



# Clamp-Together Ducting System

## TECHNICAL PRODUCT MANUAL- 2008



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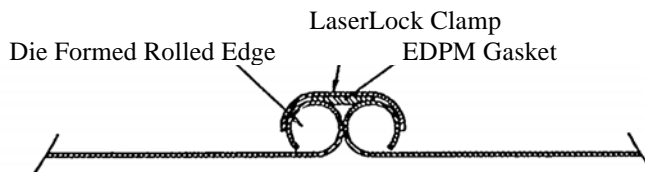
# ENGINEERING SPECIFICATIONS FOR DUCT INCORPORATED LASERLOCK DUCTING

## **DUCT-WORK:**

All ductwork shall be of clamp-together design using a die-formed rolled edge which is then joined together by a single lever clamp of similar material. All clamp together ducting 3” through 24” to be continuous welded construction along the longitudinal seam of the rolled form duct. All connections shall have EDPM gasket in clamp for standard installations or specialized gasket for mist, food grade and high temperature applications.

Duct material sheet blanks are 40” long for 3”, 48” long for 4” – 5” and 60” long for 6” and larger diameters, which is then rolled and fused together with a weld process along the longitudinal seam.

The duct is then pressed in a die to form a rolled bead on each end of the duct. The rolled end of the duct is used for reinforcement as well as the clamping process.



Duct diameters for LASERLOCK duct:

3”-17” available in 1” increments  
18”-24” available in 2” increments

## **COMPONENT MATERIAL:**

Galvanized duct and all components to be constructed of galvanized sheets produced by the continuous galvanizing process in which conforms to commercial quality ASTM-A-527. Galvanized sheet produced with coating weight of G-90 with a minimal spangle.

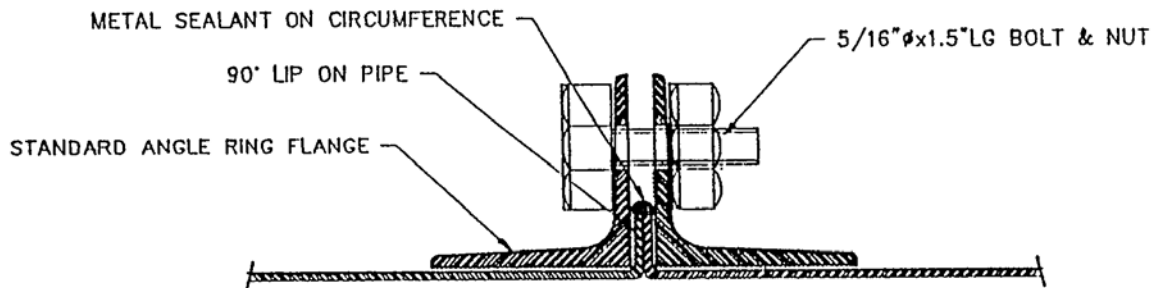
Stainless Steel duct and components to be constructed of stainless steel sheets 304 cold rolled with finish ASTM-A240.

For additional information regarding materials, gauges, temperature ratings, etc. refer to the Duct Incorporated Technical manual.



# ENGINEERING SPECIFICATIONS FOR DUCT INCORPORATED FLANGE DUCTING

## DUCT-WORK:



Duct material sheet blanks are rolled and fused together with a weld process along the longitudinal seam. An angle ring produced from angle bar stock rolled on edge is placed on the end of duct using a van-stone connection. (see above illustration)

Duct diameters for DuctIncorporated flanged duct:

4"-17" available in 1" increments

18"-24" available in 2" increments

## COMPONENT MATERIAL:

Galvanized duct and all components to be constructed of galvanized sheets produced by the continuous galvanizing process which conforms to commercial quality ASTM-A-527. Galvanized sheet produced with coating weight of G-90 with a minimal spangle.

Stainless Steel duct and components to be constructed of stainless steel sheets 304 cold rolled with finish ASTM-A240.

For additional information regarding materials, gauges, temperature ratings, etc. refer to Duct Incorporated Technical manual.



# SIZING A LASERLOCK DUCT SYSTEM

Duct Incorporated offers assistance to those sales people and customers who have never designed a ducting system before. We can assist you in determining the correct duct size and configuration that will supply you with the correct flow. We will also assist in training sales sessions for your sales group.

We have the ability to assist customers in designing a gated system; taking into account flow dynamics that will be affected by slide gates. While slide gates can be used to effectively utilize an undersized filtering system, they can also destroy the flow if not properly placed.

## USING THE CFM / FPM CHART

In the following pages, you will find information and a chart that allows you to pick the right size duct for the CFM that is required. Different materials need to be moved at different velocities so as to prevent the material from falling out of the air stream. For example: wood chips and saw dust flow well at 4500 feet per minute. Referring to the chart, you will see that a 4" duct will convey 395 CFM at 4500 FPM. This will mean that a 4" pick-up on a machine will take 395 CFM from your filtering system; or working in reverse, if you know that a machine will require approximately 400 CFM to remove the waste, then you should design a 4" duct for the purpose.

Description of Conveyed Material	Velocity FPM	Example
Gases, Smoke, Vapor	1,000 - 2,000	All vapors gases and smoke
Fumes	2,000 - 2,500	Welding
Very Fine Light Dust	2,500 - 3,000	Cotton Lint, Litho Powder, Wood Flour
Dry Dusts and Powders	3,500 - 4,000	Light shavings, Rubber Dust, Soap Dust
Typical Industrial Dust	3,000 - 4,000	Grinding or Buffing Dust, Granite/Brick/Clay Dust
Heavy Dusts	4,000 - 4,500	Heavy or Wet Sawdust, Metal Turnings, Sand Blast Dust, Wood Blocks
Heavy or Moist	4,500 +	Moist Cement Dust, Quick-Lime Dust, Sticky Buffing Lint.



## SIZING BRANCHES

The chart will also allow you to determine the transitions and branches needed.

**EXAMPLE: Always work from your machines back toward the filter,**

suppose that you have a 4" drop that rises and runs back to join with a 6" drop as sketch on right. What size branch will you need?

## SOLUTION

The 4" duct carries 395 CFM at 4500 FPM. (See Chart). The 6" duct will need 885 CFM at the same velocity. (See Chart). Added together, you have a total of (395 + 885) 1280 CFM coming together. Looking again at the chart under 4500 FPM, you find that 1280 CFM is not listed, but falls very close to the 1205 CFM listed for a 7" duct. This indicates that the 4" joined to the 6" will require a 7" duct to carry all of the material at the right velocity. The branch, therefore, will be 7" on the upstream end reducing down to a 4" with a 6" branching off of it. That is listed as a 7-4-6 branch and is shown below. (Additional technical info. can be found in the "LaserLock" catalog).

All branches come off the duct at a 45-degree angle, so it is important to add a 45-degree elbow to complete a full 90 degree drop or turn. See sketch. The "LaserLock" catalog contains all pertinent data about the duct and sizes. With a few basic pieces of information, you should be well equipped to design a system. But, if you have any questions as to the design, please call.



# **SIZING**

## ***ELBOWS***

The catalog lists the standard sizes and the standard gauges. However, Duct Incorporated also makes elbows in long radius and in heavier gauges. The elbows can be made in segments or can be made with tubing with a smooth wall. Pricing for the various sizes and gauges should be obtained by calling Duct Incorporated.

## ***SPECIAL COMPONENTS***

As with the elbows, Duct Incorporated is able to provide special hoods or special designed pieces for almost any dust collection application. To obtain help in design or pricing, call Duct Incorporated.

## ***ADAPTING THE EXISTING SYSTEMS***

There will be instances where the customer will desire to apply LaserLock Duct to an existing ducting system. Duct Incorporated makes adapters for this purpose. We can provide these in flange to LaserLock or through simply supplying LaserLock collars that can be attached to the end of existing spiral duct so that LaserLock can be coupled to the duct.



# LASERLOCK SECRET TO ELIMINATING UP TO 50% OF INSTALLATION TIME



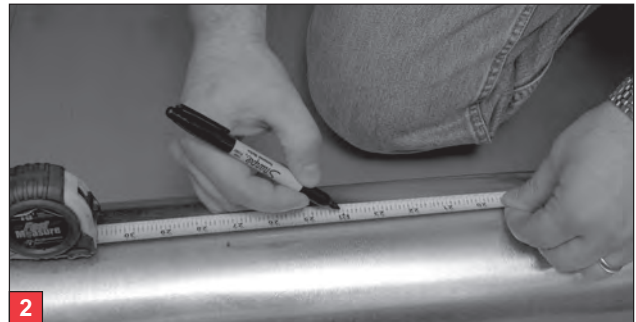
## INSTRUCTIONS FOR INSTALLING A SLIP JOINT

LaserLock™ Slip Joint telescopes in length to eliminate wasted parts due to improper measurements.



