



K-FLEX USA

INNOVATION IN INSULATION



PLUMBING

HVAC/R

COMMERCIAL/INDUSTRIAL

MARINE

OIL&GAS

ACOUSTIC

www.kflexusa.com

info@kflexusa.com

1-800-765-6475



INSTALLATION MANUAL

K-FLEX USA Insulation Products



K-FLEX USA

INNOVATION IN INSULATION

Insulating the piping of cooling, heating or air-conditioning systems requires a methodical and thorough approach, as well as the right tools to do the job properly.

K-FLEX USA's products are backed up by a comprehensive range of accessories specifically designed to help.

This manual contains information and practical tips, along with clear, step-by-step illustrated instructions to ensure you get the best results quickly and easily.

For general installation tips, K-FLEX also recommends consulting ASTM C1710, "Standard Guide for Installation of Flexible Closed Cell Preformed Insulation in Tube and Sheet Form".

GUIDE TO SYMBOLS



A blue arrow indicates parts or sections to be glued.



Green lines and arrows indicate a dimension to be measured.



A red line with an arrow indicates the direction for measuring or fitting.



A yellow line represents a measurement and its position on a sheet to be cut to size.



TABLE OF CONTENTS

INTRODUCTION: GENERAL INSTRUCTIONS	
K-FLEX USA Terms, Conditions & Warranty	4
Installation Check List (Foreman)	6
Installation Quality Audit (Engineer)	7
Job Layout / Quotation Check List	8
Insulation Products and Accessories	9
Application Techniques	10
Tools	11
Practical Tips - <i>Consult for All Applications</i>	12
SMALL DIAMETER PIPES (K-FLEX® AND CLAD® TUBES & FITTINGS)	
Pipes - Non-slit Tubes	14
Fitted Pipes - Non-slit Tubes	15
Pipes - Self-Adhesive Tubes	16
K-FLEX CLAD® Tubes	19
K-FLEX CLAD® WT/AL NS Tubes	20
Pipe Fittings - K-FIT® Factory-fabricated Tees, 90° Elbows, P-Traps, Grooved Fittings	21
90° Pipe Bends - Field-fabricated Elbows	24
K-FLEX CLAD® Elbow Covers	28
Pipe Intersections - Field-fabricated Tees	29
Curved Pipe Bends - Field-fabricated Segmented Elbows	31
Pipe Bends (>90°) - Field-fabricated Elbows	32
Stopcocks	33
Collars	34
Blocking Off Ends of Pipes	35
Pipe Hangers	36
LARGE DIAMETER PIPES / ROUND DUCTS (K-FLEX® AND CLAD® SHEETS)	
Multi-Layer Insulation	37
K-FLEX CLAD® Sheets	39
Pipe Bends	40
Pipe Intersections	42
Collars	43
Flanges	44
Stopcocks	46
Angled stopcocks	51
RECTANGULAR DUCT WRAPS (K-FLEX® AND CLAD® SHEETS)	54
DUCT LINING (K-FLEX DUCT® LINER GRAY)	56
Rectangular and Round Ducts	
TANKS	58
TECHNICAL RESOURCES	61

K-FLEX USA TERMS, CONDITIONS & WARRANTY

These are the Terms and Conditions of sale for K-FLEX USA L.L.C. and each of its divisions (Seller). There are no other terms of sale unless Seller agrees in writing to different terms with you, the "Purchaser" of Seller's products:

1. ACCEPTANCE OF ORDERS

Seller's offer to sell products to Purchaser or acceptance of Purchaser's order is expressly conditioned upon Purchaser's acceptance of these Terms and Conditions (Terms). Purchaser's acceptance, use or holding of Seller's products for 10 days after shipment also establishes Purchaser's acceptance of these Terms. Seller expressly rejects and objects to all new, different or additional terms of sale submitted by Purchaser. Seller also reserves the right to select its own customers and the right to reject any order. Affidavits or certificates of compliance must be requested when orders are placed.

2. PRICES

All prices are subject to change without notice. Unless otherwise specified, orders will be shipped and invoiced at the price in effect at the time of shipment, and price adjustments for products in transit or in Purchaser's inventory will not be allowed. Any tax or other charge on the production, sale or shipment of the products imposed by federal, state or local governmental authorities will be added to the price to be paid by Purchaser. All listed prices are in US dollars.

3. TERMS OF PAYMENT

Subject to the approval of Seller's credit department, terms of payment are those in effect for product sales as of the date of shipment. Purchaser is also responsible for amounts due under No. 11 below. Payment Terms are Net 30.

4. DELIVERY

All product sales are F.O.B. Seller's place of shipment. Seller will use commercially reasonable efforts to ship all products in accordance with published lead times set forth on Seller's current price list but shall have no liability for delivery delays. Seller shall have no liability for damage or delivery failures occurring after the product is delivered to the carrier. Purchaser is solely liable for demurrage charges assessed at the destination. Product shortages and visibly damaged or defective products must be reported to Seller within 10 days of delivery. Purchaser may not withhold payment on uncontested product deliveries.

5. TITLE AND RISK OF LOSS; SECURITY INTEREST

Title to and all risk of loss or damage to the products vests in Purchaser at the time Seller delivers the products to the carrier regardless of any shipping and insurance arrangements made by Seller on Purchaser's behalf. However, Seller reserves, until full payment is received, a purchase money security interest in each product delivered.

6. RETURNS

Product returns will be accepted only after Purchaser receives Seller's prior written approval as follows: (a) For returns authorized due to Purchaser's rightful rejection or justifiable revocation of acceptance of the products, Seller will pay for reasonable commercial charges for the product return and, in addition, will, at Seller's option, refund or credit the full purchase price upon return of the products. No request for returns based on damaged or defective products will be approved unless received within the time periods set forth in No. 4 and No. 7; (b) Where Seller determines, in its sole discretion, to accept returns for the convenience of Purchaser, the products are to be returned to the point of shipment, at Purchaser's expense, properly packed. Seller will issue a

credit for the quantity of product received at Seller's shipping point in resalable condition, as determined by Seller in its reasonable discretion, less: (i) 20% of the original purchase price for handling and reconditioning; or, if greater, (ii) the actual charges incurred.

7. LIMITED WARRANTY; SPECIFICATIONS

All products sold are subject to the following limited warranty: Seller warrants, for a period of one (1) year from the date of shipment or 90 days from the date of original installation, whichever is the shorter period of time, that:

- the product at the time of delivery is free from defects in material and workmanship and manufactured in all material respects to Seller's current written product specifications on the shipment date (General Warranty), and
- the performance of the product with respect to water vapor permeability and thermal conductivity will conform to Seller's current written product specifications on the shipment date (Performance Warranty).

Note: Seller's products may vary in details of design and construction from descriptions in any literature or from any sample, display or other model inspected by Purchaser.

The above Performance Warranty will be void if the product is not installed, used and maintained in accordance with Seller's then current product installation and maintenance instructions and recommendations (including gluing of seams, taping of exposed edges, appropriate protection in outdoor and other harsh conditions, and minimum thickness required for the intended product performance), and all other written instructions and technical specifications data sheet of Seller. Any installation instructions not clearly defined in Seller written product instructions are addressed by Seller's recommendation to abide by ASTM C1710, Installation Guide for Flexible Closed Cell Foams, and SMACNA Duct Guidelines. It is the responsibility of the Purchaser of Seller products to 1) provide the product installer with all known installation instructions and recommendations made by Seller and 2) consult Seller technical support on recommendations for the product installation for applications not referenced in Seller or approved industry written instructions. The above Performance Warranty also will be void if the product is installed using ancillary materials such as adhesives, paints, coatings or tapes that are not approved products as defined by Seller written technical specifications or installation instructions.

All statements, technical information and recommendations concerning products sold or samples provided by Seller are based upon tests believed to be reliable but do not constitute a guarantee or warranty and shall not be construed to enlarge, vary or override in any way this limited warranty. All products are sold and samples of products provided with the understanding that Purchaser, installer, specifier and owner (Owner) of the product installation location (Location) have independently determined the suitability of such products for its purposes.

Seller's obligation under this limited warranty is limited to the provision of new product materials for the repair or replacement, at Seller's sole discretion, of defective product, and is expressly conditioned upon the Owner of the Location allowing an inspection during normal business hours of the Location by Seller and its representatives upon reasonable request. Thus, Seller's only responsibility under this warranty is for the cost of manufacturing and shipping such new product materials to the Location. Seller shall have no responsibility for such new product materials after delivery to the Location or for any labor or other costs associated with the removal, repair, replacement or disposal of any defective product materials. Any product repaired or replaced by Seller



under this warranty will be subject to the warranty period remaining under the originally installed product.

SELLER DISCLAIMS ALL OTHER REPRESENTATIONS AND WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, IN FACT OR IN LAW, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. Purchaser agrees that it will not alter, amend or add to this limited warranty. If Purchaser desires to offer additional warranties or make any representation on its own, such warranties and/or representations will clearly state that they are Purchaser's additional warranties and not those of Seller. Every claim under this limited warranty shall be deemed waived (i) unless in writing and received by Seller within 10 days of delivery if visibly damaged or defective, and otherwise, within 30 days after the defect to which each claim related is discovered, or reasonably could have been discovered, but in no event longer than 1 year after product shipment or 90 days from the date of installation, whichever is the shorter period of time, or (ii) if the defective product has been discarded, destroyed or altered at the Location before inspection by Seller.

8. LIMITATION OF REMEDY

PURCHASER'S EXCLUSIVE REMEDY AND THE LIMIT OF SELLER'S LIABILITY FOR BREACH OF THE LIMITED WARRANTY SET FORTH IN No. 7, WHETHER BASED ON NEGLIGENCE, BREACH OF WARRANTY, STRICT LIABILITY, OR ANY OTHER THEORY, SHALL BE, AT SELLER'S OPTION, REPAIR, REPLACEMENT WITH A LIKE QUANTITY OF NONDEFECTIVE PRODUCT OR REFUND OF THE PURCHASE PRICE, PLUS REASONABLE COMMERCIAL SHIPPING CHARGES INCURRED FOR APPROVED RETURNS UNDER No. 6 ABOVE.

9. NO RECOVERY OF CONSEQUENTIAL OR SPECIAL DAMAGES

SELLER SHALL NOT BE LIABLE TO PURCHASER, NOR TO ANY THIRD PARTY CLAIMING THROUGH PURCHASER, FOR ANY CONSEQUENTIAL OR SPECIAL DAMAGES BASED ON NEGLIGENCE, BREACH OF WARRANTY, STRICT LIABILITY, OR ANY OTHER THEORY, FOR FAILURE TO PERFORM ITS OBLIGATIONS UNDER THIS AGREEMENT. ADDITIONALLY, CONSEQUENTIAL AND SPECIAL DAMAGES SHALL NOT BE RECOVERABLE EVEN IF THE REPAIR, REPLACEMENT OR REFUND REMEDY FOR SELLER'S BREACH OF ITS LIMITED WARRANTY FAILS OF ITS ESSENTIAL PURPOSE OR FOR ANY OTHER REASON.

10. FORCE MAJEURE

Seller shall not be liable, nor deemed in default hereunder, for any failure or delay in delivering the products or in the performance of its other obligations to Purchaser hereunder, caused by or arising out of: (a) compliance in good faith with any applicable foreign or domestic governmental regulation or order of whatever nature and whether foreign, federal, state or local; (b) all acts of God (such as, but not limited to, floods, fires, hail, or tornadoes); (c) strikes and other labor trouble; (d) delays or nonperformance by suppliers (or other third parties) of raw materials, power or other needed supplies or services; (e) delays or nonperformance by transporting carriers; and/or (f) any other cause, contingency, or circumstance not subject to the reasonable control of Seller affecting the performance of Seller's obligations hereunder. Seller shall determine in good faith the extent to which it can reasonably control a cause, contingency, or circumstance affecting its performance obligations.

11. DEFAULT

In the event of Purchaser's default, Purchaser agrees to pay all costs and expenses, including reasonable attorneys' fees or costs and expenses, incurred

by Seller in the event Seller reasonably anticipates a default by Purchaser, whether involving collecting payments due or otherwise enforcing these Terms. Purchaser also agrees to pay Seller simple interest on unpaid amounts from the payment due date at the lesser of 1-1/2% per month or the highest lawful rate.

12. SEVERABILITY

If any of these provisions are determined to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remainder of these Terms shall be unaffected.

13. ENTIRE AGREEMENT; MODIFICATION; THIRD PARTY BENEFICIARIES

These Terms and the specific order provisions contained on Seller's order set (together, this "Agreement") are the entire contract between the parties with respect to this order. This cancels and supersedes all previous agreements, confirmations, and terms of sale, oral or written. No waiver or modification of these Terms shall be binding upon Seller unless made in writing and signed by a duly authorized representative of Seller. Additional or different terms submitted by anyone other than Seller are specifically rejected and shall be deemed to be of no effect. In case of any conflict between Seller's order set and these Terms, the provisions of the order set shall control. This Agreement is not intended to confer upon any person other than the parties hereto any rights or remedies hereunder.

14. GOVERNING LAW; JURISDICTION

All matters arising out of or relating to this Agreement are to be governed by, and interpreted according to, the internal laws of the State of North Carolina without regard to its choice of law provisions. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement. The parties consent to the jurisdiction of the state and federal courts in Raleigh, North Carolina and the effectiveness of service of process by certified United States mail, in any and all disputes, whether in law or equity, arising out of or relating to this Agreement. Each of the parties hereby waives and agrees not to assert in any such dispute, to the fullest extent permitted by applicable law, any claim that (i) such party is not personally subject to the jurisdiction of such courts, (ii) such party and such party's property is immune from any legal process issued by such courts or (iii) any litigation or other proceeding commenced in such courts is brought in an inconvenient forum.

15. CONFIDENTIAL PRICING

In no event shall either party disclose the prices of any products ordered pursuant to this Agreement without the prior written consent of the other party.

