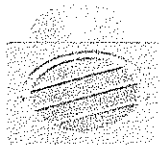


SAP
Aluminum Snaplock Pipe

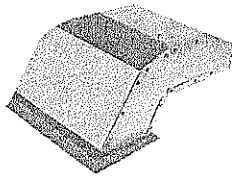


SAE
Aluminum 90° Elbow

RV51
Aluminum Roof Cap with Screen
Up to 8" Round



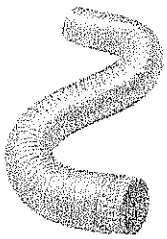
EV141
Eave Vent



220EC
Eave Vent with Grille

SPC
Pipe Clamp

SH
Flexible White Vinyl Hose



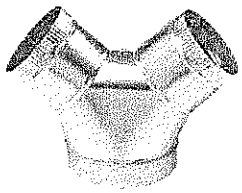
MF
Flexible Aluminum Duct

SAL
Aluminum Transition Duct

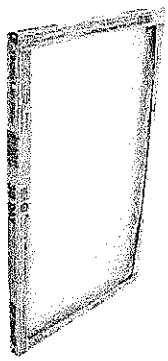
MOBILE HOME KITS

SWK
Single Wide Kit
Includes:
1 - Return Air Box
1 - Butterfly Damper
1 - Floor Grille
1 - Panel Filter

DWK
Double Wide Kit
Includes:
1 - Return Air Box
2 - Butterfly Dampers
1 - 78 Wye Branch
1 - Floor Grille
1 - Panel Filter

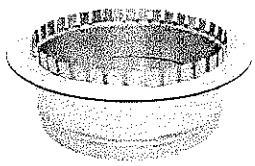


78
Wye Branch

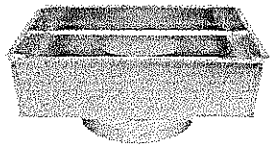


Panel Filter

Floor Grille



Butterfly Damper

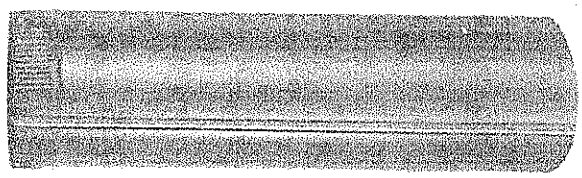


74
Return Air Box
Available as 6" Deep Box or 12" Deep Box

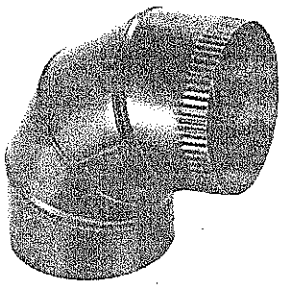
Kit sizes available: 12x20-12 Round, 12x20-14 Oval, and 14x20-14 Round.

BLACK PIPE & FITTINGS:

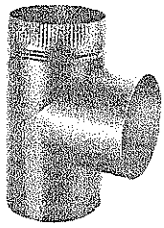
- Available in 5", 6", 7", and 8" diameters
- 24 Gauge material, cold-rolled steel coils per ASTM A1008 CS-B (aiming ½ standard ASTM tolerances), skinpassed
- High heat black painted with Valspar WPA0053 (.35 mil each side)
- Heat and rust resistant
- Standard packaging



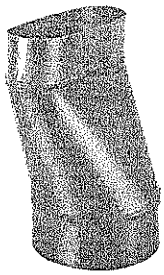
BP
Snaplock Pipe
Available in 12", 24", and 36" lengths



