Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 2/25/2025
Return Request: 3/10/2025
Project: UAMS (CAMID)
Supplier: Middleton
Manufacturer: Middleton
Submittal: Ductwork
Submittal Number: 23 31 13-02
Drawing # and Installation: Mechanical Drawings

ARCHITECT
Clark Kenersen
2020 Baltimore Avenue, Suite 300
Kansas City, MO 64108
816-474-8237

ENGINEER
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Kansas City, MO 64108
816-474-8237

GENERAL CONTRACTOR
CDI Contractors
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Little Rock, AR 72202
501-666-4300

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
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N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
22-6069
sean@comfortar.com

MIDDLETON, INC

P.O. BOX 506 BRYANT, AR 72089
TELEPHONE (501) 224-4888
LICENSE # 0225670422
Email: dsingleton@middletoninc.com

HVAC SUBMITTALS
02-25-25

PROJECT: UAMS Center for Animal Models of infection & Disease
CONTRACTOR: Comfort Systems

PREPARED BY: David Singleton – **Middleton, Inc.**

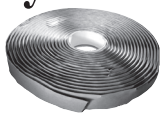
CONTENTS

FURNISHED BY: **MIDDLETON, INC.**

Submittal Items : 23 31 13 – Duct Sealants

SUBMITTAL RECORD_____
JOB _____
LOCATION_____
SUBMITTED TO_____
SUBMITTAL PREPARED BY_____
APPROVED BY _____
DATE_____

Submittal Form BTL316 Butyl Gasket



DESCRIPTION

BTL316 Butyl Gasket is used in tape and bead form to seal transverse duct connection systems helping to provide a moisture and air tight seal. It is a dark gray permanently soft, non-drying tape sealant compound which contains virgin butyl polymer to enhance its sealing properties and aging characteristics. It is formulated to retain low temperature operating properties. BTL316 Butyl Gasket will not crack or separate while being applied at low end of temperature usage range, however, it is recommended that the material be stored at moderate temperature to enhance its application characteristics. When stored at warehouse conditions, it will remain usable for a prolonged period. BTL316 Butyl Gasket will adhere to most clean, dry surfaces such as steel, galvanized steel, aluminum, plastic, wood and concrete. The product is non-hazardous and non-toxic.

FEATURES

- Excellent sealant for HVAC, as well as many others industries.
- Non-irritant: No limitation to eyes or skin as listed in CFR, Title 16, "Appraisal of the safety of chemicals in food, drugs, and cosmetics".
- Remains pliable and will not crack or separate while being applied at low end of temperature usage range; when stored in warehouse conditions, it will remain useable for a prolonged period.
- Chemical Resistance: Excellent resistance to water, alcohols, mild acids and bases.

TYPICAL PROPERTIES

Base: Non-drying synthetic polymer
Fillers: Mineral fillers and inert ingredients—Non-asbestos
Specific Gravity: 1.43 to 1.47 G/CC
Cone Penetration: Modified to total moving load at 300 gm., 5 sec @ 77° F; 80-90 mm/10.
Adhesive Tensile Strength: 10 to 12 PSI
Temperature Tolerance: -40° F to +249° F
Application Temperature: Above 40° F
Weatherometer Test: Will not harden even after 1000 hour
Flame & Smoke Rating: Flame 15 Smoke 15
Shelf Life: 1 year minimum
Flexibility: No cracking at -20° F.
Paintability: Yes
Vehicle Bleedout: None
Non-Corrosive: Will not corrode Metals
Color: 21046-light gray / 13099-dark gray

ITEM#	CODE	DESCRIPTION
21046	BTL316-58LG	3/16 x 5/8 UV Resistant Butyl
13099	BTL316-58DGH	3/16 x 5/8 UV Resistant Butyl H-Style

RELATED SMACNA RECOMMENDATIONS*

1.4.1 - Duct Sealing

Ducts 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.

The designer is responsible for determining the pressure class or classes required for duct construction and for evaluating the amount of sealing necessary to achieve system performance objectives. It is recommended that all duct constructed for the 1 in. (250 Pa) and 1/2 in. (125 Pa) pressure class meet Seal Class C. However, because designers sometimes deem leakage in unsealed ducts not to have adverse effects, the sealing of all ducts in the 1 in. (250 Pa) and 1/2 in. (125 Pa) pressure class is not required by this construction manual. Designers occasionally exempt the following from sealing requirements: small systems, residential occupancies, ducts located directly in the zones they serve, ducts that have short runs from volume control boxes to diffusers, certain return air ceiling plenum applications, etc. When Seal Class C is to apply to all 1 in. (250 Pa) and 1/2 in. (125 Pa) pressure class duct, the designer must require this in the project specification. The designer should review the *HVAC Air Duct Leakage Test* Manual for estimated and practical leakage allowances.

Seven pressure classes exist [1/2 in. (125 Pa), 1 in. (250 Pa), 2 in. (500 Pa), 3 in. (750 Pa), 4 in. (1000 Pa), 6 in. (1500 Pa), and 10 in. wg (2500 Pa)]. If the designer does not designate pressure class for duct construction on the contract drawings, the basis of compliance with the SMACNA *HVAC Duct Construction Standards* is as follows: 2 in. wg (500 Pa) for all ducts between the supply fan and variable volume control boxes and 1 in. wg (250 Pa) for all other ducts of any application.

Some sealants can adversely affect the release function of breakaway connections to fire dampers; consult the damper manufacturer for installation restrictions.

Table 1-1 Standard Duct Sealing Requirements

Seal Class	Sealing Requirements	Applicable Static Pressure Construction Class
A	Class A: All Transverse joints, longitudinal seams, and duct wall penetrations	4 in. wg and up (1000 Pa)
B	Class B: All Transverse joints and longitudinal seams only	3 in. wg (750 Pa)
C	Class C: Transverse joints only	2 in. wg (500 Pa)
In addition to the above, any variable air volume systems duct of 1 in. (250 Pa) and 1/2 in. wg (125 Pa) construction class that is upstream of the VAV boxes shall meet Seal Class C		

**From SMACNA HVAC Duct Construction Standards Metal and Flexible • Third Edition • 2005*

Duro Dyne Corporate Headquarters, Bay Shore, NY
631-249-9000 • Fax: 631-249-8346
Duro Dyne Midwest • Duro Dyne West • Duro Dyne Canada
www.durodyne.com • E-mail: durodyne@durodyne.com

Printed in USA 8/19
BO050000

SF 685

Shurtape®
TRUE TO YOUR WORK®

SHURMASTIC® BUTYL FOIL TAPE

TYPICAL APPLICATIONS

- For indoor or outdoor use to seal Class 1 Flex Duct, sheet metal and duct wrap vapor barriers
- Also approved for subgrade application on PVC-coated duct

PRODUCT FEATURES

- Waterproof backing
- Lined
- Stays supple and forms a permanent bond to substrate
- Paintable with paint recommended for aluminum
- Contains no asbestos, CFCs or PCBs

CONSTRUCTION

Overall Grade/Function: Mastic duct sealer
Backing: Printed, 2 mil aluminum foil
Adhesive: Non-flammable, butyl rubber

STANDARD WIDTH(S)

2 in 3 in

STANDARD LENGTH(S)

100 ft
Contact your Shurtape sales representative for other available sizes

APPLICABLE STANDARDS

Tested in accordance with UL 723; FSI 20/SDI 40; Pressure Classes SMACNA ½, 1, 2, 3, 4 & 6; Seal Classes A, B, C

STORAGE AND USAGE CONDITIONS

Tape should be stored in its original packaging in a cool, dry area away from direct sunlight and should be used within 12 months of date of shipment. Surfaces to which tape is applied should be clean, dry and free of grease, oil or other contaminants.

COLOR(S)

SILVER PRINTED (SPT)

PHYSICAL PROPERTIES	STANDARD	METRIC
Tensile Strength	25 lbs/in width	43.8 N/10 mm
Adhesion to Stainless Steel	255 oz/in width	27.91 N/10 mm
Thickness	17 mils	0.43 mm
Elongation	560%	560%
Application Temperature Range	35 F to 110 F	1.7 C to 44 C
Service Temperature Range	-20 F to 200 F	-29 C to 93 C

Physical and performance characteristics shown above are obtained from tests recommended by PSTC, ASTM, government agencies or Shurtape Technologies, LLC, Quality Assurance and Technical Service departments and do not represent a guarantee of product performance. Individual rolls may vary slightly from these averages. The user should determine whether the product is fit for a particular purpose and is suitable for the user's method of application before use.

Shurtape Technologies, LLC | PO BOX 1530 Hickory, NC 28603-1530 USA | Phone 1.888.442.TAPE (8273) | Fax 800.335.7651 | shurtape.com
ISO 9001 CERTIFIED QUALITY SYSTEM

 Form# TDS-SF-685-07/25/2017

HARDCAST
DUCT SEALANTS & INSULATION ADHESIVES

Contributes to LEED® Credit Requirements

CCWI-181

Indoor/Outdoor
Water Based Duct Sealant

PART NUMBERS

304142	1 Case w/ (25) 11 oz. Cartridges (White)
304146	1 Case w/ (25) 11 oz. Cartridges (Gray)
304144	1 Case w/ (4) 1-Gallon Pails (White)
304148	1 Case w/ (4) 1-Gallon Pails (Gray)
304143	1 - 2-Gallon Pail (White)
304147	1 - 2-Gallon Pail (Gray)
304145	1 - 5-Gallon Pail (White)

TECHNICAL DATA

Color	White & Gray
Consistency	Heavy textured
Base	Synthetic latex
Solvent	Water
Weight per Gallon	11.6 lbs.
Solids Content	73.4%
Viscosity	Thixotropic
Coverage (UL 181 A-M)	Apply 18 mil, scrim, addt. 18 mil
Coverage (UL 181 B-M)	Approximately 214 to 320 lin. ft. per gal. at 20 to 30 mil wet film thickness at 3" width
Shore A Hardness	> 20
Flexibility	Passes ¼ inch mandrel bend
Time to Test	48 hours*
Service Temperature	-20°F to 200°F
Mildew Resistance	Mold & Mildew resistant
VOC	Exempt: 0 g/l Non Exempt: 38 g/l (less water)
Surface Burning	Flame Spread - 0, Smoke Developed - 0 (When tested in accordance with ASTM E84, UL 723)
Pressure Classes	SMACNA ½ , 1, 2, 3, 4, 6 and 10 inches w.g.
Seal Class	Meets Seal Class A
Packaging	11 oz. cart.; 1, 2 & 5 gal. pails
Freeze/Thaw Stability	Passed 5 Cycles

*May vary according to temperature and humidity

SPECIFICATION/STANDARDS COMPLIANCE

Property	Method	Results
Freeze Thaw & Heat Cycling	ASTM C-731	Pass
Slump Test	ASTM D-2202	Pass
VOC Limitation	SCAQMD Rule 1168	Pass
	USDA	Pass
	FDA	Pass
	EPA	Pass
	City of Los Angeles Approval RR#8427	Pass

A versatile, all purpose duct sealant for use on all types of metal duct, fiberglass duct board, duct fabric and flex duct. CCWI- 181 incorporates a built-in polyester reinforcement for exceptional strength, with UV inhibitors for outdoor use. UL 181A-M listed / UL 181B-M listed.

APPLICATION

Temperature	35°F to 110°F (1.7°C to 44°C)
Method	Brush, putty knife, caulk gun
Preparation	Surface must be dry, dirt, oil, and grease free.
Rate (UL 181 A-M)	Apply 18 mil, scrim and 18 mil over scrim.
Rate (UL 181 B-M)	Approx. 214 to 320 lin. ft. per gal. at 20 to 30 mil wet film thickness at 3" width.
Clean Up Wet	Soap and water
Clean Up Dry	UN-TACK™ or Solvent (Use safe handling practices.)
Painting	Only latex or epoxy paints
Ductboard	Scrim required for UL 181A-M

STORAGE

Temperature	35°F to 110°F (1.7°C to 44°C) DO NOT FREEZE
Shelf Life	One year (unopened)
Flammability	Non-flammable

Underwriters Laboratories Inc.®
LISTED
17NF
UL 181A-M
FOR USE WITH U.L. LISTED RIGID FIBERGLASS AIR DUCTS OR CONNECTORS.
UL 181B-M
FOR USE WITH U.L. LISTED FLEXIBLE AIR DUCTS OR CONNECTORS

PRECAUTIONS

Surface must be clean and free of moisture, contamination and foreign matter. Do not allow this product to freeze. Apply when temperatures will not fall below freezing for at least 36–48 hours, depending on temperature and humidity. Do not apply this product where temperatures will exceed 200°F. Keep out of the reach of children. Review MSDS for complete safety information prior to use. DO NOT use where acidic or alkaline chemicals are present (ie., lab fume hood, vents, etc.)

For Industrial Professional Use Only.

GREENGUARD GOLD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

USA: 900 Hensley Lane, Wylie, TX 75098 • (877) 495-4822
Canada: 205 Brunswick Boulevard, Suite 300, Pointe-Claire, QC H9R 1A5 • (800) 544-5535
www.hardcast.com

MIDDLETON, INC

P.O. BOX 506 BRYANT, AR 72089
TELEPHONE (501) 224-4888
LICENSE # 0225670422
Email: dsingleton@middletoninc.com

HVAC SUBMITTALS
03-26-25

PROJECT: UAMS Center for Animal Models of Infection & Disease
CONTRACTOR: Comfort Systems

PREPARED BY: David Singleton – **Middleton, Inc.**

CONTENTS

FURNISHED BY: **MIDDLETON, INC.**

Submittal Items : 23 31 13 – Insulated Flex Duct
Duro Dyne Flex Connector
Turning Vanes & Rails

FLEX DUCT FOR LOW PRESSURE APPLICATIONS ONLY.

Flexible Duct Systems

Atco. Working Together. Doing It Right.

Thermal Performance

25' Insulated
UL 181
Class 1 Air Duct

Children & Schools GREENGUARD® Indoor Air Quality Certified

UPC #030
R-Value 4.2

UPC #036
R-Value 6.0

UPC #031
R-Value 8.0

All thermal performance (R-Values) are classified by Underwriters Laboratories in accordance with ADC Flexible Duct Performance and Installation Standard using ASTM C-518, at installed wall thickness, on flat insulation only.

Description

ATCO #030, 036, and 031 are UL 181, Class 1 Air Ducts and are manufactured with a tri-directional fiberglass scrim reinforced, metallized polyester outer jacket. The inner core of all three products is air-tight and designed for low-to-medium operating pressures in HVAC systems. ATCO #036 and 031 have increased insulation for superior thermal performance.

Construction

A double lamination of tough polyester which encapsulates a steel wire helix forms the air-tight inner core of the ATCO #030, 036, and 031. The double-layer core of each product is wrapped in multiple thicknesses of fiberglass insulation. All three products are sheathed in a rugged and durable tri-directionally reinforced, metallized polyester jacket.

FEATURES & BENEFITS

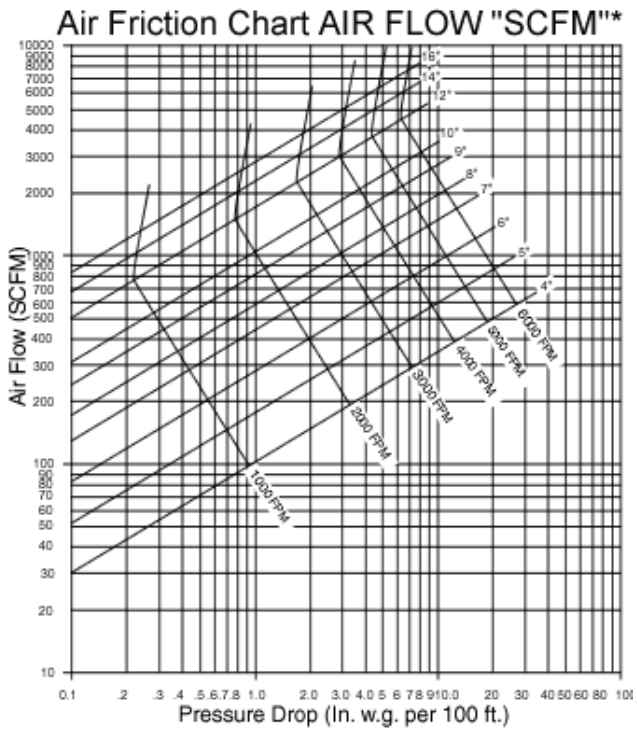
Air-tight Inner Core - Energy efficient / No fiberglass erosion into air stream.
Encapsulated Wire Helix - No unraveling when cut to length / Quick installation
Smooth Inner Core - Low friction loss / Low operating cost.
Thick Blanket of Fiberglass Insulation - Energy efficient / Excellent thermal characteristics
Tough Reinforced Metallized Polyester Jacket - Tear and puncture resistant / Low maintenance.
Lightweight Compact Carton - Reduces warehouse and Jobsite handling cost.

