



**FACTORY  
FABRICATED  
DUCTS**  
4-BOLT FLANGE  
SYSTEM



**RUSKINTITUS** India  
Future of Air Technology



Actual Executed Projects

## WHY ROLASTAR DUCTS ?

- ⌘ Ultra Low Leakage
- ⌘ Highest Strength to Weight Ratio
- ⌘ High Energy Saving
- ⌘ Leakage Test Facilities
- ⌘ Quick Installation
- ⌘ Four Manufacturing Plants All Over India
- ⌘ Nationwide Sales & Support
- ⌘ Most Cost Effective Solution

## AIR LEAKAGE TEST RESULTS

TEST PRESSURE	CLASS	LEAKAGE IN CFM			
		Max. Permissible	ROLAMATE™	TDF	Slip & Drive Cleats
½" w.g.	24	15.3	2.0 - 3.5	4.0 - 7.0	9.0 - 12.0
1" w.g.	24	24.0	3.0 - 6.0	7.0 - 11.0	19.0 - 22.0
2" w.g.	24	37.7	8.0 - 12.0	12.0 - 18.0	30.0 - 36.0 (with sealant)
3" w.g.	12	24.5	10.0 - 16.0	15.0 - 22.0	NA
6" w.g.	6	19.2	14.0 - 18.0	NA	NA
10" w.g.	6	26.8	18.0 - 24.0	NA	NA

### Notes:

- \* As per SMACNA Air Duct Leakage Test Manual
- \* Tests conducted in-house with high efficiency Air Duct Leakage Tester
- \* For test ducts of surface area of 100 Square feet.

## COMPARISON

	ROLAMATE™	TDF	Angle Iron	Cleats / G.I. Flanges
	★★★	★	★★	★
Installation speed	★★★	★★★	★★	★★
Low leakage / Energy saving	★★★	★★	★★	-
3 <sup>rd</sup> party testing and certification	★★★	Not Available	Not Available	Not Available
	Yes	Yes	No (+)	Yes
Damage resistance in transportation	★★★	★★	★★	★★★
Overall cost effectiveness	★★★	★★★	★	★

(+) Red-oxide is a suspected carcinogen

RECOMMENDED SMACNA STANDARD AT 4 FEET TRANSVERSE JOINT REINFORCEMENT

# ROLASTAR STANDARD

## For Selection of TDF Duct Gauges for 1220 MM coil

Duct Pressure in Inches / (Pascals)