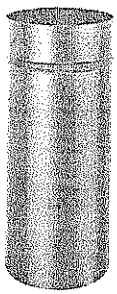
BP90
90° Adjustable Elbow



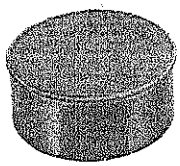
BP54
Tee



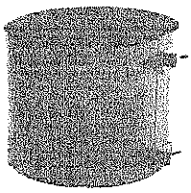
BP127
Oval to Round Adapter



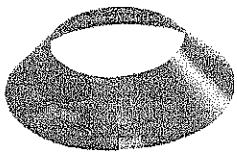
BPCHAD
Chimney Adapter



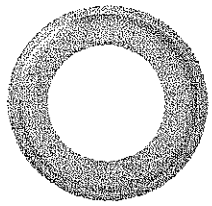
BP55
End Cap



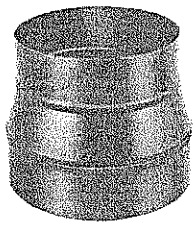
BP96
Drawband



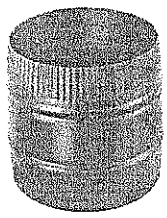
BPTC
Trim Collar



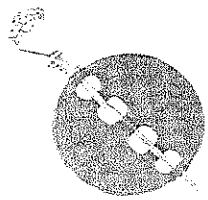
BPC
Pipe Collar



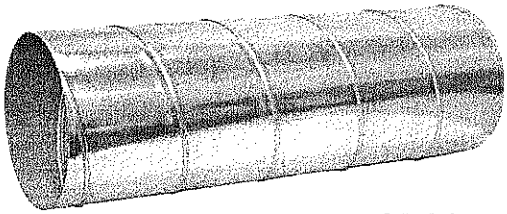
BP58
3 pc Reducer



BPCON
Connector



CID
Cast Iron Damper

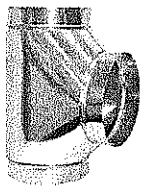


SP10
Spiral Pipe

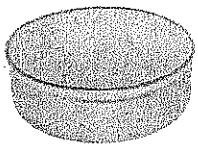
Featuring:
- 10 ft lengths
- Available in 4" - 24" diameters
- RL-1 spiral lock seam
- Available in 26Ga and 24Ga

SPIRAL PIPE & FITTINGS:

- 26 Ga and 24 Ga galvanized steel
- Also available in galvannealed steel by request
- Low pressure fittings (+/- 4" w.g. pressure rating)
- Riveted connection
- Outside dimensions of each end diameter is approximately 1/8" under nominal size

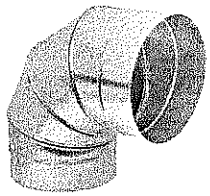


SP54
Tee Joint

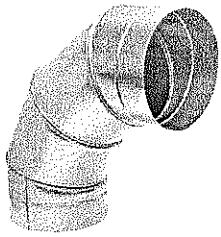


SP55
End Cap

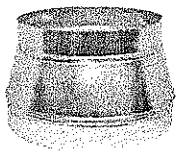
SP45
45° Angle



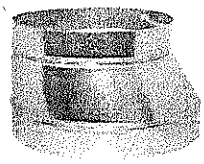
SP90
90° Adjustable Elbow



SP90LR
Long Radius 90° Elbow



SP58
Tapered Reducer



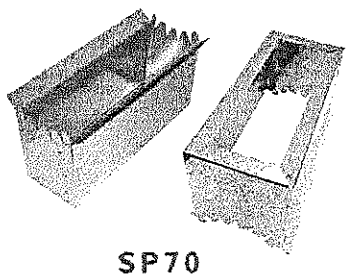
SP58ER
Eccentric Reducer

SP6
90° Shoe Tap

Diameter	Bend Radius
4"	3"
5"	3¾"
6"	4½"
7"	5¼"
8"	6"
10"	7½"
12"	9"
14"	10½"
16"	12"
18"	13½"
20"	15"
22"	16½"
24"	18"

Diameter	Bend Radius
4"	6"
5"	7½"
6"	9"
7"	10½"
8"	12"
10"	15"
12"	18"
14"	21"
16"	24"
18"	27"
20"	30"
22"	33"
24"	36"