1

Measure the distance to be spanned.



2

Mark pipe approximately 4" less than the distance needed.



3

Mark for cutting.



4

Drill access hole, then cut with metal snips or saw along line, then remove burrs.



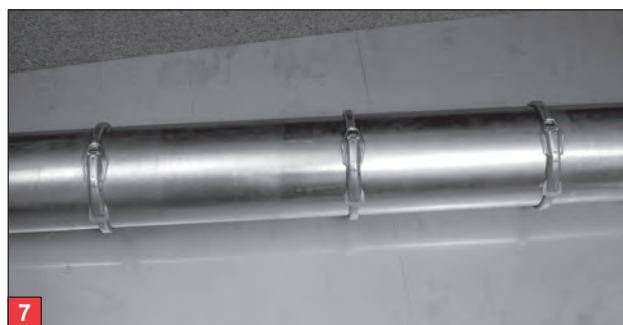
5

Put O-ring on cut pipe. Slide slip joint over cut end of pipe.



6

Adjust its length. Snap clamp over O-ring and one end of slip joint.



7

Insert slip joint assembly to complete connection.

# AIR VOLUME IN DUCTS (CFM)

VELOCITY FPM	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000
	DUCT										
3	100	125	150	170	195	220	245	270	295	320	345
4	175	220	260	305	350	395	440	485	525	570	615
5	275	340	410	475	545	615	680	750	820	885	955
6	395	490	590	685	785	885	980	1080	1180	1275	1375
7	535	670	800	935	1070	1205	1335	1470	1605	1735	1870
8	700	875	1050	1220	1395	1570	1745	1920	2095	2270	2445
9	885	1105	1325	1545	1765	1990	2210	2430	2650	2870	3090
10	1090	1365	1635	1910	2180	2455	2725	3000	3270	3545	3820
12	1570	1965	2355	2750	3140	3535	3925	4320	4710	5105	5500
14	2140	2675	3205	3740	4275	4810	5345	5880	6415	6950	7485
16	2790	3490	4190	4885	5585	6285	6980	7680	8380	9075	9775
18	3535	4420	5300	6185	7070	7950	8835	9720	10600	11485	12370
20	4365	5455	6545	7635	8725	9815	10910	12000	13090	14180	15270
22	5280	6600	7920	9240	10560	11880	13200	14520	15840	17160	18480
24	6285	7855	9425	10995	12656	14135	15710	17280	18850	20420	21995
26	7370	9210	11055	12900	14740	16580	18420	20270	22110	23950	25800
28	8550	10685	12820	14960	17100	19230	21310	23500	25650	27780	29920
30	9800	12260	14700	17170	19625	22080	24530	26990	29440	31890	34350

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# LaserLock PARTS LIST TAKE-OFF WORKSHEET

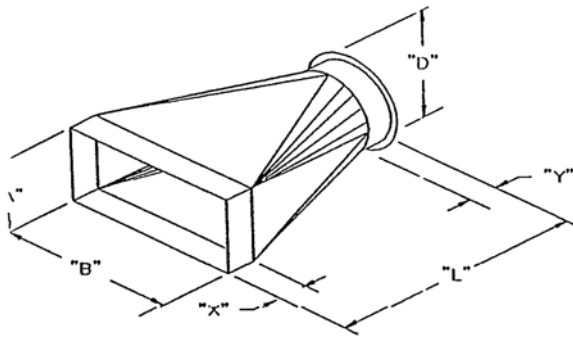
DIA	PIPE 3" 40" 4-5" 48" 6" & above 60" LONG	SLIP JOINT INCL O-RING	ELBOWS				SLIDE GATES	FLOOR SWEEP	MACHINE ADAPTOR STAND. IS LL TO ID	FLEX HOSE ADAPT	LL CLAMP	PIPE HANGER	FLEX HOSE RUBB OR STEEL	FLEX HOSE CLAMP	MISC. FITTINGS (REDUCERS, ADAPTORS TRANSITION, ANY FITTINGS THAT CAN NOT BE SPECIFIED ELSEWHERE!	BRANCH, DOUBLE BRANCH & Y BRANCH				
			90	60	45	30										A	B	C	D	Qty.
3"																				
4"																				
5"																				
6"																				
7"																				
8"																				
9"																				
10"																				
12"																				
14"																				
16"																				
18"																				
20"																				
22"																				
24"																				

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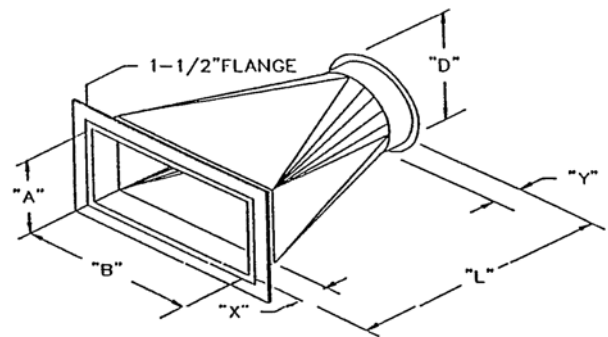
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## RECTANGULAR TO ROUND TRANSITION



**STYLE #1**



**STYLE #2**

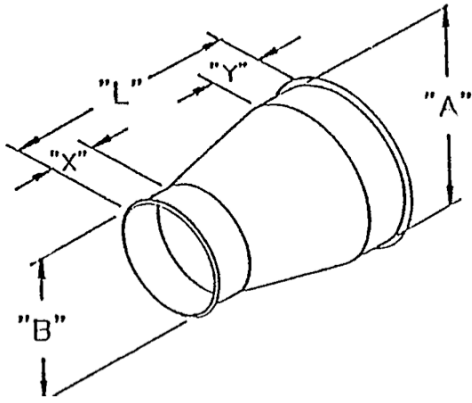
Built to your specifications. Please list all required dimensions and details.

Specify Rectangle End:	Flanged	Raw End	
Flange Type:	Angle Bar	Flat Bar	Sheet Metal
Specify Round End:	LaserLock	Flanged	Raw    Hose Conn.

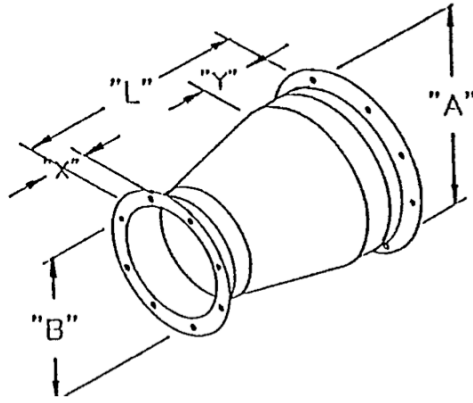
**NOTE:** *If no hole pattern is supplied for flanges, they will be supplied "Blank" to be field drilled.*

Item #	Qty.	"D"	"A"	"B"	"X"	"Y"	"L"	Gauge	Flange Material	Flg Dwg	Special Notes

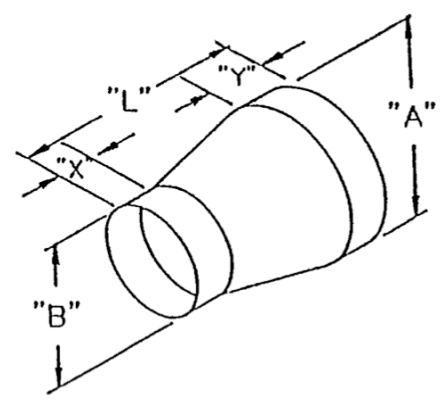
## REDUCER STYLES



**LaserLock**



**Flanged**



**Raw "ID" or "OD"**

**NOTE:** Any combination of the above style is available upon request. Please specify all the required dimensions.

**SPECIFY:** All reducer end configurations (LaserLock, ID, OD, Flange Style, Etc.).

Item #	Qty.	"A"	Style "LL" "Flange" "Raw"	"B"	Style "LL" "Flange" "Raw"	"L" <small>(A-B+6")</small>	"X" STD- 2"	"Y" STD- 2"	Part Gauge	Flange Material	Flg Dwg	Special Notes



# INSTRUCTIONAL INFORMATION

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- INSTALLING HANGERS
- OIL MIST APPLICATIONS
- O-RING ALTERNATIVES AND TEMPERATURE RATINGS

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## RULE OF THUMB LABOR GUIDELINES

- A. Long straight runs and trunk-lines
  - “LaserLock” duct = 15 man hours per 100'.
  - Flanged duct = 20 man hours per 100'.
  