Duct Dimension in (mm)	1"(250)*		2"(500)**		3"(750)***		4"(1000)		6"(1500)		10"(2500)	
	TDF (Rolled on flanges)	Rolamate (Slip on flanges)	TDF (Rolled on flanges)	Rolamate (Slip on flanges)	TDF (Rolled on flanges)	Rolamate (Slip on flanges)	TDF (Rolled on flanges)	Rolamate (Slip on flanges)	TDF (Rolled on flanges)	Rolamate (Slip on flanges)	TDF (Rolled on flanges)	Rolamate (Slip on flanges)
200 & Under	26	26 - F	26	26 - F	26	26 - F	26	26 - F	26	26 - F	26	26 - F
200 - 250	26	26 - F	26	26 - F	26	26 - F	26	26 - F	24	24 - F	24	24 - F
251 - 300	26	26 - F	26	26 - F	26	26 - F	26	26 - F	24	24 - F	24	24 - F
301 - 350	26	26 - F	26	26 - F	26	26 - F	26	26 - F	24	24 - F	22	22 - F
351 - 400	26	26 - F	26	26 - F	26	26 - F	26	26 - F	24	24 - F	20	20 - F
401 - 450	26	26 - F	26	26 - F	26	26 - F	26	26 - F	24	24 - F	20	20 - F
451 - 500	26	26 - F	26	26 - F	24	24 - F	24	24 - F	24	24 - F	20	20 - F
501 - 550	26	26 - F	26	26 - F	24	24 - F	24	24 - F	22	24 - F	20	20 - I
551 - 600	26	26 - F	26	26 - F	24	24 - F	24	24 - F	22	22 - F	18	20 - I
601 - 650	26	26 - F	26	26 - F	24	24 - F	22	24 - F	22	22 - F	18	20 - I
651 - 700	26	26 - F	26	26 - F	24	24 - F	22	24 - F	20	22 - I	18	18 - I
701 - 750	26	26 - F	24	26 - F	24	24 - F	22	24 - F	20	22 - I	18 - JTR	18 - I
751 - 900	26	26 - F	24	24 - F	22	22 - F	20	22 - I	18	20 - I	18 - JTR	18 - I
901 - 1000	24	26 - F	22	24 - F	20	22 - I	18	20 - I	18 - JTR	18 - I	18 - JTR	18 - J
1001 - 1200	24	24 - F	20	22 - F	20 - JTR	20 - I	18 - JTR	18 - I	18 - JTR	18 - I	16 - JTR	16 - J
1201 - 1300	22	24 - F	20 - JTR	20 - I	18 - JTR	18 - I	18 - JTR	18 - I	16 - JTR	16 - J	16 - JTR	16 - J (JTR)
1301 - 1500	22	24 - F	20 - JTR	20 - I	18 - JTR	18 - I	18 - JTR	18 - I	16 - JTR	16 - J		
1501 - 1800	22 - JTR	22 - I	20 - JTR	20 - I	18 - JTR	18 - J	16 - JTR	16 - I (JTR)				
1801 - 2100	20 - JTR	20 - I	20 - JTR	20 - I	16 - JTR	16 - I (JTR)						
2101 - 2400	18 - JTR	18 - I	18 - JTR	18 - J	16 - JTR	16 - J (JTR)						
2401 - 2700	18 - JTR	18 - I	16 - JTR	16 - J (JTR)								
2701 - 3000	16 - JTR	16 - J										

**(Recommended Configurations as per SMACNA)**

**Notes:**

A higher class flange can always be substituted for a lower class (e.g. Class "J" for Class "H", / Class "H" for Class "E", etc.)

1- **SMACNA**- Sheet Metal and Air conditioning Contractors' National Association Inc-"HVAC Duct Construction Standards- Metal and Flexible"-2005 (Third Edition), U.S.A.

2- Reading Guide- For duct sizes between, say, 901 mm and 1000 mm, when the pressure class is 1" w.g. static, we require duct gauge of 26 & slip-on connector F. For the same size range but with static pressure at 6" w.g. duct gauge of 18 & slip-on connector I. For the same range in case of TDF flanges in case of pressure class 1" w.g. the gauge should be 24, in case of 6" w.g. the gauge should be 18 g with TDF flange & with joint tie rod (JTR).

3- Use gasket size 10 mm wide and 4.5 mm thick for ducts up to 2" static pressure in case of slip-on flanges upto rigidity class I and for rigidity class above I use 15 mm wide & 6 mm thick gasket. Use gasket size of 15 mm wide X 6 mm thick with pressure class 3" w.g static and above.

4- Cleats should be fixed at max. 150 mm distance from corner & the at the center distance of 250 mm for ducts up to 3" w.g. static. For more than 3" w.g. static the center distance should not exceed 150 mm.

5- (Not applicable to current specification)

For non-critical comfort cooling applications (1" w.g. pressure class), optional "C & S" or "C & SS" cleat joints can be used.

Upto 450 mm duct size use "C & S" cleats.

451 to 750 mm duct size use "C & SS" cleats.

Over 750 mm duct size use Rolamate flanges or Rolastar TDF system.

**Notes:**

\* For 1" pressure class we can use cleats.