INSTALLATION CHECK LIST FOREMAN

Before you start using K-FLEX USA's products, make sure you have read and understand our *Terms, Conditions and Warranty* on page 4. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

1. Review work order / specifications for areas to be insulated and materials (thicknesses) required. Layout a plan/schedule for areas to insulate first, coordinating with other trades that may be working in the area.
2. Be sure all materials (insulation and accessories, i.e. adhesives, tapes, jacketing, fittings, etc) are on site and are scheduled to be delivered at the appropriate time. Be sure all materials are stored in a clean, dry room.
3. Check materials (i.e. proper sizes and thicknesses) against what was specified. Organize insulation according to size (ID) and thickness.
4. Know job site conditions (where other trades are working, what the weather will be over the period of the job, etc). Understand access to the working area. **NOTE:** *Because of the potentially extreme environmental conditions, insulation used on outdoor applications require protection from mechanical abuse and UV resistance, i.e. coating, jacketing, or cladding.*
5. Check equipment/tools to be sure everything is in place for what is needed. This would include lifts, etc.
6. Check manpower, review experience of workers. Develop manpower allocation plan accordingly.
7. Review manufacturer's recommended installation procedures. If there are any questions, contact supplier for recommendations.
8. Check to be sure the piping system or equipment is turned off and at ambient conditions. Also, make sure it is clean and free of dirt or moisture.
9. For most applications, it is recommended to apply the fittings first (which can be purchased pre-fabricated by the manufacturer or be pre-fabricated at an offsite location) and then apply the straight runs. The straight length material is easier to place for a tight fit than the elbows. For K-FLEX CLAD®, install rubber elbows first then apply straight runs of clad tubing and then apply the clad elbows to the rubber elbows. For complex applications, contact manufacturer for recommendations.
10. Inspect workmanship as the materials are being installed. Notify appropriate personnel if problems arise.
11. At the end of each day, be sure all materials are put away in a clean, dry area and that the installed portion of the job has been appropriately sealed/closed in such a way to prevent any damage from other trades or from the weather. Make sure all cutting waste is either 1) put back in appropriate boxes to maintain size identification or 2) scrapped.
12. On cold applications, make sure that all seams are glued and sealed. Install vapor stops when needed (for details reference the "Practical Tips" section of this manual.
13. When job is finished, make a final inspection of the job.



INSTALLATION QUALITY AUDIT ENGINEER

Before you start using K-FLEX USA's products, make sure you have read and understand our *Terms, Conditions and Warranty* on page 4. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

1. Obtain a list of all areas that are specified to be insulated (including material type and thickness). Obtain a data sheet and appropriate installation instructions from the manufacturer for each material.
2. Make a preliminary inspection of the entire job. Make a list of any obvious issues that may need to be replaced, repaired or corrected. Be sure all areas called out for insulation have been insulated. Also check for overall neatness of the job.
3. Check materials used for compliance to those specified (material type, size (ID) and thickness). Material type and size can generally be found on the product box or on the insulation itself.
4. Check to be sure all seams (longitudinal, butt joints and terminations) have been sealed/closed properly (per manufacturer recommendations). Check all fittings, valves, etc to be sure the insulation is sealed properly at any termination points.
5. When checking materials, be sure there are no tears, cuts or damage to the installation that would cause performance issues. If any are found, the insulation must be repaired or replaced. None of the insulation should be wet.
6. On straight runs, seams should be facing down to reduce weight/pressure on the seam.
7. Check for appropriate jacketing, coating or mastic. **NOTE:** *For outdoor applications, all insulation must be protected, i.e. jacketed for protection from the elements and mechanical abuse.*
8. Review all hanger/strut areas to be sure they were handled according to manufacturer recommendations. The insulation should not be compressed as the thickness of the insulation should not be compromised.
9. If the system has been turned on, look for any signs of condensation or ice formation.



JOB LAYOUT / QUOTATION CHECK LIST

Before you start using K-FLEX USA's products, make sure you have read and understand our *Terms, Conditions and Warranty* on page 4. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

1. Review all pipe temperatures to be sure they are consistent with insulation use temperatures. Consider any pipe temperature cycling and/or yearly maintenance that may affect pipe temperatures.
2. Determine insulation thickness based on design conditions and expected benefit from insulation.
3. Review element conditions (UV, chemical contact, mechanical abuse, etc) to determine proper jacketing / protective covering / coating for the insulation.
4. When deciding on the insulation configuration/style, consider the following:
 - a) Method of installation, i.e. slide-on, slit, and glue.
 - b) Trade-off between labor and cost of materials, i.e. self-seal products cost more but install faster (saving labor).
 - c) Trade-off between labor and product performance, i.e. factory-fabricated fittings may cost more in material cost, but save labor and guarantee performance.
 - d) Trade-off between upfront material cost and maintenance costs down the road, i.e. Clad products cost more than the Protective Coating, but require less maintenance down the road.
 - e) Consider the configuration of the item to be insulated, i.e. is the duct round or square, or will you be going around the surface as in a valve or boxing it in.
5. Layout job in a manner to eliminate seams as much as possible. If using multiple layers to achieve thickness, then stagger the seams.
6. When deciding on how to achieve the desired thickness, consider the bending radius of the material, the ability of the seams to be closed, the length of the rolls so as to eliminate seams in the outer layer, and the most cost effective way to achieve the desired thickness.
 - a) 2" thick insulation sheets are stiff and difficult to close the seam when wrapping a pipe. For this reason, K-FLEX recommends applying 2" thick sheets on pipes or round ducts that are greater than 18" in diameter. Multiple layers should be used for pipes or round ducts less than this size. As a general rule of thumb, factory-applied K-FLEX CLAD® (AL or WT) sheet products are to be used only for rectangular ducts. On jobs with pipes or round ducts, K-FLEX CLAD® jacketing should be field-applied to the insulation as described in this manual to better handle the expansion/contraction cycles of the elastomeric insulation.
 - b) It may be more cost effective to go with two (2) layers rather than one (1) 2" thick layer (material cost of a 1½" layer and ½" layer would be much less than one (1) 2" layer. Also, the short rolls on 2" thick would make for more seams whereas with two (2) layers you can stagger the seams.
 - c) For pipe sizes below 5" IPS, K-FLEX recommends using tube insulation to prevent the tension and stress cracking that can occur when using sheet insulation on smaller pipe sizes.
7. Consider the time frame the job has to be completed in.
8. If the time window is small, as in maintenance during a plant shutdown, you may want to consider using self-seal products and factory-fabricated fittings because of the time saved even though the materials may cost more.
9. Consider the availability of materials to be sure they can be delivered to the job in time.
10. Consider the availability of labor and the skill of the labor pool as this may make a difference in the choice of materials.
11. Consider how important aesthetics are for the job.

INSULATION PRODUCTS AND ACCESSORIES

K-FLEX USA manufactures flexible, closed-cell elastomeric foam insulation in tubes and sheets. Self-adhesive versions are also available.

When tubing has to be cut for application purposes, thermal insulation properties are maintained using K-FLEX® Contact Adhesive. With large diameter pipes or conduits, elastomeric sheets, which can be cut to size, are applied. For technical information and details

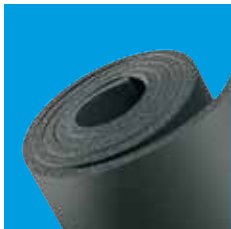
of sizes available, please refer to the individual specification sheets available at www.kflexusa.com. K-FLEX USA recommends that installation be carried out to the highest possible standards to optimize the insulation effectiveness.



TUBING



PRE-CUT
SELF-ADHESIVE
TUBING



48" wide ROLL/SHEET



48" wide ROLL/SHEET
with PSA



K-FIT® FITTINGS Factory-fabricated elbows, tees and p-traps in the thickness and diameter required.



K-FLEX INSULATED PIPE SUPPORTS
Specifically designed to ensure that thickness of the insulation is maintained, especially at fixed points.



K-FLEX® CONTACT ADHESIVES

K-FLEX® Contact Adhesive is specifically designed for use with K-FLEX products and provides secure bonding. The glue hardens when dry, making it resistant to aging and weather.



K-FLEX® 374 PROTECTIVE COATING

K-FLEX® 374 Protective Coating is an acrylic paint that protects insulation both indoors and outdoors. The paint is environmentally safe and odorless, making it particularly suitable for use in confined spaces. It gives a professional, durable finish. It dries rapidly and provides excellent coverage. When used as a primer, subsequent layers of white paint retain their color even when applied over dark substrates. Colors are fade resistant.



K-FLEX® ELASTOMERIC FOAM TAPE

1/8" thick, 2" wide, self-adhesive insulating tape for covering gaps or sealing insulated sections.



K-FLEX GLUE DISPENSER

Eliminates the need for continuous dipping of the brush in the can. The controlled flow of the adhesive allows for proper and regular distribution to the application surface.

APPLICATION TECHNIQUES

Before starting, choose the right type of K-FLEX insulation (thickness and size) for the application. For more information, reference *Technical Bulletins* at www.kflexusa.com.

CLEAN SURFACES

The surfaces to be glued must be clean and free of grease. Ensure that the surface of the K-FLEX insulation is also clean, otherwise it will not stick properly.

COATED SURFACES

Where surfaces have previously been painted, ensure that the contact adhesive is compatible and will adhere to the paint. Do not use the contact adhesive on surfaces that have been treated with products containing asphalt, bitumen or linseed oil. Use only chrome-zinc rust inhibitors and removers.

REFRIGERATION & AIR CONDITIONING APPLICATIONS

Treat steel surfaces with rust inhibitor prior to applying insulation. Paint should be left for a minimum of 24 hours to dry. Take special care when applying adhesive to critical areas such as curved sections, flanging and support brackets. Ensure that the ends of the insulating material are always firmly attached to the piping. Do not apply insulation where parts are too close together, as this will result in the insulation becoming compressed and losing some of its properties. When carrying out particularly complicated installations on nickel steel, contact K-FLEX USA's Technical Support.

USING CONTACT ADHESIVE

An effective adhesive must be able to moisten and stick to the bonding surfaces ("*adhesion*"), and it must have adequate internal strength between molecules ("*cohesion*"). The surface must be clean, because if it is not, the molecules are not able to come close enough to each other for adhesion to occur. ***It is critical that the adhesive is applied thinly and evenly.***

Application Temperatures: Adhesives must be applied between +40°F and +100°F. At temperatures below +40°F, the latent heat of the adhesive can lead to an increase in the formation of condensation on the surfaces to be bonded or the adhesive film. In these circumstances adhesion is hardly, or not at all, possible. The adhesive should also be stored at +60°F.

Cold Weather Installation: If contact adhesive is to be used in cold weather, it is critical that the installer understands the effect of temperature on flash time. Decreased temperatures extend the time required for a solvent to flash and very low temperatures prevent any flashing of the solvent from occurring. In extreme conditions it will be necessary to keep the temperature of the adhesive warm.

Preparation And Storage: Before use, stir the K-FLEX® Contact Adhesive thoroughly. To store, close the lid tightly to prevent the solvents from evaporating. If the contact adhesive becomes too hard (eg. when stored in contact with the air or in extreme

temperatures), it must be discarded. Do not thin the glue.

Method Of Application: When using a large quantity (eg. 1 gallon), pour a small amount out into a separate container and top off when necessary. When applying K-FLEX insulation to metallic or other surfaces, K-FLEX® Contact Adhesive must first be applied to the insulation, then to the corresponding surface.

Conditions For Use: Do not apply to systems that are in use. Do not use in sunlight. The insulation should be left to dry for 36 hours before turning the system back on. The ideal working temperature of the glue is 70°F. Do not use contact adhesive at temperatures below +40°F as drying times are excessive. At temperatures above +90°F, the contact adhesive dries quickly. **CURING TIME:** 36 hours; **STORAGE:** in cool conditions, 60°F - 80°F; **SHELF LIFE:** one year (6 months for K-FLEX® 720 LVOC); **QUANTITIES USED:** with insulation sheets, from 200 sqft/gallon.

Brush/Roller Applied Adhesives: Container contents must be mixed well. Apply at temperatures above +40°F. Coat BOTH surfaces to be joined with an adequate but thin, even coat. Allow adhesive to dry to the touch, approximately 3-10 minutes, depending on ambient conditions. Join surfaces with moderate pressure to ensure complete contact and elimination of air pockets. Joined surfaces cannot be repositioned. Allow bond to set at least 24 hours before bringing pipes or equipment to service temperature.

Spray Applied Adhesives: For best results, coat BOTH surfaces to be joined. Always evaluate bonding in the shop before proceeding with a one sided application method. Refer to manufacturer's operation instructions. Apply at temperatures above +50°F (***do not warm above +120°F***). Hold tip of spray gun eight inches from substrate and pull back on trigger to start flow of adhesive. Proper coverage is best achieved by spraying six to eight inch-wide patterns along width of substrate and releasing trigger. Overlap spray patterns by one inch. Repeat these steps until 100% coverage is attained. Depending on ambient conditions, allow 2-5 minutes for adhesive solvent to flash. Join surfaces with moderate pressure to ensure complete contact and elimination of air pockets. A hand roller is recommended to apply even pressure. Joined surfaces cannot be repositioned. Allow bond to set at least 24 hours before bringing system to service temperature.

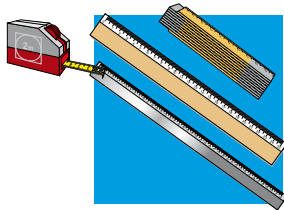
Hot Melt Adhesive Application: For seams and butt joints, a hot melt glue gun is typically used. All guns are available with a variety of applicator tips. Hot melt adhesives are best applied in a thin layer rather than a "glob".

USING K-FLEX® 374 PROTECTIVE COATING

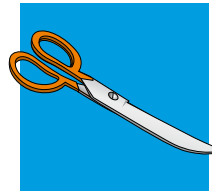
K-FLEX® 374 Protective Coating can be applied as soon as K-FLEX® Contact Adhesive has dried. Paint within two weeks of installing.

TOOLS

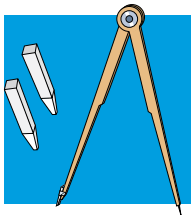
A selection of good tools is essential for carrying out jobs to the highest standards.



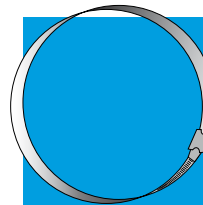
RIGID AND FLEXIBLE TAPE MEASURE
for measuring and tracing lines to cut.



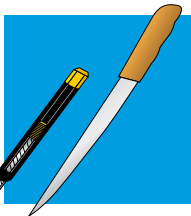
SCISSORS
for cutting insulation.



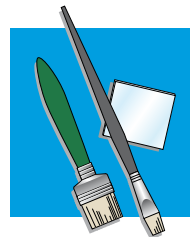
CHALK AND COMPASS
to draw reference lines for measurements and cuts.



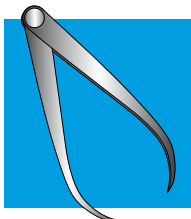
METAL BAND
to help cut insulation sheets at the end of large diameter pipes.



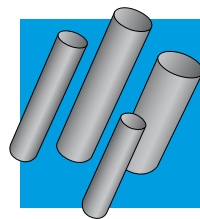
CUTTERS AND KNIVES
use both long and short bladed knives, with spare blades.



BRUSHES (VARIOUS) AND FLEXIBLE SPATULA
for spreading contact adhesive and coating.



CALLIPER
for measuring the external diameter of surfaces to be insulated.



CIRCULAR PUNCHES
with a cutting edge to make holes in the insulation in a range of sizes.

PRACTICAL TIPS

Many tasks performed when insulating a system are repetitive. We have attempted to provide examples which can help bring optimum results quickly, saving time and effort. Three basic concepts should be followed with all products:

1. Properly size the insulation.
2. Push, don't pull the insulation.
3. Seal all seams, butt joints, termination points and open ends. Install vapor stops when needed.

K-FLEX USA recommends that the temperature of the air and of the insulation be between 40°F and 100°F at the time of installation.

