REVISED 4TH EDITION

Revised 6/06 to be in compliance with SMACNA
HVAC Duct Construction Standards
Third Edition - 2005

CONSTRUCTION STANDARDS

Submittal Data
Engineering Specifications and
Assembly Instructions
for
Rectangular Duct Work
and
Round Duct Work

CONSTRUCTION STANDARDS

Submittal Data
LEED - Certified Construction
Green Building

C.L. WARD & FAMILY INC.

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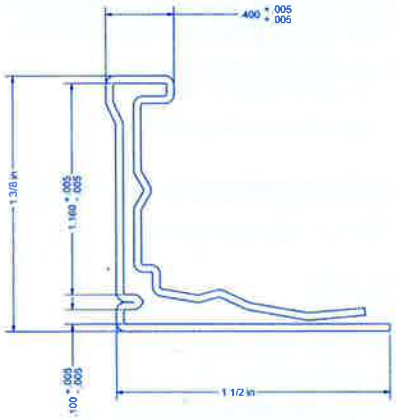
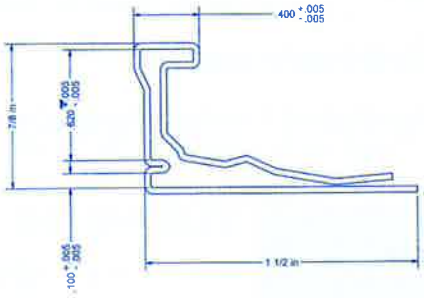
SMACNA

In accordance with the SMACNA Duct Performance Test Standard No. DPT-2005 criteria as described in Chapter 11 of the SMACNA HVAC Duct Construction Standards, Third Edition, 2005. Also, as described in paragraph S1.18 on page 1.3 of the SMACNA HVAC Duct Construction Standards, Third Ediction, 2005 the C.L. Ward and Family, Inc. 1 1/4" flange has the rigidity of a SMACNA "J" Classification and the 7/8" flange has the rigidity of a SMACNA "H" Classification.

Energy Savings Duct Reinforcement Connections



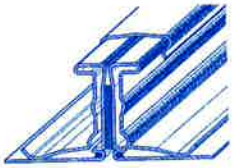
J Connect – Rolled formed from 20 gage galvanized steel.



H Connect – Rolled formed from 22 gage galvanized steel.

J Corner – Stamped from 11 gage galvanized steel. 3/8" x 1" Nut and Bolt packaged with corners

H Corner – Stamped from 11 gage galvanized steel. 1/4" x 1" Nut and Bolt packaged with corners



Metal Cleat – Rolled formed from 20 gage galvanized steel.
PVC Cleat – Available.

Also available in Aluminum, Stainless Steel, Galvaneal, Aluminized and PVC.

BUTYL GASKET		NEOPRENE GASKET
20	Flame Spread	10
0	Fuel Contribution	0
0	Smoke Density	0
3/16"	Thickness	5/16"
20 yr	Life Expectancy	Unlimited shelf life
300 F	Flash Point	–
None	Compression Set	–

All Butyl Gasket is not EQUAL

Penetration: The consistency and hardness of the butyl gasket, desired limits should be 8-10mm. ASTM D5.	**CL Ward - 9**
Specific Gravity: (lbs./gal.) Reveals polymers to a filler ratio, desired range is 12 - 13.5 ASTM D71-84	**CL Ward - 12.76**
Adhesive Tensile Strength: The ability by which the gasket adheres to the flange. Desired limits should be 20 psi minimum. ASTM C-907	**CL Ward - 30**
Vechicle Migration: Look for oils migrating out from the gasket - there should not be any.	**CL Ward - None**
Elongation: Try to pull the gasket apart to see where it snaps/breaks - compare for the best stretch, desired limits should be 450% minimum. AASTM D1191-84	**CL Ward - 550**
Odor: Strong odor indicates possible oxidation - Problem: Deterioration. No offensive odor. No amines contained. ASTM D816-82	**CL Ward - None**
Sag: 1/2" x 30" ft. roll. Excessive sag my result in product flowing out of the joint. ASTM D816-82	**CL Ward - Pass**
UL Classification: UL 723 / ASTM E84	**CL Ward - Yes**