SPCON
Connector



SP70
Register Saddle

PRODUCT INDEX

Item No.	Product Name	Page
3	Fiberglass Extension	4
4	Plenum Chamber	4
5	Duct Hanger	4
6S	S-Cleat	4
8D	Drive Cleat	4
13	Flat Trunk 45° Angle	3
14	Flat Trunk 90° Elbow	3
14TT	Trunk Tee	4
15	Vertical Trunk 45° Angle	3
16	Vertical Trunk 90° Elbow	3
17	Trunk Transition	3
17C	Trunk Transition (center)	3
17CR	Adjustable Register Boot	2
17TT	Trunk Tee	4
18	Connector- Plenum to Trunk	4
19RC	Register Collar	14
20	Trunk Straight Collar	3
21	Trunk End Cap	3
23	Trunk Offset Collar	3
23AT	Trunk Transition Collar	3
24	90° Stack Boot	7
24R	90° Register Boot	2
26	Angle Stack Boot	7
26R	45° Register Boot	2
27	Straight Stack Boot	7
27R	Straight Register Boot	2
28	End Stack Boot	7
28R	End Register Boot	2
29RO	Offset Register Boot	2
31	Return Air Frame	5
31PF	Plaster Frame	13
34PLF	Adj. Takeoff Fiberglass	9
35	Trunk Reducer	5
35A	Trunk Reducer	5
36	Fresh Air Intake	15
37	Rigid S-Cleat	4
39	Galvanized Vent Hood	15
39AL	Alum Wall Cap w/Damper	15
39GP	Gray Plastic Wall Cap	16
39WP	White Plastic Wall Cap	16
40	Damper Section	15
42	Trunk Volume Damper	3
44	Round Damper	15
44-1	One Quad Damper	15
44S	Rd Damper- Fixed Hardware	15
45	45° Adjustable Angle	2
47	Connector- Furnace to Plenum	4
48	Panning Material	5
49C	Adjustable Plenum (Complete)	4
49P	Adjustable Plenum Panel	4
49T	Adjustable Plenum Top	4
50	Wye - 15" Long	12
51	Wye - 24" Long	12
51CRD	Straight CRD Boot	13
51F	Straight Ceiling Box	13
51FCRD	Straight CRD Boot w/ Flange	13
51P	Straight Ceiling Box w/ Plate	13
52	Flue Wye	12
53	Tee - 24" Long	12
54	Tee - 15" Long	12
54SW	Swivel Tee	12
55	Tee Cap	12
58	3-pc Reducer	12
58CRD	End CRD Boot	13
58FCRD	End CRD Boot w/ Flange	13
58WF	Diffuser Outlet w/ Flange	14
59CRD	90° CRD Boot	13
59F	90° Ceiling Box	13
59FCRD	90° CRD Boot w/ Flange	13
59P	90° Ceiling Box w/ Plate	13
62	Top Takeoff (Metal)	9
62FG	Top Takeoff (Ductboard)	9
63	Side Takeoff (Metal)	9
63A	Adjustable Takeoff (Metal)	9
63AFG	Adjustable Takeoff (Ductboard)	9
63FC	Ceiling Collar	15
63FG	Side Takeoff (Ductboard)	9
64	Double Top Takeoff (Metal)	10
64FR	Flue Reducer	12
66WF	Ceiling Diffuser Outlet	14
70	Register Takeoff	14
71	Register Tee	14
72	Diffuser Tee	14
72WF	Diffuser Tee w/ Flange	14
73	Square Diffuser Box	14
73C	Sq to Rd Transition Outlet	14
74	Register Cap	14
74	Return Air Box	16
75	Register Box - 7" Deep	14
77	Sq to Rd Diffuser Box	14
77S	Sq to Rd Diff. Box, Side Outlet	14
77WF	Diffuser Funnel w/ Flange	14
78	Wye Branch	12
78-1	One Way Adjustable Wye	12
78-2	Two Way Adjustable Wye	12
81	Ceiling Outlet	14
81D	Ceiling Outlet w/ Damper	14
83	Insul. Ceiling Box, Top Outlet	13
83E	Insul. Ceiling Box, End Outlet	13
83PC	Branch Connector	15
83S	Insul. Ceiling Box, Side Outlet	13
83TF	Insul. Ceiling Box, Top Flange	13
84DB	Insul. Ceiling Box (Ductboard)	13
84ST	Ductboard Collar	8
84STWD	Ductboard Collar w/ Damper	8
85	Insul. Ceiling Box, Top Outlet	13
85A	Insul. Ceiling Box, Angle	13
85DB	Insul. Ceiling Box (Ductboard)	13
85S	Insul. Ceiling Box, Side Outlet	13
86	Insul. Ceiling Box, Slant Top	13
86SC	Sleeve Connector	15
87	Lever Takeoff (Metal)	10
90	90° Adjustable Elbow	2
90	Floor Register Box - 6" Deep	14
91	Floor Register Box - 10" Deep	14
92	Funnel Register Box	14
92B	Funnel Register Box (B-Style)	14
93	Elbow Draft Vent	15
94	Horizontal Draft Vent	15
95	Vertical Draft Vent	15
96	Drawband	15
97	Flat Collar	8
97FC	Flex Connector	15
97FG	Spin Collar (Ductboard)	8
97FGWD	Spin Collar (DB) w/ Damper	8
97LS	Long Collar	8
97LSWD	Long Collar w/ Damper	8
98	Spin Collar (DB) w/ Scoop	8
98WD	SpinCollar(DB)w/Scoop/Damp.	8
99	Chimney Cap	15
99A	Chimney Cap	15
99LD	Lo-Draft Chimney Cap	15
99VC	Vent Cap	15
100	Oval Pipe - 100"	6
106	Rd to Oval Reverse Boot	6
110	Oval Stackhead	6
111	Register Outlet	6
113	Flat Oval 45° Angle	6
114	Flat Oval 90° Elbow	6
115	Vertical Oval 45° Angle	6
116	Vertical Oval 90° Elbow	6
117	Flue Thimble	12
120SC	Snap Collar	8
121SC	Snap Collar (Ductboard)	8
122SC	Snap Collar (Ductboard)	8
124	Rd to Oval 90° Boot	6
124R	Oval 90° Register Boot	8
127	Rd to Oval Straight Boot	6
127R	Oval Straight Register Boot	6
128	Oval to Oval Reverse Boot	6