1. PROPERLY SIZE THE INSULATION

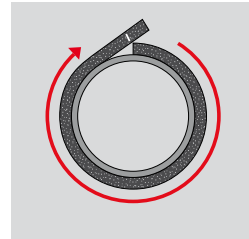
Pipe insulation I.D.'s are designed so that the insulation will slide easily over piping and most fittings. Properly sized pipe insulation is loose, not snug on the pipe. For pipe sizes below 5" IPS, K-FLEX recommends using tube insulation to prevent the tension and stress cracking that can occur when using sheet insulation on smaller pipe sizes.

FITTING CHART			
INSULATION NOMINAL I.D.	COPPER TUBE SIZE (NOM. I.D. PLUMBING)	COPPER TUBE (O.D. HVAC/R)	IPS NOMINAL
1/4"	-	1/4"	-
3/8"	1/4"	3/8"	1/8"
1/2"	3/8"	1/2"	1/4"
5/8"	1/2"	5/8"	3/8"
3/4"	5/8"	3/4"	1/2"
7/8"	3/4"	7/8"	-
1-1/8"	1"	1-1/8"	3/4"
1-3/8"	1-1/4"	1-3/8"	1"
1-5/8"	1-1/2"	1-5/8"	1-1/4"
1-1/2" IPS	-	-	1-1/2"
2-1/8"	2"	2-1/8"	-
2" IPS	-	-	2"

Items may fit loosely. Air space between layers of insulation will not adversely affect performance as long as butt joints are properly sealed.

MEASURING A CIRCUMFERENCE

The measurement is obtained by using a strip of K-FLEX material of the same thickness as the insulation to be installed. This gives you the measurement of the circumference, including the thickness of



the insulation itself. **Do not stretch the strip** when encircling the pipe, as this will alter the measurement. Mark the strip with chalk where the two edges overlap.

2. PUSH, DON'T PULL THE INSULATION

When installing the product, it is important not to stretch the insulation: it should be pushed rather than pulled. All butt joints should be fitted under compression to insure proper adhesion.

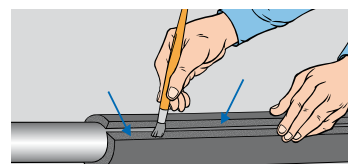
3. SEAL ALL SEAMS, BUTT JOINTS, TERMINATION POINTS AND OPEN ENDS

Using simple installation techniques, it is easy to seal the entire system, which is critical for condensation control applications. All seams, butt joints, cutouts and termination points shall be sealed with a manufacturer's approved adhesive to prevent air / moisture intrusion.

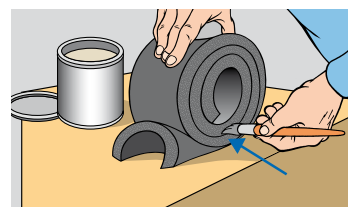
For below-ambient applications, install vapor stops at all insulation terminations or interruptions, such as at supports, valves and flanges by adhering the insulation directly to the pipe using a 2 inch (50mm) strip of contact adhesive or sealant to maintain closure. Insulation tape can also be used for this purpose. On straight runs, install vapor stops every 18 ft (5.4m) to minimize moisture problems if they occur.

GLUING THE EDGES OF A TUBE CUT ALONG ITS LENGTH

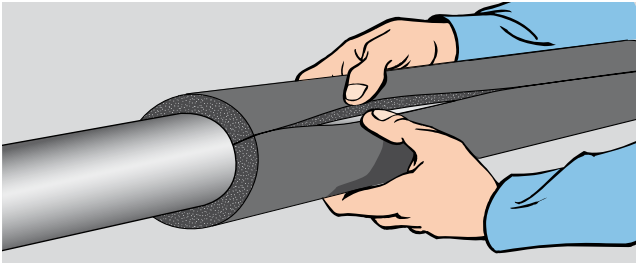
To glue the edges, wrap the tube around a larger diameter pipe so that the edges do not overlap and apply the glue. Then slide the tubing over the pipe to be insulated, taking care to keep the edges



from sticking before the tube is in place.



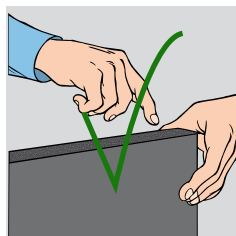
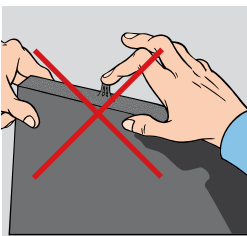
If the tube is not very long, or is not very thick, it can be rolled up and glued. This way, the tube can be quickly and easily applied to the pipe.



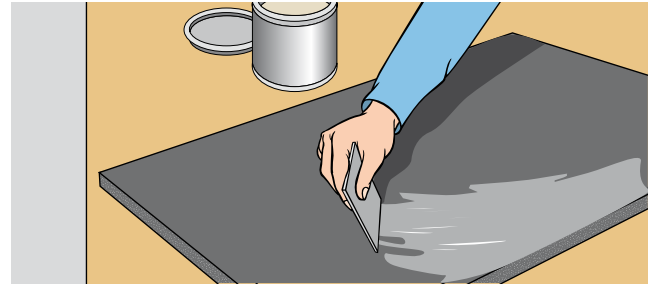
When attaching the two surfaces, press them together firmly with your fingers, starting at the far ends, moving towards the center and finishing along the intermediate points to avoid an irregular joint.

GLUEING THE EDGES OF A K-FLEX® SHEET

When insulating large diameter pipes, sheets should be cut to the appropriate length and both edges glued. For the best results, a thin, even layer of K-FLEX® Contact Adhesive should be applied using a brush with short, hard bristles.

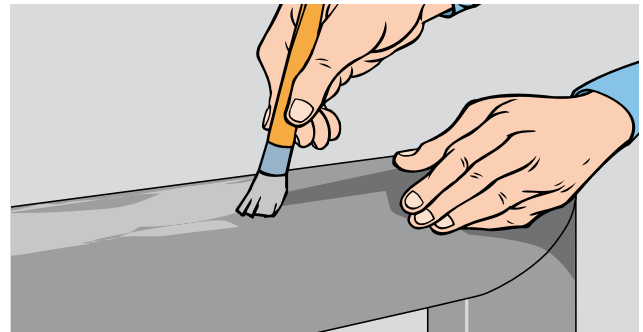


After spreading the glue, ensure that it has dried properly before attempting to stick the edges together. The best test is by touching the surface with your finger: if K-FLEX® Contact Adhesive no longer sticks to your finger forming threads, it is ready to be positioned.



Use a straight-edged squeegee to spread the glue over larger areas. If the whole surface is to be insulated, first apply the glue to the K-FLEX® sheet, then to the surface it is to be stuck to. When the glue has dried sufficiently, apply the sheet to the surface.

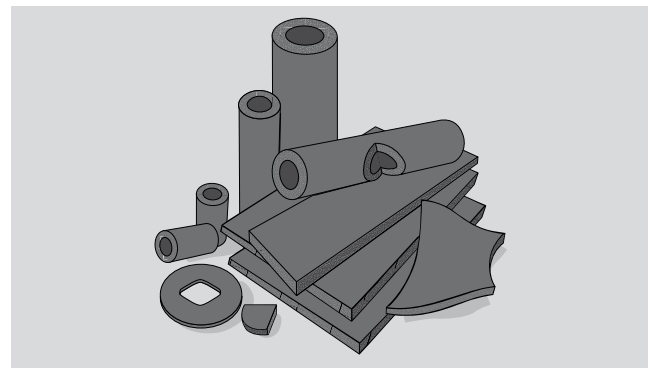
PAINTING INSULATION



PAINTING INSULATION FOR OUTDOOR APPLICATIONS

We recommend painting insulation for outdoor applications with K-FLEX® 374 Protective Coating to protect it from the weather and UV rays. To complete the protection, apply two layers for the top coat. Allow at least 36 hours (or a maximum of five days) between the first and second coats. An extra layer of coating should be applied every two years. A more permanent solution for outdoor applications is K-FLEX CLAD®.

USING OFF-CUTS

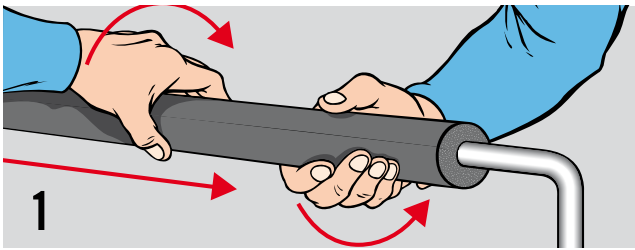


Off-cuts from K-FLEX® tubes and sheets can be re-used when filling in gaps, or where smaller quantities of material are required.

SMALL DIAMETER PIPES K-FLEX® NON-SLIT TUBES

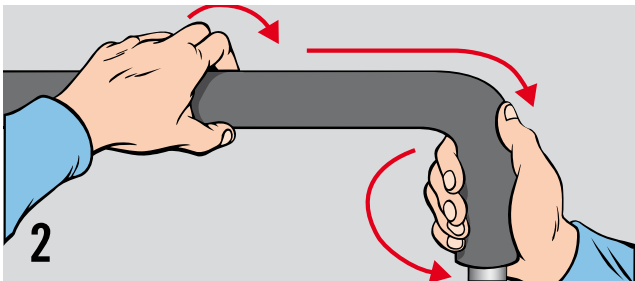
For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference "Practical Tips" on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

When possible, piping should be insulated before installed. This simplifies the task and saves time, taking advantage of the elastomeric product's flexibility.

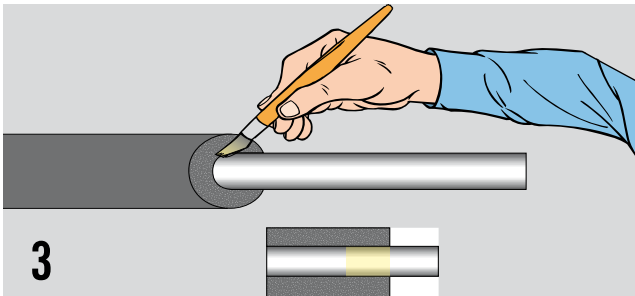


PIPES TO BE INSULATED

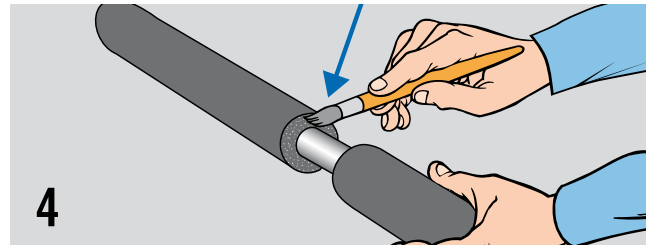
Slide the K-FLEX tube directly over the pipe from one end.



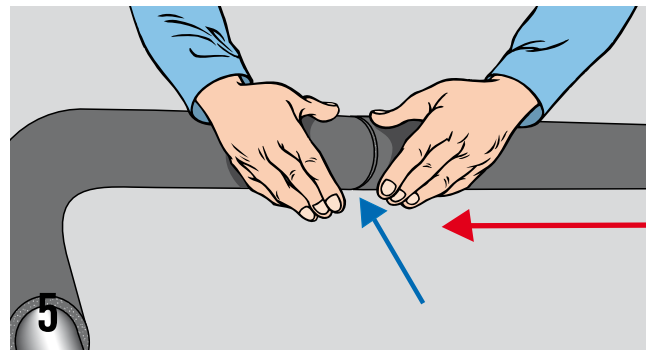
Do not force the tube while installing as this will deform the material. Instead push it smoothly without exercising undue pressure. This will ensure that it grips to the surface of the pipe naturally, especially around curved sections.



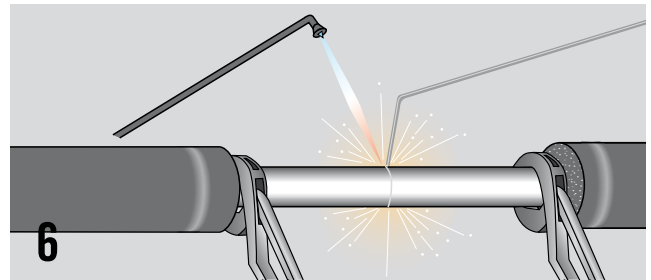
When a section of tubing has been positioned satisfactorily, stick at least one end to the pipe with K-FLEX® Contact Adhesive.



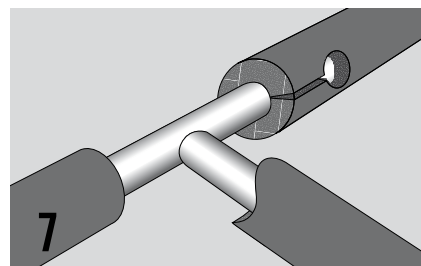
Apply glue to the edge of the tubing already in place and the edge of the next section of tubing to be positioned.



Bring the edges of the tubing to be glued together and press tightly.



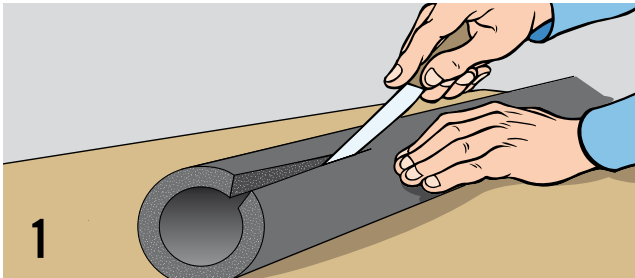
If the underlying pipe has to be brazed, free an area of 1 foot between the part to be soldered and the edge of the tubing. Once the pipe has cooled, the insulation can be completed.



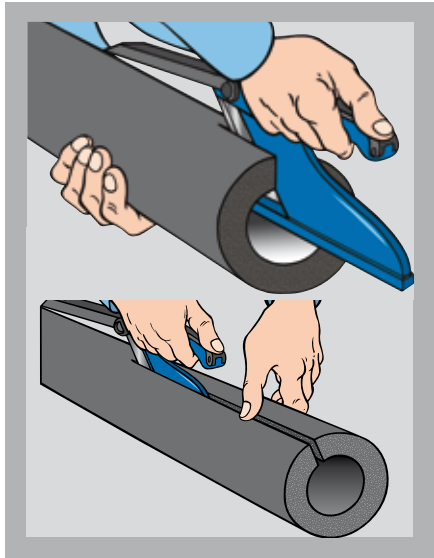
Test for strength around critical stress points in the pipes, such as elbow joints, branches or stopcocks, before gluing the tubing around them.