INSTALLATION INSTRUCTIONS

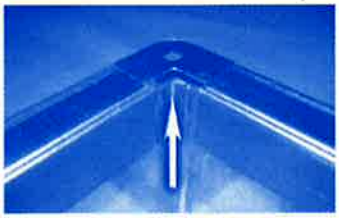
(Installation Instructions also shown on website video)

CUTTING THE CONNECTOR

The connector should be cut with a 3 h.p., 1350 rpm "chop saw" using a metal-tooth blade to insure a clean burr-free edge. An abrasive blade will melt the mastic and leave a burr. Cut the connector with the legs down, cutting through the "spine". The connector should be cut 1-5/16" shorter than the duct dimension.

ASSEMBLING THE FRAME

With the raised portion of the corner facing the mating corner insert the corners into the shorter connectors using a mallet. Complete the frame by adding the longer connectors.



SEATING THE FRAME ON DUCT

Hammer the completed frame onto the raw edge of duct section starting at one corner and working your way around making sure the duct is seated in the mastic pocket **and the corners of the duct are visible beyond the corners of the frame as shown.**

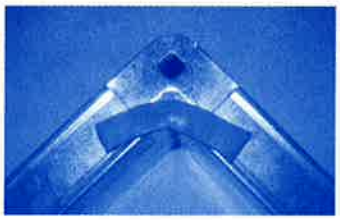
SECURING THE FRAME TO DUCT

Secure the frame to the ductwork by using either 10 x 3/4 tek screws or spot welds. On installations were leakage is critical (less than 1%) or static pressures exceeds 3", spot welding or rubber sealant coated tek screws is recommended.

Labor Saving Tools / Equipment shown on website video.

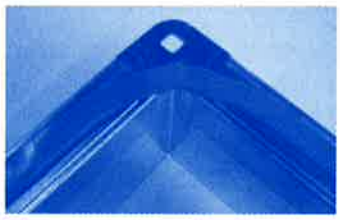
RECOMMENDED SPACING		
STATIC PRESSURE	DUCT SIZE	RECOMMENDED CENTERS
Low Pressure 1/2" to 2"	To 48" 49" to 96" Over 96"	@ corners & centerline @ corners & 24" centers @ corners & 18" centers
Medium Pressure 2" to 4"	To 36" 37" to 72" Over 72"	@ corners & centerline @ corners & 18" centers @ corners & 12" centers
Medium Pressure 4" to 6"	To 30" 31" to 72" Over 72"	@ corners & centerline @ corners & 18" centers @ corners & 12" centers
High Pressure 6" to 10"	To 24" 25" to 60" Over 60"	@ corners & centerline @ corners & 12" centers @ corners & 8" centers

Fastening the frame must start within 3/4" of each end of the flange at the corners.



GASKET POSITIONING

On one of the mating frames, apply a 2" to 3" strip of gasket to each corner, as shown, **making sure the gasket covers the exposed edge of the ductwork.**



Apply a single strip of gasket around the inside edge of the mating frame, again **making sure the gasket covers the exposed edge of the ductwork.**

Where leakage requirements are critical, less than 1%, contact C.L. Ward & Family, Inc. for consultation.

CLEAT SPACING

In accordance with the following spacing chart, install a piece of metal or PVC cleat over the mating frames.

STATIC PRESSURE	RECOMMENDED CENTERS
1/2" to 2"	24" centerline
2" to 4"	18" centerline
4" to 10"	12" centerline
Over 10"	Continuous

TIE ROD OPTION CONSTRUCTION

Tie rod installation tool shown on website video.

Tie Rods at midpoint of the duct panel are acceptable alternatives to external intermediate duct reinforcement.

The C.L. Ward & Family Inc. Duct Construction Standards have been prepared in accordance with the SMACNA HVAC Duct Construction Standards, Third Edition, 2005.