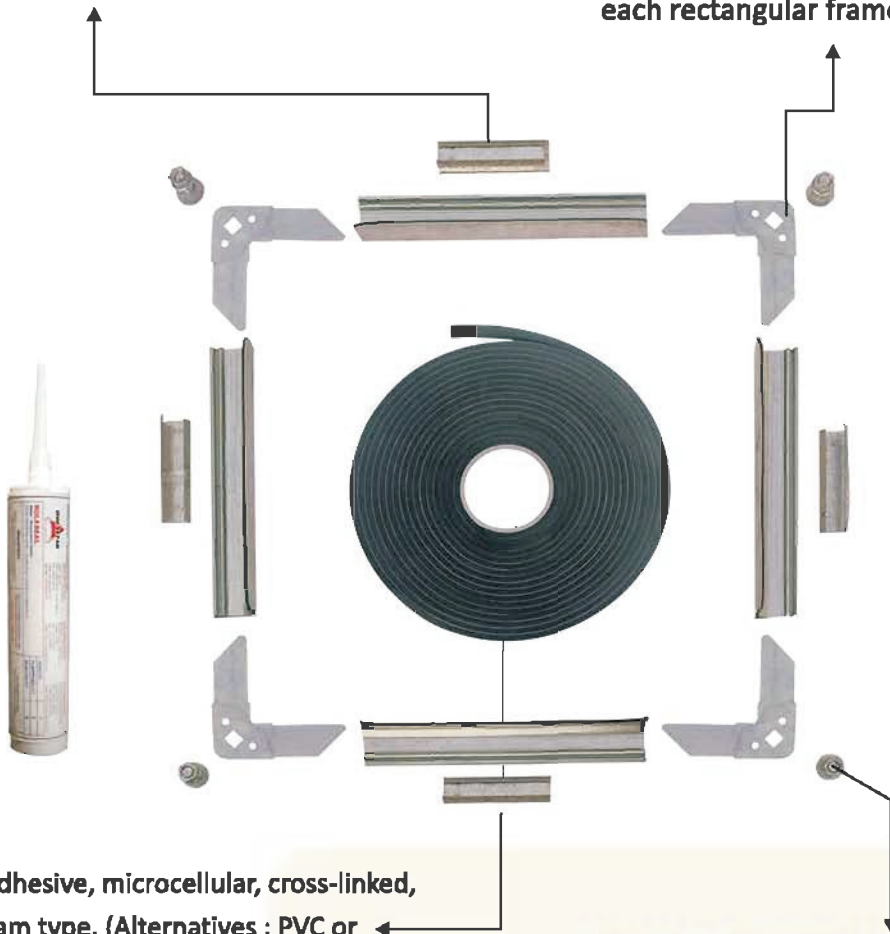
\*\* Cleats not recommended over 1" pressure class but if it must be used then appropriate sealant is required for all applications above 1" w.g.

\*\*\* In any event cleats should not be used for applications over 3" w.g.

## ROLAMATE™ SYSTEM COMPONENTS

**Slip on Flanges :** Roll-formed G.I. Section with embedded sealant. Available in different cross-sections to provide a range of rigidity and strength characteristics.

**Corners :** To be inserted into the hollow we of the slip-on flange. 4 corner pcs. are required for each rectangular frame, 8 corner pcs. per joint



**Gasket :** Self-adhesive, microcellular, cross-linked, Polyethylene foam type. (Alternatives : PVC or

**Carriage Bolts with Flanged Nuts :** Electro-galvanised, square-necked carriage bolts, with flanged nuts, Each joint required 4 sets.

## FLANGE TESTING AND CERTIFICATION

- **ROLAMATE™** Flanges have been designed to meet the appropriate SMACNA -2005 Reinforcement Classes and tested successfully at **ROLASTAR** to meet the rigidity and leakage requirement in accordance with both
  - a) **SMACNA** testing norms and practices.
  - b) **Benchmarking with leading international 4-Bolt systems.**
- All tests are carried out with **ROLAMATE™** System Components. Further details on test procedures used at **ROLASTAR** and third party's laboratory test results are available from the company upon request.
- It is mandatory to use all **ROLAMATE™** system components, specifically Rolastar-supplied gaskets sealants to obtain the desired performance.