SMALL DIAMETER FITTED PIPES K-FLEX® NON-SLIT TUBES

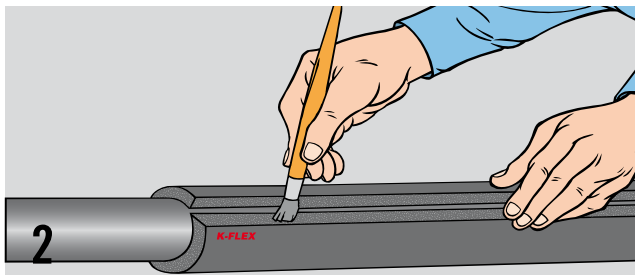
For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



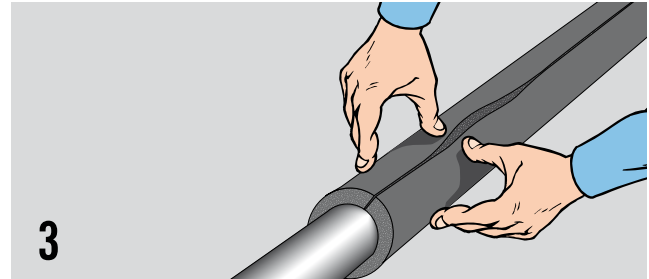
If the piping has already been installed, the K-FLEX® tubing must be cut along its length to fit it.



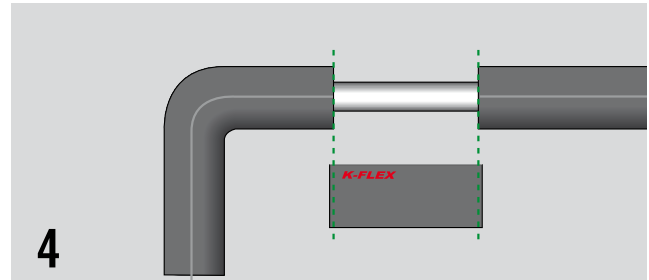
Use only the sharpest knife for cutting - this makes gluing easier.



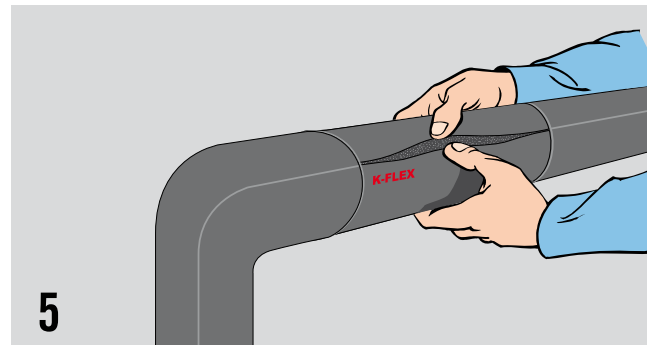
Position the tube so that the edges are separated, and apply an even layer of K-FLEX® Contact Adhesive.



Once the glue has dried, reseal the tube, pressing the edges firmly together.



When making a joint between two lengths of tubing, cut the insert a little longer than necessary (1/8”). If the insert is not long enough, the insulating properties in that area will be reduced.



Cut the insert along its length and glue into place.

PRACTICAL TIPS: SMALL DIAMETER PIPES

(K-FLEX® SELF-ADHESIVE TUBES)

Many tasks performed when insulating a system are repetitive. We have attempted to provide examples which can help bring optimum results quickly, saving time and effort. Three basic concepts should be followed with all products and ten basic concepts should be followed when using K-FLEX Self-Adhesive Tubes:

- Properly size the insulation.
- Push, don't pull the insulation.
- Seal all seams, butt joints, termination points and open ends. Install vapor stops when needed.

1. K-FLEX USA recommends that the temperature of the air and of the insulation be between 40°F and 100°F at the time of installation.

2. PUSH, DON'T PULL THE INSULATION

When installing the product, it is important not to stretch the insulation: it should be pushed rather than pulled. All butt joints should be fitted under compression to insure proper adhesion.

3. SEAL ALL SEAMS, BUTT JOINTS, TERMINATION POINTS AND OPEN ENDS

Using simple installation techniques, it is easy to seal the entire system, which is critical for condensation control applications. All seams, butt joints, cutouts and termination points shall be sealed with a manufacturer's approved adhesive to prevent air / moisture intrusion.

For below-ambient applications, install vapor stops at all insulation terminations or interruptions, such as at supports, valves and flanges by adhering the insulation directly to the pipe using a 2 inch (50mm) strip of contact adhesive or sealant to maintain closure. Insulation tape can also be used for this purpose. On straight runs, install vapor stops every 18 ft (5.4m) to minimize moisture problems if they occur.

4. Contact adhesive is the preferred method used to adhere butt ends of tubular insulation to each other. The solvent portion of the contact adhesive must be allowed to flash off completely before two materials may be joined. This is especially important when adhering closed- cell foam insulations since solvents, which have not flashed off completely, will be trapped under the impermeable surface, preventing further flashing. The contact adhesive will therefore remain soft, never cure, and may fail when force is applied to separate the two surfaces.

5. If contact adhesive is to be used in cold weather, it is critical that the installer understand the effect of temperature on flash time. Decreased temperatures extend the time required for a solvent to flash and very low temperatures prevent any flashing of the solvent from occurring. In extreme conditions, it will be necessary to keep the temperature of the adhesive warm.

6. If self-seal insulation products are to be installed in cold weather, it is critical that the installer understands the relationship between temperature and the pressure required for proper sealing. It is beneficial to insure the insulation is warmed prior to installation at lower temperatures. It is recommended that the insulation be stored in a heated room or trailer until immediately prior to installation.

7. Temperature - PSA is temperature sensitive. PSA works best when the air and substrate temperatures are 50°F and above. PSA can be installed down to 40°F, but it will take significantly more pressure to obtain a good bond.

8. A PSA softens and becomes tacky as it is exposed to higher temperatures. Conversely, a PSA hardens and tackiness decreases when it is exposed to lower temperatures.

9. The optimum installation temperature for the pre-applied PSA on the longitudinal seam is approximately 75°F. A simple rule of thumb for estimating the pressure required for proper sealing of the longitudinal seam is to double the pressure for every 10°F drop in temperature. As shown in the following table, 8X as much pressure is required when PSA is installed at 45°F as would be required if PSA were installed at 75°F.

Temperature	Relative Pressure Required
75°F	1X
65°F	2X
55°F	4X
45°F	8X
55°F	16X

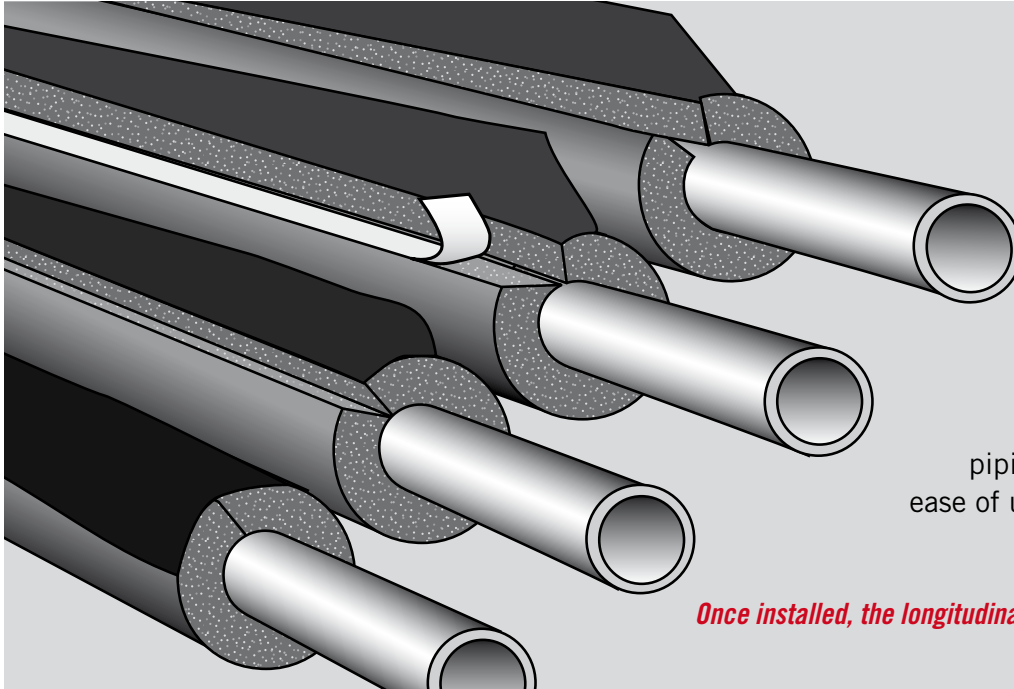
10. Self-sealing insulations should never be utilized at temperatures below 40°F due to excessive pressure requirements.

The installation environment must be clean, dry and heated if below 40°F Ambient.



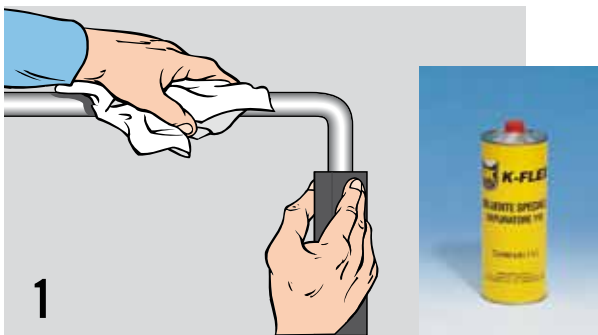
SMALL DIAMETER PIPES (K-FLEX® SELF-ADHESIVE TUBES WITH OVERLAP)

For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on pages 12-13 and 16 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

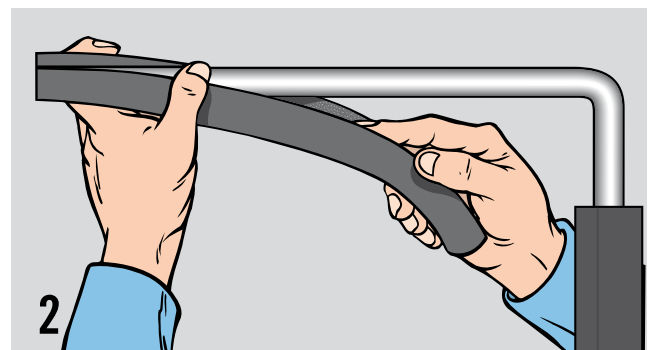


K-FLEX® self-adhesive insulation is useful in situations where the piping is already installed. Its ease of use increases the speed of installation.

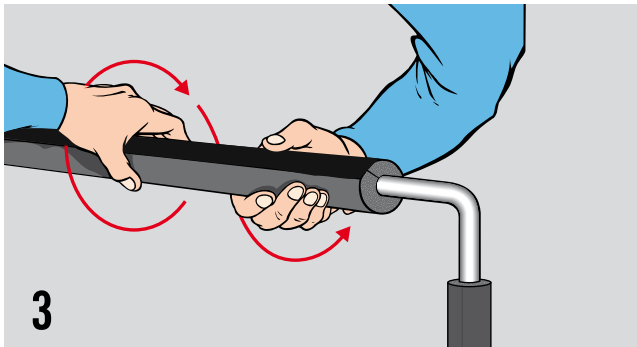
Once installed, the longitudinal seam must be facing down on the bottom of the pipe.



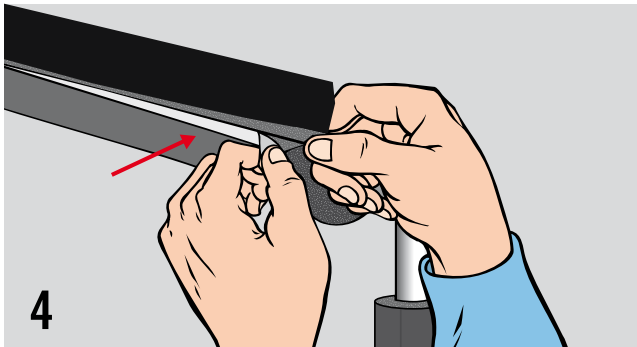
1 Make sure that the surfaces to be insulated are perfectly clean, grease-free and dry.



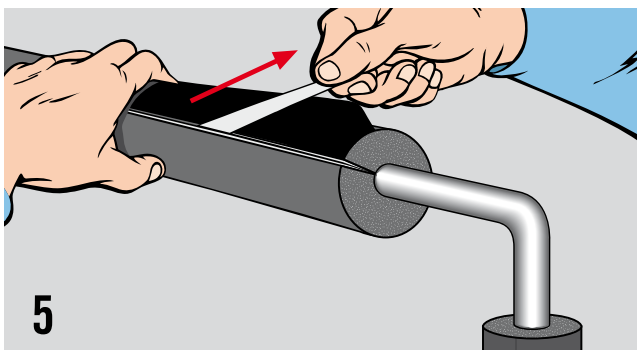
2 The pre-cut feature allows the tube to be positioned easily.



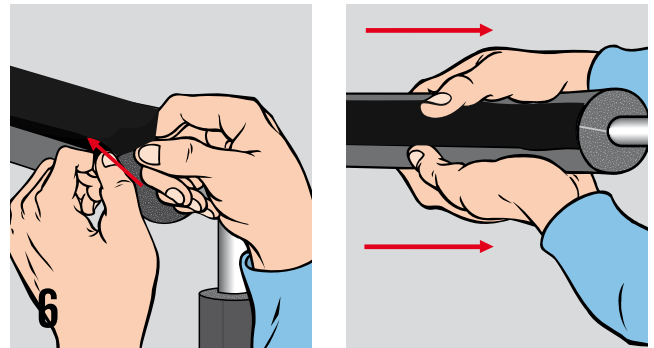
Line the edges up and straighten the tubing.



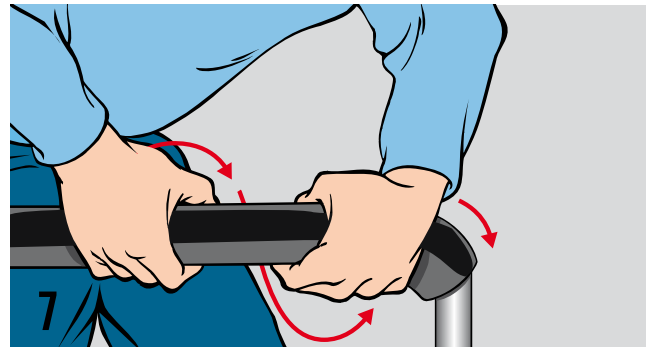
Lift the end of the adhesive strip and remove it.



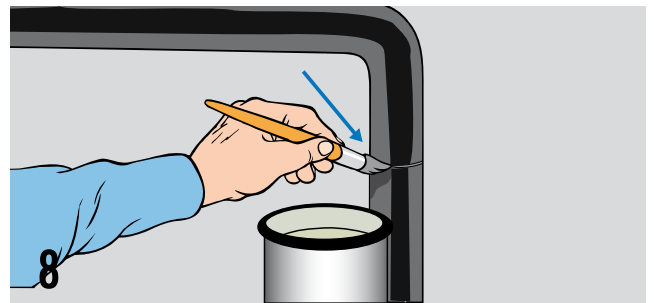
Touch the two cut edges together to match correctly to allow definitive adhesion. Press the two edges together, first from the far ends, towards the center to form a neat seal without puckering.