The Tie Rod Loc has been used for the testing as described in Chapter II of the SMACNA Standards.

The drawings below show the Tie Rod Loc being attached to the duct wall alone as the reinforcement for the panel.

Example:

H 22 T

Type of frame — Duct Gage — Tie Rod

Example:

J 20 TT

Type of frame — Duct Gage — Twin Tie Rods located at equal sub dividions of duct with but not over 48"

LEED CERTIFIED CONSTRUCTION

Green Building – is construction that includes features of reducing operating costs plus sustainability.

This means, when fabricating and installing the sheet metal duct work that serves the HVAC portion of the building construction, care must be exercised that the air leakage from the sheet metal duct work must be held at a minimum. This not only reduces the first cost of the supply and return air fans, but also reduces the operating costs.

Using the CL Ward Duct Construction Standards as your shop standards, you meet the requirements of the SMACNA HVAC Duct Construction Standards, Third Edition 2005. The SMACNA Standards are also the requirements of the

International Mechanical Code (2009)
International Energy Conservation Code, Duct Leakage
ASHRAE/IESNA Standard 90.1 (2007)

Testing the ductwork system for air leakage as per the SMACNA HVAC Air Duct Leakage Test Manual also puts the contractor in compliance with the above codes.

Duct to be sealed, SMACNA SEAL CLASS "A"
Class "A" Sealing—requires the sealing of all transverse joints, longitudinal seams, and duct wall penetrations.

LEED EQ Credit 4.1
All CL WARD Sealants & Adhesives meet LEED Requirements. LEED EQ Credit 4.1 requires that all adhesives and sealants used on the interior of the building shall comply with South Coast Air Quality Management District (SCAQMD) Rule #1168. All CL WARD water based sealants, adhesives and coatings have zero VOC and comply with the requirements for Low-Emitting materials for indoor environmental quality, credit 4.1. These products include:

- SuperSeal
- SuperSeal – Fiber
- EcoSeal
- CLWARD Adhesive
- CLWARD Adhesive HV

On projects where water based sealants cannot be applied at temperatures at or below 40°F, the USGBC has issued the following ruling:

- Project teams may classify duct sealants under "other", as listed in the SCAQMD VOC Limits Table, which permits a maximum limit of 420 g/L VOC. The CL WARD Solvent Base Duct Sealer meets this requirement.

Note: Insulation
All of the above codes require that all supply and return ducts and plenums be insulated when located in unconditioned spaces. Please refer to their specifications for the latest requirements.

The following paragraphs are reprinted from the SMACNA Duct Construction Standards 1995 edition. C.L. Ward & Family feels that these are important.

Each duct system shall be constructed for the specific duct pressure classifications shown on the contract drawings. Where no pressure classes are specified by the designer, the 1" water gage pressure class is the basis of compliance with these standards, regardless of velocity in the duct, except when duct is variable volume: All volume duct upstream of VAV boxes has a 2" basis of compliance when the designer does not give a pressure class.

DUCT SEALING COMMENTARY

Duct must be sufficiently airtight to ensure economical and quiet performance of the system. It must be recognized that airtightness in ducts cannot, and need not, be absolute (as it must be in a water piping system). Codes normally require that ducts be reasonably airtight. Concerns for energy conservation, humidity control, space temperature control, room air movement, ventilation, maintenance, etc., necessitate regulating leakage by prescriptive measures in construction standards. Leakage is largely a function of static pressure and the amount of leakage in a system is significantly related to system size. Adequate airtightness can normally be ensured by **A** selecting a static pressure, construction class suitable for the operating condition, and **B** sealing the ductwork properly.