APPLICATIONS & CODE COMPLIANCES*

ATCO #030, 036, and 031 are designed for indoor use as a supply and return air duct in residential and commercial low-to-medium pressure heating and air conditioning systems. All three models can be used as a complete air duct system and/or a branch duct connecting to mixing boxes, diffusers, light troffers, room inlets, or other terminal devices. UL 181, NFPA 90A & 90B, IMC, IRC, UMC 10-1 (ICC ES REPORT NO. ESR-1268), HUD, Cities of Chicago, New York, San Francisco, County of Dade (Florida), California State Fire Marshal.*

*ATCO recommends that you check with the local code body having jurisdiction in your area to determine applicable codes.

PRODUCT & PERFORMANCE DATA



PRODUCT DATA

- Length: 25', 50' (Other lengths available as special order)
- Diameter: 3", 4", 5", 6", 7", 8", 9", 10", 12", 14", 16", 18", 20", 22"
- Vapor Barrier: Tri-directional, scrim reinforced metallized polyester
- End Treatment: 25', 50' -plain ends
- Packaging: 1 piece per carton

INSTALLATION

Air duct connections and joints shall be made per installation instructions outlined by ATCO Rubber Products, Inc. and as required by the UL 181 listing procedure.

(Installation instructions are included inside each carton.)

STRAIGHT RUN

* FD 72-R1 Test Code of the Air Diffusion Council. Friction loss is computed in inches of water gauge per 100 ft. of duct. By using CFM or FPM values for a given duct dimension, the friction loss can be determined. Conversion of CFM to FPM also can be made.

PERFORMANCE DATA

UPC #030 R-Value 4.2	UPC #036 R-Value 6.0	UPC #031 R-Value 8.0

- Rated Positive Pressure: 10" w.g. per UL-181 (UL Listed pressure) ratings are determined in straight lengths @ ambient temperatures.)
- Recommended Operating Pressures: (Determined in a 90° bend at elevated temperatures in accordance with ADC FD 72-R1 Test Code.)

  Maximum Positive:

  6" w.g. - 4" thru 12" Dia.

  4" w.g. - 14" thru 22" Dia.

  (With factory installed metal collars, 2" w.g. - all diameters)

  Maximum Negative:

  1" w.g. - 3"-12" Dia.

  3/4" w.g. - 14" thru 22" Dia.

  Maximum Velocity: 5,000 FPM

- Vapor Transmission: .05 perms
- Maximum Operating Temperatures:

  -20°F to 140°F Continuous (@ maximum pressure)

  -20°F to 180°F Continuous (@ 2" pos. w.g. max.)

  -20°F to 250°F Intermittent (@ 1/2" pos. w.g. max.)
- Flame Spread: 25 max

  Smoke Developed: 50 max

Warranty - ATCO warrants that all flexible ducts will be free from defects in material and workmanship for a period of five years from the date of purchase only if the ducts are installed in accordance with ATCO's installation instructions and under conditions specified in ATCO's performance data. The buyer's exclusive remedies for any defect in the flexible ducts shall be replacement or refund of the purchase price, at ATCO's option. ATCO MAKES NO OTHER WARRANTIES, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE. IN PARTICULAR, ATCO MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ATCO SHALL HAVE NO LIABILITY TO THE BUYER OR ANY THIRD PARTY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, PERSONAL INJURY, PROPERTY DAMAGE, LOST PROFITS OR OTHER ECONOMIC INJURY DUE TO ANY DEFECT IN THE FLEXIBLE DUCTS. MATERIALS AND SPECIFICATIONS FOR THE FLEXIBLE DUCTS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Manufacturing & Shipping Locations

Baltimore, MD • Cartersville, GA • Fort Worth, TX
Greensboro, NC • Houston, TX • Indianapolis, IN • Phoenix, AZ
Plainville, GA • Plant City, FL • Wiggins, MS
Sacramento, CA • Springdale, AR • Vineland, NJ

ATCO RUBBER PRODUCTS, INC.

CORPORATE HEADQUARTERS
7101 ATCO DRIVE
FORT WORTH, TEXAS 76118-7098
PHONE:(817) 595-2894
1-800-USS-DUCT (1-800-877-3828)
FAX: 1-800-366-3539 TELEX: 758-510

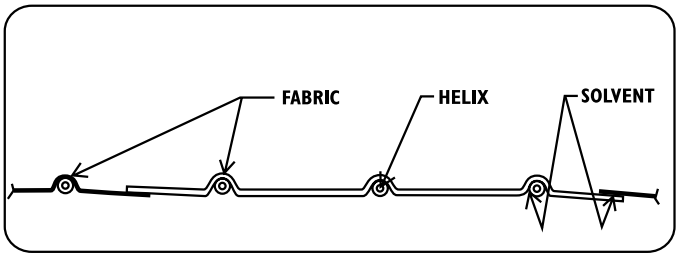
www.atcoflex.com

S-TL Submittal Sheet for Flexible Air Duct

Non-Insulated Flexible Air Duct for Pressure Cooling Systems

Thermaflex®

CODES/STANDARDS Greenguard Gold Certified for Superior Indoor Air Quality	Listed and labeled by Underwriters' Laboratories, Inc., as a Class 1 Air Duct, Standard 181 and CUL S110. It complies with the latest NFPA Bulletins 90A and 90B. Meets FHA and other U.S. government agency standards. Flame spread: not over 25. Smoke developed: not over 50.													
FABRIC TYPE	Coated fiberglass woven fabric													
STEEL WIRE	Coated spring steel wire helix													
SIZES, ID	2	3	4	5	6	7	8	9	10	12	14	16	18	20
LENGTH (feet)	25 ft.											15 ft.		
INSIDE BEND RADIUS (inches)	2	3	4	5	6	7	8	9	10	12	14	16	18	20
OPERATING TEMPERATURE RANGE	-20°F to 250°F													
RATED VELOCITY	6000 fpm													
MAX RATED PRESSURE (inches water column) POSITIVE	16 inches (2-10 in. dia.) 10 inches (12-20 in. dia.)													
NEGATIVE	1 inch													



JOB JACKSONVILLE MIDDLE SCHOOL
LOCATION JACKSONVILLE, AR
ENGINEER MATTHEW WENDEL
CONTRACTOR MIDDLETON HEAT AND AIR

P.O. NO.
JOB NO.
REPRESENTATIVE

Certified Correct

BY
TITLE
DATE

Approved for Construction

BY
TITLE
DATE

1-800-459-4822 • www.thermaflex.net
Corporate Headquarters: 381 Carwellyn Road • Abbeville, SC 29620 • Phoenix, AZ • Cairo, GA • Mississauga, ON Canada

Thermaflex®

The #1 Flexible Duct in the World.

S-TL FLEXIBLE AIR DUCT

Thermaflex® S-TL non-insulated flexible air duct is designed for use in all pressure cooling and heating systems.

Thermaflex® is a global leader in the flexible ducting industry for commercial and residential HVAC applications.

Thermaflex® S-TL air duct is used in either supply or return sections: for branch ducts and duct connections to or between mixing units induction units, control or terminal units and diffusion devices, including light troffers.

Thermaflex® S-TL air duct provides economical means for handling misalignment between system components and ducting around obstacles where fabricated and fitted ducts are difficult and costly to install. This duct is equally suitable for new jobs or refit work, and is especially useful when making system extensions or changing conditioned zones now or in the future.

Compliance with NFPA Standards lets you install lengths longer than the limitation applying to connectors. Thermaflex® S-TL air duct offers further economy of installed cost, for example, as a return duct within conditioned spaces or in any zone where the function of insulated duct is not required.

Increase productivity and profitability with innovative products by Thermaflex®. Contact us today at 1-800-459-4822.

10 year PRO warranty

GREENGUARD GOLD — PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS UL.COM/GG UL 2818

ADC · cULus LISTED · Silver Associate Member SMACNA · NADCA · HARDI

S-TL Flexible Air Duct

Features and Benefits:

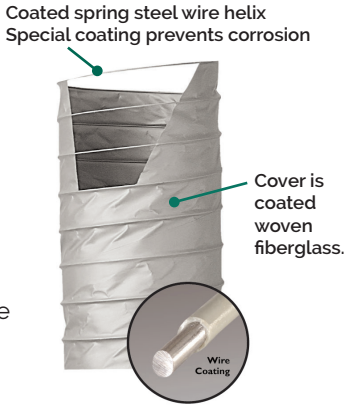
- Underwriters Laboratories listed as Class 1 air duct, UL Standard 181 and CUL S110.
- Reduced total installed cost—fast, economical installation.
- Material will not support mold or mildew growth.
- Long standard lengths help reduce waste—easily cut to exact lengths, or spliced, at the job.
- Easily shaped to fit oval inlets.
- Suitable for all bathroom venting applications.
- All components of are self-extinguishing and will not support flame.
- Complies with NFPA Standards 90A and 90B and most local, state and federal standards or codes.
- Maintenance free under normal conditions—highly resistant to rust and corrosion.
- Strict quality control over all raw materials and completed ducts.
- Will not balloon at recommended operating pressure.
- Suitable for all commercial applications where noninsulated "connector" rated products are not allowed.
- Will not collapse at recommended operating pressure.
- Assists absorbing system vibration transmitted through ductwork.
- Packaged compactly for efficient transporting, storing and handling.
- Available through broad national distribution.
- GreenGuard Certified for children and schools.

Application & Engineering Data

Nominal Inside Diameter (inches)	2	3	4	5	6	7	8	9	10	12	14	16	18	20
Length (feet)	25	25	25	25	25	25	25	25	25	25	25	15	15	15
Inside Bend Radius (inches)	2	3	4	5	6	7	8	9	10	12	14	16	18	20
Operating Pressure (inches water column)	Positive: 16 inches (2-10in. ID) 10 inches (12-20in. ID) Negative: 1 inch													
Maximum Leakage (cubic ft/min/linear ft/in diameter) At 16" water column	0.015													
Internal Operating Temperature Range (°F)	Minimum: -20							Maximum: 250						
Velocity (ft/minute)	6000													
Surface Burning Characteristics	Max. Flame Spread: 25							Max. Smoke Developed: 50						
Oxygen Index Ratings	Woven and Coated Glass Cloth Fabric: 35.60													

Construction & Materials

The supporting helix of coated spring steel wire is permanently bonded to a coated woven fiberglass cover.



Suggested Specification

Flexible air duct for connections between _____ and _____ shall be Thermaflex S-TL air duct, rated for a maximum pressure of 16" (2-10 in. ID) or 10" (12-20 in. ID) water column positive and 1" water column negative and maximum velocity of 6000 FPM and Listed by Underwriters Laboratories, Inc., under UL Standard 181 and CUL S110 as a Class 1 air duct and complying with NFPA Standards 90A and 90B. Thermaflex S-TL air duct shall be factory made and using a coated spring steel wire helix permanently bonded to a coated woven fiberglass cover.

Warranty Thermaflex warrants that all insulated and non-insulated products will be free from defects in materials and factory workmanship for a period of ten years from the date of manufacture. This warranty covers the flexible duct, materials and labor. This warranty applies only to ducts properly installed in accordance to Thermaflex's written installation instructions and under conditions specified in published performance data. Thermaflex shall not be liable to buyer or any third party for any special, secondary, incidental or consequential damages however arising.

1-800-459-4822 • www.thermaflex.net
Corporate Headquarters: 381 Carwellyn Road • Abbeville, SC 29620
Phoenix, AZ • Cairo, GA • Mississauga, ON Canada

Bulletin S-TL 4/19 Printed in U.S. A.

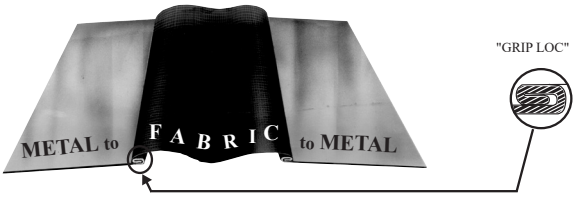
SUBMITTAL RECORD
JOB Jacksonville Middle School
LOCATION Jacksonville, AR
SUBMITTED TO
SUBMITTAL PREPARED BY
APPROVED BY
DATE

Submittal Form
DDFDC
Flexible Duct Connector

DESCRIPTION

All air duct installations for heating, cooling or ventilation are attached to mechanical equipment containing a fan or blower. Vibrations, noises and rattles resulting from operation of the fan or blower are transmitted into the metal ducts which carry the noises throughout the system.

In order to isolate the vibration and noises to the source, an air - tight flexible joint, consisting of a fabric which is attached to sheet metal on both side, must be inserted between the equipment and the ductwork. This vibration isolator is called a "Flexible Duct Connector".



Fabric Comparisons	Excelon®	Neoprene (Specification Grade)	Durolon	Insulflex®*	Teflon	Glasseal
UL Classified Listing #	R4462	R4462	UL Certified NFPA 701	n/a	n/a	R4462
Continuous Temp. Range	-40˚F. to 180˚F.	-40˚F. to 200˚F.	-40˚F. to 250˚F.	-40˚F. to 180˚F.	-150˚F. to 500˚F.	-40˚F. to 180˚F.
Color	Black	Black	White	Black	Grey Outside/Beige Inside	Grey & Black
Commercial Grade Weight	22 oz.	30 oz.	26 oz.	28 oz. (composite weight)	16.5 oz.	16 oz.
Residential Grade Weight	17 oz.	30 oz.	26 oz.	28 oz. (composite weight)	16.5 oz.	16 oz.
Abrasion Resistance[1]	15,000 cycles	600 cycles	500 cycles	500 cycles	1,000 cycles	1,400 cycles
Leakage Resistance[2]	350	595	250	125	650	120
Tear Strength[3]	100 lbs. / 100 lbs.	12 lbs. / 12 lbs.	12 lbs. / 12 lbs.	8 lbs. / 11 lbs.	50 lbs. / 30 lbs.	8 lbs. / 9 lbs.
Tensile Strength[4]	240 lbs. / 220 lbs.	500 lbs. / 450 lbs.	225 lbs. / 300 lbs.	70 lbs. / 70 lbs.	400 lbs. / 300 lbs.	90 lbs. / 90 lbs.
Base Fabric	Woven Nylon/Polyester Blend	Woven Fiberglass	Woven Fiberglass	Polyester	Fiberglass/Satin Weave	Woven Fiberglass
Coating	Vinyl	Neoprene	Hypalon	Vinyl	Teflon	Vinyl
Features	• Excellent water resistance • Excellent tear strength • Excellent all purpose fabric • Unaffected by mildew	• Extremely resistant to alkalies & gasoline • Excellent on systems exposed to toxic fumes • Good general purpose fabric • Unaffected by mildew	• Excellent ozone & weathering resistance • Best overall acid resistance • Recommended for rooftop applications • Unaffected by mildew	• Low Smoke Emission • Insulated 3-4-3 Configuration	• High temperature resistant • High corrosion resistance • Excellent chemical resistance	• Good, low cost • Resistant to acids & chemical fumes • Resistant to grease & alkalies • Unaffected by mildew
Metal-Fab® Grip Loc	MBX333 (#10159)	MFN333 (#10003)	MFD333 (#10002)	IDC343 (#10173) *Gauge: 28 +Guard Loc	MCT333 (#10278)	MGL333 (#10004)
Super Metal-Fab® Grip Loc	MB6X363 (#10160) MB12X3123 (#10252)	MF6N363 (#10012) MFN12N3123 (#10251)	MF6D363 (#10011)	Not Available	Not Available	MF6G363 (#10016)
TDC/TDF Grip Loc	MBX444 (#10210) MBX464 (#10214) MBX484 (#10280) MBX4104 (#10286)	MFN444 (#10211) MFN464 (#10246) MFN484 (#10281) MFN4124 (#10254)	MFD444 (#10237) MFD464 (#10245)	Not Available	MCT444 (#10279) MCT4104 (#10287)	Not Available

Please see individual submittals for each fabric/configuration for flame/smoke test results (ASTM E84 rating & NFPA 701).

All Metal-Fab, Super Metal-Fab and TDC/TDF Flexible Duct Connectors are manufactured with 24 gauge galvanized steel.
Duro Dyne meets or exceeds the SMACNA steel requirements for flexible duct connector.
Other materials are available upon request.

Notes:

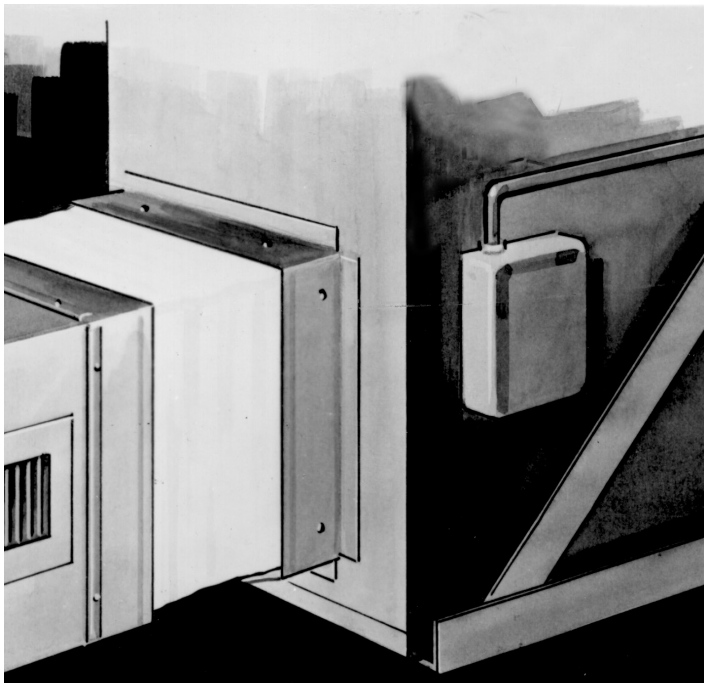
1. Abrasion resistance as per Federal Test Standard 191 Method #5306 using CS 17 wheel with 250 Gram load.
2. Leakage resistance as per Federal Test Standard 191 Method #5512. Results in P.S.I.
(To convert inches of water multiply P.S.I. x 27.176.).
3. Tear strength in tongue pounds as per Federal Test Standard 191 Method #5134.1 (warp/fill).
4. Tensile strength in grab pounds as per Federal Test Standard 191 Method #5100 (warp/fill).
5. Standard Excelon is not LA city approved. Use Excelon-LA when LA city approval is necessary.
(See Specification Form Excelon-LA - 203)

All Duro Dyne Flexible Duct Connector Products are suitable for pressures of -10 to +15 wg. Duro Dyne's standard 'single fold' metal to fabric grip has been tested by an independent testing laboratory to withstand a negative pressure of -10"WC and a positive pressure of +17.25" WC with no tearing or visible separation.