# ROLAMATE™ ASSEMBLY INSTRUCTIONS

## CUTTING SLIP-ON FLANGES

In normal practice, the correctly sized (pre-cut) slip on flanges and exact quantities of the other ROLAMATE™ System Components are supplied from the factory to be assembled at site. Where the flanges are supplied in full lengths (usually in 6 m lengths), cutting of these is done at site as follows:

Sr.No.	FLANGE TYPE	FLANGE CUTTING SIZE
1	ROLAMATE™ E/F	(X-29 mm), where X = Duct side dimension
2	ROLAMATE™ H/I & J	(X-39 mm), where X = Duct side dimension

"Slice" the blade through the ROLAMATE™ flange using a metal friction cutting blade. While cutting, the flange should always be gripped with the legs down to prevent metal cuttings from falling into the integral seal. Cutting by abrasive blade is not recommended due to melting of the mastic by the heat generated during cutting.

## ASSEMBLING FRAMES



**Step 1 -** Insert ROLAMATE™ corner at each end of the ROLAMATE™ flange as shown in fig.1. (Ensure that the recessed groove of the corner piece matches with that of the flange).



**Step 2 -** Form a "U" with two corners and the ROLAMATE™ flanges cut for the other two adjacent sides of the duct sections.

**Step 3 -** Complete the frame as shown in fig.2.

## ROLAMATE™ INSTALLATION INSTRUCTIONS

### MOUNTING OF FRAME

Start mounting the completed frame at any corner of duct section (fig.3)



Ensure that the ROLAMATE™ corners completely clear the duct edges (fig.4) (i.e. the corner piece should not sit on the duct corner edge)



For minor adjustments to ensure the proper seating of frames, tap the corners out slightly (fig.5)



Ensure that the duct section reaches right up to the end of the ROLAMATE™ slip-on flange thus dipping into the integral mastic sealant (fig.6)



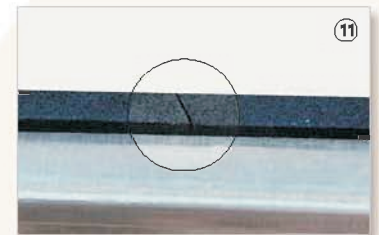
## FASTENING ROLAMATE™ FRAME SECTION

- ✦ After mounting fasten the frame to the duct section by
  - i) Clinching Machine (fig.7) (preferred system). Alternatively by
  - ii) Self tapping screws
  - iii) Pop-rievting or
  - iv) Spot-welding
 Commence fastening from one corner and proceed around the duct section in one direction. Locate the first fastener within 20mm from each end of the flange (fig.8) and distribute pitches suitably.
- ✦ Spacing : Each side must have a minimum of two fastenings within 20 mm of each end. Maximum spacing between fastenings is 300 mm.



## CORNER SEALING

- ✦ After fastening the frame to the duct section, a thin bead of sealant is applied only at the interface of the duct corner edge with the ROLAMATE™ corner piece (fig. 9). Applying the sealant as shown in (fig.10) should be avoided as it is unnecessary and results in undue wastage.



## GASKETING

- ✦ Apply the self-adhesive gasket to only one of the mating frames (not both). Ensure that the gasket is properly seated in the groove in the ROLAMATE™ flange. Commencing midway between the corners, the gasket is applied in one piece around the ROLAMATE™ frame and joined at the starting point in a butt joint (fig. 11). The gasket has to cut over the corners in an arc, protruding slightly into the air stream at the corners (fig. 12). From consideration of air leakage, the gasket should not contour the duct edge as shown in (fig. 13).

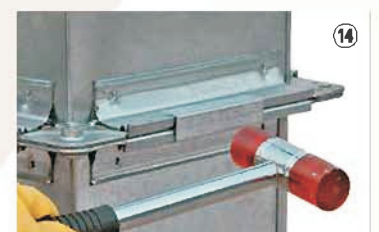
## TIGHTENING OF BOLTS & ALIGNMENT

- ✦ The square neck of the carriage bolt facilitates tightening of the nut with one hand using a ratchet (preferred) or spanner. Longer duct lengths can be aligned by passing a wire through the small round holes on the ROLAMATE™ corners.