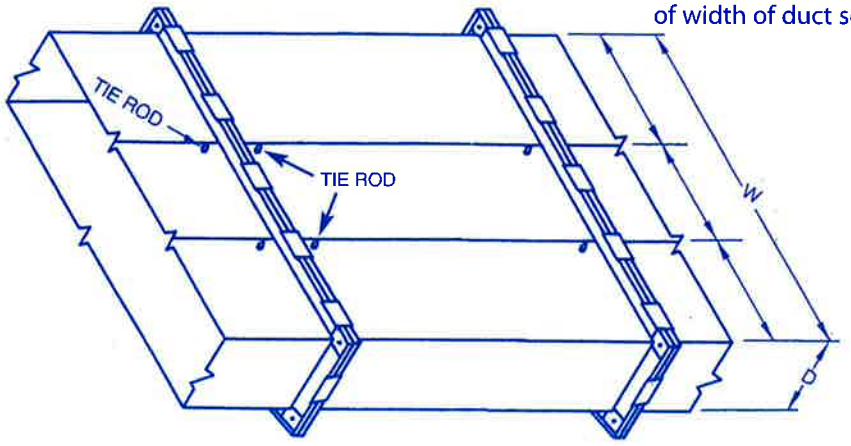
STANDARD DUCT SEALING REQUIREMENTS		
SEAL CLASS	**SEAL REQUIREMENTS**	**applicable STATIC PRESSURE construction CLASS**
A	Class A: All transverse joints, longitudinal seams, and duct wall penetrations	4" w.g. and up
B	Class B: All transverse joints, longitudinal seams only	3" w.g.
C	Class C: transverse joints only	2" w.g.

In addition to the above, any variable air volume system duct of 1" and 1/2" w.g. construction class that is upstream of the VAV boxes shall meet Seal Class C.

Large Ductwork

Ductwork over 120" wide

Tie Rods Located at equal subdivisions of width of duct section but not over 48"



Static Pressure	1/2"	1"	2"	3"	4"	6"	10"
Duct Gauge	18	18	18	18	18	18	16
C.L. Ward Flange	Jt	Jt	Jt	Jt	Jt	Kt	Lt
Duct Section	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"

Note –
Because 5'-0" duct sections on the larger ductwork would exceed 300 pounds per section, which in most cases would cause shipping, rigging and installations problems, we have limited the duct sections to 2'-0" which eliminates some installation problems.

1/2" W.G. Static pos or neg	SHOP STANDARDS RECTANGULAR DUCT REINFORCEMENT					
Duct Dimen.	6'	5'	4'	3'	2 1/2'	2 '
23-30"	H-26	H-26	H-26	H-26	H-26	H-26
31-48"	H-24	H-26	H-26	H-26	H-26	H-26
49-54"	H-22	H-26	H-26	H-26	H-26	H-26
55-60"	H-22	H-24	H-24	H-26	H-26	H-26
61-72"	H-20	H-22	H-24	H-24	H-24	H-24
73-84"	H-18	H-22	H-24	H-24	H-24	H-24
85-96"	J-18	H-20	H-22	H-22	H-22	H-22
97-108"	J-18T	J-18	J-18	H-18	H-18	H-18
109-120"	J-18T	J-18T	J-18T	J-18	H-18	H-18

1/2" W.G. Static pos or neg	SHOP STANDARDS ALUMINUM RECTANGULAR DUCT REINFORCEMENT			
Duct Dimen.	5'	4'	2 1/2'	2'
54"-Down	J-.032	J-.032	J-.032	J-.032
55"-60"	J-.04	J-.04	J-.032	J-.032
61"-72"	J-.05	J-.04	J-.04	J-.04
73"-84"	JT-.05	J-.04	J-.04	J-.04
85"-96"	JT-.071	JT-.05	J-.05	J-.05
97"-108"			JT-.071	J-.071