SUGGESTED SPECIFICATION

Vibration Isolating Flexible Duct Connector For Heating, Cooling & Exhaust Supplies & Returns.

At the inlet and discharge of all air handling equipment(unless otherwise noted) furnish and install vibration isolators. Vibration isolators shall be a coated woven fabric named _____ and shall be "Underwriters Laboratories Classified". Vibration isolators shall have a tear strength of not less then _____, and a continuous temperature range of _____ .Vibration isolators shall be preassembled metal to exposed fabric to metal. Fabric and metal shall be joined by means of a double lock seam. Vibration isolators shall be code_____ (called Flexible Duct Connectors) as manufactured by Duro Dyne Corporation, Bay Shore, N.Y.



Specifications

All Listed Duro Dyne Flexible Duct Connector Fabrics are designed to meet the following specifications:

1. MIL-C-20696B Para. 4.4.3. (Oil Resistance).
2. MIL-C-20696B Para. 4.4.4. (Hydro Carbon Resistance).
3. NFPA701 Tests for Flame Propagation of Fabrics and film (except Teflon).
4. California State Fire Marshal Approved.
5. Los Angeles City Approved. *(*See note below)*
6. Denver City Approved.

All Duro Dyne Flexible Duct Connectors utilize galvanized steel meeting ASTM-A-525 G 60 or better.

Duro Dyne Flexible Duct Connectors are also available with 300 series stainless steel or 3003 aluminum upon request.

****Note*** - Standard Excelon is not LA city approved. Use Excelon-LA when LA city approval is necessary. (See Submittal Form for Excelon-LA)

CHEMICAL RESISTANCE

(X = Extremely Resistant)
(NR = Not Recommended)
(O = No Data Available)

Chemical	Excelon	Neoprene	Durolon	Insulflex	Teflon	Glasseal
Acetic Acid	NR	X	X	NR	X	NR
Aluminum Chloride	X	X	X	X	X	X
Aluminum Sulfate	X	X	X	X	X	X
Ammonia (Anhyd)	X	X	X	X	X	X
Ammonium Hydroxide	X	X	X	X	X	X
Ammonium Sulfate	X	X	X	X	X	X
Barium Sulfide	X	X	X	X	X	X
Black Sulfate Liquor	X	X	X	X	X	X
Boric Acid	X	X	X	X	X	X
Butyl Alcohol	NR	X	X	NR	X	NR
Cadmium Plating Solution	X	NR	NR	NR	O	X
Calcium Chloride	X	X	X	X	X	X
Calcium Hypochlorite	X	NR	X	X	X	X
Chlorine Water	X	NR	NR	X	O	X
Chromic Acid	X	NR	X	X	X	X
Chromium Plating Solution	X	O	O	NR	O	X
Citric Acid	X	X	X	X	X	X
Copper Chloride	X	X	X	X	X	X
Copper Sulfate	X	X	X	X	X	X
Cottonseed Oil	X	X	X	X	O	X
Diacetone Alcohol	NR	X	X	NR	O	NR
Disodium Phosphate	X	NR	NR	X	O	X
Ethyl Alcohol	NR	X	X	NR	X	NR
Ethylene Glycol	NR	X	X	NR	X	NR
Ferric Chloride	X	X	X	X	X	X
Ferric Sulfate	X	X	X	X	X	X
Fluroboric Acid	X	X	X	NR	O	X
Formaldehyde (40%)	X	X	X	X	X	X
Formic Acid	X	X	X	X	X	X
Glucose	X	X	X	X	X	X
Glycerine	NR	X	X	NR	X	NR
Heptane	NR	X	X	NR	X	NR
Hexane	NR	X	X	NR	X	NR
Hydrobromic Acid (40%)	NR	X	X	NR	X	NR
Hydrochloric Acid (conc)	NR	X	X	NR	X	NR

Chemical	Excelon	Neoprene	Durolon	Insulflex	Teflon	Glasseal
Hydrofluoric Acid (100%)	NR	X	X	NR	X	NR
Hydrogen Peroxide	X	NR	X	X	NR	X
Hydrogen Sulfide	X	X	X	X	X	X
Lactic Acid	NR	X	X	NR	X	NR
Linseed Oil	NR	X	X	NR	O	NR
Magnesium Chloride	NR	X	X	NR	X	NR
Maleic Acid	X	NR	X	X	O	X
Methyl Alcohol	NR	X	X	NR	X	NR
Methyl Cellosolve	NR	X	X	NR	O	NR
Mineral Oil	X	X	X	X	X	X
Naptha	NR	NR	NR	NR	X	NR
Nickel Chloride	X	X	X	X	X	X
Nickel Sulfate	X	X	X	X	X	X
Nitric Acid (40%)	X	NR	X	X	X	X
Oleic Acid	X	NR	NR	X	X	X
Oleum	NR	NR	X	NR	X	NR
Oxalic Acid	X	X	X	X	X	X
Phosphoric Acid (85%)	NR	X	X	NR	X	NR
Pickling Solution	X	NR	X	X	O	X
Potassium Chloride	X	X	X	X	O	X
Potassium Cyanide	X	X	X	X	X	X
Potassium Dichromate	X	X	X	X	X	X
Potassium Hydroxide (40%)	X	X	X	NR	X	X
Potassium Sulfate	X	X	X	X	X	X
Propyl Alcohol	NR	X	X	NR	O	NR
Sodium Chloride	X	X	X	X	X	X
Sodium Hydroxide (40%)	NR	X	X	NR	X	NR
Sodium Hypochlorite	NR	NR	X	NR	X	NR
Steam	NR	X	NR	NR	X	NR
Sulfur Dioxide (Liquid)	NR	X	X	NR	X	NR
Sulfuric Acid (50%)	X	NR	X	NR	X	X
Sulfuric Acid (over 50%)	NR	NR	X	NR	X	NR
Tannic Acid	X	X	X	X	X	X
Vinegar	X	X	X	X	X	X

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Printed in USA 11/12/19
BO010403

Turning Vane

Double Wall Vane

Job: _____

Location: _____

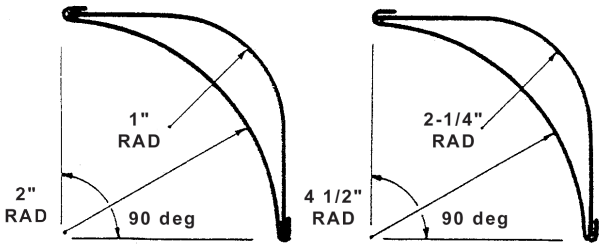
Submitted To: _____

Submittal Prepared By:

_____

Approved By: _____

Date: _____



MANUFACTURED BY

DUCTMATE Industries, Inc.
1502 Industrial Drive
Monongahela, PA 15063
800-245-3188
www.ductmate.com

LOCAL SUPPLIER

INDUSTRY REGULATIONS

Conforms to SMACNA dimensional and gauging requirements.

PRODUCT GUARANTEE

Ductmate Double Wall Turning Vane is guaranteed against defective material.

PACKAGING INFORMATION

Part Number	Size	Gauge	Feet/Bundle
2VGA26	2"	26	100'
4VGA24	4"	24	100'

DESCRIPTION

2" and 4" Double Wall Turning Vane

BASIC USE

Provide easy means for construction of consistent, double wall turning vanes systems, for the purpose of directing air around mitered elbow.

FEATURES

· Dimpled seam for superior strength
· Consistent product quality
· Union made in the U.S.A.
· Available in a variety of specialty metals
· Available for 2" and 4" turning vanes

TECHNICAL INFORMATION

Steel

Standard construction consists of G-60 galvanized. Available in Galvannealed, Stainless, Aluminized, Aluminum, Black Iron and PVC Coated.

Requirements

Ductmate Double Wall Vane is required when specifying the Ductmate PROrail system.

D U C T M A T E

PROrail®

2” and 4” Turning Vane Rail

PROrail: Every Decision Should Be This Successful... And This Easy!

- Available for 2” and 4” turning vanes
- Available in specialty metals
- Insures precise vane alignment
- Assembly is quick and easy
- Fabricated with precision equipment
- Consistent product quality

DUCTMATE® Industries, Inc.

PROrail®

2" and 4" Turning Vane Rail

DESCRIPTION

2" and 4" turning vane rail.

BASIC USE

Provides a self-aligning, easy means of securing turning vanes for the purpose of directing air around mitered elbows.

SPECIAL CHARACTERISTICS

- Precision stamped from hot-dipped galvanized steel
- Available from stock through a nationwide distributor network
- Pressure tested to 15" W.G. with no separation
- Trained Ductmate personnel are available to assist with additional technical questions

PACKAGING INFORMATION

Part#	Size	Gauge	Feet per carton
2PRGA22	2"	22	100
2PRGA24	2"	24	100
4PRGA22	4"	22	100
4PRGA24	4"	24	100

LIMITED PRODUCT WARRANTY

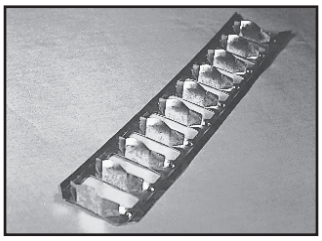
Ductmate warrants that PROrail, when properly installed and maintained, will be free from defects in material and workmanship, and will comply with all written specifications made by Ductmate at the time of sale. Ductmate's warranty shall run for a period of one year from the date of manufacture.

Warranty Limitation
The warranty stated above is in lieu of all other warranties, express or implied, including but not limited to the implied warranties of MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Although Ductmate may have suggested the product, or provided written or oral advice to the Purchaser, it is the Purchaser's responsibility to test and determine the suitability of PROrail, for the intended use and purpose, and Purchaser and/or its customer assumes all risk and liability whatsoever regarding such suitability.

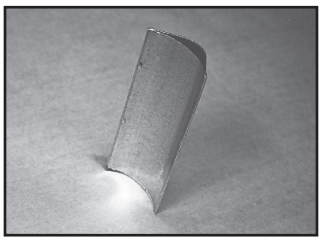
Limitation of Liability
In the event of a breach of the above warranty, Ductmate's sole obligation, and Purchaser's sole and exclusive remedy, shall be, at Ductmate's option, repair or replacement of any defective products, or refund of an applicable portion of the purchase price. Ductmate shall have no liability for costs of removal or reinstallation of the product. The Purchaser agrees that no other remedy, including but not limited to loss of profits, loss sales, injury to person or property, or any other special, incidental or consequential damages, shall be available to the Purchaser for any claim arising out of this Agreement, regardless of whether such claim is made in contract or in tort, including strict liability in tort. In no event will Ductmate be obligated to pay damages to the Purchaser in any amount exceeding the purchase price that the Purchaser paid to Ductmate for the allegedly defective product.

INSTALLATION INSTRUCTIONS

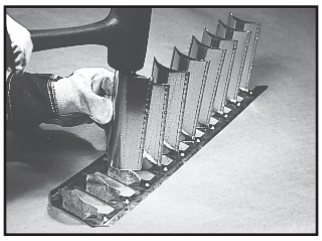
1. Cut PROrail to length.



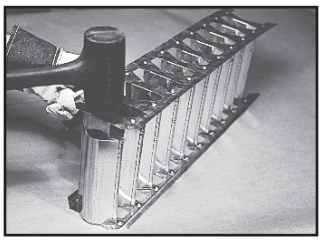
2. Cut the vanes to length.



3. Set the vanes onto the bottom rail.



4. Insert the top rail tabs into the vanes.



Assembly is ready to be inserted into the duct. Fasten to duct wall per SMACNA recommendations.

DUCTMATE® Industries, Inc.

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SMART SHEET METAL | AIR | RAIL | TRANSPORTATION · SMACNA · SPIDA SPIRAL DUCT MANUFACTURERS ASSOCIATION

Distributed By:

MIDDLETON, INC

P.O. BOX 506 BRYANT, AR 72089
TELEPHONE (501) 224-4888
LICENSE # 0225670422
Email: dsingleton@middletoninc.com

HVAC SUBMITTALS
10-17-24

PROJECT: UAMS Center for Animal Models of Infection & Disease
CONTRACTOR: Comfort Systems

PREPARED BY: David Singleton – **Middleton, Inc.**

CONTENTS

FURNISHED BY: **MIDDLETON, INC.**

Submittal Items : 233113 – Ductwork
Metal Duct Construction
Single Wall Spiral
Sigle Wall Stainless Long Seam

HVAC DUCT CONSTRUCTION SUBMITTALS

MIDDLETON SHEET METAL DUCT FABRICATION SUBMITTALS

INDEX:

TAB "A" TRANSVERSE JOINTS

1. ALL DUCT 14" X 14" AND LARGER TO BE TDC CONNECTION
2. ALL DUCT SMALLER THAT 14" X 14" WILL BE "S" & DRIVE

TAB "B" LONGITUDINAL JOINTS

1. ALL SQUARE OR RECTANGULAR DUCT WILL HAVE PITTSBURGH LOCK

TAB "C" FITTING CONSTRUCTION

1. ELBOWS TO BE RADIUS OR SQUARE TYPE PER SPECIFICATIONS
2. TRANSITIONS TO BE CENTER TAPER
3. OFFSETS TO BE FABRICATED PER SPECIFICATIONS
4. CANVAS CONNECTIONS

TAB "D" HANGERS

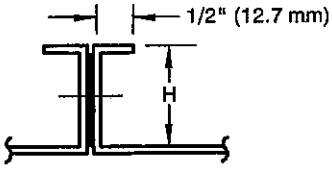
1. 3/8" ROD HANGERS FOR TRAPEZE HANGER APPLICATIONS
2. HANGER STRAP FOR SINGLE ROUND DUCT APPLICATIONS
3. OPTIONAL GRIPPLE WIRE ROPE HANGER TO BE USED IN BOTH TRAPEZE OR ROUND DUCT APPLICATIONS.

GRIPPLE SUBMITTALS ARE ATTACHED AND SMACNA APPROVED

ALL DUCT CONSTRUCTION TO MEET CURRENT SMACNA STANDARDS

FLANGED
(WITH GASKET)
T–24

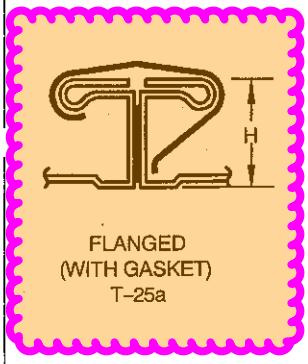
- Assemble per Figure 2-16
- Close corners with minimum 16 ga corner pieces and ⅜ in. bolts min.
- Lock flanges together with 6 in. long clips located within 6 in. of each corner
- Clips spaced at 15 in. maximum for 3 in. wg pressure class or lower
- Clips spaced at 12 in. maximum for 4, 6 and 10 in. wg
- Gasket to be located to form an effective seal



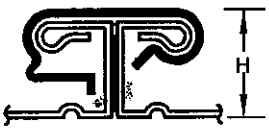
FLANGED
(WITH GASKET)
T–24A

- Bolt, rivet 1 in. maximum from ends and at 6 in. maximum intervals
- Limited to 2 in. wg pressure class
- *See* Figure 2-16
- Gasket to be located to form an effective seal

TDC FLANGED WITH GASKET

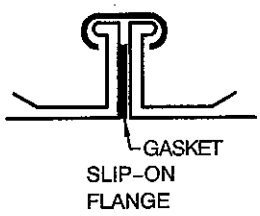


FLANGED
(WITH GASKET)
T–25a



FLANGED
(WITH GASKET)
T–25b

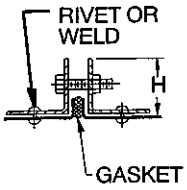
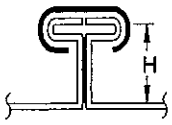
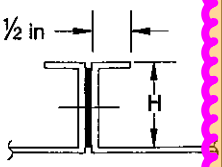
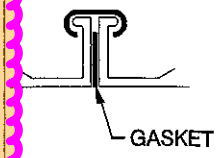
- Assemble per Figure 2-17
- Ratings may be adjusted with EI-rated bar stock or members from Tables 2-29 and 2-30
- Supplemental members may be attached to the duct wall on both sides of the joint
- Single members may be used if they are fastened through both mating flanges
- Gasket to be located to form an effective seal



SLIP–ON
FLANGE

- Consult manufacturers for ratings established by performance documented to functional criteria in Chapter 11.