This product is fabricated with an overlap tape* for the self seal seam. To properly complete the seam and protect from opening: Gradually remove the clear release liner from one end of the overlap tape, sealing the tape to the end of the elastomeric pipe. Proceed down the length of the pipe, removing release liner while smoothing and sealing the overlap tape to the elastomeric pipe. Apply firm and even pressure along the entire length. ***Make sure the tube is positioned with the longitudinal seam facing downward.***



To avoid the tube from becoming deformed while pushing it along the piping, position it without forcing. Use K-FIT® Prefabricated Elbows and apply K-FLEX® Contact Adhesive to properly insulate the corner.



Once the tubing is in place, attach it to the adjacent section of tubing using K-FLEX® Contact Adhesive.

*The overlap seam is not available in tubes of 3/8" thickness or smaller.

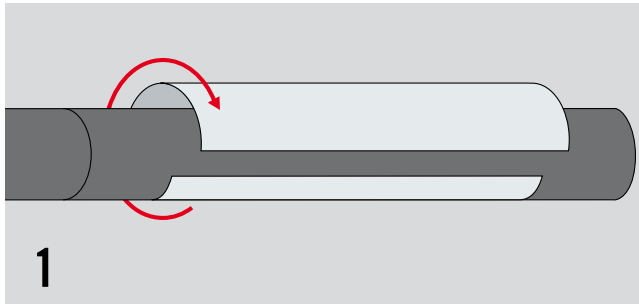
K-FLEX CLAD® TUBES (SMALL DIAMETER PIPES)

Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

K-FLEX CLAD® RIVET TOOL ACCESSORIES



Plastic awl and rivets



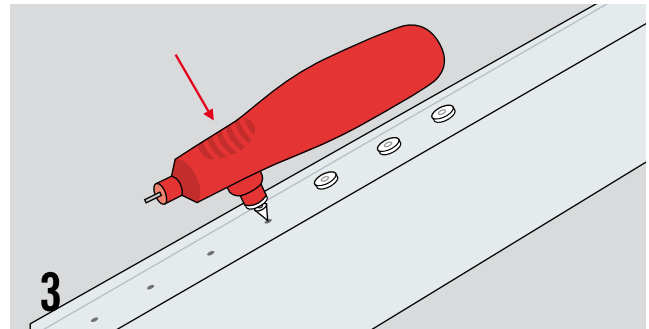
1

Wrap the K-FLEX CLAD® tube insulation around the pipe. Remove liner from the insulation by pinching the release liner and peeling the liner to expose the PSA. Seal ends first and work towards center.



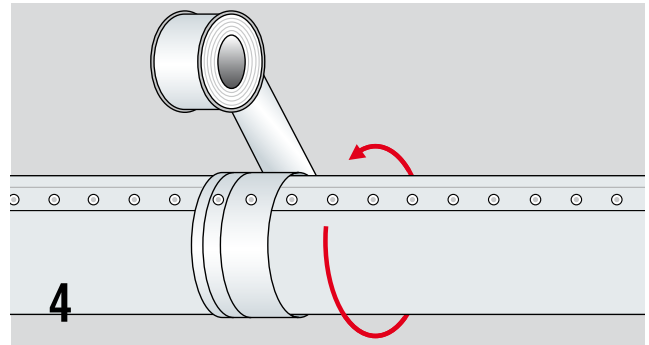
2

Remove release liner from insulation seam. The K-FLEX CLAD® surface must be clean and dry. Peel back the release liner from the overlap seam and apply uniform pressure to seal flap. Start at center and work towards ends.



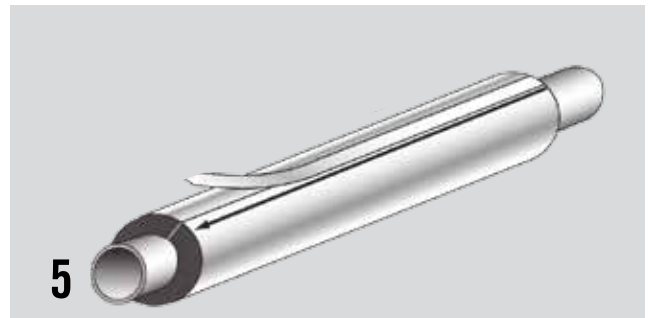
3

Apply mechanical fasteners (K-FLEX® Rivets). Apply 5 rivets for every 3' length (leaving no greater than 9" between rivets) and insert approximately 1/4" from the longitudinal edge.



4

Use 2" wide K-FLEX CLAD® Tape (included in the box) to cover butt seams. Apply even pressure and complete installation by inserting 2 mechanical rivets on the overlap area (1 on the tube and 1 on connecting tube).



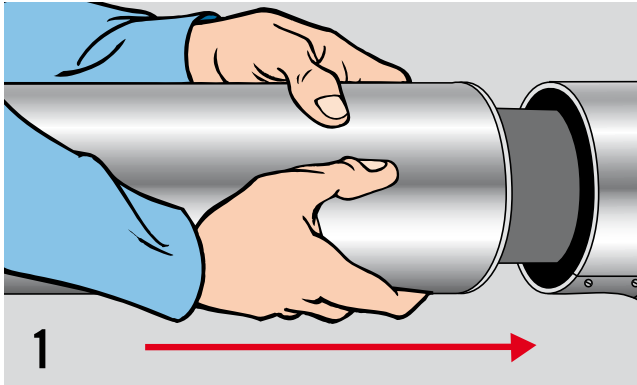
5

Apply K-FLEX CLAD® Tape on the longitudinal seam to cover mechanical fasteners and achieve finished appearance. Go over tape with a plastic squeegee to eliminate wrinkles and air pockets. If the tube is in a horizontal position, position the tube so that the longitudinal seam is facing downward.

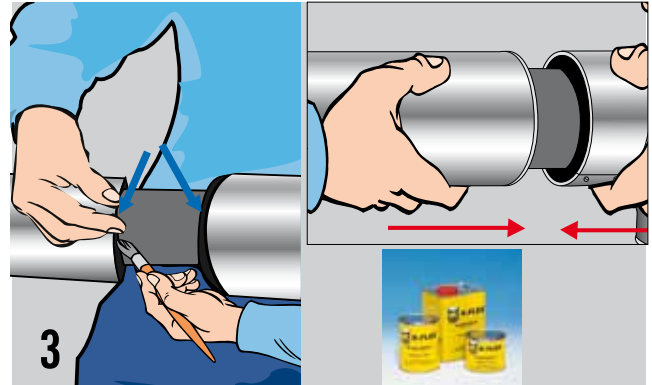
For applications subject to heavy moisture, such as wash down areas, K-FLEX recommends caulking all seams. Call K-FLEX technical support for more information.

K-FLEX CLAD® WT/AL NS (NON-SLIT) TUBES (FOR SLIDE-ON APPLICATIONS, SMALL DIAMETER PIPES)

NOTE: Before you start, thoroughly clean pipe to rid surface of dirt, grease and oil. Lay out insulation materials in a clean area. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference Technical Bulletins at www.kflexusa.com.

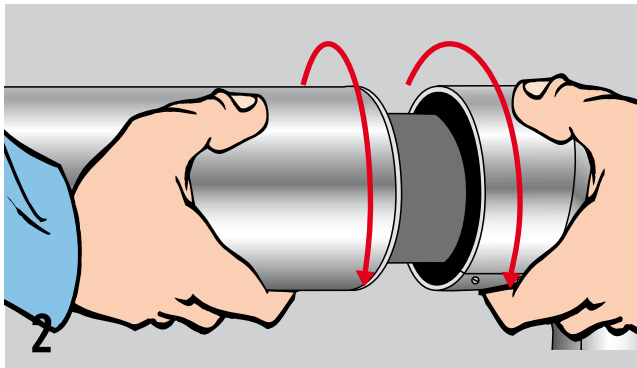


Slide tubing down pipe. Tubing will slide down with ease as the I.D. is designed to be slightly larger than the corresponding copper pipe. Slide all tubing onto pipe, leaving 1-2” in between sections to allow for adhesive application.

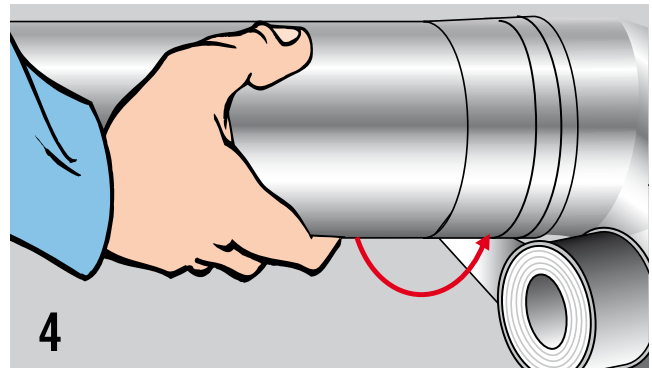


To seal butt seams, apply appropriate K-FLEX® Contact Adhesive* on complete elastomeric surface perimeter on both ends of tubing. Allow adhesive to become tacky and apply pressure by pushing tubing together to maintain vapor barrier and appearance.

Repeat this step for all connecting tubes.



Rotate all tubes so seam is facing down away from excess UV exposure and abuse.



Apply K-FLEX CLAD® Tape (tape strips included in box) to all butt seams after they have been sealed with contact adhesive. Align the tape with the longitudinal overlap seam, make sure tape is lined up straight and wrap the tape around the entire tube, applying pressure as you remove the PSA release liner to create a water-tight application. **NOTE: The K-FLEX CLAD® butt strip should be centered so that it overlaps the O.D. ends of both adjoining pipes.**

Repeat this step for all connecting tubes.

For applications subject to heavy moisture, such as wash down areas, K-FLEX recommends caulking all seams. Call K-FLEX technical support for more information.

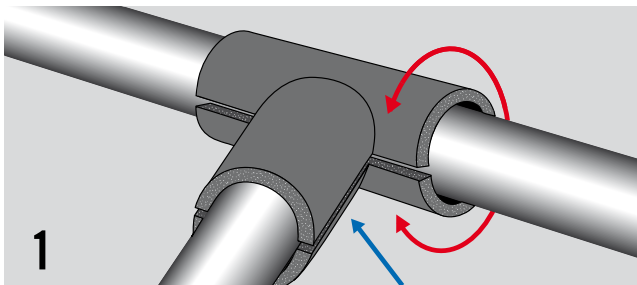
PIPE FITTINGS K-FIT® FACTORY-FABRICATED FITTINGS

For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

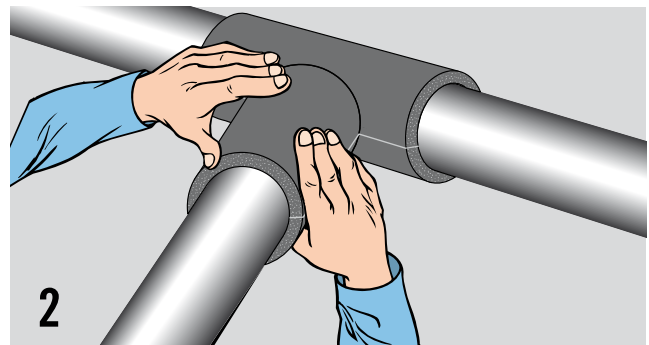


K-FLEX USA offers pre-fabricated K-FIT® Fittings in various thicknesses and diameters to simplify applications through considerable savings on time and material. K-FIT® Fittings are mechanically modeled under a high level of precision that gives an excellent fit.

K-FIT® TEES



1
Position the correct size “Tee” on the cross piping, after applying K-FLEX® Contact Adhesive to the inner edges to be bonded.

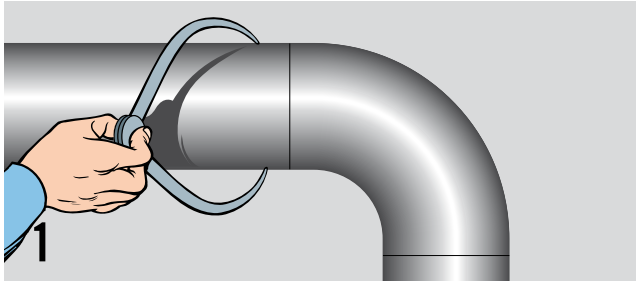


2
Join the glued edges by applying pressure.

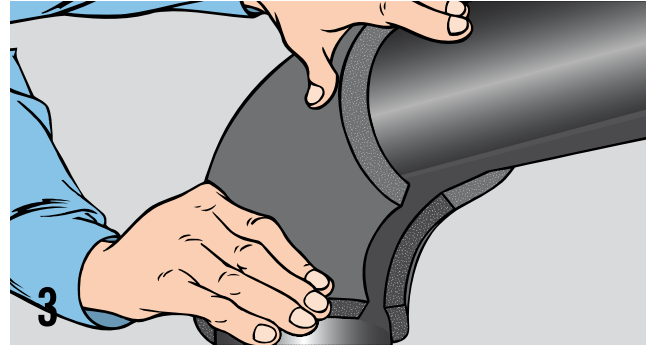


PIPE FITTINGS K-FIT® FACTORY-FABRICATED FITTINGS

K-FIT® ELBOWS



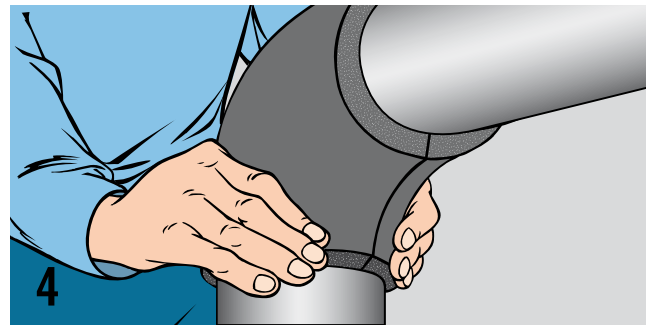
Measure the diameter of the piping to be insulated and choose the appropriate K-FIT® Fitting from a K-FLEX distributor.



Position the K-FIT® Elbow on the curve to be insulated.

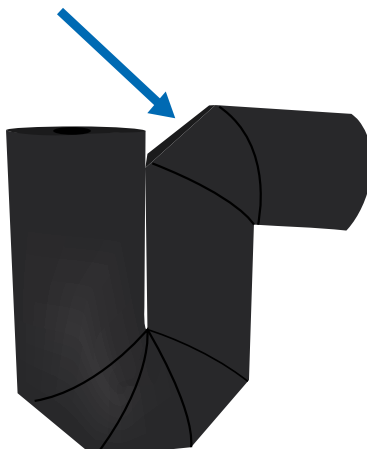


Use K-FLEX® Contact Adhesive to glue the inside edges of the K-FIT® Fitting.



Bond the glued edges together by applying pressure.