1" W.G. Static pos or neg	SHOP STANDARDS RECTANGULAR DUCT REINFORCEMENT					
Duct Dimen.	6'	5'	4'	3'	2 1/2'	2 '
20" dn	H-26	H-26	H-26	H-26	H-26	H-26
21-30"	H-26	H-26	H-26	H-26	H-26	H-26
31-42"	H-22	H-24 / H-26	H-26	H-26	H-26	H-26
43-48"	H-20	H-22 / H-24	H-24	H-26	H-26	H-26
49-60"	H-20	H-22	H-24	H-24	H-24	H-24
61-72"	H-18	H-18 / H-24T	H-22	H-24	H-24	H-24
73-84"	J-18	J-18 / H-22T	J-20	H-22	H-22	H-22
85-96"		J-18 / J-20T	J-18	J-20	H-20	H-20
97-108"		J-18T	J-18	J-18	J-18	J-18
109-120"		J-18T	J-18T	J-18	J-18	J-18

1" W.G. Static pos or neg	SHOP STANDARDS ALUMINUM RECTANGULAR DUCT REINFORCEMENT			
Duct Dimen.	5'	4'	2 1/2'	2'
30"-Down	J-.032	J-.032	J-.032	J-.032
31"-42"	J-.04	J-.032	J-.032	J-.032
43"-60"	J-.05	J-.04	J-.04	J-.04
61"-72"	JT-.071	JT-.05	J-.04	J-.04
73"-84"			JT-.05	J-.05
85"-96"			JT-.063	JT-.05

2" W.G. Static pos or neg	SHOP STANDARDS RECTANGULAR DUCT REINFORCEMENT					
Duct Dimen.	6'	5'	4'	3'	2 1/2'	2 '
12" dn	H-26	H-26	H-26	H-26	H-26	H-26
13-18"	H-24	H-26	H-26	H-26	H-26	H-26
19-26"	H-24	H-26	H-26	H-26	H-26	H-26
27-30"	H-22	H-24	H-26	H-26	H-26	H-26
31-36"	H-20	H-24	H-24	H-26	H-26	H-26
37-42"	H-20	H-22	H-24	H-24	H-26	H-26
43-48"	H-20	H-22	H-22	H-24	H-24	H-24
49-54"	J-24T	H-20	H-20	H-24	H-24	H-24
55-60"	J-22T	J-20	H-20	H-22	H-24	H-24
61-72"		J-22T	J-20	H-22	H-22	H-24
73-84"		J-22T	J-20	J-20	J-22	J-22
85-96"		J-20T	J-22T	J-18	J-20	J-22
97-108"		JT-18T	JT-18T	JT-18T	J-18	J-18
109-120"			JT-18T	JT-18T	JT-18	J-18

2" W.G. Static pos or neg	SHOP STANDARDS ALUMINUM RECTANGULAR DUCT REINFORCEMENT			
Duct Dimen.	5'	4'	2 1/2'	2'
26"-Down	J-.032	J-.032	J-.032	J-.032
27"-30"	J-.04	J-.032	J-.032	J-.032
31"-36"	J-.04	J-.04	J-.032	J-.032
37"-42"	J-.05	J-.04	J-.04	J-.032
43"-48"	JT-.05	J-.05	J-.04	J-.04
49"-54"	JT-.063	JT-.063	J-.04	J-.04
55"-60"		JT-.063	J-.04	J-.04
61"-72"			JT-.05	JT-.04

3" W.G. Static pos or neg	SHOP STANDARDS RECTANGULAR DUCT REINFORCEMENT					
Duct Dimen.	6'	5'	4'	3'	2 1/2'	2'
12" dn	H-26	H-26	H-26	H-26	H-26	H-26
13-18"	H-24	H-24	H-26	H-26	H-26	H-26
17-22"	H-22	H-24	H-24	H-26	H-26	H-26
23, 24"	H-22	H-24	H-24	H-26	H-26	H-26
25, 26"	H-22	H-24	H-24	H-26	H-26	H-26
27, 28"	H-20	H-22	H-24	H-26	H-26	H-26
29, 30"	H-20	H-22	H-24	H-26	H-26	H-26
31-36"	H-18	H-20	H-22	H-24	H-26	H-26
37-42"	H-18	H-20	H-22	H-24	H-24	H-26
43-48"	J-18	H-24T	H-20	H-22	H-24	H-24
49-54"		J-24T	H-24T	H-22	H-24	H-24
55-60"		J-22T	H-22T	H-20	H-22	H-24
61-72"		J-22T	H-22T	J-20	J-22	J-24
73-84"		JT-20T	JT-20T	J-18T	J-20	J-22
85-96"		JT-18T	JT-18T	JT-18T	J-18	J-20
97-108"		JT-18T	JT-18T	JT-18T	JT-18	JT-18
109-120"				JT-18T	JT-18	JT-18