FIGURE 2–1 RECTANGULAR DUCT/TRANSVERSE JOINTS (CONTINUED)

Reinf. Class		T-22 Companion Angles		T-24 Flanged		T-24a Flanged		T-25b Flanged		Slip-On Flange
				 H = 1⅜ in. (WITH GASKET)		 (WITH GASKET)		 T-25a Flanged 		
	E1*	H × T	WT LF	T (Nom.)	WT LF	H × T (Nom.)	WT LF	H × T (Nom.)	WT LF	
B	1.0	Use E		Use D		Use D		Use D		
C	1.9	Use E		Use D		Use D		Use D		
D	2.7	Use E		26 ga	0.5	1 × 22 ga	0.4	26 ga	0.5	
E	6.5	C 1 × ⅛	1.7	24 ga	0.6	Use F		24 ga	0.6	
F	12.8	H 1 × ⅛	1.7	22 ga	0.7	1½ × 20 ga	0.6	22 ga	0.7	
G	15.8	1¼ × ⅛	2.1	22 ga (R) 20 G	1.0	1½ × 18 ga	0.8	22 ga (R) 20 ga	1.0	
H	26.4	C 1½ × ⅛ (+) H 1½ × ⅛	2.6	18 ga	1.1	SEE TIE ROD TEXT		18 ga	1.1	
I	69	1½ × ¼	3.7	20 ga (R)	1.0			20 ga (R)	1.0	
J	80	1½ × ¼ (+) 2 × ⅛	4.7	18 ga (R)	1.1			18 ga (R)	1.1	
K	103	2 × 3/16	5	18 ga (R)	1.1			18 ga (R)	1.1	
L	207	H 2 × ¼	6.5	18 ga (R)	1.1			18 ga (R)	1.1	

Consult manufacturers for ratings established by performance documented to functional criteria in Chapter 11. *See* text S1.18 on page 2.4.

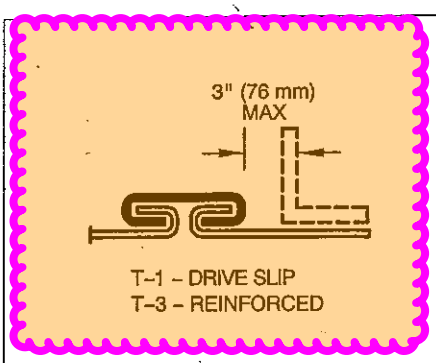
Table 2–32 Transverse Joint Reinforcement

See Section 2.1.4. *Effective EI is number listed times 10^5 before adjustment for bending moment capacity. For T-22, see tie rod downsize options in Tables 2-1 to 2-7; one rod for two angles. (R) means Tie Rodded. Accepted Pressure Mode for T-24a is (+) or (-) 2 in. wg maximum. *See* Figures 2-5 and 2-6 and tie rod text. (+) indicates positive pressure use only.

2 in. wg Static Pos. or Neg. Duct Dimension	5 ft Joints			5 ft Joints w/2 ½ ft Reinf. Spacing				
				Joints/Reinf.			Int. Reinf.	
	Min ga	Joint Reinf.	Alt. Joint Reinf.	Min ga	Joint Reinf.	Alt. Joint Reinf.	Tie Rod	Alt. Reinf.
10 in. and under	24 GA ONLY	N/R	N/R	Use 5 ft Joints				
11 – 12 in.		N/R	N/R					
13 – 14 in.		N/R	N/R					
15 – 16 in.		N/R	N/R					
17 – 18 in.		N/R	N/R					
19 – 20 in.		N/R	N/R					
21 – 22 in.		N/R	N/R					
23 – 24 in.		N/R	N/R					
25 – 26 in.		N/R	N/R					
27 – 28 in.	24	N/R	N/R	26	N/R	N/R	MPT	C
29 – 30 in.	24	N/R	N/R	26	N/R	N/R	MPT	D
31 – 36 in.	22	N/R	N/R	26	N/R	N/R	MPT	D
37 – 42 in.	22	JTR	(2) C	24	N/R	N/R	MPT	E
	20	N/R	N/A					
43 – 48 in.	20	JTR	(2) E	22	N/R	N/R	MPT	F
	18	N/R	N/A					
49 – 54 in.	20	JTR	(2) E	22	N/R	N/R	MPT	F
	18	N/R	N/A					
55 – 60 in.	20	JTR	(2) H	22	JTR	(2) C	MPT	G
61 – 72 in.	18	JTR	(2) H	20	JTR	(2) E	MPT	H
73 – 84 in.	16	JTR	(2) H	20	JTR	(2) I	(2) MPT	I
85 – 96 in.	Not Designed			20	JTR	(2) I	(2) MPT	I
97 – 108 in.				18	JTR	(2) I		J
109 – 120 in.				18	JTR	(2) I		K

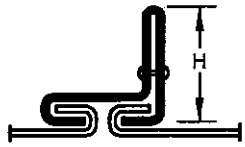
Table 2–17 5 ft Coil/Sheet Stock/T25a/T25b (TDC/TDF) Duct Reinforcement

N/R - Not Required
N/A - Not Applicable
JTR - Joint Tie Rod
MPT - Mid Panel Tie Rod(s)
(2) (X) - Indicates 2 external reinforcements of class (X) to be used in lieu of Joint Tie Rods



T–1 – DRIVE SLIP
T–3 – REINFORCED

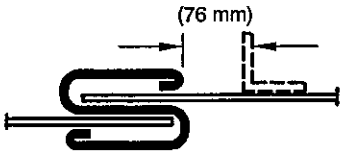
- Gage no less than two gages less than duct gage
- 24 ga minimum
- Qualification as reinforcement per Table 2-48
- T-3 – Slip Gage as per T-1
  - Any length at 2 in. wg
  - 36 in. maximum length at 3 in. wg
  - 30 in. maximum length at 4 in. wg
  - Not allowed above 4 in. wg



STANDING DRIVE SLIP
T–2

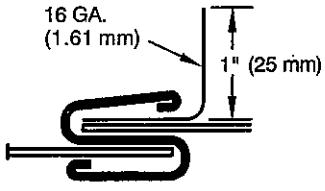
- Fasten standing portions within 2 in. of each end and elsewhere at 8 in. spacing or less
- Any length at 2 in. wg
- 36 in. maximum length at 3 in. wg
- 30 in. maximum length at 4 in. wg
- Not allowed above 4 in. wg

PLAIN "S" SLIP
T–5



T–6 HEMMED "S" SLIP
(T–6a REINFORCED)

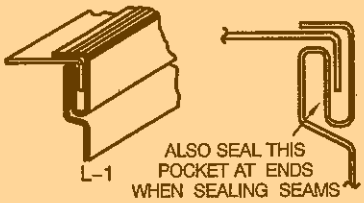
- Not less than two gages less than duct gage
- 24 ga minimum
- When used on all 4 sides, fasten within 2 in. of the corners and at 12 in. maximum intervals
- 2 in. wg maximum pressure



REINFORCED "S" SLIP
T–7

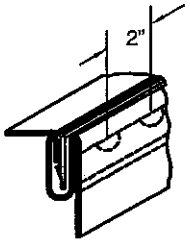
- Use slips conforming to T-6
- Use 16 ga angle of 1 in. height into slip pocket
- Fasten with screws at ends
- Angle used only for A, B, or C rigidity class
- 2 in. wg maximum pressure

FIGURE 2–1 RECTANGULAR DUCT/TRANSVERSE JOINTS



PITTSBURGH LOCK

- Pocket depth from ¼ in. to ⅝ in.
- Use on straight duct and fittings
- To ± 10 in. wg

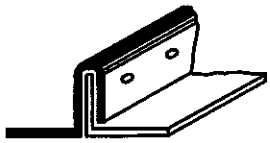


L–2
BUTTON PUNCH SNAP LOCK

- ⅝ in. pocket depth for 20, 22, and 24 ga
- ½ in. pocket depth for 24 and 26 ga
- To ± 4 in. wg
- Screws must be added at the ends of all duct of 4 in. wg and at the ends of 3 in. wg when the duct is over 48 in. width

L–3
GROOVED SEAM
ALSO CALLED FLAT LOCK AND PIPE LOCK

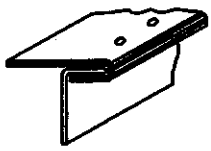
- To ± 10 in. wg



SEE FIG. 2–7 ALSO

L–4 STANDING SEAM

- To ± 10 in. wg
- 1 in. seam up to duct width of 42 in.
- 1 ½ in. seam for larger ducts
- May be used on duct interiors
- Fasten at 2 in. maximum from ends and at 8 in. maximum intervals



L–5 SINGLE CORNER SEAM

- To ± 10 in. wg
- Fasten as per L-4

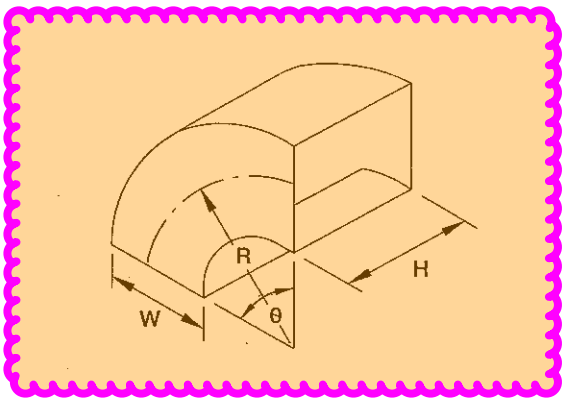
FLANGED
(WITH GASKET)
T–25a

FLANGED
(WITH GASKET)
T–25b

- Assemble per Figure 2-17
- Ratings may be adjusted with EI-rated bar stock or members from Tables 2-29 and 2-30
- Supplemental members may be attached to the duct wall on both sides of the joint
- Single members may be used if they are fastened through both mating flanges
- Gasket to be located to form an effective seal

FIGURE 2–2 RECTANGULAR DUCT/LONGITUDINAL SEAMS

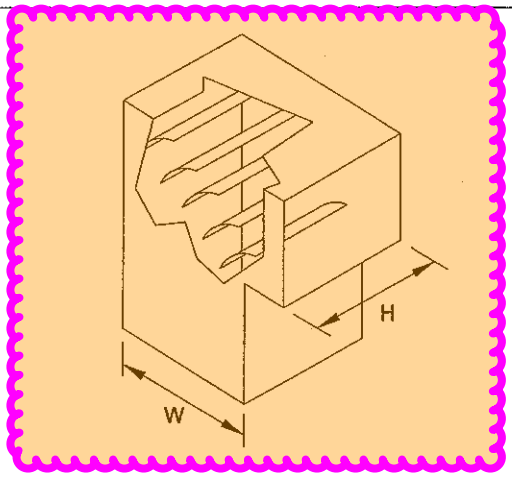
FITTING TYPE IS DETERMINED BY DRAWINGS AND SPECS



TYPE RE 1
RADIUS ELBOW

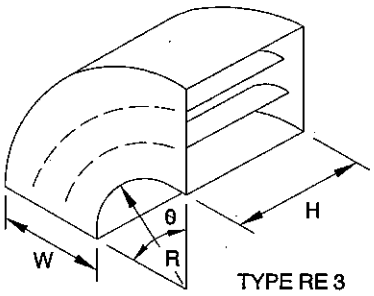
CENTERLINE R = $\frac{3W}{2}$ UNLESS OTHERWISE SPECIFIED – IS NOT RESTRICTED TO 90°

SQUARE THROAT, $\frac{R}{W}$ = 0.5, MAY BE USED, UP TO 1000 FPM (5 mps).



TYPE RE 2
SQUARE THROAT ELBOW
WITH VANES

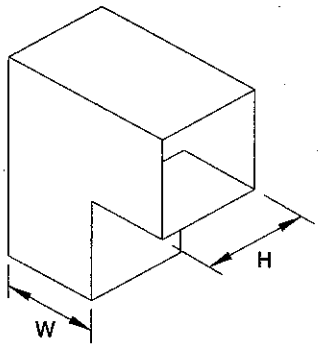
No Square Throated 90s without the approval from Engineer of record



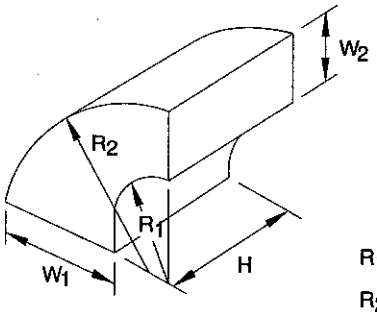
TYPE RE 3
RADIUS ELBOW
WITH VANES

NOTE:

FOR RE 3 *SEE* SPLITTER VANES IN SMACNA *HVAC SYSTEMS DUCT DESIGN*



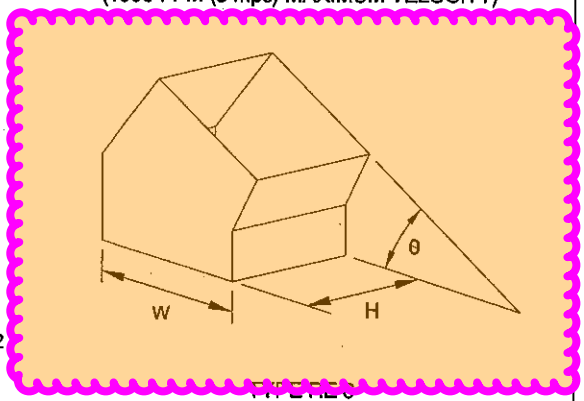
TYPE RE 4
SQUARE THROAT ELBOW
WITHOUT VANES
(1000 FPM (5 mps) MAXIMUM VELOCITY)



TYPE RE 5
DUAL RADIUS ELBOW

$R_1 = 3/4 \quad W_1$

$R_2 = R_1 + W_2$

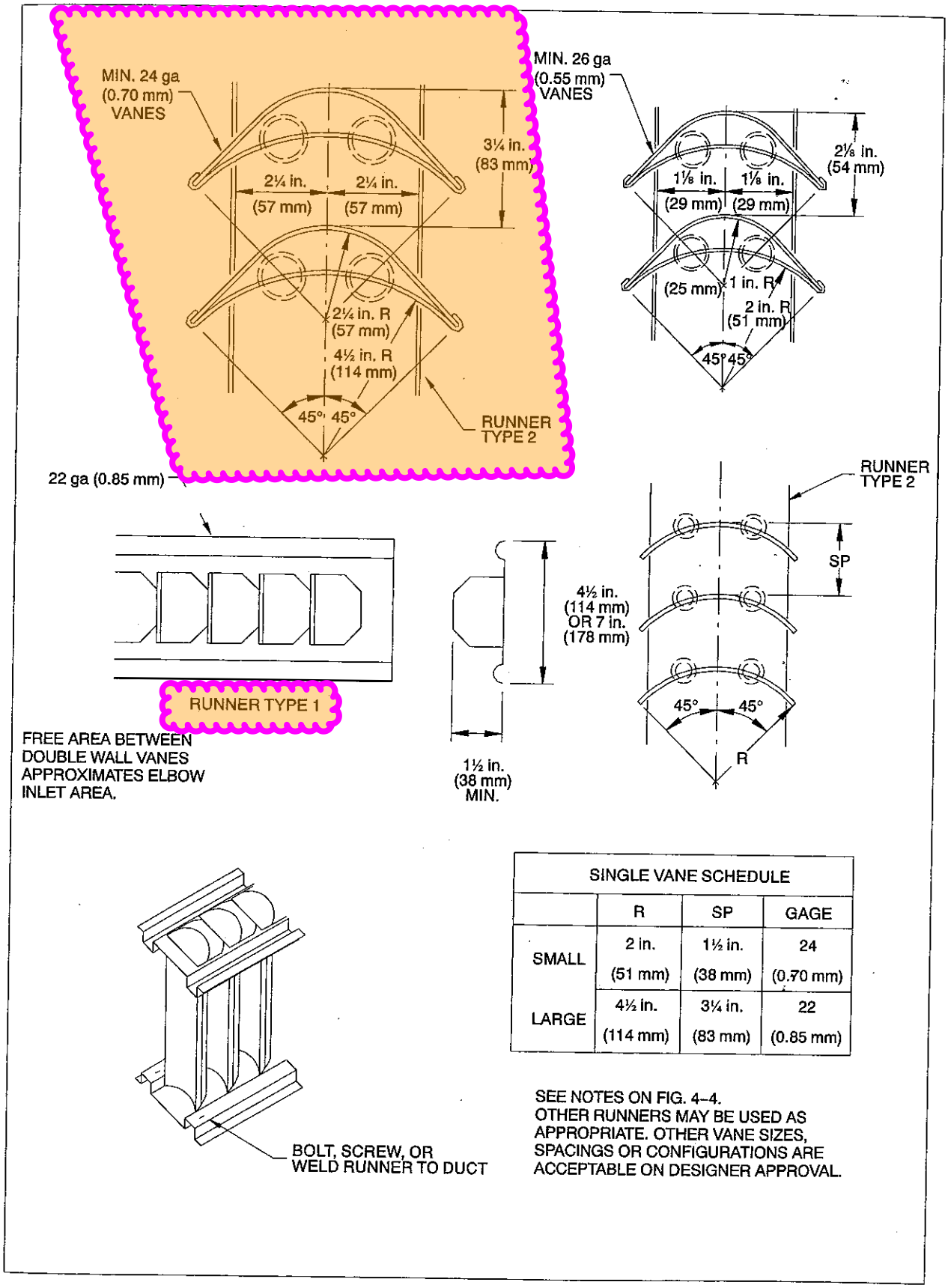


MITERED ELBOW

BEAD, CROSSBREAK AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT

PAGE 1 OF 2

FIGURE 4–2 RECTANGULAR ELBOWS



SINGLE VANE SCHEDULE			
	R	SP	GAGE
SMALL	2 in. (51 mm)	1½ in. (38 mm)	24 (0.70 mm)
LARGE	4½ in. (114 mm)	3¼ in. (83 mm)	22 (0.85 mm)

SEE NOTES ON FIG. 4–4.
OTHER RUNNERS MAY BE USED AS APPROPRIATE. OTHER VANE SIZES, SPACINGS OR CONFIGURATIONS ARE ACCEPTABLE ON DESIGNER APPROVAL.