K-FIT® P-TRAPS

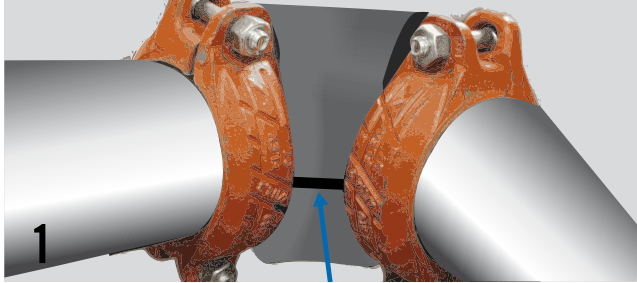


1. Slit the K-FIT® P-Trap and position the correct size P-Trap on the pipe after applying K-FLEX® Contact Adhesive to the inner edges to be bonded.

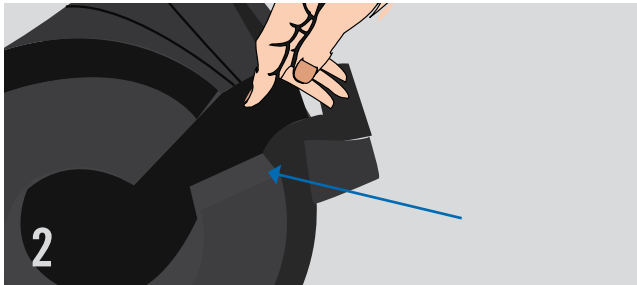
2. Join the glued edges by applying a firm pressure.

PIPE FITTINGS K-FIT® FACTORY-FABRICATED FITTINGS

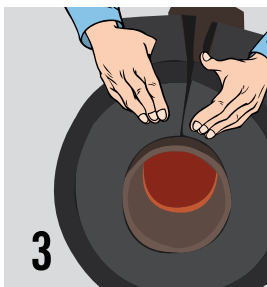
K-FIT® GROOVED FITTINGS ON 4" IPS GROOVED PIPE AND UNDER



Apply the inner layer (wedge) to the pipe after applying K-FLEX® Contact Adhesive to the seam. Push the seams firmly together to secure layer to pipe.



Slit the fitting along the inside radius of the seam and the donut ends and apply K-FLEX® Contact Adhesive to the slit areas (be careful making sure they don't touch).



Wrap fitting and donut ends around pipe. Push seams together to secure fitting to pipe.

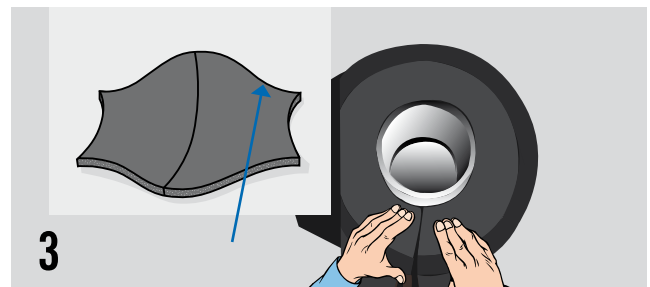
K-FIT® GROOVED FITTINGS ON PIPES OVER 4" IPS GROOVED PIPE



Apply the inner layer (wedge) to the pipe after applying K-FLEX® Contact Adhesive to the seam. Push the seams firmly together to secure layer to pipe.



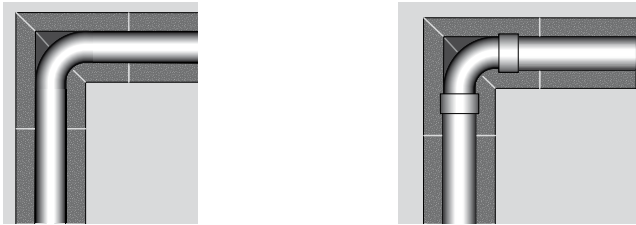
Slit donut and apply K-FLEX® Contact Adhesive to the slit area (make sure ends don't touch). Wrap the donut around the pipe and push together glued sides to secure the donut to the pipe. Repeat this step with the second donut.



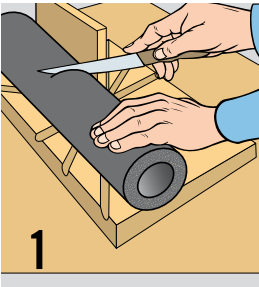
Apply K-FLEX® Contact Adhesive to inside edge of outer layer of the butterfly section. Apply K-FLEX® Contact Adhesive to small ends of outer layer. Apply K-FLEX® Contact Adhesive to outer edge of donut. Allow the adhesive to become tacky. Then apply outer butterfly layer to pipe and donut, aligning all edges. Firmly secure seams with pressure. **NOTE: The 2 layers are not adhered to each other.**

90° PIPE BENDS K-FLEX® TUBES (SMALL DIAMETER PIPES)

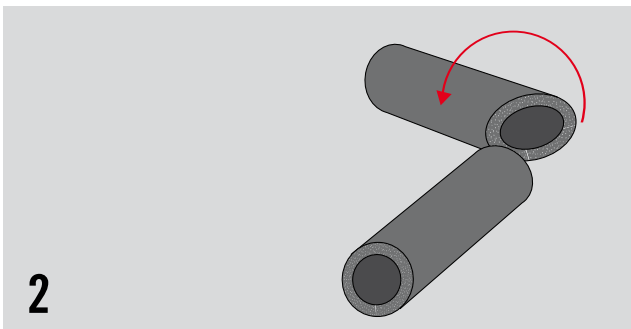
K-FLEX USA offers K-FIT® pre-fabricated 90's to fit any of the products and pipe sizes offered. Pre-fabricated fittings offer advantages in performance, time, and appearance. For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference "Practical Tips" on page 12-13 for all applications. For more installation tips, reference Technical Bulletins at www.kflexusa.com.



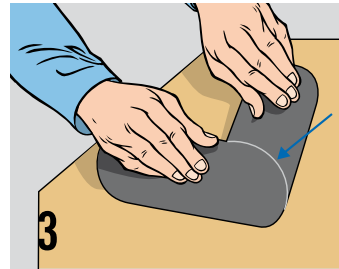
An elbow is a pipe with a 90° bend, either curved or fitted. The attachment points may present a different diameter than the pipes on either side. There are two solutions to insulating them: a right-angled section or a segmented section.



INSULATING AN ELBOW FITTING with tubing of the same diameter
Cut a K-FLEX® tube to the right length to cover the elbow. Cut it in the middle at an angle of 45°. Use a standard cutting board (as shown in picture) or the K-FLEX carton as a template for the angle of the cut. A long-bladed knife is required.



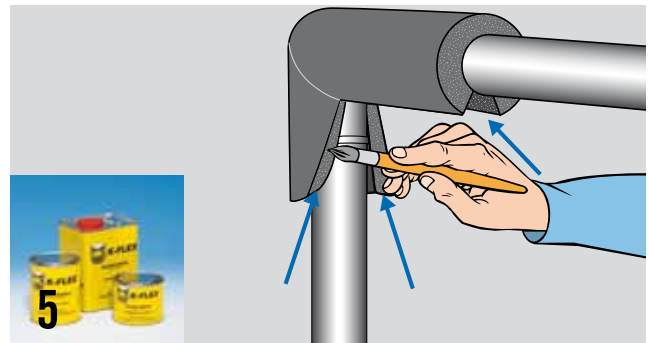
Twist one of the pieces of tube until you form a right angle.



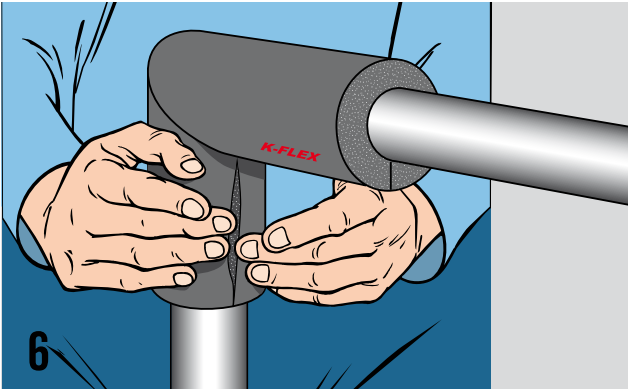
Glue the two sections with K-FLEX® Contact Adhesive.



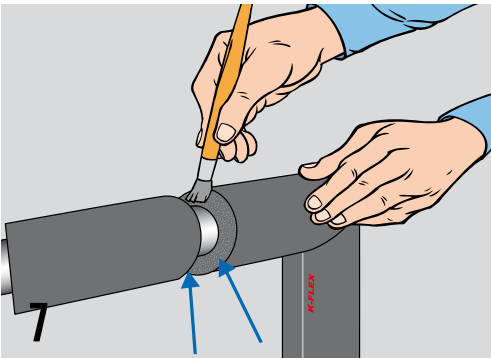
After letting the glue dry, cut the right-angled section along its length on the inside.



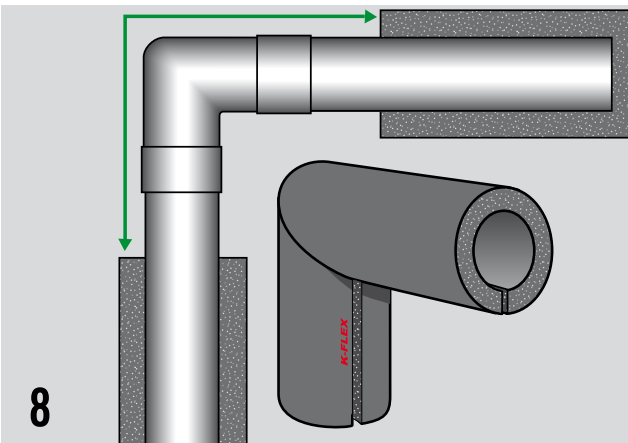
Position it on the pipe and glue the two edges.



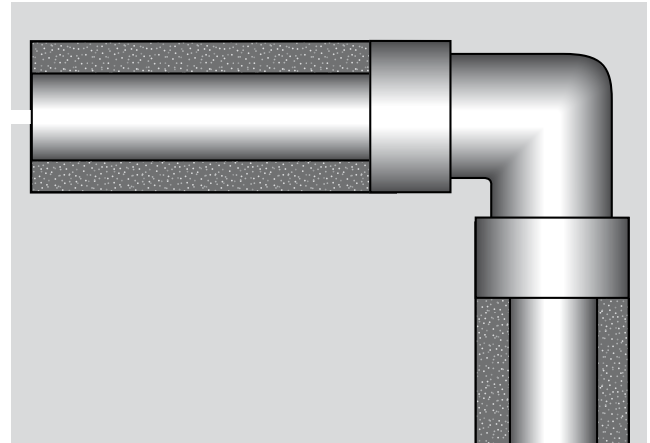
Press the edges together to seal.



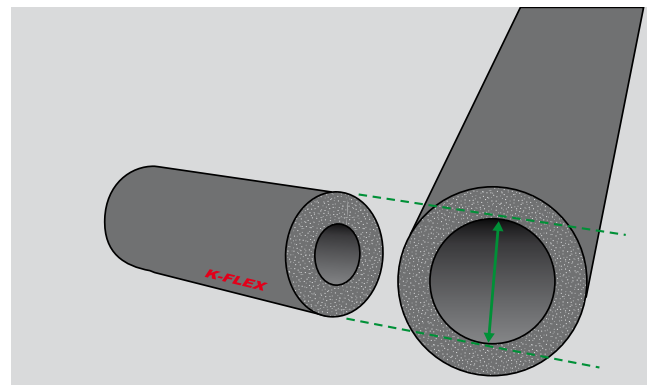
Carefully glue the edges of the elbow section to the straight tubes to be positioned on either side.



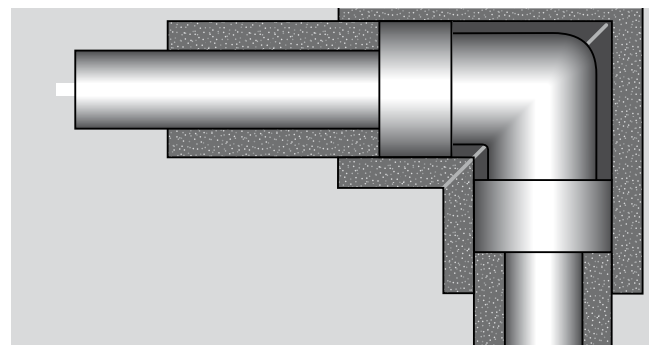
If the straight sections have already been glued into place, the right-angled section will have to be accurately measured to fit.



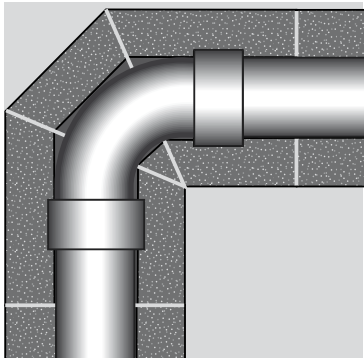
INSULATING AN ELBOW FITTING with tubing of different diameter
Should the elbow fitting be substantially different in size to the pipes on either side, the latter should be insulated first.



Find a section of tubing with an internal diameter that is the same as the external diameter of the smaller side...

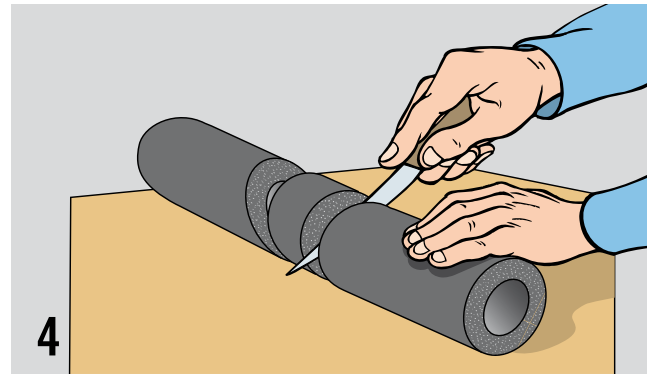


... and cut the right-angled joint so that it overlaps the ends.