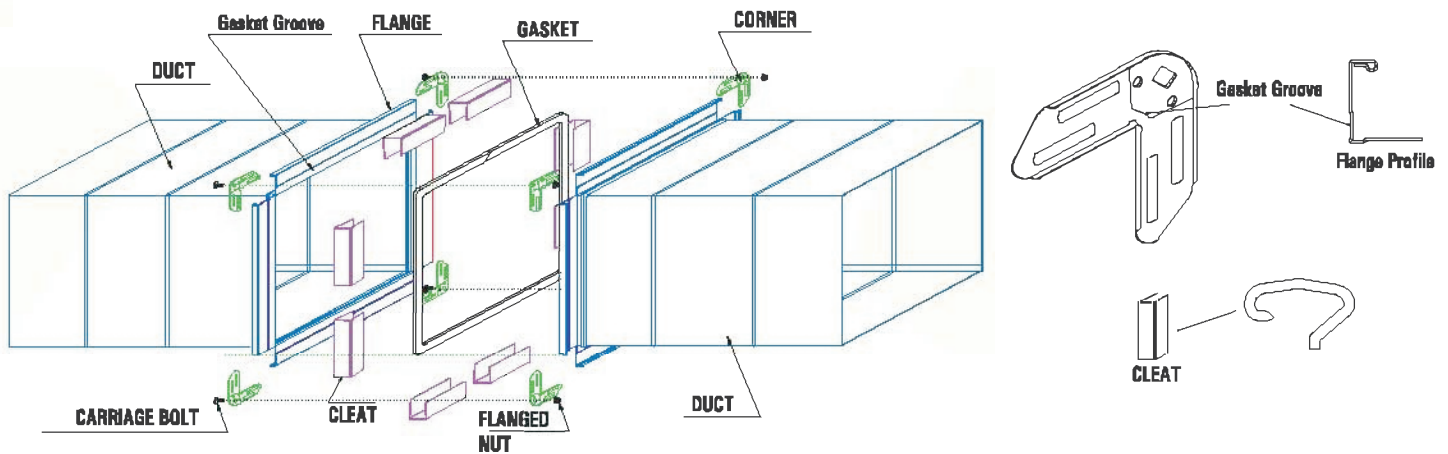
## CLEAT INSTALLATION

- ✦ For ROLAMATE™ E/F and H/I flange classes the new ROLAMATE™ cleat the J class flange, The ROLAMATE™ GI cleat must also be crimped using a special crimping tool available from ROLASTAR. Cleats should be spaced so that the cleat end is within 150mm (6") of each companion flange end and the pitch between cleats is,

Pressure Class	Pitch Spacing
Upto 750 Pa (3" w.g)	250 mm
Above 750 Pa	150 mm



# ROLASTAR TDF SYSTEM



TDF is a flanging system that consists of forming a flange profile on the duct ends, thus made out of a sheet from which the duct is fabricated. TDF is a 4 bolt duct connection system that eliminates time wastage. Rather than using separate connectors to assemble your system, TDF flanges are rollformed onto duct during the manufacturing process. This connection minimizes leakage and installation costs. These TDF flange eliminates the additional internal sealing around the edges of duct & thereby saves the labour & material.

## Features :

- ✦ Highly accurate flange profiles and components ensure ease of fitting and high quality assembly.
- ✦ A Recessed groove on flange and radial groove on corner pieces for proper gasket seating.
- ✦ Snap fit corner pieces to allow easy fitting at sites.
- ✦ Flexibility to use suit-to-site pieces with ROLAMATE™ slip-on flanges.

# SLIP & DRIVE CLEATS SYSTEM

Slip and Drive Cleats system is generally used for low-end, less-critical applications. Traditionally, only the Drive cleats ("C") which are positioning cleats were used for all four sides. This was giving a poor joint. The Slip cleats ("S" / "Standing S") on the alternate opposite sides provide the moderate rigidity to the joint.

**While installing, Drive cleats are always fitted on the shorter sides and Slip cleats on the longer sides.**



## Special Notes :

1. **ROLASTAR** does not subscribe to usage of red-oxide painted Angle Iron flanges as red-oxide is a known carcinogen.
2. Conventional G.I. flanges have now become obsolete as they are totally substituted by Slip and Drive cleats system.
3. TDF can not be made below 250 mm size of the duct. We suggest to use C & S cleat instead of TDF.



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