FIGURE 4–3 VANES AND VANE RUNNERS

FITTING TYPE IS DETERMINED BY DRAWINGS AND SPECS

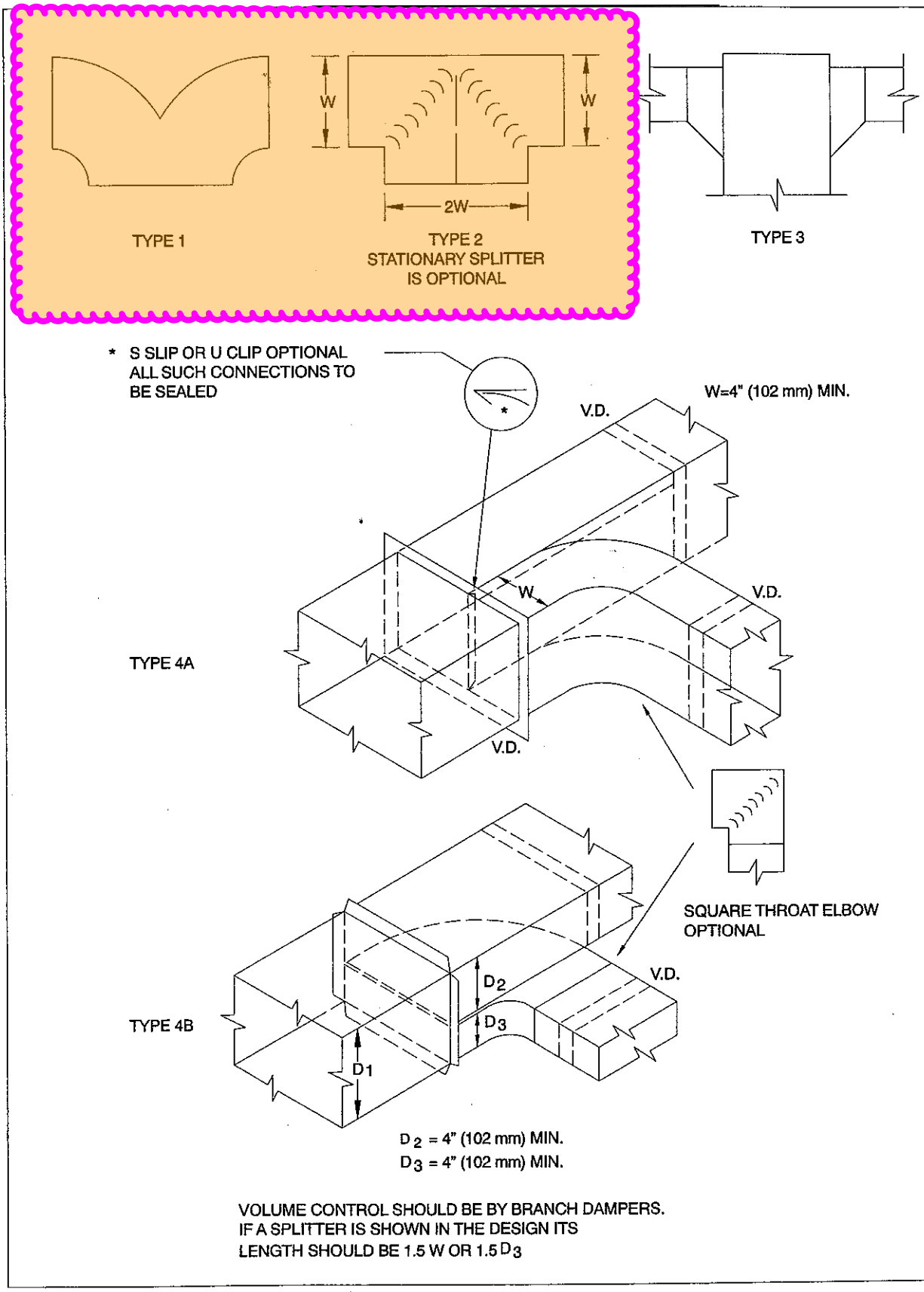
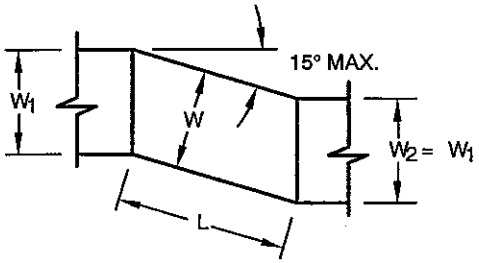


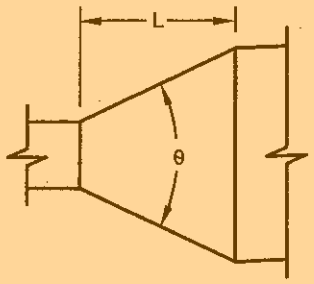
FIGURE 4–5 DIVIDED FLOW BRANCHES

FITTING TYPE IS DETERMINED BY DRAWINGS AND SPECS

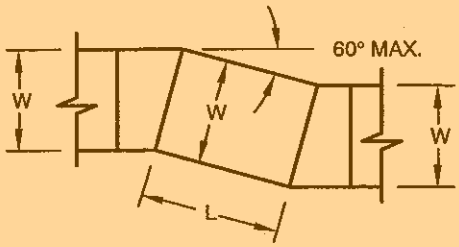
OFFSETS 2 AND 3 AND TRANSITIONS MAY HAVE EQUAL OR UNEQUAL INLET AND OUTLET AREAS. TRANSITIONS MAY CONVERT DUCT PROFILES TO ANY COMBINATION FOR RECTANGULAR, ROUND OR FLAT OVAL SHAPES.



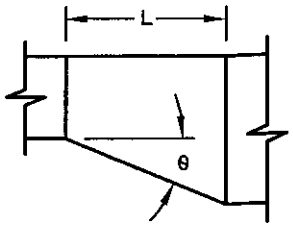
OFFSET TYPE 1
(ANGLED)



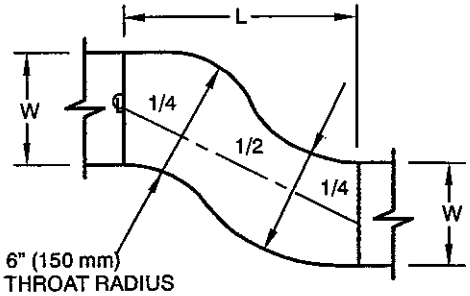
CONCENTRIC TRANSITION
θ MAX. 45° DIVERGING, 60° CONVERGING



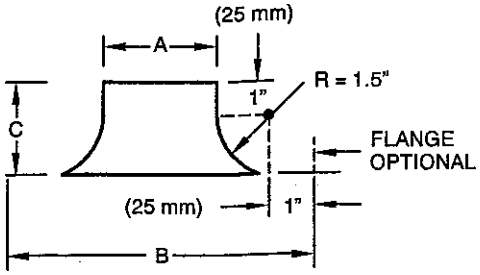
OFFSET TYPE 2
(MITERED)



ECCENTRIC TRANSITION
θ MAX. 30°
(EXCEPT 45° IS PERMITTED
AT ROUND TO FLAT OVAL)

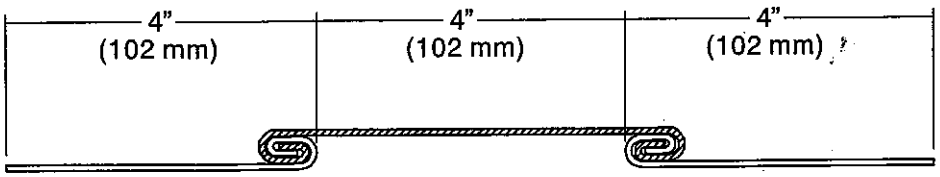


OFFSET TYPE 3
(RADIUSSED
OR OGEE)

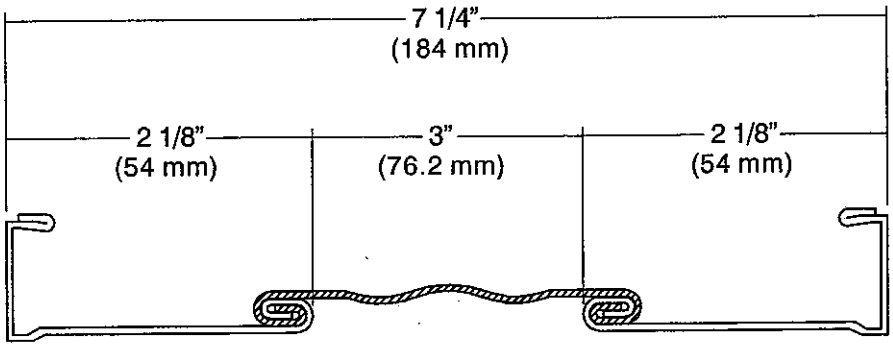


STANDARD BELLMOUTH
(ON SHORT PATTERN BELL
C = 3" (76 mm)
B = A + 4" (102 mm))

FIGURE 4–7 OFFSETS AND TRANSITIONS



4/4/4 FLEX CONNECTION



T–25 a FLANGES
ON A 4/4/4 FLEX CONNECTION

FIGURE 7–9 ALTERNATIVE FLEX CONNECTOR DETAILS

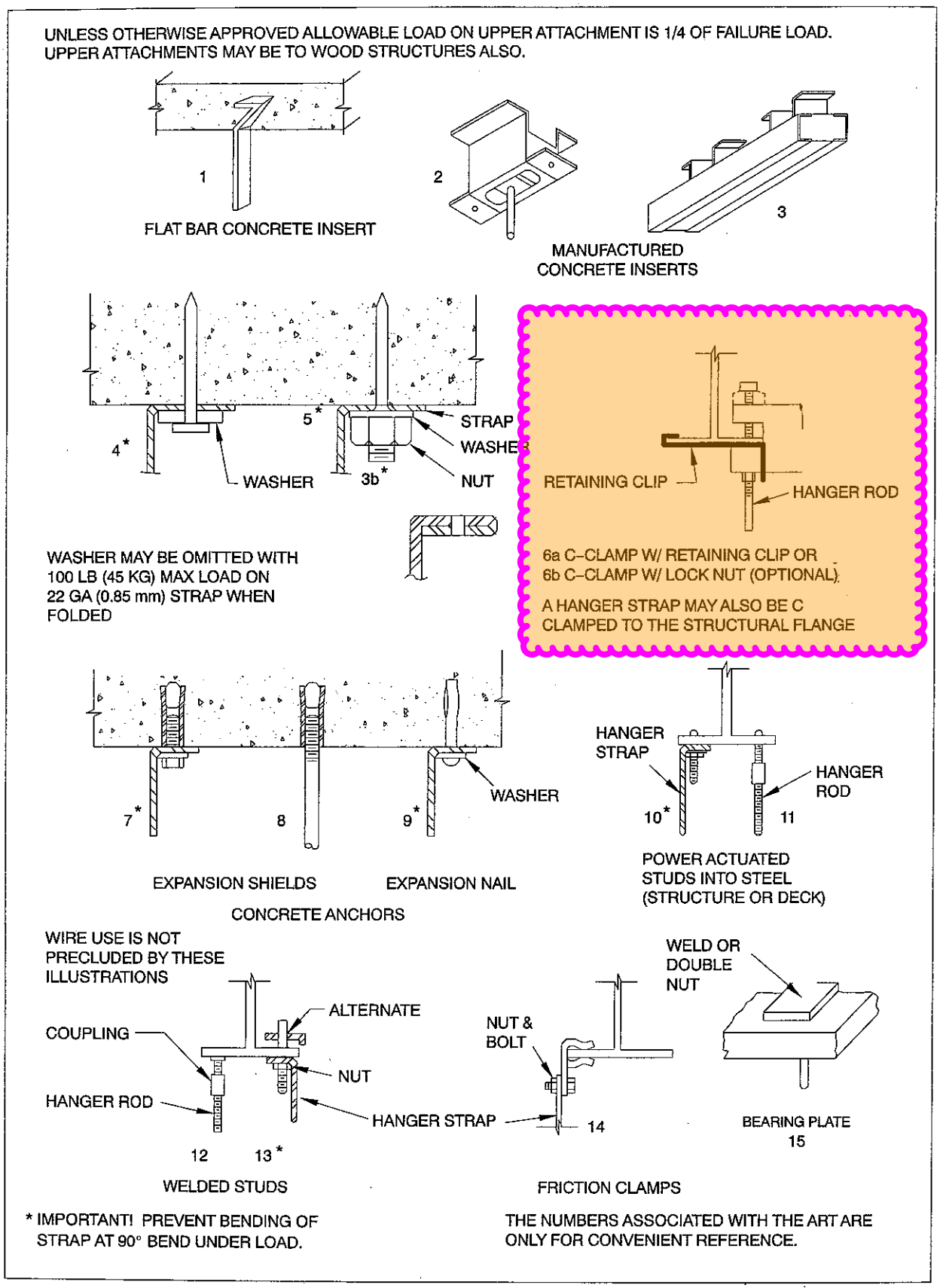


FIGURE 5–2 UPPER ATTACHMENT DEVICES – TYPICAL

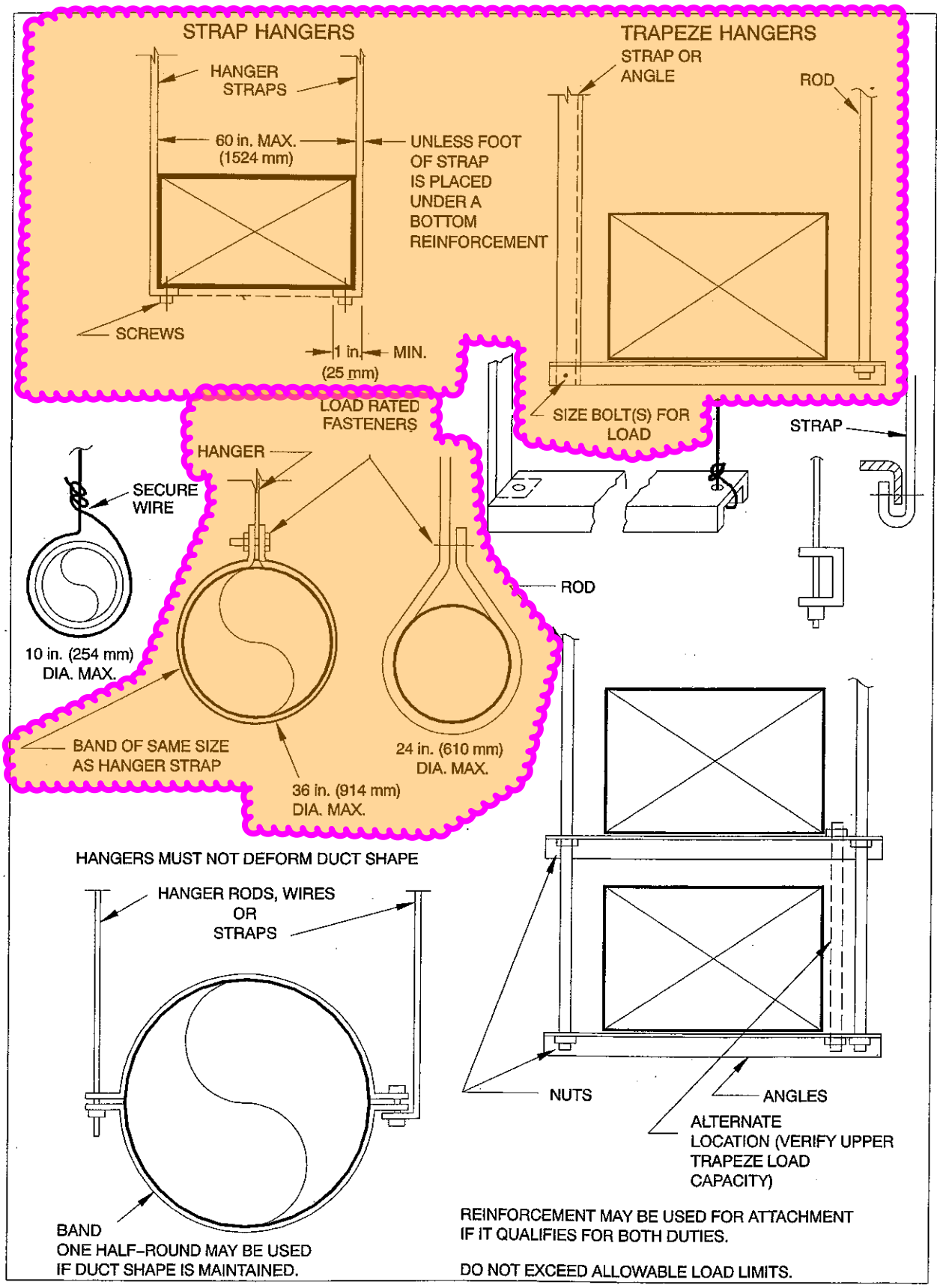


FIGURE 5–5 LOWER HANGER ATTACHMENTS

FRAMING CHANNEL (STRUT) MAY BE USED AS AN ALTERNATIVE TO THE TRAPEZE ANGLES SHOWN IN TABLE 5–3 AS FOLLOWS:

Channel (Strut)			Section Modulus (Z)	Moment of Inertia (I)	Trapeze
H	W	GA	$in.^3$	$in.^4$	Table 5-3
1 in.	1 5/8 in.	12	0.0923	0.0533	A, B, C
1 3/8 in.	1 5/8 in.	12	0.1559	0.1209	D, E
1 5/8 in.	1 5/8 in.	12	0.2042	0.1850	F, G
2 7/16 in.	1 5/8 in.	12	0.3927	0.5203	H, I
3 1/4 in.	1 5/8 in.	12	0.5772	0.9379	J, K

Channel (Strut)			Section Modulus (Z)	Moment of Inertia (I)	Trapeze
H (mm)	W (mm)	MM	mm^3	mm^4	Table 5-3M
25.4	41.3	2.45	1500	22,200	A, B, C
34.9	41.3	2.45	2600	50,300	D, E
41.3	41.3	2.45	3300	77,000	F, G
61.9	41.3	2.45	6400	216,000	H, I
82.6	41.3	2.45	10,300	454,000	J, K

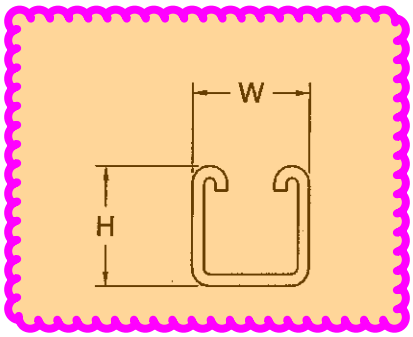
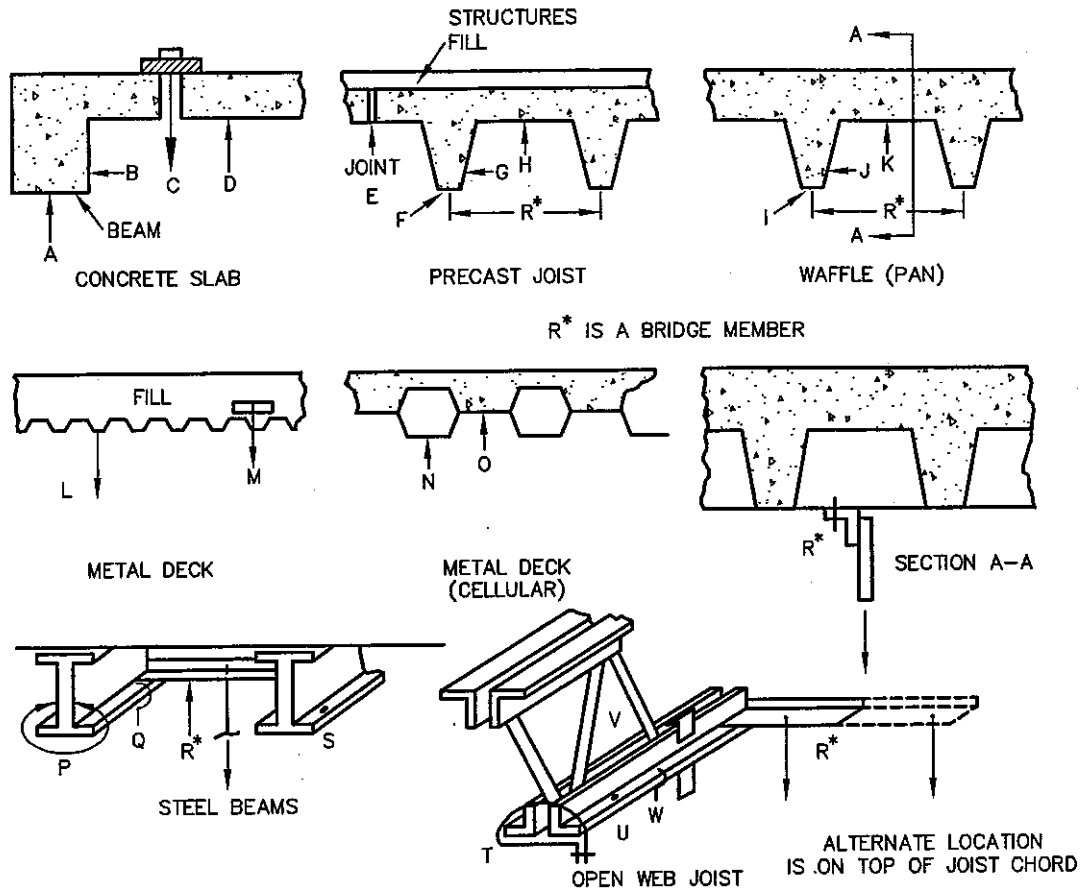


Table 5–4 Channel (Strut) Used as Trapeze

ALPHABET LETTER ONLY INDICATES AN ALTERNATIVE LOCATION OR SITUATION THAT MAY BE PERMITTED OR RESTRICTED BY DESIGN DOCUMENTS. ILLUSTRATIONS OF CONCRETE AND STEEL DO NOT PRECLUDE ATTACHMENTS TO WOOD.



CONVENTIONAL HANGER METHODS AND DEVICES

CONCRETE SCREW ANCHORS
CONCRETE INSERTS, SINGLE
CONCRETE INSERTS, SLOTTED
POWDER ACTUATED FASTENERS
GAS DRIVEN FASTENERS
"C" CLAMPS
WELDED STUDS
FRICTION CLAMPS
STRAP
ROD, THREADED, UNTHREADED
BRIDGE
BEAM CLAMP, HALF FLANGE
BEAM CLAMP, FULL FLANGE
EYE BOLT (OR ROD)
TOGGLE BOLTS
DRILLED HOLE AND BOLT
STANCHION
SELF TAPPING SCREWS PLUS STRAPS
DROP IN EXPANSION ANCHORS
KNEE BRACKET FROM WALL
LAG SCREW EXPANSION ANCHOR
NAILED PIN FASTENERS
RIVETS
SWAY BRACING
"FISH" PLATE OR WASHER AND ROD
HOOK OR LOOP
VIBRATION ISOLATOR
WIRE

NOTE: CABLE HANGING SYSTEMS WITH ADJUSTABLE MECHANICAL DEVICE SELECT HANGERS FOR TYPE OF STRUCTURE AND SUSPENSION. DO NOT EXCEED ALLOWABLE OR SPECIFIED LOAD LIMITS.

ALLOWABLE LOAD ON UPPER ATTACHMENT IS 1/4 OF FAILURE LOAD

Gripple Hangers as option to Straps

FIGURE 5–1 HANGER ATTACHMENTS TO STRUCTURES

Maximum Half of Duct Perimeter	Pair at 10 ft Spacing		Pair at 8 ft Spacing		Pair at 5 ft Spacing		Pair at 4 ft Spacing	
	Strap	Wire/ Rod	Strap	Wire/ Rod	Strap	Wire/ Rod	Strap	Wire/ Rod
P/2 = 30"	1" × 22 ga	10 ga (.135")	1" × 22 ga	10 ga (.135")	1" × 22 ga	12 ga (.106")	1" × 22 ga	12 ga (.106")
P/2 = 72"	1" × 18 ga	⅜"	1" × 20 ga	¼"	1" × 22 ga	¼"	1" × 22 ga	¼"
P/2 = 96"	1" × 16 ga	⅜"	1" × 18 ga	⅜"	1" × 20 ga	⅜"	1" × 22 ga	¼"
P/2 = 120"	1½" × 16 ga	½"	1" × 16 ga	⅜"	1" × 18 ga	⅜"	1" × 20 ga	¼"
P/2 = 168"	1½" × 16 ga	½"	1½" × 16 ga	½"	1" × 16 ga	⅜"	1" × 18 ga	⅜"
P/2 = 192"	Not Given	½"	1 ½ " × 16 ga	½"	1" × 16 ga	⅜"	1" × 16 ga	⅜"
P/2 = 193" up	Special Analysis Required							

When Straps are Lap Joined Use These Minimum Fasteners:	Single Hanger Maximum Allowable Load	
	Strap	Wire or Rod (Dia.)
1" × 18, 20, 22 ga -two #10 or one ¼" bolt 1" × 16 ga -two ¼" dia. 1½" × 16 ga -two ⅜" dia Place fasteners in series, not side by side.	1" × 22 ga - 260 lbs. 1" × 20 ga - 320 lbs. 1" × 18 ga - 420 lbs. 1" × 16 ga - 700 lbs. 1½" × 16 ga - 1100 lbs.	0.106" - 80 lbs. 0.135" - 120 lbs. 0.162" - 160 lbs. ¼" - 270 lbs. ⅜" - 680 lbs. ½" - 1250 lbs. ⅝" - 2000 lbs. ¾" - 3000 lbs.

Table 5–1 Rectangular Duct Hangers Minimum Size

NOTES:

a. Dimensions other than gage are in inches.

b. Tables allow for duct weight, 1 lb./sf insulation weight and normal reinforcement and trapeze weight, but no external loads!

c. For custom design of hangers, designers may consult SMACNA's *Rectangular Industrial Duct Construction Standards,* the AISI *Cold Formed Steel Design Manual* and the AISC Steel *Construction Manual.*

d. Straps are galvanized steel; other materials are uncoated steel.

e. Allowable loads for P/2 assume that ducts are 16 ga maximum, except that when maximum duct dimension (w) is over 60 in. then P/2 maximum is 1.25 w.

f. For upper attachments *see* Figs. 5-2, 5-3 and 5-4.

g. For lower attachments *see* Fig. 5-5.

h. For trapeze sizes *see* Table 5-3 and Fig. 5-6.

i. 12, 10, or 8 ga wire is steel of black annealed, bright basic, or galvanized type.

j. Cable hanging systems with adjustable mechanical device.

Gripple Trapeze Fastener System

Purpose made one-way Gripple for quick and easy suspension of pre-fabricated units in a single or multi-tiered configuration.

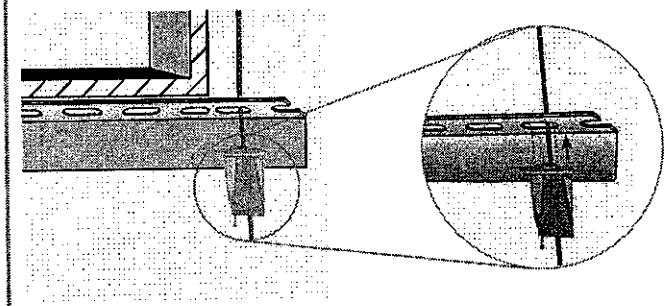
ADVANTAGES

- Can be used with standard Gripple hangers for multi-tiered installations.
- Available in a kit with choice of 10 end fixings.
- Releasable pin for easy adjustment.

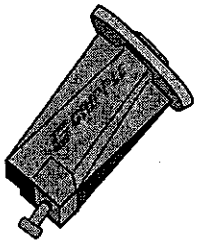
PRODUCT INFORMATION

- Suitable for low-void ceilings, allowing adjustment up to the ceiling.
- Purpose made one-way Gripple for use on Gripple Hanger size No.3.
- Load rated at 90kg SWL based on a 4:1 instant load.

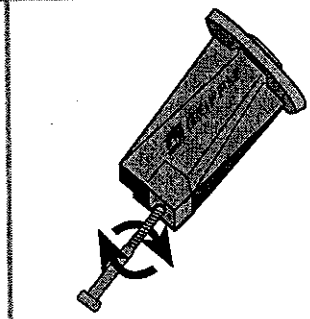
INSTALLATION



Gripple Trapeze slots into the configuration of the channel.

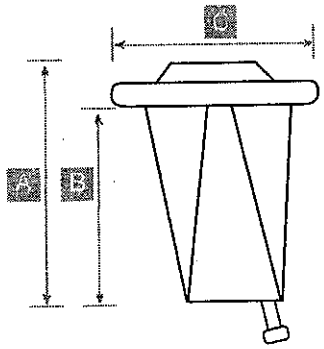


Releasable pin makes adjustment easy.



Unscrew pin and remove to complete the installation.

TRAPEZE SPECIFICATION



Size	A mm	B mm	C mm
No.3	49	44	37

Important Information

1. Construction materials and conditions vary on different sites. If it is suspected that the base material has insufficient strength to achieve a suitable fixing, contact Gripple Ltd. The responsibility for judgement of base material strength lies with the installer, and not with Gripple Ltd.

2. The information and recommendations given herein are believed to be correct at time of writing. The data has been obtained from tests done under laboratory, or other controlled conditions and it is the users responsibility to use the data given in light of conditions on site, taking account of the intended use of the products concerned.

3. Whilst Gripple Ltd can give general guidance and advice, the nature of Gripple products means that the ultimate responsibility for selecting the correct product for a particular application must lie with the customer.

4. All products must be used, handled and applied in accordance with current product instructions and manufacturers recommendations for use, published by Gripple Ltd.

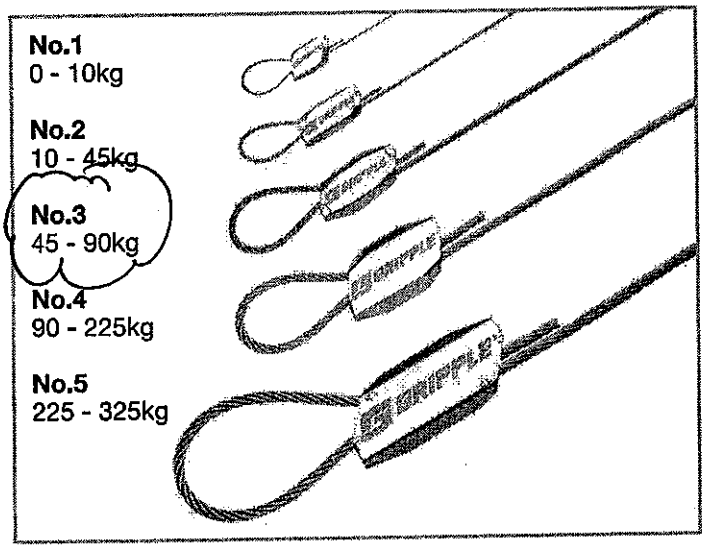
5. Gripple's policy is one of continuous development and innovation. We therefore reserve the right to alter specifications, etc. without notice.

Gripple Limited, The Old West Gun Works, Savile Street East, Sheffield, S4 7UQ
telephone: 0114 275 2255, fax: 0114 276 1155, email: info@gripple.com or visit www.gripple.com

Gripple Hangers

ADVANTAGES

- **Strong**
  5:1 load rated system.
- **Replaces threaded rod**
  No more sawing, filing or fixing nuts.
- **Faster**
  Reduces installation time by 80%.
- **Safe**
  Lightweight, making it easier to carry on site.
- **Saves time and money**
  No need for additional bracketry.



CALCULATION FORMULA

A simple formula to determine the correct hanger size is:

Weight per metre x distance between hangers

Example: 15kg load per metre → Distance between hangers is 2m
Plane: Vertical

15 x 2 = 30kg → Size will be No.2

Gripple Hangers – Do's

- Ensure that the wire rope protrudes at least 7.5cm from the Gripple housing.
- Use Gripple hangers for suspending static loads only.
- Use the hanger within it's stated load range.
- Check that the self-locking fastener is fully engaged.
- Ensure all hangers are evenly loaded.
- Keep the hanger components clean.
- Follow the manufacturers recommendations.
- Consider the effect of an angle, or forming in-line joins has on the SWL (see overleaf).
- Follow health and safety guidelines and best practice recommendations in the work place.
- Ensure appropriate PPE is worn when handling wire rope.