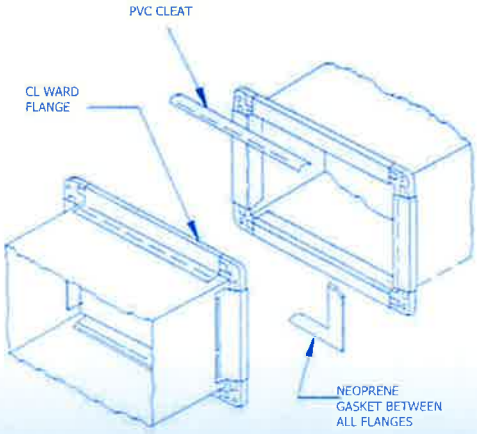
3" W.G. Static pos or neg	SHOP STANDARDS ALUMINUM RECTANGULAR DUCT REINFORCEMENT			
Duct Dimen.	5'	4'	2 1/2'	2'
12"-Down	J-.032	J-.032	J-.032	J-.032
13"-26"	J-.04	J-.04	J-.032	J-.032
27"-30"	J-.05	J-.04	J-.032	J-.032
31"-36"	J-.063	J-.05	J-.032	J-.032
37"-42"	JT-.063	J-.05	J-.04	J-.032
43"-48"		JT-.063	J-.04	J-.04
49"-54"			J-.04	J-.04
55"-60"			JT-.05	J-.04

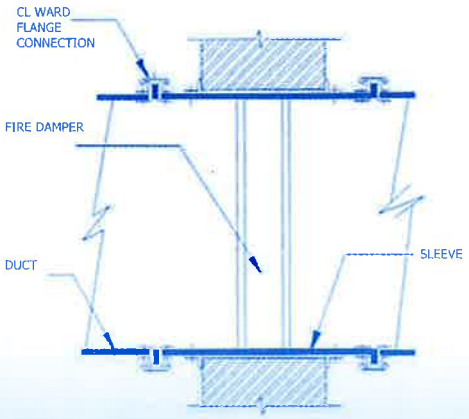
4" W.G. Static pos or neg	SHOP STANDARDS RECTANGULAR DUCT REINFORCEMENT					
Duct Dimen.	**6'**	**5'**	**4'**	**3'**	**2 1/2'**	**2 '**
10" dn	H-26	H-26	H-26	H-26	H-26	H-26
11,12"	H-24	H-26	H-26	H-26	H-26	H-26
13,14"	H-22	H-24	H-26	H-26	H-26	H-26
15,16"	H-22	H-24	H-26	H-26	H-26	H-26
17-20"	H-22	H-24	H-24	H-26	H-26	H-26
21,22"	H-20	H-24	H-24	H-26	H-26	H-26
23-30"	H-20	H-22 / H-24	H-24	H-26	H-26	H-26
31-36"	H-18	H-20 / H-22	H-22	H-24	H-26	H-26
37-42"	J-16	H-24T	H-20	H-22	H-24	H-26
43-48"	J-16	H-24T	H-24T	H-22	H-24	H-24
49-54"	J-16	H-22T	H-24T	J-20	H-22	H-24
55-60"		J-22T	J-24T	J-20	J-22	H-24
61-72"		JT-20T	JT-22T	J-18	J-20	J-22
73-84"		JT-18T	JT-20T	JT-20T	J-18	J-20
85-96"					JT-18	J-20
97-108"					JT-18	JT-18
109-120"					JT-18	JT-18

Please consult CLWard & Family Inc. for aluminum rectangular duct reinforcement requirements for 4" W.G. Static and above