- B. Machine Connections
  - Machine with 1 or 2 ports = 3 man hours per port.
  - Machines with 3 or more ports = 4 man hours per port.

A + B = TOTAL MAN HOURS

### OR QUICK METHOD

(TOTAL # OF PORTS) X 3 HOURS EACH = X  
X x 2 = DUCTING SYSTEM TOTAL MAN HOURS

**NOTE:** The above methods should be used for comparison and budgetary purposes only! By no means should they be used to confirm a job installation. It should be the salesperson's responsibility to analyze each individual job and make his/her own judgment.

## HINTS FOR ORDERING LaserLock

- 1. Order one clamp per LaserLock component.
  - 1 - duct -- 1 clamp
  - 2 - elbows -- 2 clamps
  
- 2. Specify dimensional information to speed-up process:
  - Transitions A, B, D, L, X, Y and flange style
  - Branches A x B x C
  - Cut-in A, B
  - Reducer All diameters

**THERE IS NO SUCH THING AS TOO MUCH INFORMATION!**

- 3. Look for 45-degree elbows to compliment branch orders. This is typical application since the two components will create a perpendicular run to the trunk line.
- 4. Ask for flange styles, hole patterns, ID, OD, when applicable. Typical components requiring flanges will be parts that connect to filters, fans or other types of equipment.



# INSTALLING A CUT-IN OR TAP-IN

## STEP 1

- Temporarily place the cut-in on the main trunk in the required position, and while holding in place, place hand inside of branch and mark the interior of the branch on trunk line where it is to be cut out.

## STEP 2

- Take down cut-in and drill a starter hole in the main trunk along the line traced from the branch. Then using metal snips or a reciprocating saw, cutout metal piece that has been traced out. File or grind any sharp edges to insure efficient flow.

## STEP 3

- Now use an industrial strength silicone sealant to seal between cut-in base and main trunk.

## STEP 4

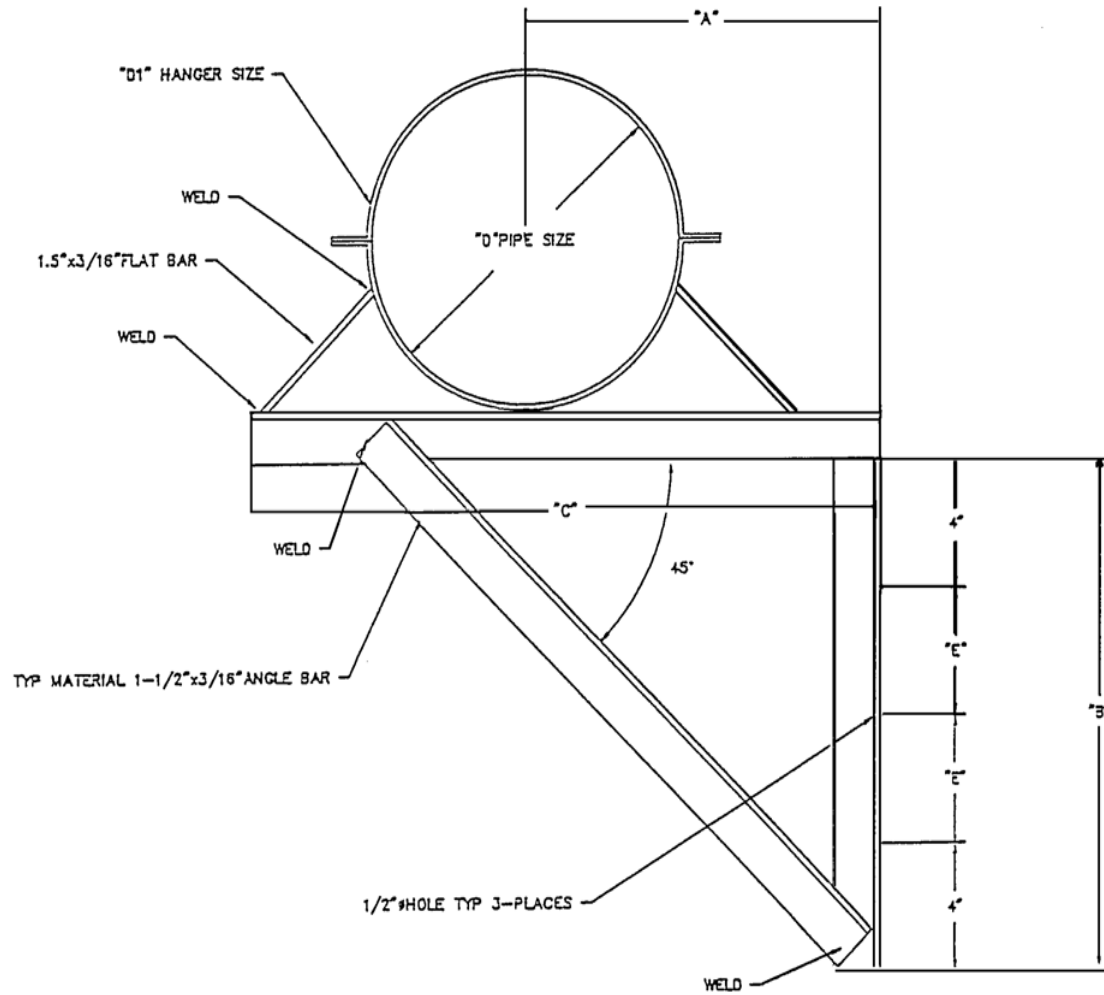
- Use small sheet metal screws or a banding type clamp material to secure cut-in to the main trunk line.

# PAINTING GALVANIZED COMPONENTS

1. Wash down all components with an industrial de-greaser insuring that no oils or residues are left behind.
2. Apply an epoxy primer in a light coating.
3. For final coat, apply an acrylic water base paint. (Example: Glidden<sup>®</sup> - Lifemaster<sup>®</sup>)



# TYPICAL WALL MOUNTING BRACE



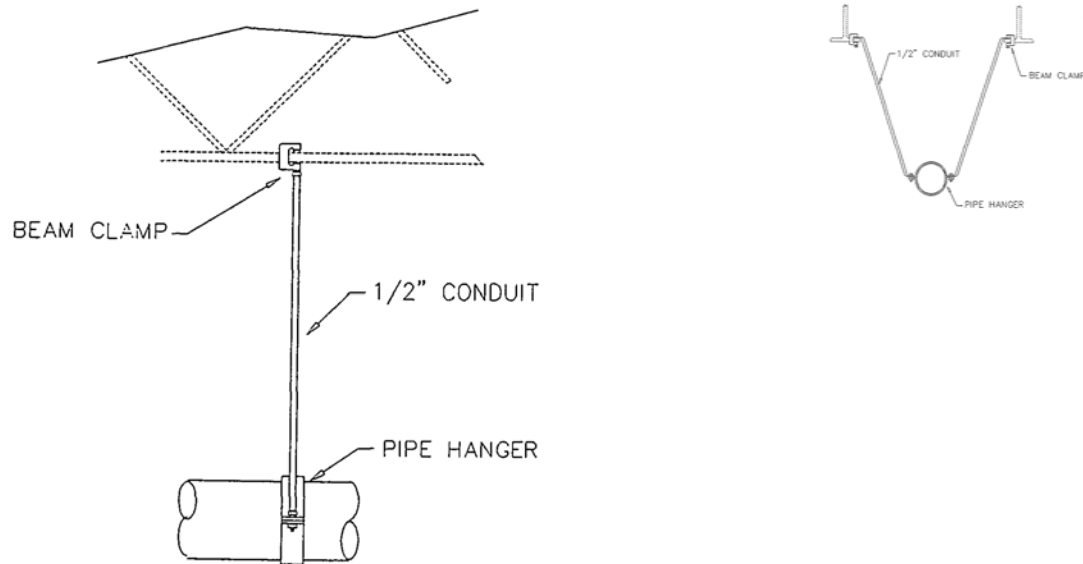
QTY	"A"	"B"	"C"	"D1"	"D"	"E"

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# TYPICAL DUCT HANGING METHOD



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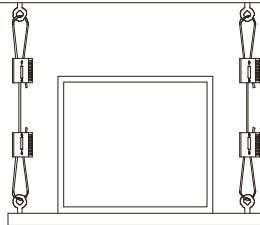
# Specification Form

## CABLE LOCK AND WIRE ROPE SUGGESTED SPECIFICATION:

All ductwork and equipment shall be supported using wire rope cable terminated by Cable Locks. All Cable Locks shall have an Ultimate Breaking Strength (U.B.S.) of at least 5 times the wire rope published Working Load Limit (W.L.L.). All wire rope shall have a U.B.S. of 5 times the published W.L.L. Wire ropes shall be of the size and spaced per manufacturers printed specifications.