PRODUCT INDEX

Item No.	Product Name	Page
128R	Oval End Register Boot	6
132	"A" Adapter	6
133	"B" Adapter	6
133	Line Cover	7
134	Can Stock	7
135	Rigid S-Cleat (1" Leg)	4
137	Drain Pan	5
140	Adjustable Roof Flashing	15
141	Tail Cone Flashing	15
142	Storm Collar	15
150	Oval Stackhead w/ Collar	15
156	Spin Collar	15
156BM	Bellmouth Spin Collar	6
156D	Spin Collar w/ Damp	8
156SDBM	Bm. Spin Collar w/Scoop/Damp	8
156DBM	Bellmouth Spin Collar w/ Damp	8
156S	Spin Collar w/Scoop	8
156SD	Spin Collar w/Scoop/Damper	8
156SDBM	Bm. Spin Collar w/Scoop/Damp	8
160	Oval Pipe - 60"	8
162	Oval Top Takeoff	8
163	Oval Side Takeoff	6
170	Return Air Pan	6
177	Ceiling Outlet	6
177S	Ceiling Side Outlet	5
199	H-Vent	14
200	Trunk Tee	12
201	Straight Thru Tee	12
201VH	Aluminum Wall Vent	12
201VHWP	White Plastic Vent	12
202	Reducing Tee	16
203S	Stub Wye	12
207	90° Vent Saddle	12
207QT	Quick Tee 90°	12
208	45° Vent Saddle	12
208QT	Quick Wye 45°	12
220EC	Eave Vent	12
239	Alum Roof Cap w/ Damper	12
240	Alum Roof Cap w/ Damper	16
241	Alum Roof Cap w/ Damper	16
277	Ceiling Outlet, No Flange	14
277F	Sq to Rd Outlet w/ Flange	14
355	Oval Straight Register Box	6
360	Oval Angle Register Box	6
390WP	White Louver Hood w/ Tail	16
391WP	White Louver Hood	16
577	Insulated Wye	13
577P	Insulated Wye Panel	13
582	2-pc Reducer	12
810-817	Return Air Package	5
810B-817B	Cold Air Boot	5
1050	Collar, No Crimp	8
1051	Collar	8
1060	Free Flow Tee	12
1106	Cold Air Frame	4
1109	Transition Collar	3
1112	Plenum Corner	4
1149	Long Collar w/ Damper	8
1150	Long Collar	8
2015	Rd Takeoff Elbow (Ductboard)	10
2016	Adjustable Takeoff (Ductboard)	9
2022	Round Takeoff (Ductboard)	10
AT62	AirTite Top Takeoff	11
AT62WD	AirTite Top Takeoff w/ Damper	11
AT63	Rectangular AirTite Takeoff	11
AT63A	Adjustable AirTite Takeoff	11
AT63WD	Rect. AirTite Takeoff w/ Damp	11
ATD	AirTite Takeoff w/ Damper	11
ATDBM	Bellmouth AT Takeoff w/ Damp	11
ATDRP	Rd Pipe AT Takeoff w/ Damper	11
ATHE	High Efficiency AirTite Takeoff	11
ATHEWD	High Eff AT Takeoff w/Damper	11
ATS	AirTite Takeoff w/ Scoop	11
ATSD	AirTite Takeoff w/ Scoop/Damp	11
ATSRP	Rd Pipe AT Takeoff w/ Scoop	11
ATSDRP	Rd Pipe AT T/O w/Scoop/Damp	11
ATT	AirTite Takeoff	11
ATTBM	Bellmouth AirTite Takeoff	11
ATTRP	Round Pipe Takeoff	11
ATTRP45	45° Saddle AirTite Takeoff	11
ATTRP90	90° Saddle AirTite Takeoff	11
BP24	Black Pipe - 24"	17
BP54	Black Tee	17
BP55	Black End Cap	17
BP58	Black 3-pc Reducer	17
BP90	Black 90° Elbow	17
BP96	Black Drawband	17
BP127	Black Oval to Rd Adapter	17
BPC	Black Pipe Collar	17
BPCHAD	Black Chimney Adapter	17
BPCON	Black Connector	17
BPTC	Black Trim Collar	17
CID	Cast Iron Damper	17
DWK	Double Wide Mobile Home Kit	16
EP15	Full Tab Takeoff (Metal)	10
EV141	Eave Vent	16
FB	Furnace Box	5
FR	Filter Rack	4
HT15	Half Tab Takeoff (Metal)	10
MF	Aluminum Flexible Duct	16
MU120	Conductor Pipe	2
MR	Mounting Rails	13
PH5	90° Basement Boot	2
PHEXT	PH Extension	7
RV51	Alum Roof Cap - 8" Opening	16
S5	Pivot Takeoff (Metal)	10
S75	Snap Drawband	15
SAE	Aluminum Elbow	16
SAL	Aluminum Transition Duct	16
SAP	Aluminum Pipe	16
SB	Support Box	5
SBF	Support Box w/ Filter Rack	5
SH	White Flexible Vinyl Hose	16
SL	Snaplock Pipe	2
SP6	Spiral 90° Shoe Tap	18
SP10	Spiral Pipe	18
SP45	Spiral 45° Angle	18
SP54	Spiral Tee	18
SP55	Spiral End Cap	18
SP58	Spiral Tapered Reducer	18
SP58ER	Spiral Eccentric Reducer	18
SP70	Spiral Register Saddle	18
SP90	Spiral 90° Elbow	18
SP90LR	Spiral Long Radius 90° Elbow	18
SPC	Pipe Clamp	16
SVH	Aluminum Vent Hood	16
SVHBP	Brown Plastic Vent Hood	16
SVHWP	White Plastic Vent Hood	16
SWK	Single Wide Mobile Home Kit	16
TD	Trunk Duct	3
WSJ	Wallstack	7
WS7C	Center Reverse Stack Elbow	7
WS9	Double Stackhead	7
WS10	Stackhead	7
WS10X	Long Throat SH w/ Ears	7
WS11	Projection Stackhead	7
WS12	Horizontal Stackhead	7
WS13	Flat Stack 45° Angle	7
WS14	Flat Stack 90° Elbow	7
WS15	Vertical Stack 45° Angle	7
WS16	Vertical Stack 90° Elbow	7
WS17	Stack Transition	7
WS20	Straight Stack Collar	7
WS21	Stack End Cap	7
WS45	Stack Damper	7
WS60	Stack Top Takeoff	7
WS61	Stack Side Takeoff	7