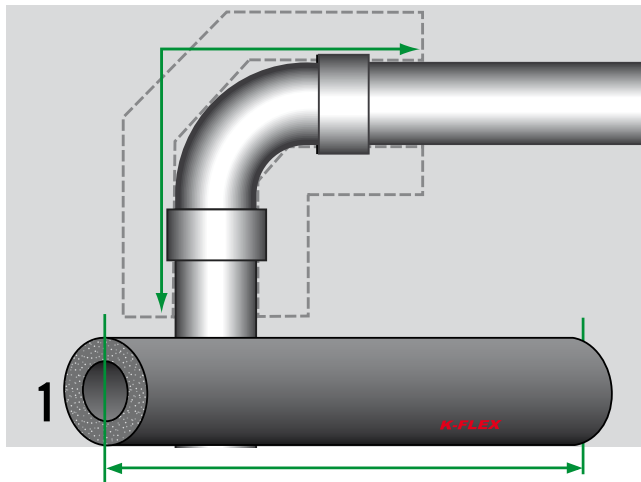


SEGMENTED INSULATION OF AN ELBOW FITTING with tubing of the same diameter

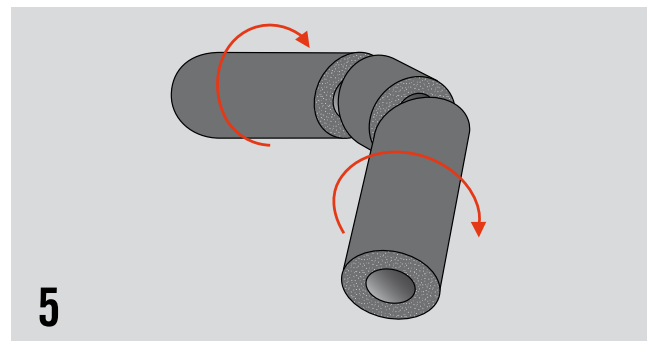
An elbow can also be insulated using jointed sections of tubing. This requires two angled cuts to be made.



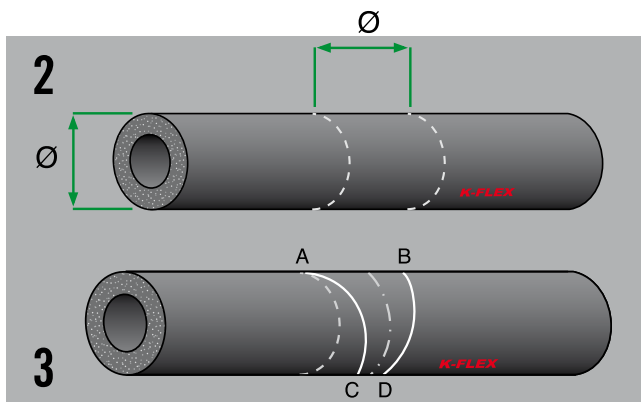
Cut along lines AC and BD.



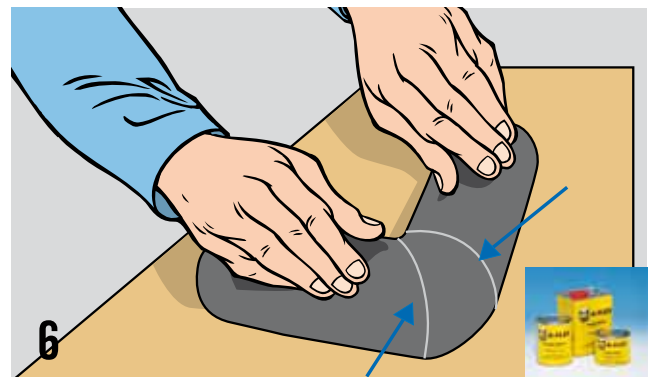
Cut a piece of K-FLEX® tubing to the right length to cover the elbow.



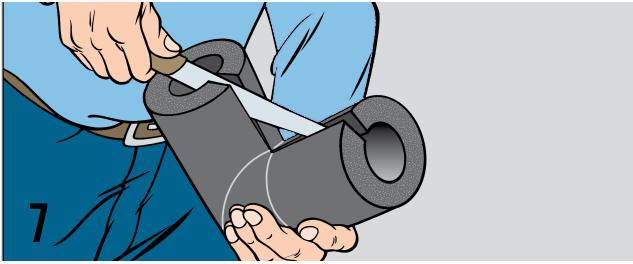
Rotate the two ends to obtain a right-angled section.



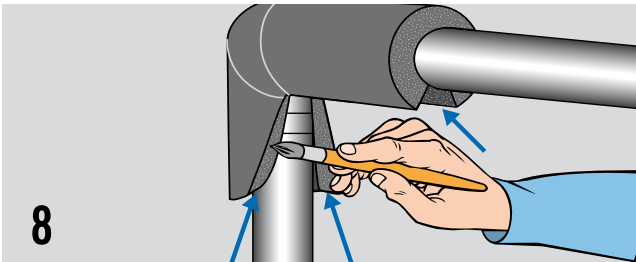
Calculate the tube's external diameter and trace two parallel lines in the middle. Draw a line between the two to mark the center line. Then make two marks (C and D) on either side of the center line one centimeter from it, and draw two lines running A to C, and B to D.



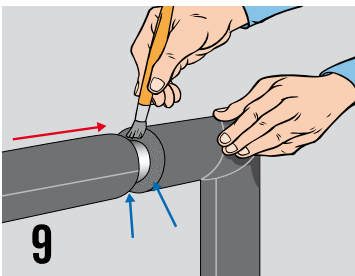
Glue the three sections together using K-FLEX® Contact Adhesive.



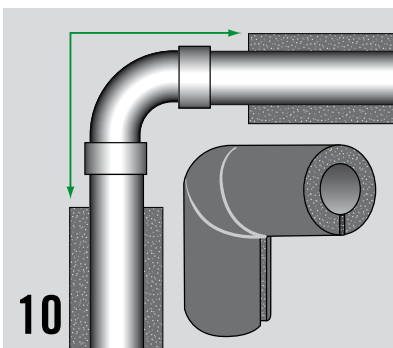
Cut the segmented elbow section along its length on the inside surface only.



Slide the elbow section over the pipe and carefully glue the edges together.

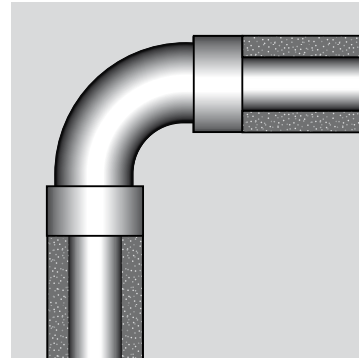


After completing this stage, adhere the elbow section to the tubing on either side with K-FLEX® Contact Adhesive.



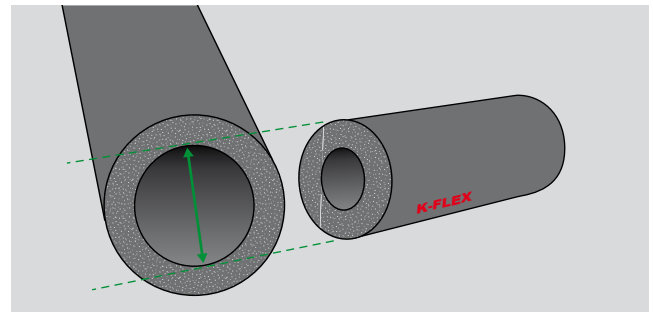
If the adjacent tubes are already in place, the length of the elbow section will have to be accurately measured.

Cut the length of tube required a little longer than it should be and trim it if necessary.

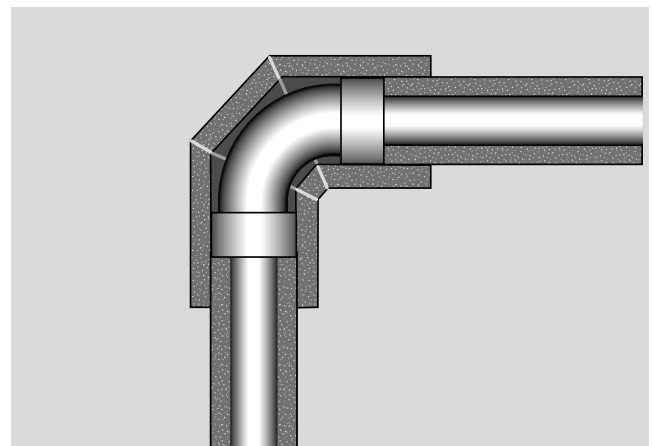


SEGMENTED INSULATION OF AN ELBOW FITTING with tubing of different diameters

If the pipes on either side of the elbow are smaller in diameter, first insulate the straight pipe sections.



Then find a tube with an internal diameter the same as the external diameter of the adjacent insulation.



The segmented elbow section will overlap the edges of the insulation on either side.

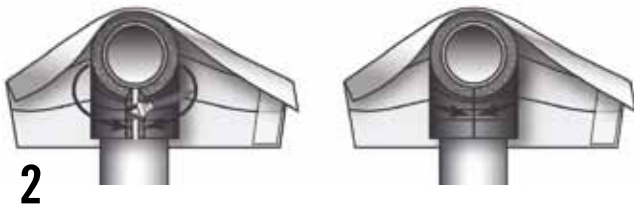
K-FLEX CLAD® AL ELBOW COVERS

Prepare K-FLEX CLAD® covers at the required diameters necessary. The diameter of the cover should be slightly larger than the pipe so it can be easily fitted. For more information, reference *Technical Bulletins* at www.kflexusa.com.

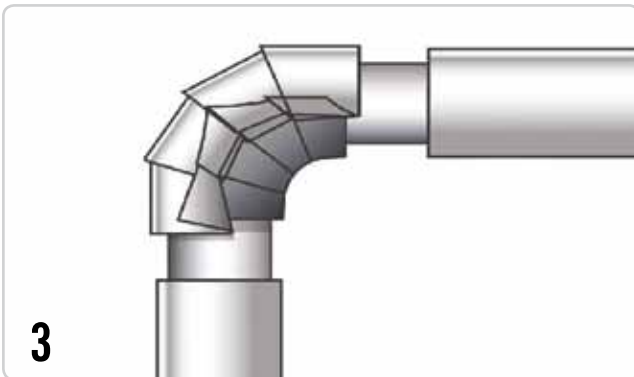
PROTECTING BENDS WITH K-FLEX CLAD® COVERS



1 Close seam of K-FIT® fitting with K-FLEX® Contact Adhesive. Seal butt joints of elastomeric fittings and adjacent K-FLEX CLAD® tubular insulation.

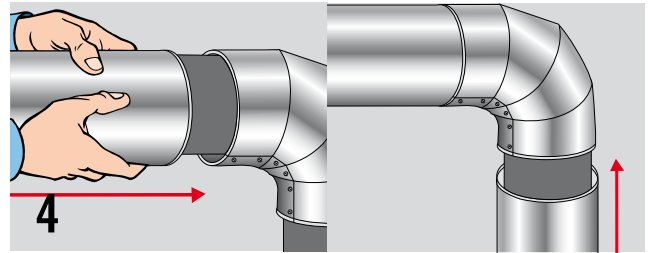


2 Open the CLAD® cover lengthwise wide enough to fit it over the elastomeric fitting.

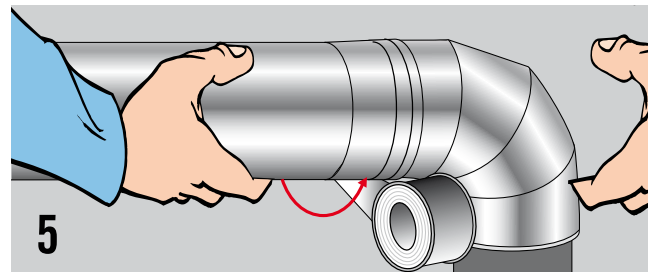


3 Apply K-FLEX CLAD® fitting cover and seal the seam with attached PSA. Next, insert mechanical fasteners (K-FLEX® rivets or stainless steel tacks) in the longitudinal seam and cover with CLAD® tape or a coating of contact adhesive.

For applications subject to heavy moisture, such as wash down areas, K-FLEX recommends caulking all seams. Call K-FLEX technical support for more information.

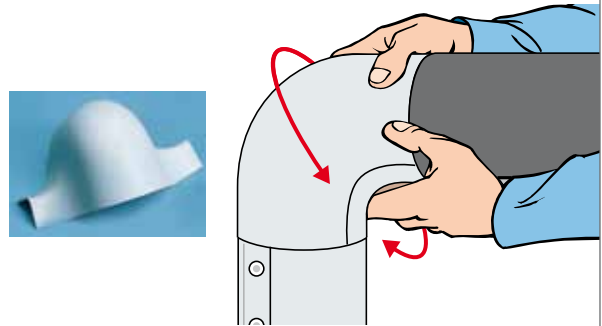


4 Join both adjacent sections of tubing with the fitting



5 Apply K-FLEX CLAD® Tape (tape strips included in box) to all butt seams after they have been sealed with contact adhesive. Align the tape with the longitudinal overlap seam, make sure tape is lined up straight and wrap the tape around the entire tube, applying pressure as you remove the PSA release liner to create a water-tight application. **NOTE: The K-FLEX CLAD® butt strip should be centered so that it overlaps the O.D. ends of both adjoining pipes.**

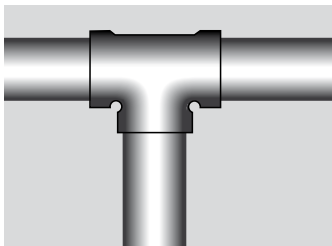
CLAD® WT MOLDED COVERS



Choose the correct size Clad WT® Molded Fitting Cover and position it over the installed elastomeric fitting. The inner edges will overlap to allow for proper alignment. Use K-FLEX® 120 Contact Adhesive to seal the cover, making sure that edges are smooth and flat after application, and tape butt joints in place. K-FLEX recommends a minimum of 24 hours of applied pressure on the elbow (using stainless steel tacks: Heico #2 white) for the adhesive to have adequate time to set and create a seal. Apply K-FLEX® 120 Contact Adhesive over the tacks to seal the puncture area.

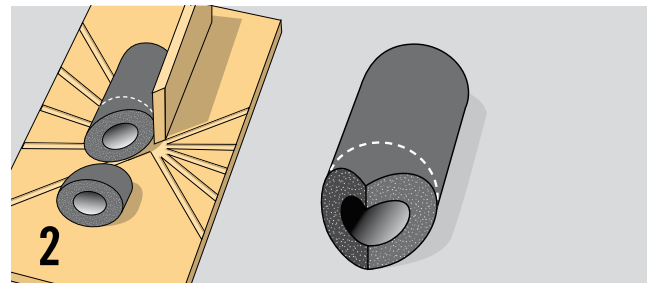
PIPE INTERSECTIONS K-FLEX® TUBES (SMALL DIAMETER PIPES)

K-FLEX USA offers K-FIT® pre-fabricated Tee's to fit any of the products and pipe sizes offered. Pre-fabricated fittings offer advantages in performance, time, and appearance. For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference "Practical Tips" on page 12-13 for all applications. For more installation tips, reference Technical Bulletins at www.kflexusa.com.

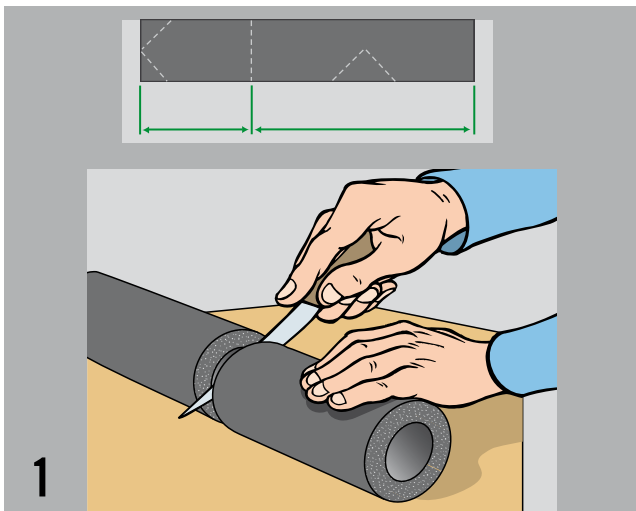


Tee-fittings can be insulated with or without the tubing on either side installed. The latter is the simplest method and is the one illustrated here.