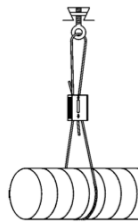
Description	Construction	Working Load Limit (W.L.L.)	Minimum Ultimate Breaking Strength (U.B.S.)
Cable Lock	Stainless Steel Sintered Steel Zinc Alloy	250 lbs.	1250 lbs. With 1/8" Wire Rope
		640 lbs.	3200 lbs. With 3/16" Wire Rope

Description	Diameter Nominal	Construction
Wire Cable	1/8"	7x7 Hot Galvanized
Wire Cable	3/16"	7x19 Hot Galvanized



### RECTANGULAR DUCT HANGING TABLE

Maximum Half of Duct Perimeter	10 ft Spacing 1 Pair	8 ft Spacing 1 Pair	5 ft Spacing 1 Pair	4 ft Spacing 1 Pair
p/2 = 30"	1/8	1/8	1/8	1/8
p/2 = 72"	1/8	1/8	1/8	1/8
p/2 = 96"	3/16	1/8	1/8	1/8
p/2 = 120"	3/16	3/16	1/8	1/8
p/2 = 168"	3/16	3/16	3/16	3/16
p/2 = 192"	3/16	3/16	3/16	3/16



### ROUND DUCT HANGING TABLE

Maximum Round Pipe Diameter	10 ft Spacing Single Wire	8 ft Spacing Single Wire	5 ft Spacing Single Wire	4 ft Spacing Single Wire
10"	1/8	1/8	1/8	1/8
18"	1/8	1/8	1/8	1/8
24"	1/8	1/8	1/8	1/8
36"	1/8	1/8	1/8	1/8
50"	3/16	3/16	1/8	1/8
60"	3/16	3/16	3/16	1/8
84"	3/16	3/16	3/16	3/16

#### NOTES:

1. Tables are calculated using a normal duct construction and reinforcement weight as outlined in SMACNA Duct Construction Standards.
2. For special applications refer to specification table of working load limits.

#### SPECIFICATION DATA

- 1) All wire rope supplied by **Duct Incorporated** is statistically tested to minimum breaking strength.
- 2) Cable lock has been submitted and tested to be an acceptable alternative to the duct hanger systems prescribed in SMACNA HVAC-DCS 2nd edition By SMACNA Testing & Research Institute.
- 3) All Working Load Ratings of Cable Locks have been witnessed and verified by Independent Testing Labs.
- 4) Cable Locks may be used in temperatures up to 300 degrees F.
- 5) Cable Lock wedges are constructed of corrosion resistant sintered steel.
- 6) Cable Lock springs are constructed of tempered stainless steel.

#### WIRE ROPE SPECIFICATION CARBON STEEL & GALVANIZED

Galvanized steel wire rope, supplied by Duct Incorporated is manufactured to exacting standards and statistically tested to verify the breaking strength Duct Incorporated recommends only using wire rope supplied by Duct Incorporated. The chart below outlines the specification.

Wire Rope Size	Tolerance	Rope Construction
1/8	+ .014/ - .007	7x7
3/16	+ .018 / - .009	7X19

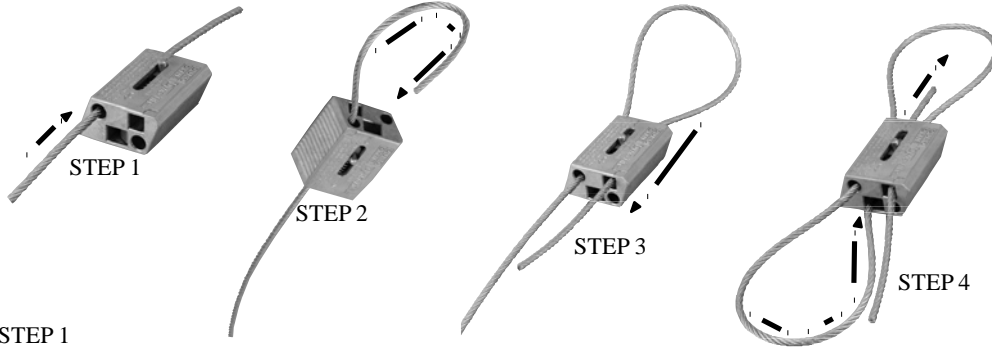
#### APPLICABLE SMACNA STANDARD

4.2.11 Hanging System Selection The selection of a hanging system should not be taken lightly not only because it involves a significant portion of the erection labor, but also because an inadequate hanging system can be disastrous. In any multiple hanging system, the failure of one hanger transfers that load to adjacent hangers. If one of these fail, an even greater load is transferred to the next. The result is a cascading failure in which an entire run of duct might fail.

There are many hanger alternatives, especially in the upper attachments. Besides structural adequacy, the contractor's choice of hanging system must also take into account the particulars of the building structure, the skills of the workmen, the availability of tooling, and the recommendations of the fastener manufacturer. Because of these variables, it is suggested that the hanging system be the contractor's choice, subject to the approval of the engineer.

# Cable Lock Assembly Instructions and Warnings

## Single Cable Lock Method



**STEP 1**  
Thread the wire rope into the "through hole" in Cable lock.

**STEP 2**  
Pass the wire rope "tail" through (or around) the anchor point (Eyehook, Beam, or Purlin)

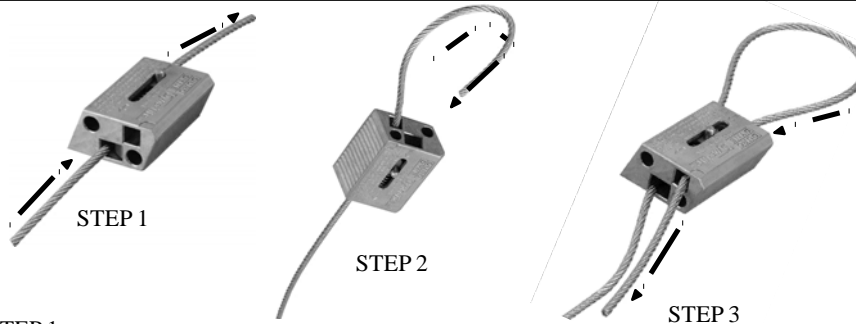
**STEP 3**  
Push the wire rope tail into one locking channel in the Cable lock and pull at least six inches of the wire rope through.

**STEP 4**  
Pass the other wire rope end through (or around) the bracket or fixture on the object to be suspended. Return the wire rope to the Cable lock and push at least six inches of wire rope through to remaining locking channel.

As a matter of sound engineering practice, the Cable lock assembly must be located no closer than 12 inches to the suspension point. In the case of round duct, where the wire rope encircles the duct, the Cable lock must be located the distance of one diameter from the duct wall.

Adherence to these minimum clearances will distribute the load the most efficiently among all duct hanging components.

## Double Cable Lock Method



**STEP 1**  
Thread the wire rope through one of the locking wedge channels of the Cable lock, following the arrow.

**STEP 2**  
Pass the wire rope through (or around) the anchor point (Eyehook, Beam or Purlin)

**STEP 3**  
Following the arrow thread the wire rope through the remaining locking wedge channel of the Cable lock. Push through at least six inches.

**STEP 4**  
Repeat steps 1 through 3 for the lower attachment point.

**PRIOR TO THE LOAD BEING APPLIED, THE WIRE ROPE CAN BE ADJUSTED IN EITHER DIRECTION.** With the load off the wire rope and the Cable Lock, push the release pin on the Cable Lock in the direction of the arrow. This will release the locking wedge and allow the wire rope to be moved freely in either direction. (After a load has been applied it may be necessary to pull the cable slightly to disengage the teeth on the wedge). Be sure the load is fully supported before attempting an adjustment.