TECHNICAL INFORMATION

EQUIVALENT LENGTHS		
PLENUM/DUCT FITTINGS		
No. 23	Offset starting collar	10' EL
No. 20	Straight starting collar	35' EL
No. 120SC	Snap collar, round	35' EL
ROUND ELBOWS & ANGLES		
	90° elbows	30' EL
	45° angles	10 - 20' EL
REGISTER BOOTS		
No. 24R	90° register boot	30' EL
No. 27R	Straight register boot	5' EL
No. 28R	End register boot	50' EL
ROUND FITTINGS (TAKEOFFS)		
No. 97	Round starting collar	35' EL
No. 63	Square to round straight	20' EL
No. 63A	Square to round adj. side takeoff	50' EL
No. 62	Square to round top takeoff	50' EL
No. S5	Round to round (adjustable)	50' EL
No. 65	Round to round	50' EL
DUCT ELBOWS, RADIUS THROAT		
No. 14	Up to 11"	10' EL
	12" to 21"	15' EL
	22" to 27"	20' EL
	28" to 33"	25' EL
DUCT ELBOWS, SQUARE THROAT		
No. 16S	Up to 11"	40' EL
	12" to 15"	55' EL
	16" to 21"	75' EL
	22" to 27"	100' EL
	28" to 33"	125' EL
RETURN AIR SYSTEM		
No. 810	Cold air boot, collar, duct	45- 65' EL