6" W.G. Static pos or neg	SHOP STANDARDS RECTANGULAR DUCT REINFORCEMENT					
Duct Dimen.	**6'**	**5'**	**4'**	**3'**	**2 1/2'**	**2'**
10" dn	H-22	H-26	H-26	H-26	H-26	H-26
11,12"	H-22	H-24	H-24	H-26	H-26	H-26
13,14"	H-20	H-22	H-24	H-26	H-26	H-26
15-18"	H-20	H-22	H-24	H-26	H-26	H-26
19-22"	H-20	H-22	H-24	H-24	H-26	H-26
23,24"	H-20	H-22	H-22	H-24	H-26	H-26
25-28"	H-18	H-20	H-22	H-24	H-24	H-24
29,30"	H-18	J-24T	H-22	H-24	H-24	H-24
31-36"		J-24T	H-20	H-22	H-24	H-24
37-42"		J-22T	J-22T	H-20	H-22	H-22
43-48"		J-22T	J-22T	J-20	J-22	J-22
49-54"		JT-20T	JT-22T	J-18	J-20	J-22
55-60"		JT-20T	JT-22T	J-18	J-20	J-22
61-72"		JT-18T	JT-20T	JT-16	J-18	J-20
73-84"			JT-18T	JT-16	JT-18	JT-18
85-96"				JT-16	JT-16	JT-18

CL WARD FLANGE AS BREAKAWAY CONNECTION





NOTE:

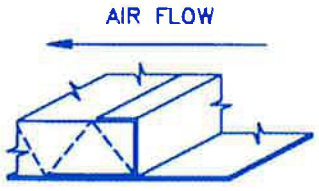
- SECURE FIRE DAMPER TO SLEEVE
- DO NOT BOLT CORNERS
- MINIMUM ONE PVC CLEAT PER SIDE—12" CENTERS

As shown on Figure 5-2 of the SMACNA Fire Damper Guide - Fifth Edition

10" W.G. Static pos or neg	SHOP STANDARDS RECTANGULAR DUCT REINFORCEMENT						
Duct Dimen.	6'	5'	4'	3'	2 1/2'	2 '	
8" dn	H-22	H-24	H-24	H-26	H-26	H-26	
9",10"	H-20	H-22	H-24	H-26	H-26	H-26	
11",12"	H-20	H-22	H-24	H-26	H-26	H-26	
13",14"	H-18	H-20	H-22	H-24	H-26	H-26	
15-18"	H-18	H-20	H-20	H-24	H-24	H-26	
19",20"	H-18	H-18	H-20	H-22	H-24	H-24	
21-24"	H-18	H-18	H-20	H-22	H-24	H-24	
25-28"	J-22T	J-18	H-18	H-22	H-24	H-24	
29",30"	J-22T	J-18	J-18	H-22	H-24	H-24	
31-36"		J-22T	J-18	J-20	H-22	H-24	
37-42"		J-20T	J-18	J-18	J-20	J-22	
43-48"		J-18T	J-22T	JT-18	J-18	J-22	
49-54"		JT-18T	JT-20T	JT-18	J-18	J-20	
55-60"			JT-20T		JT-18	J-20	
61-72"					JT-18	JT-18	
73-84"					JT-16	JT-18	

NOTE:
Metal nosing must be used wherever liner is preceded by unlined metal; otherwise when velocity exceeds 4000 FPM (20.3 MPS), use metal nosing on every leading edge.

As described on Page 2.24, Figure 2-19 of the SMACNA HVAC Duct Construction Standards, 2nd Ed., 1995.