**WARNINGS** Do not exceed the working load limits printed in the Cable Lock. Do not use for overhead lifting. Do not lubricate, paint or apply any coatings on the wire rope or the Cable Lock. Periodically inspect the Cable Lock assembly. Replace upon any indications of wear, distortion or damage. **IMPORTANT:** Cable Lock and wire rope each have working load limits, which may not be equal. Always use the lower of the two working load limits. Wire rope is not included with Cable lock.

Duct Incorporated reserves the right to change data/specifications without notice. Product photographs/drawings are for reference only. General Conditions of Sale apply. Please call for quotation on specialty parts. 20

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# OIL MIST APPLICATIONS

**There are a number of installation recommendations and product options when configuring a LASERLOCK system for oil mist. The basic is to select options to meet the specific requirements of the application without “over-designing” the solution. While a “leak-free” system is always the objective, Duct Incorporated cannot offer leakage guarantees with the LASERLOCK product in the environment. Specific product issues are as follows:**

## DUCT & SLIP JOINT

1. Vertical installations recommend exterior caulking of longitudinal seam.
2. Horizontal installations should position longitudinal seam at the 12 o'clock position.
3. A vertical sleeve installation requires that the “o-ring” side of the assembly be on top. Horizontal sleeves should be installed as usual with the cut pipe facing away from the airflow.

## ELBOWS

1. For 4” through 7”, standard product is our press-formed elbow with caulked exterior seams. A tubed elbow with fully welded collars will provide better leak resistance.
2. For 8” through 12”, standard product is our segmented elbow with caulked exterior seams. Fully welded seams will be more leak resistant. A tubed elbow with fully welded collar is even better.
3. For 14” through 22”, standard product is our segmented elbow with caulked exterior seams. Fully welded seams will again be more leak resistant.

For elbow specification, the customer should be advised to consider the cost associated with additional leakage protection against the application requirements.

## JOINTS/ CLAMPS

The standard method of sealing joints differs from other applications in that PTFE sealant material is applied to one end of each part (e.g. duct, elbows, sleeves, etc.) instead of inside the clamps. The sealant manufacturer has determined this method to be much more effective against leakage. The customer always has the option to have PTFE sealant also installed in the clamp at additional cost; however, while it would seem to be even better, testing has not shown this to improve performance. Duct Incorporated will specify the appropriate amount and profile of PTFE required for the particular application. PTFE sealant should be field applied during installation as follows:

1. As mentioned above, a layer of PTFE sealant is required for each joint; therefore, you only need apply the material to ONE end of each part, not both.
2. To apply, first cut a strip of PTFE equal to the circumference of the part plus 1 “.
3. With an end of a part towards you, begin applying the sealant ” to the left or right of any longitudinal seam. Apply the material in the same plane as the end and take care to center it on the LASERLOCK edge
4. Continue to apply with light pressure around the circumference of the part and make sure NOT to stretch the PTFE, as it will adversely affect its sealing properties.
5. Once complete, you should have a material overlap at the longitudinal seam. Gently form the edges of the sealant strip around the LASERLOCK edge to create a thorough seal.
6. Install the LASERLOCK product as normal.

## SPECIFICATION

1. Standard caulking material is 3M 2084 metal sealant. Add 10% to list for fully caulked product.
2. For welding detail and add-on pricing call Duct Incorporated customer service.
3. For positive systems, please contact Duct Incorporated customer service for design assistance.

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# O-RING ALTERNATIVES AND PRODUCT TEMPERATURE RATINGS

## 1. GALVANIZED DUCT

- Ducting will accommodate systems 0 degrees to 500 degrees F with little or no breakdown of the zinc coating. Zinc melting point is 740 degrees f.
- i. *NOTE: for temperatures 250 degrees F to 500 degrees F, please request ARTV@ high temp silicone caulk on components. This will be a 10% add on to list price.*

## 2. 304/316 SS DUCT

- Ducting will accommodate systems 500 degrees F to 1100 degrees F with no problems. At temperatures above 800 degrees, a small amount of “bluing” may occur.

## 3. BLACK RUBBER O-RING MATERIAL

- Service Temperature: -40 Degrees F. To 250 Degrees F.
- 50 Duro-meter Hardness

## 4. RED RUBBER SILICON O-RING MATERIAL

- Service Temperature: -100 Degrees F. To 500 Degrees F.
- FDA Suitable for use in most any Food and Pharmaceutical Industry
- Specification: ZZ-R-765 CLASS 2A AND 2B GRADE 50
- AMS-3304E AND 3304F AND 3303G
- 50 Duro-meter Hardness

**5. Diverter Gasket: 200 Degrees F.**

**6. (RFH) Rubber Hose: 275 Degrees F.**

**7. UHMW Seals in Blast Gates: 180 Degrees F.**

**8. Teflon Seals: 300 Degrees F.**

**9. RTV High Temp Caulk: 500 Degrees F.**

**10. Standard Caulk: Up to 250 Degrees F.**



# CONSTRUCTION METHODS AND STANDARDS

- CONSTRUCTION METHODS
- SMACNA ROUND INDUSTRIAL DUCT CONSTRUCTION STANDARDS OF 1999
- ACTUAL DUCT DIMENSIONS
- PIPE & ELBOW GAUGE UPGRADES
- STRENGTH OF DUCTING
- DUCT LEAKAGE RATES
- DUCT LEAKAGE CLASS



# CONSTRUCTION METHODS AND STANDARDS

## CAULKING USED ON SEAMS OF COMPONENTS

- Scotch seal (R) 2084 metal sealant
- 3M ID #62-2084-2631-2
- Ingredients: Acetone, acrylonitrile, kaolin, phenolic resin, rosin ester salicylic acid, aluminum pigment zinc oxide, amorphous silica

## PAINT USED ON WELDS AND SPOT WELDS

- KRYLON Industrial Tough Coat, Acrylic Enamel #1760 Aluminum

## SMACNA ROUND INDUSTRIAL DUCT CONSTRUCTION STANDARDS OF 1999.

The following gauge thickness reinforcement information is recommended for Class 2 Duct Systems Subjected to a negative pressure of 10” water gauge.

<u>SIZES</u>	<u>SMACNA STANDARDS</u>		<u>DUCT INCORPORATED</u>	
	<u>GAUGE</u>	<u>REINFORCEMENT</u>	<u>STANDARD</u>	<u>REINFORCEMENT</u>
3”	22	NONE	24 GA	40”
8”	20	NONE	22 GA	5’
10”	20	15’ ON CENTER	22 GA	5’
12”	20	11’ ON CENTER	22 GA	5’
14”	20	8’ ON CENTER	20 GA	5’
16”	20	6’ ON CENTER	20 GA	5’
18”	20	5’ ON CENTER	18 GA	5’
20”	20	4’ ON CENTER	18 GA	5’
22”	18	7’ ON CENTER	18 GA	5’

Class 2 is defined as including applications with moderately abrasive particles in light concentrations: i.e. buffing, polishing, woodworking, grain dust etc.

Please take into account that our pipe comes in 4-5' lengths with a rolled lip on each end, thus providing reinforcement every 4-5', which presents a sound structural design that should be stronger than any pipe in its class

Products are designed to withstand velocities of 4500-5500 FPM and static pressures to -25” water gauge.





# WRITTEN SPECIFICATIONS

Also see Specification Sheets on page 4-5  
 Duct should be supported as follows:

- \*4"-12" diameter == 20' centers
- \*14"-22" diameter == 15' centers

Supports should be installed to provide lateral stability to entire piping system. However, each installation differs and should be evaluated properly.