SMACNA Gauge Requirements for Galvanized Steel

Duct Diameter	2" w.g. max Positive Pressure	Duct Diameter	2" w.g. max Negative Pressure
3" - 8"	28 Ga	6" - 10"	28 Ga
9" - 14"	26 Ga	12"	26 Ga
15" - 26"	24 Ga	14" - 16"	24 Ga
		18" - 20"	22 Ga
		22" - 26"	20 Ga

From SMACNA HVAC Duct Construction Standards Metal and Flexible, 2nd Ed (1995); 3.3 & 3.8

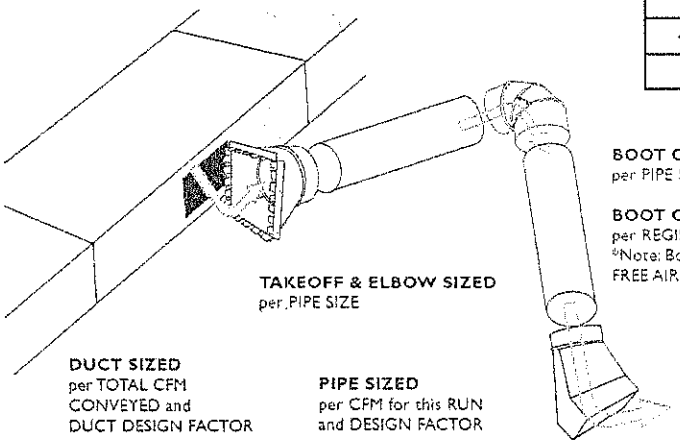
SUPPLY OR RETURN DUCT SIZE/CAPACITY

(.09 to .10 pressure drop per 100' EL)

CFM	Round (No. S-5)	Rectangular (RT)		
50	5"	8 x 6		
75	5"	8 x 6		
100	6"	8 x 6	3½ x 10	(110)
125	6"	8 x 6	3½ x 12	(140)
150	7"	8 x 6	3½ x 14	(160)
175	7"	8 x 6		
200	7"	8 x 6		
250	8"	6 x 10	8 x 8	6 x 12
300	9"	6 x 10	8 x 8	6 x 12
350	9"	6 x 10	8 x 8	6 x 12
400	9"	8 x 10	8 x 8	6 x 12
500	10"	10 x 10	12 x 8	8 x 12
600	12"	10 x 10	12 x 8	8 x 12
700	12"	12 x 10	14 x 8	10 x 12
800	12"	12 x 10	16 x 8	10 x 12
900	14"	14 x 10	18 x 8	12 x 12
1,000	14"	14 x 10	18 x 8	12 x 12
1,200	14"	16 x 10	24 x 8	14 x 12
1,400	16"	18 x 10	24 x 8	16 x 12
1,600	16"	20 x 10	28 x 8	18 x 12
1,800	16"	24 x 10	30 x 8	20 x 12
2,000	18"	26 x 10	32 x 8	20 x 12
2,500	18"	30 x 10	20 x 14	24 x 12
3,000	20"	36 x 10	24 x 14	28 x 12
3,500	22"	40 x 10	28 x 14	32 x 12
4,000	24"	26 x 16	32 x 14	38 x 12

8" Joist - 375 CFM; 10" Joist - 525 CFM (return only)

SIZING REQUIREMENTS



BOOT COLLAR SIZED
per PIPE SIZE

BOOT OPENING SIZED
per REGISTER SIZE*
*Note: Boot sized LARGER than FREE AIR OPENING of register

TAKEOFF & ELBOW SIZED
per PIPE SIZE

DUCT SIZED
per TOTAL CFM CONVEYED and DUCT DESIGN FACTOR

PIPE SIZED
per CFM for this RUN and DESIGN FACTOR

$$\frac{\text{*ASP} \times 100}{\text{TOTAL EQ. LENGTH}}$$

REGISTER SIZED
per STYLE, SPREAD THROW and FREE AREA of register and CFM requirement