C.L. Ward Spiral Flange Round Duct Reinforcement

REINFORCEMENT CLASS B Size (W x H x T) 1-1/4 x 1-1/4 x 3/16	5'-0" STIFFENER SPACING SPIRAL SEAMED DUCT POSITIVE AND NEGATIVE PRESSURE			
Duct Dia.	2" Duct Gage	4" Duct Gage	6" Duct Gage	10" Duct Gage
4"-18"	28	28	28	28
19"-24"	28	28	28	26
25"-30"	28	28	26	24
31"-36"	28	28	26	24
37"-42"	28	26	24	22
43"-48"	28	26	24	22
49"-54"	28	24	24	22
55"-60"	26	24	22	
61"-66"	26	24	22	
67"-72"	26	24		
73"-84"	24			

REINFORCEMENT CLASS B Size (W x H x T) 1-1/4 x 1-1/4 x 3/16	10'-0" STIFFENER SPACING SPIRAL SEAMED DUCT POSITIVE AND NEGATIVE PRESSURE			
Duct Dia.	2" Duct Gage	4" Duct Gage	6" Duct Gage	10" Duct Gage
4"-18"	28	28	26	26
19"-24"	28	26	24	24
25"-30"	28	26	24	22
31"-36"	28	24	22	22
37"-42"	26	24	22	20
43"-48"	26	22	22	
49"-54"	24	22		
55"-60"	24	22		
61"-66"	24			
67"-72"	24			

In accordance with SMACNA Duct Performance Test Standards #DPTS-2005 as described in the HVAC Duct Construction Standards, Third Edition - 2005, the C.L. Ward & Family, Inc. SpiralFlange for round duct connection system and round duct reinforcement meets the requirements of a SMACNA B Reinforcement Class.

Hanger Systems Engineering Information

ALLOWABLE LOADS FOR TRAPEZE HANGER AND ANGLE IRON			
DUCT CLASS	18 GA. TRAPEZE	16 G. 1 1/2 x 1 1/2 ANGLE	16 GA. 1X1 ANGLE
18"	850	150	80
24"	850	150	75
30"	840	150	70
36"	830	130	60
42"	810	110	40
48"	780	80	
54"	735		
60"	680		
66"	600		
72"	520		
78"	400		
84"	275		

The above calculations assume that a hanger rod is 6" max. distance from side of duct. If the rod is 2" away, the allowable load increases significantly, approximately 70%.

Call CL Ward & Family for more engineering assistance.

APPROXIMATE WEIGHT OF UNLINED SHEET METAL DUCT WORK - 5 FT. SECTIONS					
TYPICAL DUCT SIZE	24 GA.	22 GA.	20 GA.	18 GA.	16.GA.
36/24	64	76	83	119	135
42/24	70	85	100	131	150
48/24	76	93	110	143	160
60/30	96	116	137	178	200
72/36	115	140	164	214	240
84/48	140	171	201	261	300
96/48	153	186	219	285	200

Above weights are stated in lbs.

SHOP STANDARDS
RECTANGULAR INDUSTRIAL DUCT REINFORCEMENT
CLASS 1 SYSTEM CLASSIFICATION

	2'0" Duct Section				4'0" Duct Section			
	16 GA		14 GA		16 GA		14 GA	
Duct Size	Flange	Static Pressure	Flange	Static Pressure	Flange	Static Pressure	Flange	Static Pressure
12-18"	J	17"	J	22"	J	8"	J	11"
19-24"	J	17"	J	22"	J	8"	J	11"
25-30"	J	17"	J	22"	J	8"	J	11"
31-36"	J	17"	J	22"	J	8"	J	11"
37-42"	J	17"	J	22"	J	8"	J	11"
43-48"	J	17"	J	22"	J	8"	J	11"
49-60"	J	14"	J	14"	JT	8"	JT	11"
61-72"	JT	13"	JT	13"	JT	6"	JT	6"
73-84"	JT	8"	JT	8"	JT	4"	JT	4"
85-96"	JT	5"	JT	5"	JT	3"	JT	3"
97-108"	JT	4"	JT	4"	JT	2"	JT	2"
109-120"	JT	3"	JT	3"	JT	1"	JT	1"
121-144"	JT	1"	JT	1"	JT	.5"	JT	.5"

The CLWard J Flange can be used on limited rectangular industrial ductwork.
These are some typical applications.
Please call CLWard for engineering applications.