Duct diameters for LaserLock Clamp-Together Duct and Flange Duct as follows:

**LaserLock**    3" through 18" available in 1" increments  
                   20" through 24" available in 2" increments

**Flanged**        4" through 18" available in 1" increments  
                   20" through 40" available in 2" increments

## Duct material gauges as follows:

<u>LaserLock DIA GALV &amp; SS</u>		<u>"FLanged" DIA GALV &amp; SS</u>	
3"	24 gauge	3"	24 gauge
4"-13"	22 gauge	4"-13"	22 gauge
14"-22"	20 gauge	14"-40"	20 gauge

## ELBOWS

- A) Standard elbows will have a centerline radius of 1.5 x dia & 2.5 x dia as specified in catalog. However, longer radius elbows are available upon request.
- B) Standard elbows 4" to 7" are pressed formed, and 8" and up are segmented construction with a lap form seam every 15 degrees. Segmented type elbows are produced as follows:

<u>ANGLE IN DEGREES</u>	<u>NUMBER OF SEGMENTS @ 15DEG</u>
0 TO 30	3
31 TO 45	4
46 TO 60	5
61 TO 90	7

- C) Standard elbow gauges are as follows:

<u>LaserLock DIA GALV &amp; SS</u>		<u>"FL" DIA GALV &amp; SS</u>	
3 - 7"	24 gauge	3" - 7"	24 gauge
8" - 17"	20 gauge	8" - 17"	20 gauge
18" - 24"	18 gauge	18" - 40"	18 gauge



## **FITTINGS**

- A) Branch fittings are produced to have a concentric design, as they taper to a specific dimension. Joints are lapped, spot welded, cleaned, and painted with KRYLON Industrial Tough Coat, Acrylic Enamel #1760 Aluminum. Seams are sealed with 3M Scotch-Seal (R) 2084 gray sealant.
- B) Fitting gauges vary from 22 to 18 gauge depending on the configuration of the branch or fitting. If exact gauge is required, contact factory for more information.
- C) All standard branch fittings are produced on a 45-degree angle, however other angles are available upon request.

## **REDUCERS**

- A) Reducers are produced by the following formula:

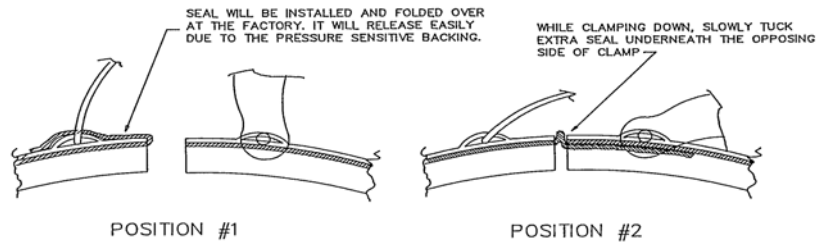
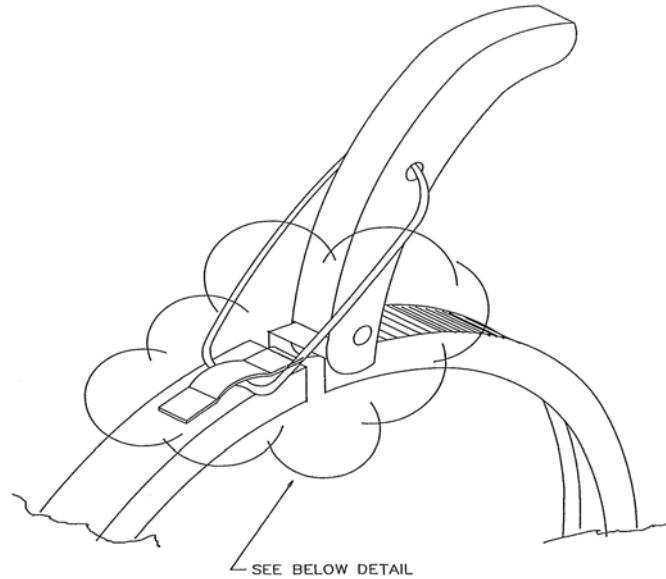
$$\text{LENGTH} = (A - B) + 6" \quad \text{----} \quad 7" \text{ MINIMUM LENGTH}$$

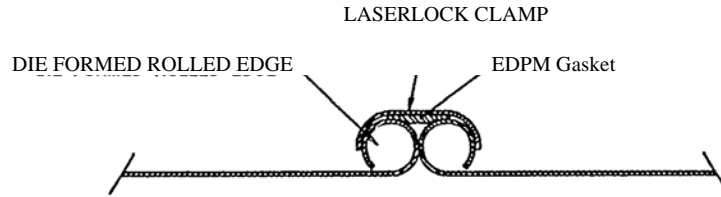
- B) Material gauges as follows:

3"- 13"	22 gauge
14"- 17"	20 gauge
18" and up	18 gauge

# EXAMPLES OF CONSTRUCTION METHODS:

## LASERLOCK COMPONENT CONNECTION – CLAMP





## **IMPORTANT CLAMP INFORMATION / GUIDELINES:**

**CLAMPS HAVE TENSIONING SPRINGS TO INSURE TIGHT CONNECTION OF DUCT. IT MAY BE NECESSARY TO PRE-STRETCH CLAMP BY LOCKING CLAMP AROUND ONLY ONE END BEFORE ATTACHING TWO PIECES TOGETHER. CARE MUST BE TAKEN TO KEEP LEVER **IN LINE** WITH CLAMP DURING CLAMPING. **“SIDEWAYS PRESSURE”** ON LEVER CAN **DAMAGE!** CLAMP.**



# LaserLock CLAMP GASKET ALTERNATIVES

## 1. EPDM STANDARD

- High quality closed cell EPDM rubber with enveloping sheath. Self adhesive on one side with non stretch reinforcement. Standards number SS240705A1, SS818134ASTMD, 1056RE42B2C3. Resists UV light, ozone, oxidation and temperature.
- Service Temperature up to 122 Degrees F.
- Standard Gasket Installed in Clamp
- 3/8”Gasket for 3” through 6”
- 1/2” Gasket for 7” and Larger

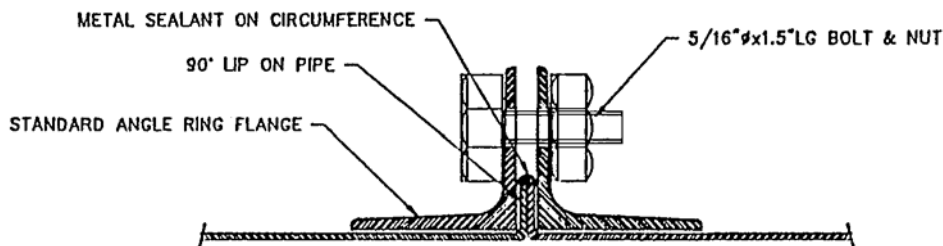
## 2. PTFE OPTION

- Service Temperature: -450 Degrees F. To 600 Degrees F.
- FDA Suitable for use in most any Food and Pharmaceutical Industry
- Not degraded by any common chemicals [0-14 PH Range]
- Non-contaminating and Non-aging
- 3/8" Gasket for 3" through 6"
- 1/2" Gasket for 7" and Larger



### FLANGE COMPONENT CONNECTION - VANSTONE

\* Applies to the method of mounting flange onto all components. This allows flange to spin freely during installation to allow alignment of holes.



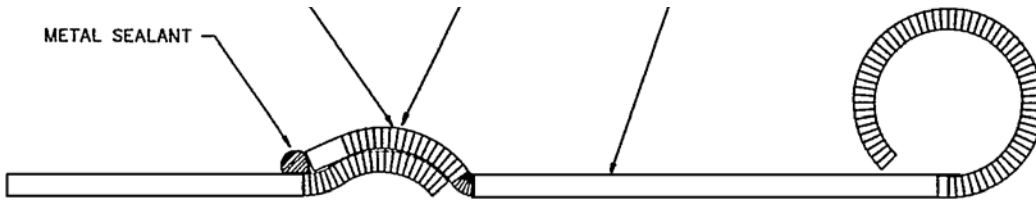
*Van-Stone Flange Connection Cross Section*

### LaserLock COLLAR CONNECTION - LAP SEAM

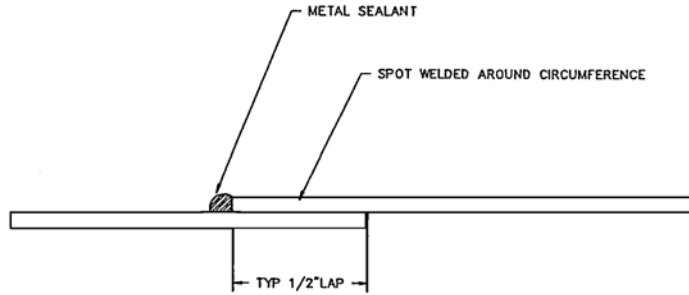
\* Applies to all branches, transitions, reducers, cut-in, etc.

This allows components to be produced and then collared with the LaserLock connection.