ADJUSTMENT OF DUCT DESIGN PRESSURE (RATE) FOR EQUIVALENT LENGTHS

Total Effective Length (Feet)	.05	.06	.08	.10	.125	.14	.16	.18	.20	.25	.30	.34	.375	.40	.50	.625	.75	1.00
35 -44	.13	.15	.20	.25	.32	.35	.40	.45	.50	.63	.75	.85	.95	1.00	1.25	1.50	1.90	2.54
45- 54	.10	.12	.16	.20	.25	.28	.32	.36	.40	.50	.60	.68	.76	.80	1.00	1.26	1.52	2.02
55 - 64	.08	.10	.13	.17	.21	.23	.27	.30	.33	.42	.50	.57	.63	.67	.83	1.05	1.26	1.68
65 - 74	.07	.09	.11	.14	.18	.20	.23	.26	.29	.36	.43	.49	.54	.57	.72	.90	1.08	1.44
75 - 84	.06	.08	.10	.13	.16	.18	.20	.23	.25	.31	.38	.43	.47	.50	.63	.79	.94	1.26
85 - 94	.06	.07	.09	.11	.14	.16	.18	.20	.22	.28	.33	.38	.42	.45	.56	.70	.84	1.12
95 - 104	.05	.06	.08	.10	.13	.14	.16	.18	.20	.25	.30	.33	.38	.40	.50	.63	.75	1.01
105 - 114	.05	.05	.07	.09	.11	.13	.15	.16	.18	.23	.28	.31	.34	.37	.47	.57	.69	.91
115 - 129	.04	.05	.07	.08	.10	.12	.13	.15	.17	.21	.25	.28	.31	.33	.46	.51	.62	.82
130 - 149	.04	.04	.06	.07	.09	.10	.11	.13	.14	.18	.21	.24	.27	.29	.36	.45	.54	.72
150 - 169	.03	.04	.05	.06	.08	.09	.10	.11	.13	.16	.19	.21	.24	.25	.31	.39	.47	.63
170 - 189	.03	.03	.04	.06	.07	.08	.09	.10	.11	.14	.17	.19	.21	.22	.28	.35	.42	.56
190 - 214	.03	.03	.04	.05	.06	.07	.08	.09	.10	.13	.15	.17	.19	.20	.25	.31	.37	.50
215 - 239	.02	.03	.04	.05	.05	.06	.07	.08	.09	.11	.13	.15	.17	.18	.22	.28	.33	.44
240 - 264	.02	.02	.03	.04	.05	.06	.06	.07	.08	.10	.12	.14	.15	.16	.20	.25	.30	.40
265 - 289	.02	.02	.03	.04	.04	.05	.06	.07	.07	.09	.11	.12	.14	.15	.18	.23	.27	.36
290 - 324	.02	.02	.03	.03	.04	.05	.05	.06	.07	.08	.10	.11	.12	.13	.17	.20	.24	.33
325 - 374	.02	.02	.02	.03	.04	.04	.05	.05	.06	.07	.09	.10	.11	.11	.14	.18	.21	.29
375 - 424	.01	.02	.02	.03	.03.	.04	.04	.05	.05	.06	.08	.09	.09	.10	.13	.16	.19	.25
425 - 474	.01	.01	.02	.03	.03	.03	.04	.04	.05	.06	.07	.08	.08	.09	.11	.14	.17	.22
475 - 524	.01	.01	.02	.02	.03	.03	.03	.04	.04	.05	.06	.07	.08	.08	.10	.13	.15	.20
525 - 574	.01	.01	.02	.02	.02	.03	.03	.03	.04	.05	.06	.07	.07	.07	.09	.11	.14	.18
575 - 625	.01	.01	.01	.02	.02	.02	.03	.03	.03	.04	.05	.06	.06	.07	.08	.10	.13	.17

FORMULAS

Sensible Heat Formula

BTU/Hour = CFM x TD x 1.1

$$CFM = \frac{BTU/Hour}{1.1 \times TD \times ACF}$$

1.1 is a conversion factor
TD is the Temperature Difference created by the appliance
ACF is the Altitude Correction Factor (see *above table*)

Altitude Correction Factor (ACF)			
0 ft	1.0	5000 ft	.826
500 ft	.981	6000 ft	.801
1000 ft	.962	7000 ft	.772
2000 ft	.926	8000 ft	.749
3000 ft	.891	9000 ft	.715
4000 ft	.858	10000 ft	.687

Sensible Heat Ratio = $\frac{\text{Sensible Load}}{\text{Sensitive Load + Latent Load}}$

SHR below .80 = 21° TD — High humidity = 350 CFM/ton
SHR .80 to .85 = 19° TD — Ave. humidity = 400 CFM/ton
SHR above .85 = 17° TD — Low humidity = 450 CFM/ton

$$CFM = \frac{\text{Sensible Load}}{1.1 \times TD \times ACF}$$

Total Heat Equation

$$CFM = \frac{BTU/Hr}{4.5 \times H \times ACF}$$

4.5 is a conversion factor
H is the BTU per lb. of air removed

Friction Rate

**used in duct calculators*

$$\text{Friction Rate} = \frac{\text{Pressure Drop} \times 100}{TEL}$$

Pressure Drop is the available static pressure (ASP) allocated to the duct work.