Gripple Hangers – Dont's

- Exceed the product's Safe Working Load.
- Use the hanger for lifting.
- Use the hanger for moving services.
- Splice together two Gripple hanger kits, or any other joining device.
- Walk on any suspended service.
- Use the self-locking fasteners on coated wire of any kind.
- Apply paints, lubricants or other coatings to the Gripple or wire rope.
- Use standard hangers in a chlorinated or humid atmosphere.
- Exceed an angle of 60°.
- Attempt to use the setting key when the suspension is under load.
- Re-use Gripple hangers, they are designed for permanent installations.

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Gripple Hangers - Best Practice Guide

HOW TO CHOOSE THE RIGHT SIZE AND MODEL

1. Choose the size where the object's weight falls within the products working range. Examples of the calculation formula are detailed overleaf.
2. Unless specified, each of our end fixings maintains the load ratings of the individual kits.
3. Each size has a specified safe working load rated at 5:1, and offers a working load range.
4. The load range should be observed; choosing a size that is lighter or heavier than necessary is counter-productive, both functionally and financially.
5. Remember to adjust your size choice if the hanger is to be used at an angle other than vertical. The table below (effect on SWL of hanging objects at an angle) shows the effect a sideways load has on a vertical installation.
6. In areas of high humidity (a paper factory) and frequent wash down (a food processing factory), stainless steel kits should be considered for extended life performance.

EFFECT ON SWL OF HANGING OBJECTS AT AN ANGLE

The load rating for a Gripple hanger is based on the suspension being hung vertically. If the wire rope is suspended at an angle, an additional sideways load is applied which reduces the capacity of the suspension. The net effect is shown on the table below:

Maximum SWL (kg) at an angle from vertical					
Gripple Hanger	0°	15°	30°	45°	60°
No.1	10.0	9.6	8.6	7.0	5.0
No.2	45.0	43.2	38.7	31.5	22.5
No.3	90.0	86.4	77.4	63.0	45.0
No.4	225.0	217.3	194.8	159.1	112.5
No.5	325.0	313.9	281.4	229.8	162.5
Load %	100	96	86	70	50

EFFECT ON SWL OF FORMING IN-LINE JOINTS

When using a Gripple as an end-stop on light duty applications, the SWL is affected by a 55% reduction in efficiency, and so the following ratings should be applied.

In order to calculate the SWL at 5:1 when forming joints, multiply the current safe working load limit 0.45 *(see table below).*

Maximum SWL (kg) at an angle from vertical		
Size	Standard	In-line join
No.1	10kg	4.5kg
No.2	45kg	20.25kg
No.3	90kg	40.5kg
No.4	225kg	101.25kg
No.5	325kg	146.25kg

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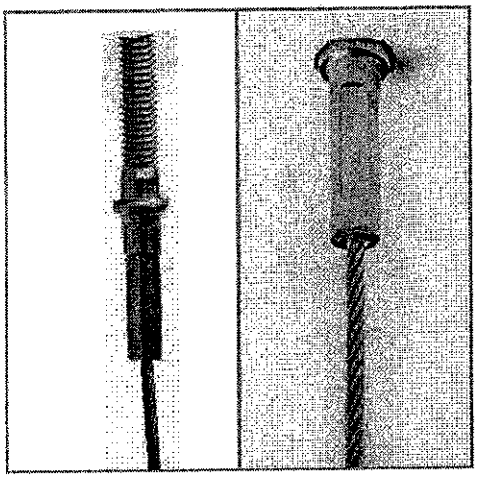
Gripple Stud Hangers

The 'stud' anchor method provides an extremely fast way of fixing a suspension to a concrete structure, or an existing metal bracket.

ADVANTAGES

- Reduces installation time by over 90%
- Threaded for ease of use, no tools required.
- Ideal for use in concrete ceilings, metal decking and pressed metal brackets.

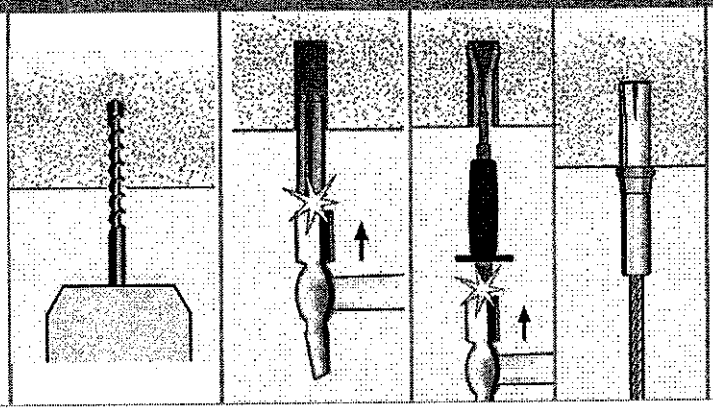


PRODUCT INFORMATION

- Supplied with drop-in anchors, free as part of the kit, or with nylock nuts (on request).
- Hollow core anchors available, specifically designed for use with Gripple Stud hangers in hollow core ceiling slabs. (note: standard hollow core anchors are not suitable)

INSTALLATION

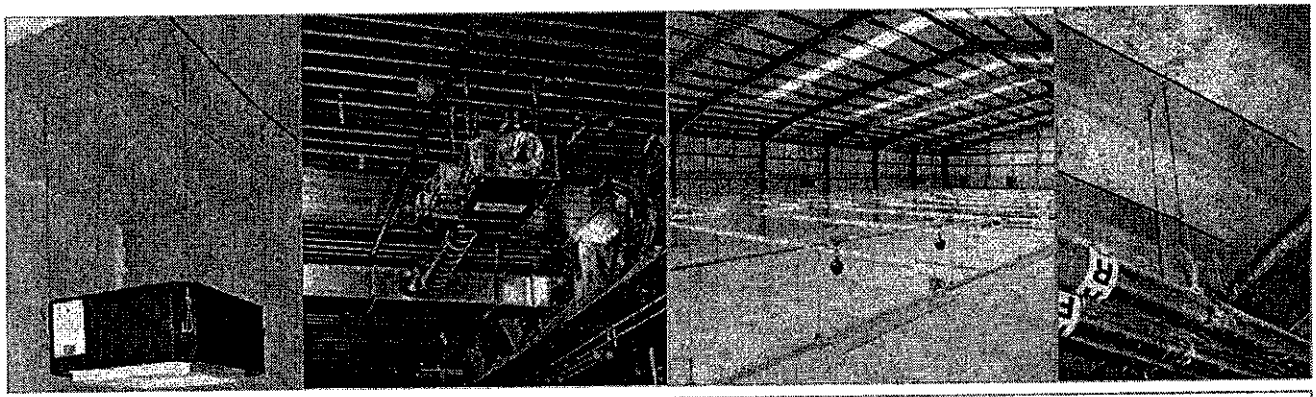
1. Drill concrete (Note: Use a wire brush to ensure drilled hole is clear).
2. Push in the drop-in anchor.
3. Use a hammer to drive in the setting punch to expand the anchor.
4. Screw in the stud.



Tips:

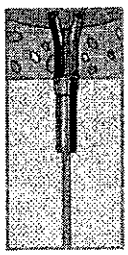
The stud is designed to be manually screwed in.

It is not essential that the stud screws up tight against the drop-in anchor.



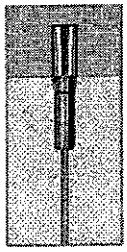
Ideal for:

- Concrete structures.
- Metal decking structures.
- Metal brackets, using nuts.



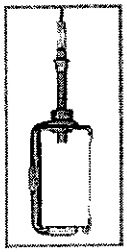
Hollow Core Ceiling

For use with M8 Fischer fixing.



Concrete Ceiling

For use with M8 drop-in anchor.



Metal bracket

For use with M8 Stud fixing and nylock nuts.

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Stud End Fixing - Technical Information

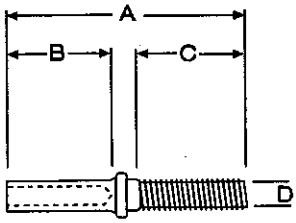
MATERIALS AND QUALITY

All Gripple studs are manufactured from mild steel, which is zinc coated for maximum anti-corrosion properties. A stainless steel version is available in the M6 and M8 size only. The stud is swaged on to one end of the wire rope by a power press. The tail end is then heat cut, fusing the individual wire filaments together, which eliminates any chance of the rope fraying. This allows the wire to be easily fed through the fastener and reduces the possibility of injury to the installer.

RANGE OF SIZES

Sizes	Safe Working Load Range	M6 x 20mm	M8 x 45mm	M10 x 27mm	Stainless Steel (M6 or M8)
No.1	0 - 10kg	✔			
No.2	10 - 45kg	✔	✔		✔
No.3	45 - 90kg	✔	✔		✔
No.4	90 - 225kg	✔	✔	✔	

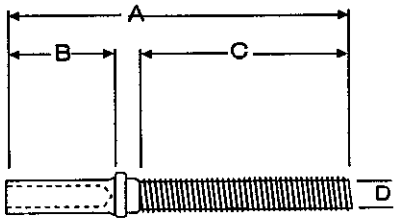
M6



No 1 - 3
No 3 Stainless steel

A → 47
B → 21
C → 20
D → M6

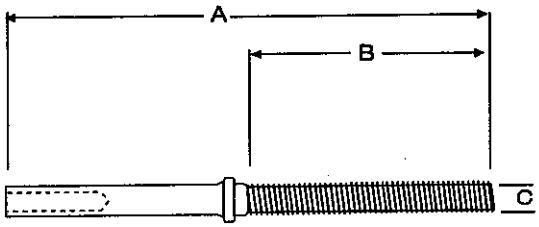
M8



No 2 & 3

A → 70
B → 21
C → 45
D → M8

M10



No 4

A → 100
B → 50
C → M10

mm	M6	M8	M10
SWL	330kg	330kg	510kg
Drill bit diameter	8mm	10mm	12mm
Anchorage Depth	25mm	30mm	40mm
Screwing Depth	8/11mm	10/13mm	12/16mm
Tightening Torque	4Nm	8Nm	15Nm
Clearance Hole	7mm	9mm	12mm
Min. base material thickness	100mm	100mm	100mm

Important Information

1. Construction materials and conditions vary on different sites. If it is suspected that the base material has insufficient strength to achieve a suitable fixing, contact Gripple Ltd. The responsibility for judgement of base material strength lies with the installer, and not with Gripple Ltd.

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5. Gripple's policy is one of continuous development and innovation. We therefore reserve the right to alter specifications, etc. without notice.

CONFORMS TO DW/144 · SHEFFIELD REGISTERED TRADE · apave · HVCA · ECA

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Telephone: 0114 275 2255, fax: 0114 275 1155, email: info@gripple.com or visit www.gripple.com

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

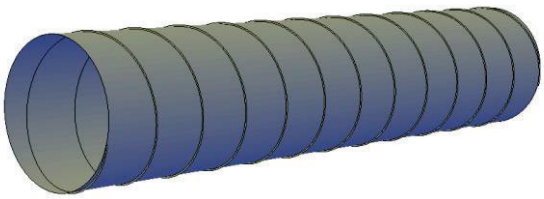
PRODUCT	Single Wall Round Spiral
MANUFACTURER	Dixie
JOB NAME	UAMS Center for Animal Models of Infection & Disease
LOCATION	Little Rock, AR
ENGINEER	James R. Beecher
CONTRACTOR	Middleton Inc.
DATE	10/16/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

963 South Bellevue
Memphis, TN 38106
(901) 774-2220
(901) 774-2174 Fax

SINGLE WALL ROUND
GALVANIZED
** LOW & MED PRESSURE **
MANUFACTURING STANDARDS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR



SPIRAL SEAM

10" Positive WG
(SMACNA 2005 Standard)

DIAMETER	Spiral Seam Pipe	Longitudinal Seam Pipe	Fitting Construction
3" -18"	26		24
18"-29"	26		24
30" - 42"	24		22
44" - 60"	22		20
62" – 80"	20		18

Construction Standards:

- Standard lengths of spiral pipe are 10' for spiral seam and 5' for longitudinal welded seam construction
- Class 1 air duct materials, or UL 181
- Galvanized Steel pipe will be lock-forming quality and have a zinc-coating of G-60 or greater in accordance with SMACNA 2005 Duct Construction Standards and ASTM A653 (formerly ASTM A525/A527)
- Spiral Seam construction will be RL-1 to 10" W.G. +/- pressure. Longitudinal seam will be RL-4 to 10" W.G. +/- in accordance with SMACNA
- Fabrication in accordance with SMACNA HVAC Duct Construction Standards - Metal & Flexible (2005) except as indicated and Spiral Pipe Manufacturers Association (SPIDA) standards.

Submittal By:	Dale Turner
Submittal Date:	9/20/24

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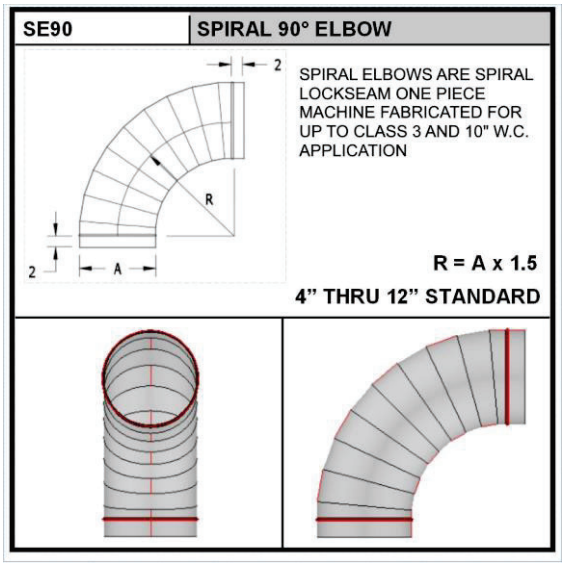
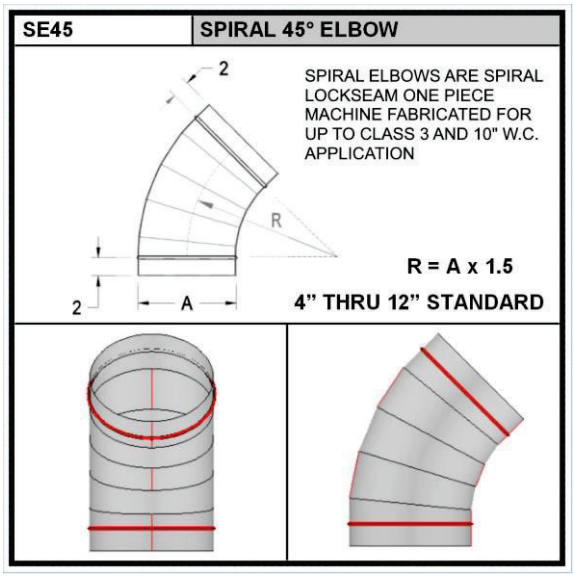
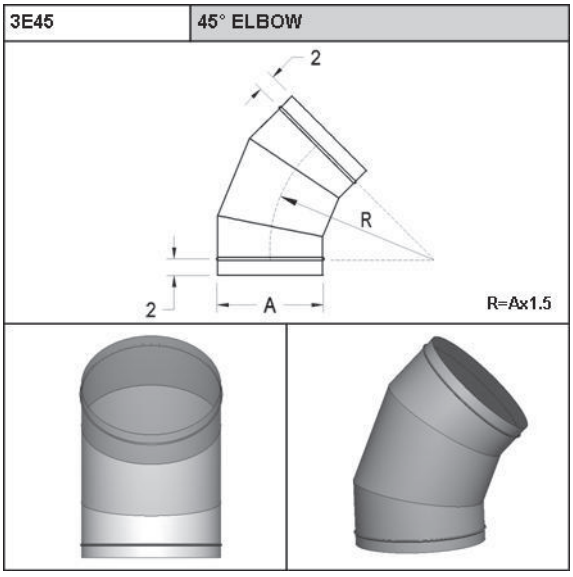
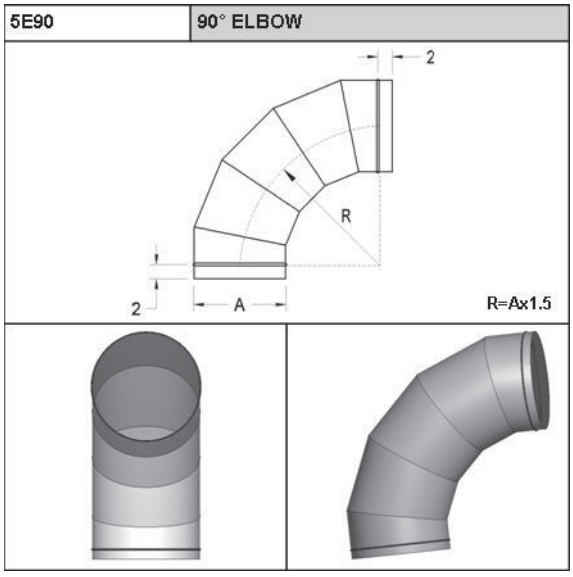
SINGLE WALL ROUND FITTINGS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant









Submitted By:	Dale Turner
Submittal Date:	9/20/24

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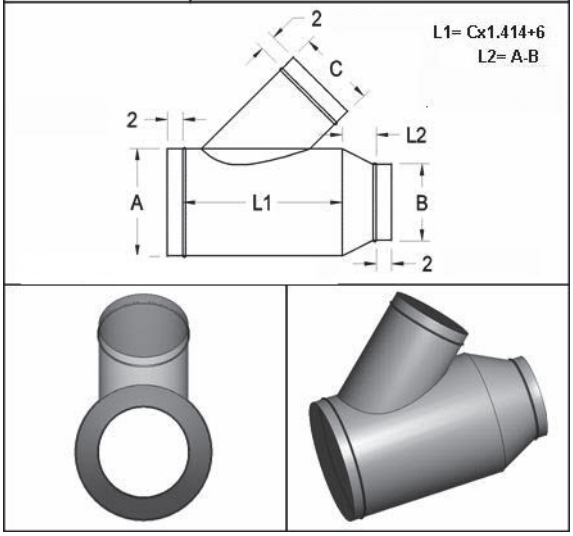
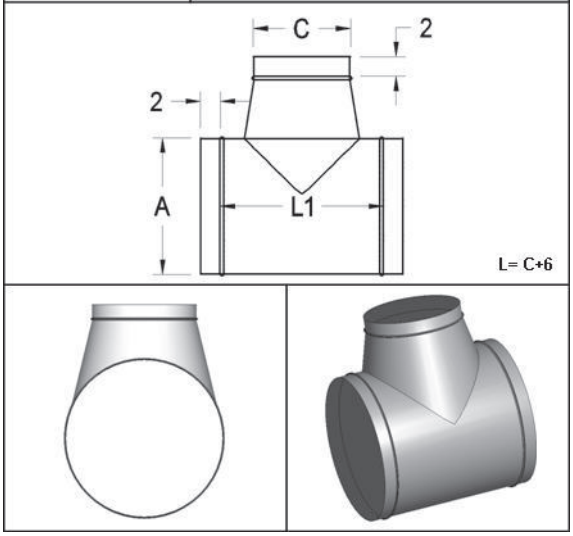
SINGLE WALL ROUND FITTINGS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant

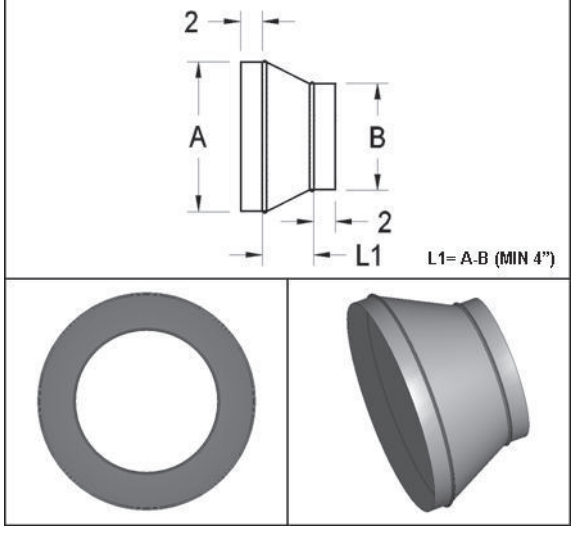
LR — LATERAL REDUCING



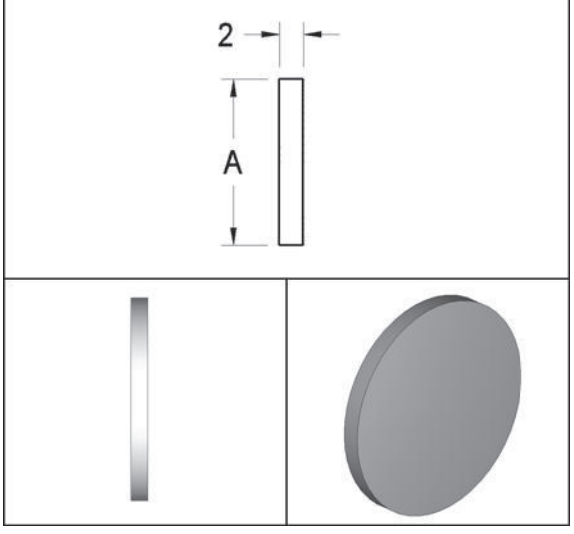
CT — CONICAL TEE



R — CONCENTRIC REDUCER



EC - EP — END CAP - END PLUG



Submitted By:	Dale Turner
Submittal Date:	9/20/24

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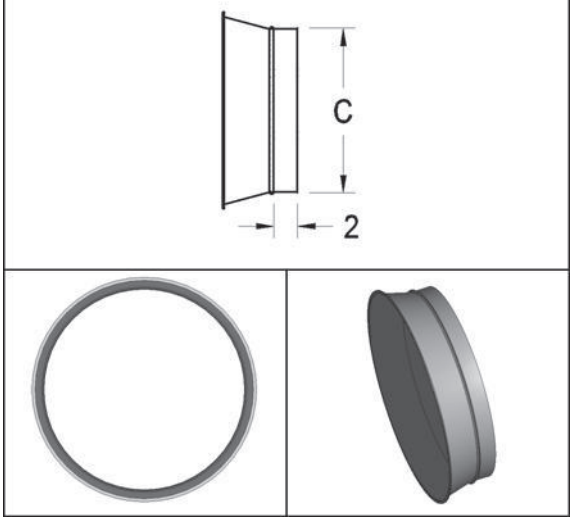
(901) 774-2174 Fax

SINGLE WALL ROUND FITTINGS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant

CTF	CONICAL TAP ON FLAT



Conical Taps will be used for medium pressure applications only.

Submitted By:	Dale Turner
Submittal Date:	9/20/24

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Memphis, TN 38106
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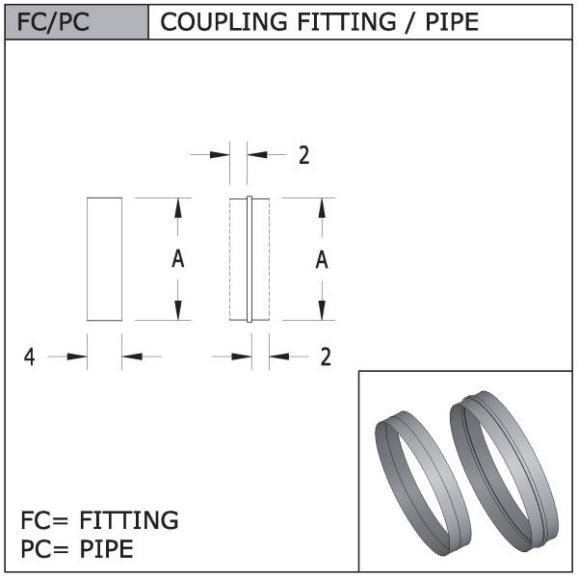
(901) 774-2174 Fax

SLIP COUPLING
TRANSVERSE DUCT CONNECTION

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Sizes:	All Round Single Wall
Construction:	Transverse duct connection via slip coupling for pipe/pipe or fitting/fitting connection. Coupling will be of comparable fitting gauges per duct submittal. Single Wall (SW) duct connection will be with single coupling. For field installation, coupling should be inserted into pipe/fitting until contact is made with center bead in coupling. Adjoining pipe/fitting will be slipped on remaining half of coupling until contact is made with center bead. Coupling is then screwed on 6" centers with sheet metal screws and sealed with appropriate high pressure duct sealant.

ROUND DUCT:



Submitted By:	Dale Turner'
Submittal Date:	9/20/2024

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Single Wall Stainless Long Seam Pipe
MANUFACTURER	Dixie
JOB NAME	UAMS Center for Animal Models of Infection & Disease
LOCATION	Little Rock, AR
ENGINEER	James R. Beecher
CONTRACTOR	Middleton Inc.
DATE	10/16/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

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Memphis, TN 38106
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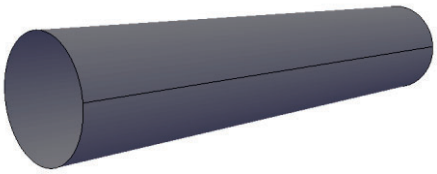
(901) 774-2174 Fax

SINGLE WALL ROUND
304-2b STAINLESS STEEL
MANUFACTURING STANDARDS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR



LONG SEAM WELD

-2" Negative WG
(SMACNA 2005 Standard)

DIAMETER	Long Seam Welded	Fitting Construction
3" -20"	20**	20
21" - 36"		
37" - 50"		
50" – 54"		
56" - 80"		

** NOTE: Exceeds SMACNA standards

Construction Standards:

- **Standard lengths are 5' or 10' where applicable for longitudinal welded seam construction**
- Class 1 air duct materials, or UL 181
- Stainless Steel will be 304 2B construction as required per ASTM A167
- Continuous weld longitudinal seam will be RL-4 Butt Weld or RL-3 Stitch Welded in accordance with SMACNA 2005
- Fabrication in accordance with SMACNA HVAC Duct Construction Standards - Metal & Flexible (2005) except as indicated and Spiral Pipe Manufacturers Association (SPIDA) standards.

NOTE: All transverse joint connections to be provided with a ¼" flange out for field welding

Submittal By:	Dale Turner
Submittal Date:	9/20/24

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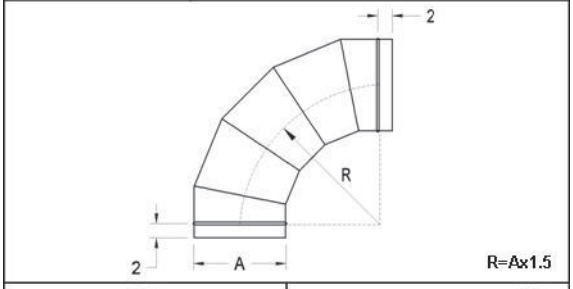
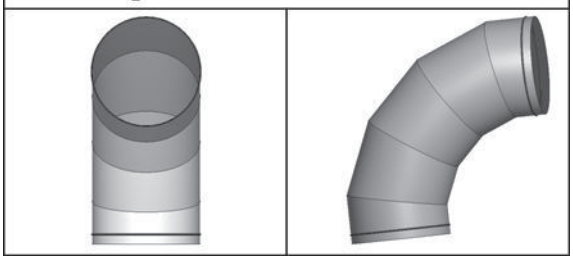
Memphis, TN 38106
(901) 774-2220
(901) 774-2174 Fax

304-2b STAINLESS STEEL ROUND SUBMITTALS

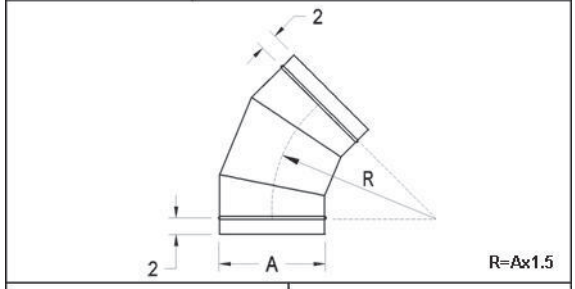
Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	304 2B Stainless Steel – Solid Welded Seam Construction

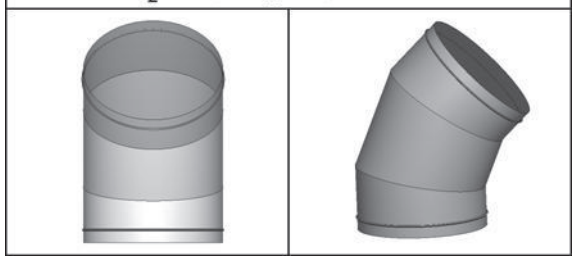
5E90	90° ELBOW



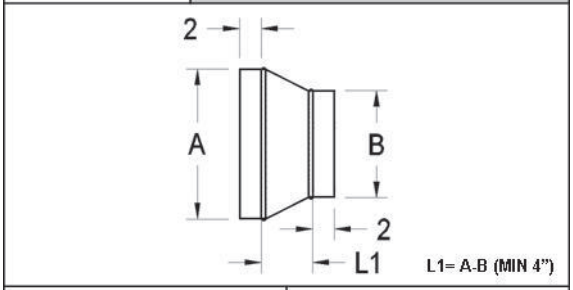


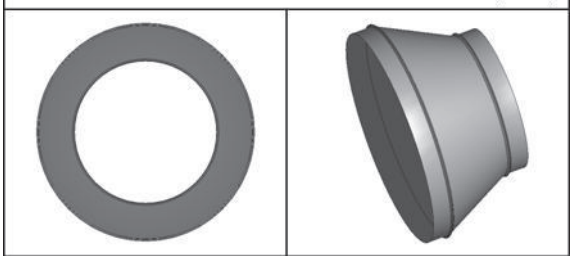
3E45	45° ELBOW



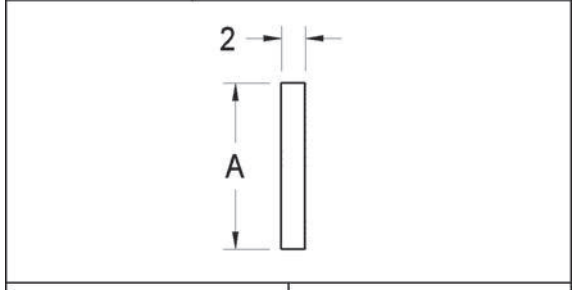


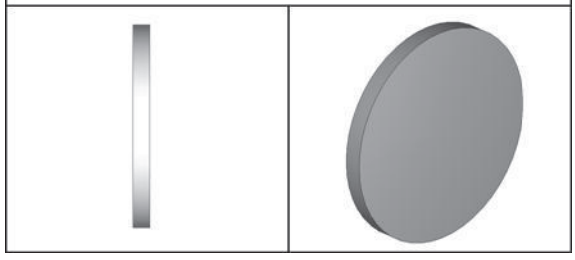
R	CONCENTRIC REDUCER





EC - EP	END CAP - END PLUG





Submitted By:	Dale Turner
Submitted Date:	9/20/24

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Memphis, TN 38106
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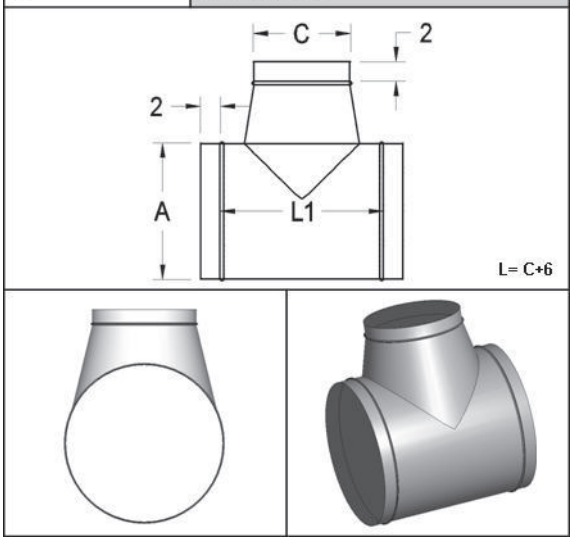
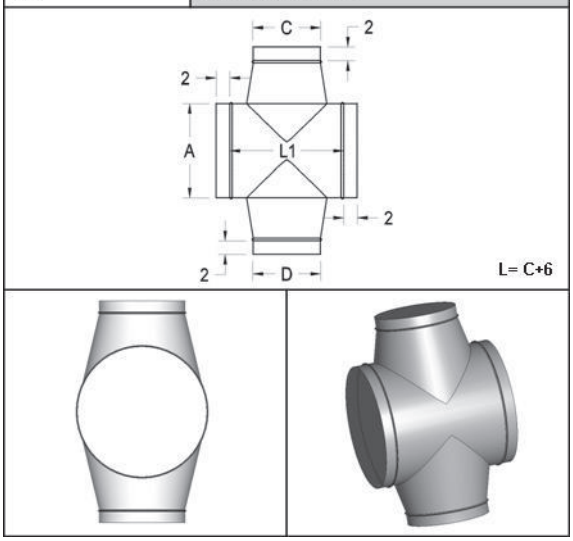
304-2b STAINLESS STEEL ROUND SUBMITTALS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	304 2B Stainless Steel – Solid Welded Seam Construction

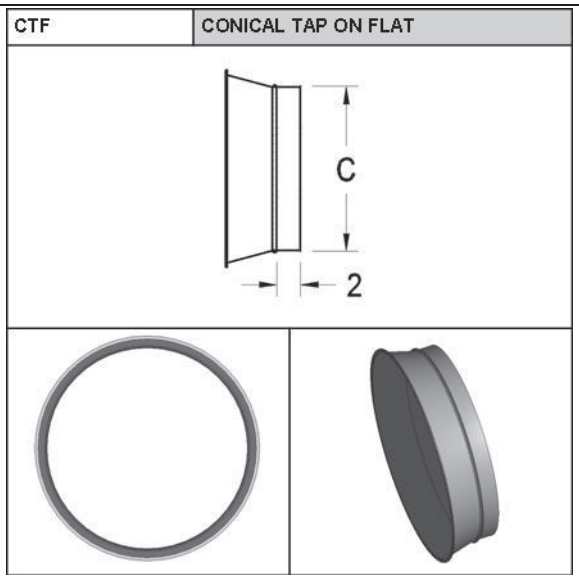
CT CONICAL TEE



CC CONICAL CROSS



CTF CONICAL TAP ON FLAT



Submitted By:	Dale Turner
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