Hemmed construction      Spot welded      LaserLock Collar



**STANDARD SEAM JOINING METHOD ON HOODS, BOXES, TRANSITIONS, AND SPECIALTY ITEMS.**



\*Lapped, then spot welded, and caulked



# LaserLock DUCT DIMENSION SHEET

## LaserLock DUCT OD

3"	3.18"
4"	3.86"
5"	4.87"
6"	5.85"
7"	6.87"
8"	7.84"
9"	8.89"
10"	9.87"
11"	10.95"
12"	11.94"
13"	12.98"
14"	13.97"
15"	14.97"
16"	15.94"
17"	16.97"
18"	17.97"
20"	19.97"
22"	21.91"
24"	23.97"

## LaserLock Slip Joint ID

3"	3.21"
4"	3.92"
5"	4.92"
6"	5.90"
7"	6.91"
8"	7.90"
9"	8.93"
10"	9.94"
11"	11.01"
12"	12.00"
13"	13.03"
14"	14.02"
15"	15.02"
16"	16.00"
17"	17.02"
18"	18.03"
20"	20.03"
22"	21.96"
24"	24.04"

**\*\*ALL DIMENSIONS WERE TAKEN WITH A CIRCUMFERENCE TAPE MEASURE!**

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# GALVANIZED GAUGE UPGRADES

## LaserLock DUCT

Dia.	Std. GA	Heaviest GA Avail.
3"	24	22
4" – 13"	22	18
14" – 17"	20	16
18" – 24"	20	14

## LaserLock ELBOWS

Dia.	Std. GA	Heaviest GA Avail.
3" – 7"	24	18
8" – 13"	22	16
14" – 17"	20	14
18" – 24"	18	14



<b>TECHNICAL DATA</b>
Collapsing Strength of Round LaserLock Ducting Diameters. 3" to 24"

## COLLAPSIBILITY STRENGTH OF LaserLock PIPING

Each size of piping has been tested for strength against collapsing. The piping was exposed to constant positive pressure and constant vacuum. Each pipe was exposed to a maximum capacity of the test equipment of 85" WG of vacuum and positive pressure.

None of the pipe showed any form of deformation during the test.

Pipe and fittings must be installed in accordance with DUCT INCORPORATED's standard specifications and normal good workmanship practices.

## LEAKAGE RATE

All fit together ducting systems allow for some degree of leakage. LaserLock ducting is no exception and is not sold as an airtight system. In addition to the standard EPDM gasket DUCT INCORPORATED offers special clamp gasket material for high heat and enhanced sealing. Further, tightness of the system can be enhanced by the application of sealants to the individual rolled ends. However, the LaserLock system is sold as a quick way of installing and modifying ductwork while at the same time retaining the usability of each component. In short, LaserLock is meant to be able to be taken apart, re-assembled, stored or moved. Completely eliminating the possibility for leakage jeopardizes the inherent benefits of the duct.

Standard LaserLock is designed to provide tight sealing and efficient airflow under negative pressures. To that end we are providing the following information for piping situations where fan sizing is of extreme importance.

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The following data was obtained using standard components and was performed In accordance with the SMACNA, "HVAC AIR DUCT LEAKAGE TEST MANUAL". The information gives the leakage rate per joint of duct at various pressures. To utilize the chart, count the number of clamps (this equals the number of pieces) per size and multiply by the number given beside the corresponding diameter and under the applicable pressure.

These numbers assume that the product is correctly installed; free of dents in the joining ends and that the gasket is in place. Special gasket material and sealants will increase the sealing capabilities.



## LEAKAGE RATE DATA

### LEAKAGE RATE IN CFM PER LASERLOCK JOINT

DIA.	5" WG	7.5" WG	10" WG	15" WG	20" WG	25" WG	30" WG
4"	0.25	0.30	0.35	0.35	0.50	0.60	0.80
5"	0.25	0.30	0.30	0.35	0.50	0.60	0.80
6"	0.25	0.30	0.30	0.35	0.50	0.60	0.80
7"	0.25	0.30	0.30	0.35	0.50	0.60	0.80
8"	0.25	0.30	0.30	0.35	0.50	0.60	0.80
9"	0.25	0.30	0.30	0.35	0.50	0.60	0.80
10"	0.25	0.30	0.30	0.35	0.50	0.60	0.80
12"	0.30	0.40	0.40	0.40	0.60	0.70	0.90
14"	0.30	0.50	0.60	0.80	0.80	0.90	1.10
16"	0.40	0.60	0.70	1.00	1.10	1.20	1.40
18"	0.40	0.70	0.80	1.10	1.30	1.50	1.70
20"	0.60	0.80	0.90	1.20	1.50	1.70	2.00
22"	0.60	0.80	1.10	1.40	1.50	2.00	2.20

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<b>TECHNICAL DATA</b>
Leakage Class of Round LaserLock Ducting Diameter. 3" to 24"

**LEAKAGE CLASS**

All fit together ducting systems allow for some degree of leakage. LaserLock ducting is no exception and is not sold as an airtight system. In addition to the standard EPDM gasket, DUCT INCORPORATED offers special clamp gasket material for high heat and enhanced sealing. Further, the applying of sealants to the individual rolled ends can enhance the tightness of the system. However, the LaserLock system is sold as a quick way of installing and modifying ductwork while at the same time retaining the usability of each component. In short, LaserLock is meant to be able to be taken apart re-assembled, stored or moved. Completely eliminating the possibility for leakage jeopardizes the inherent benefits of the duct.

Duct Incorporated is currently unaware of any method of evaluating dust collection piping alone. The following data is presented using the criteria for all duct, including HVAC.

This data is presented only for the purpose of indicating acceptability of the LaserLock in dust/fume removal in negative pressure situations and should not be confused with ducting that uses tape or gaskets as sealant in the positive conveyance of air.

<b>LEAKAGE CLASS DETERMINED IN ACCORDANCE WITH SMACNA</b>			
Duct Size	Avg. leakage per 100 sq. ft.		SMACNA class
	5" SP	10" SP	
4" - 6"	13 CFM	20 CFM	5
7" - 10"	7 CFM	12 CFM	3
12" - 22"	14 CFM	21 CFM	5

**Structural integrity of LaserLock Piping System**

The Duct Incorporated LaserLock Piping System has been used in many different industrial applications, and under various negative static pressures.

The typical design range we see in our applications, range from -2" wg. to -28" wg, however we have some systems operating at vacuums of -32" wg. to -42" wg. under normal operating parameters. Should these levels of static pressure be required, we suggest an alternative seal be used in the clamp such as the PTFE seal. This increases the sealing properties on the connection joint.

Please take into account that our pipe comes in 4-5' lengths with a rolled lip on each end, thus providing reinforcement every 4-5', which presents a sound structural design that should be stronger than any pipe in its class



## RUBBER FLEXIBLE HOSE

**RFH** - Flexible Rubber Hose (RFH) sold by DUCT INCORPORATED is constructed of thermoplastic rubber and reinforced with a wire helix. No cements, solvents, chemicals, adhesives or glues are used in the manufacturing process. RFH has superior chemical resistance and is capable of handling fumes as tough as methyl ethyl ketone, sulfuric acid or toluene.

RFH can be manufactured in standard black. Please consult us for minimums and prices for other lengths and on non-standard diameters, including metric sizes from 51mm to 500mm.

Temperature range - 60 degrees Fahrenheit to 275 degrees, continuous service, intermittent to 300 degrees.

Sizes:	2" - 20"	Standard Lengths:	25' - 50'
Standard Color:	Black	Excellent Ozone Resistance	
Superior Chemical Resistance		Good Abrasion Resistance	
Low Compression Set		Excellent Weathering Resistance	
Good Flex Fatigue Resistance		Good UV Resistance	

**CVD** - Constructed of polyvinyl chloride (PVC) and reinforced with wire, CVD is an excellent choice for many industrial and foodservice applications. The materials in this clear hose are FDA acceptable.

Standard Sizes: 2" - 18" diameter.

Contact DUCT INCORPORATED for information on heavier hoses.