ASP = Blower Static Pressure - Component Pressure Drops

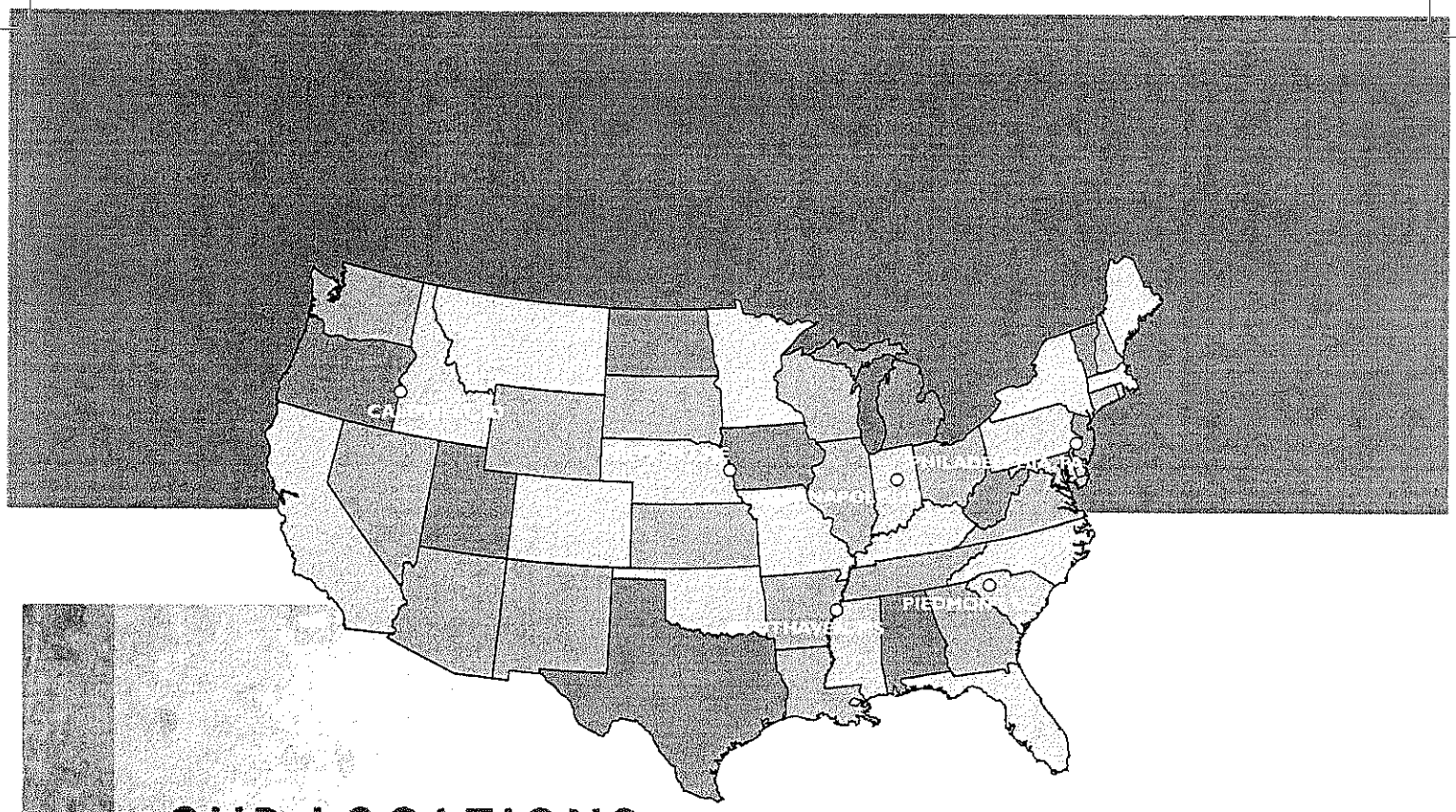
TEL is the Total Effective Length of the longest supply run and the longest return run.

CFM Calculations

$$\text{Room CFM} = \frac{\text{Blower CFM} \times \text{Room Load}}{\text{Equipment Sizing Load}}$$

$$\text{Flow Factor} = \frac{\text{Blower CFM}}{\text{Equipment Sizing Load}}$$

Room CFM = Flow Factor x Room Load



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