## HEAVY DUTY SQUARE LOCK

Manufactured in sizes ranging from 1" dia. thru 8" dia. of stainless steel or galvanized steel. Can either be packed or unpacked. Some applications would include Air Handling and Dust Collectio

TYPE TF-19 TYPE TF-19AZ				Medium-Heavy Galvanized or Stainless Steel Medium-Heavy Duty Aluminized (2" & Above)				.017 - .020 Strip Thickness			
Inside Dia. Inches	Approx. Outside Dia. Inches	Min. Inside Bend Dia. (Inches)	Approx. Weight Per Foot, Pounds	Inside Dia. Inches	Approx. Outside Dia. Inches	Min. Inside Bend Dia. (Inches)	Approx. Weight Per Foot, Pounds	Inside Dia. Inches	Approx. Outside Dia. Inches	Min. Inside Bend Dia. (Inches)	Approx. Weight Per Foot, Pounds
1	1 1/4	7.5	.50	3 1/2	3 3/4	25.0	2.01				
1 1/8	1 3/8	8.0	.60	4	4 1/4	27.0	2.30				
1 1/4	1 1/2	9.0	.64	4 1/2	4 3/4	30.0	2.59				
1 3/8	1 5/8	10.0	.70	5	5 1/4	33.0	2.86				
1 1/2	1 3/4	11.0	.85	6	6 1/4	43.0	3.45				
1 3/4	2	11.5	.95	7	7 1/4	48.0	4.03				
2	2 1/4	13.0	1.15	8	8 1/4	55.0	4.60				
2 1/4	2 1/2	15.0	1.29	9	9 1/4	59.0	5.18				
2 1/2	2 3/4	17.0	1.44	10	10 1/4	63.0	5.75				
2 3/4	3	19.0	1.58	12	12 1/4	76.0	6.90				
3	3 1/4	21.0	1.73	14	14 1/4	85.0	8.05				

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# CONDITIONS OF SALE

## NEW ACCOUNTS

Applications for credit are normally processed in two working days, for businesses with a Dunn and Bradstreet rating. Orders for new accounts may require pre-payment, C.O.D. or freight collect terms.

## GENERAL CONDITIONS OF SALE

**Contract and Acceptance:** The terms and conditions of acceptance of sale set forth herein, and all drawings, specifications, descriptions and other documents attached hereto and incorporated herein by reference constitute the entire agreement between Duct Incorporated (seller) and the buyer. Seller's acceptance of this order is expressly conditioned by the buyer's assent to the terms contained herein. The terms and conditions of the Seller's proposal (if any) and acknowledgement shall prevail over any conflicting or different terms in buyer's order unless buyer notifies seller in writing of its objections thereto within (15) fifteen days from receipt of seller's acknowledgement. The failure of Seller to object to any provision in conflict herewith whether contained in Buyer's purchase order or otherwise, shall not be construed as a waiver of the provisions hereof nor as an acceptance thereof. Seller's proposal is only preliminary unless it is otherwise confirmed. All payments shall be made to the address stated on the invoice.

## CLAIMS FOR SHORTAGES

Any claim for loss, breakage (obvious or concealed) are Buyer's responsibility and should be made to the carrier. Seller will render Buyer reasonable assistance in securing satisfactory adjustment of such claims. Any notices of shortages or other errors must be made in writing to Seller within 1 days after receipt of shipment. Failure to give such notice shall constitute unqualified acceptance and a waiver of all claims by Buyer. Risk of loss for damage to the products sold hereunder passes to Buyer upon deliver to the carrier regardless of who pays shipping costs.

## WARRANTIES

The Seller warrants that the products sold hereunder conform to any applicable drawings and specifications accepted in writing by Seller and will be free from any defects in material and workmanship which become apparent under normal use, and of which Buyer gives written notice to Seller with a period of 6 months from the date of installation or 12 months from the date of shipment, whichever period first expires. If, within that period, the Seller receives from Buyer written notice of any alleged defect in, or non-conformance of, any product and if, in Seller's sole judgment, the product does not conform or is found to be defective in material or workmanship, then Buyer shall, at Seller's request, return the part or product F.O.B. Seller's shipping point and Seller, at its option and expenses, shall repair or replace the defective part or product or repay the Buyer the full price paid for such part or product by Buyer. Dismounting and reinstallation of defective or nonconforming parts is done on Buyer's expense. Warranty for delivery of spare parts or replacement for non-conforming parts expires when warranty for original equipment expires. Any repayment of purchase price shall be without interest. Seller's sole responsibility, and Buyer's exclusive remedy hereunder shall be limited to such repair, replacement, or repayment of the purchase price as above provided. There are no other warranties, express, statutory or implied, including those of merchantability, quality or fitness for purpose, nor any affirmation of fact or representation that extends beyond the description on the face hereof. The warranties of Seller do not cover and Seller makes no warranty with respect to:

a) failures not reported to Seller within the warranty period specified above;

- b) failure or damage due to misapplication, abuse, improper installation or abnormal conditions of temperature, dirt or other corrosive matter;
- c) failures due to operation, either intentional or otherwise, above rated capacities or in an otherwise improper manner;
- d) products which have been in any way tampered with or altered by anyone other than an authorized representative of Seller;
- e) products damaged in shipment or otherwise without fault of Seller;
- f) expenses incurred by Buyer in an attempt to repair or rework any alleged defective product, and;
- g) defects in material and workmanship which are attributable to drawings and specifications provided by Buyer.

## LIMITATION OF LIABILITY

Seller's sole responsibility and Buyer's sole and exclusive remedy with respect to any breach of warranty of guarantee under this agreement shall be limited to repair, replacement or repayment of the purchase price at Seller's sole option. Seller's total responsibility and liability for any and all claims, damages of any nature, losses, liabilities or costs of corrective efforts, including but not limited to those relating to any warranty or guarantee arising out of or related to performance of this agreement or the products covered hereunder or the performance thereof for any special, indirect, incidental or consequential damages of any character; including but not limited to, loss of use or productive facilities or equipment, lost profits, property damage, expense incurred in reliance on Seller's performance hereunder, or lost production, whether suffered by Buyer or any third party. Seller disclaims all liability for any and all costs, claims demands, charges, expenses or other damages, either direct or indirect, incident to all property damages arising out of any cause of action based on strict liability.

## COSTS & EXPENSES

Buyer agrees to pay Seller all costs and expenses, including reasonable attorney's fees (including those on appeal) incurred by Seller in exercising any of its rights and remedies hereunder, including specifically the collection of any outstanding balance owed to Seller and Buyer.

## MISCELLANEOUS

The rights and duties of the parties and construction and effect of all provisions hereof shall be governed by and construed according to the law of the State of North Carolina, United States of America, except as otherwise provided herein. Failure of Seller to insist in any one of more instances upon the performance of any of the terms and conditions of this contract or the failure of Seller to exercise any of its rights hereunder shall not be construed as a waiver or relinquishment of any such term, condition, or right hereunder and shall not affect Seller's right to insist upon strict performance and compliance with regard to any unexecuted portions of this contract or future performance of these terms and conditions.

## RETURN POLICY

Customer must fill out a RGA (Return Goods Authorization) Worksheet. Absolutely no shipment will be accepted by Duct Incorporated without a RGA. A RGA cannot be issued on an order that is older than 90 days from original order ship date. There will be a 25% charge for re-inventorying and re-stocking of returned components. Specific items that can be returned **MUST BE RESELLABLE** components: Pipe, Standard Elbows, Slip joint, Hangers, Blast Gates and Clamps. **CUSTOM CONFIGURATIONS ARE NON-RETURNABLE.** Return freight costs to our manufacturing site in North Carolina are returnee's responsibility.

SEND THE FAX FORM BELOW TO DUCT INCORPORATED FOR ALL THE INFORMATION YOU NEED.

**FAX 336•768•0701**

- RUSH! I HAVE A CURRENT PROJECT THAT REQUIRES LASERLOCK™ DUCT.
- PLEASE CALL ME FOR PROJECT.

NAME \_\_\_\_\_

TELEPHONE #( \_\_\_\_\_ ) \_\_\_\_\_

EMAIL \_\_\_\_\_ FAX #( \_\_\_\_\_ ) \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

CURRENT NEED \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



STRATFORD INDUSTRIAL PARK • 2529 VICEROY DRIVE  
WINSTON-SALEM, NC 27103-6713

**P** TOLL FREE 877-BUY-DUCT (289-3828) **D** 336-768-0700 **F** 336-768-0701  
**E** SALES@DUCTINCORPORATED.COM **W** WWW.DUCTINCORPORATED.COM

**877•BUY•DUCT**

0802

**FOR ASSISTANCE CALL TOLL FREE 1-877-289-3828 / Fax 1-336-768-0701**

**E:** [sales@ductincorporated.com](mailto:sales@ductincorporated.com) **W:** [www.ductincorporated.com](http://www.ductincorporated.com)