There are two methods of insulating a Tee-fitting: by dovetailing two tubes with a 90° cut-out or by punching a circular hole.

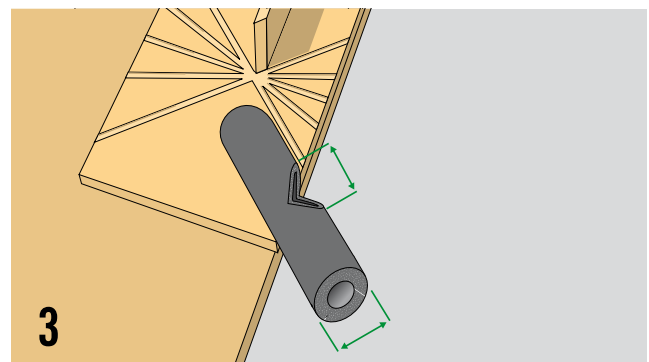


Using a standard cutting board or the K-FLEX Carton, cut the end of the shorter tube twice at an angle of 45°.

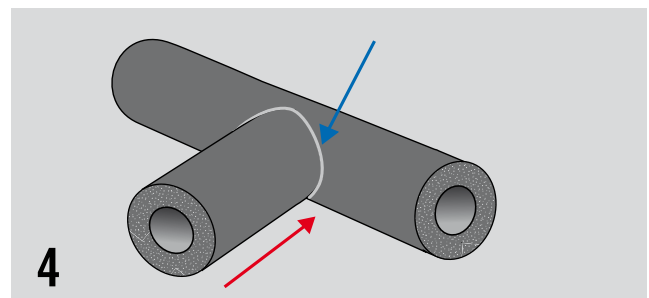


INSULATING A TEE-FITTING WITH A 90° CUT-OUT

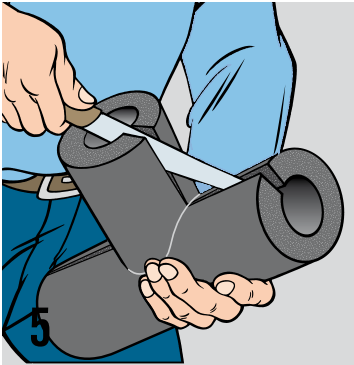
Cut a section of K-FLEX® tubing into one-third and two-thirds of its original length respectively. The overall length should obviously be sufficient to cover the three pipes leading from the fitting.



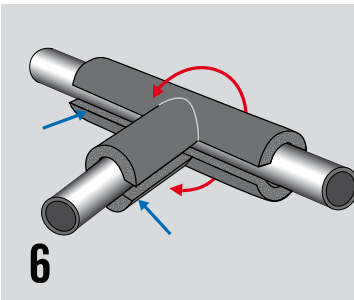
Taking the second, longer segment, make two 45° cuts in the middle. The cut-away section should have the same cross-section as the outside of the tube so that the two sections (see 2) dovetail perfectly.



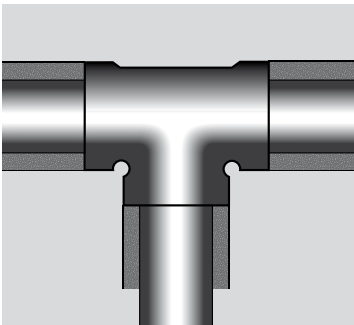
Glue the cut edges and stick them together in the shape of a "Tee".



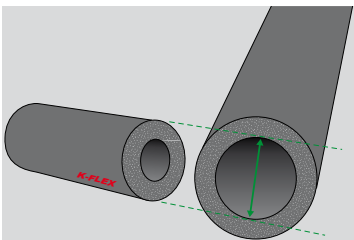
Cut the lower half of the “Tee” along its entire length so that it fits snugly over the Tee-junction. Then apply a layer of K-FLEX® Contact Adhesive to the edges.



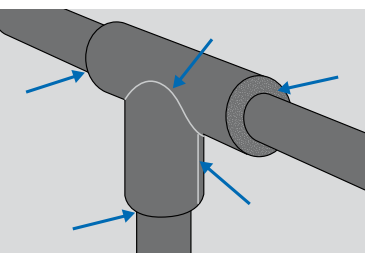
Stick the insulation to the Tee-junction. The three straight tube sections can then be attached and glued together.



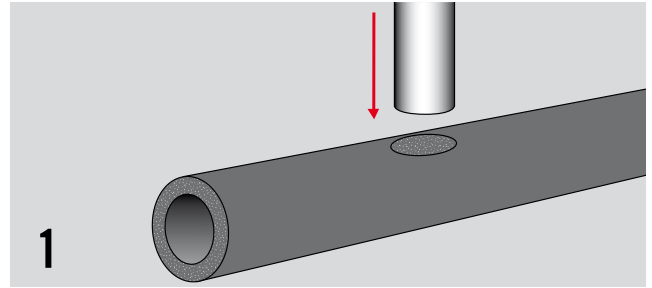
Where the adjacent pipes are smaller in diameter than the Tee-junction, these can be insulated before the Tee-junction itself.



Make a Tee-section joint as before using a tube with an internal cross-section the same as the external diameter of the adjacent tubes.

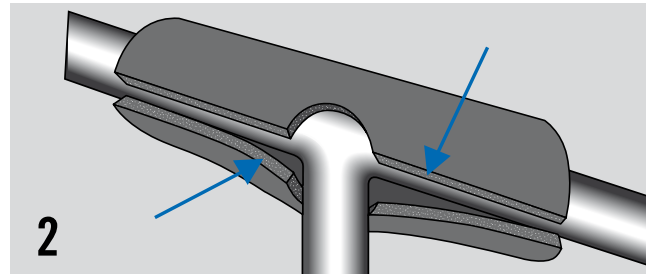


Apply the joint that should overlap the edges of the other tubes. Carefully glue and stick the edges and those surfaces in contact with the other tubes.

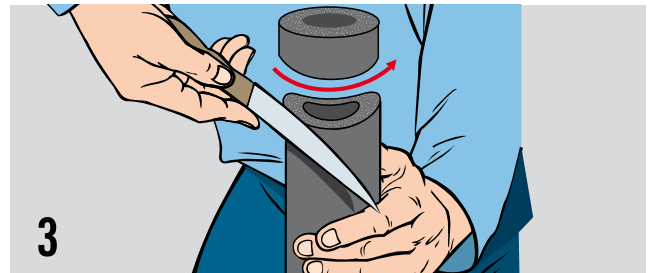


INSULATING A TEE-FITTING WITH A ROUND INSERT

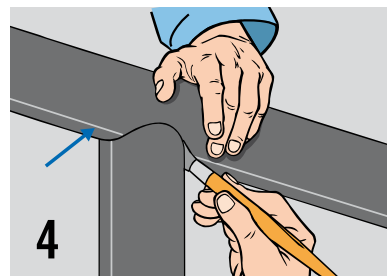
Using a punch or metal tube with a cutting edge of the same diameter as the tubing, make a hole in the insulating tubing at the point where the “T” is to be formed.



Cut the tube along its length and slide it onto the pipe so that the hole is positioned around the third pipe. Then stick the edges back together.



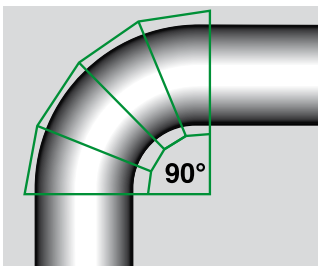
The joint for the lower branch is created by cutting a U-shaped section from a second piece of tubing.



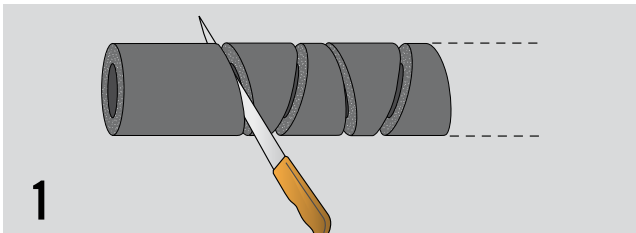
Align the lower tube so that it fits the hole in the upper section snugly and glue the whole assembly together.

CURVED PIPE BENDS K-FLEX® TUBES (SMALL DIAMETER PIPES)

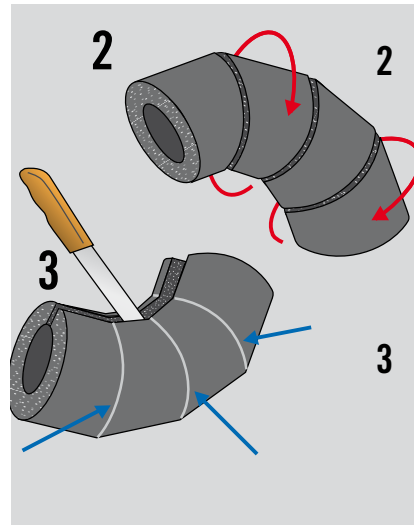
K-FLEX USA offers K-FIT® pre-fabricated segmented curves to fit any of the products and pipe sizes offered. Pre-fabricated fittings offer advantages in performance, time, and appearance. For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



When it is not possible to slide the tubing around bends in the piping, a segmented curve can be made.

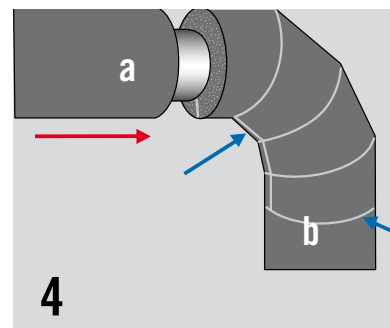


1
Take a section of tubing of the correct diameter and cut it either three or five times at the same angle at 90° to each other. Use a standard cutting board or the K-FLEX Carton to ensure accurate results.



2
Twist every other segment obtained 180° and assemble them together to get a curved section.

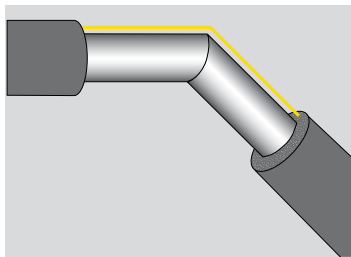
3
After gluing all the sections together with K-FLEX® Contact Adhesive to complete the bend, make a lengthwise cut in the lower half so that it can be fixed onto the piping.



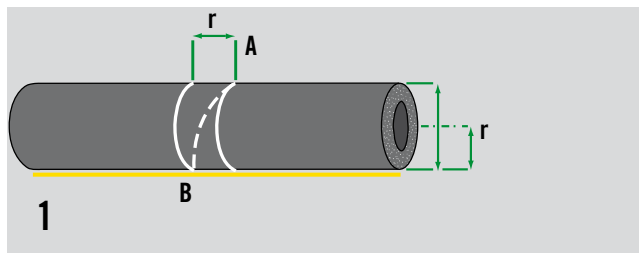
4
Position the tubing over the bend in the pipe and bond the edges of the lengthwise cut with K-FLEX® Contact Adhesive. The side sections (a-b) must be positioned so that they match the ends of the tubing on either side.

PIPE BENDS (>90°) K-FLEX® TUBES (SMALL DIAMETER PIPES)

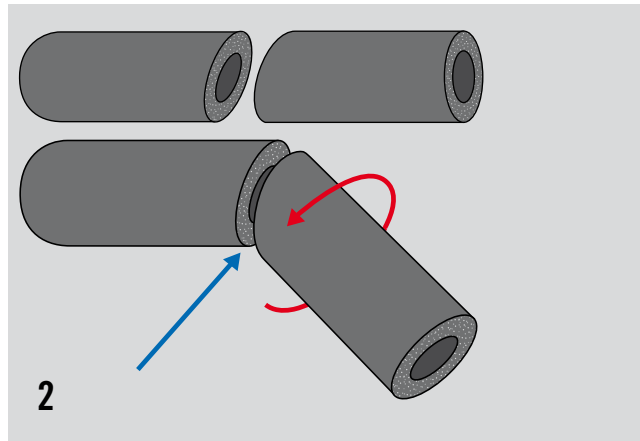
K-FLEX USA offers K-FIT® pre-fabricated elbows to fit any of the products and pipe sizes offered. Pre-fabricated fittings offer advantages in performance, time, and appearance. For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



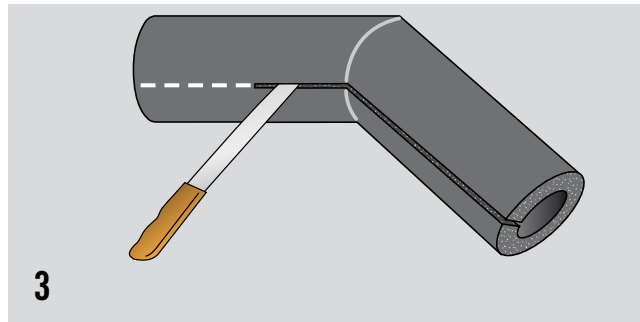
This is a joint created by welding two sections of pipe at an angle over 90°.



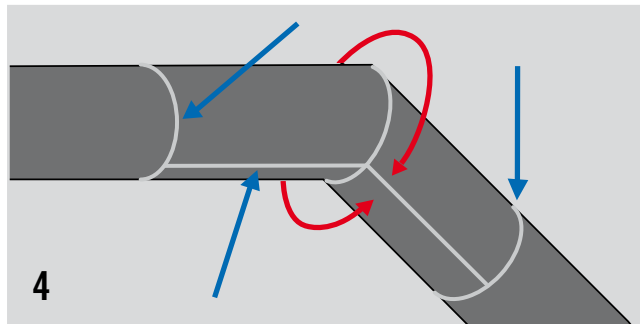
The adjacent tubes would normally already be in place when calculating the length of tubing necessary to complete the insulation of the joint. We recommend cutting the central section slightly longer than necessary so that it can be trimmed down to size when installed. Measure the radius of the external circumference and draw two parallel lines in the middle. Draw a line at an angle between points A and B.



Cut along this line and rotate one of the sections until the required angle is obtained. Glue the two parts together with K-FLEX® Contact Adhesive.



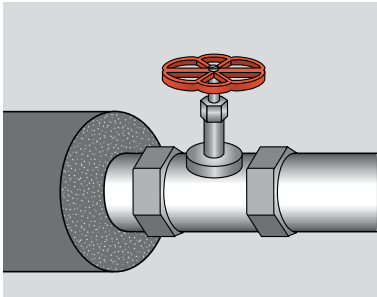
Cut along the inner surface of the joint.



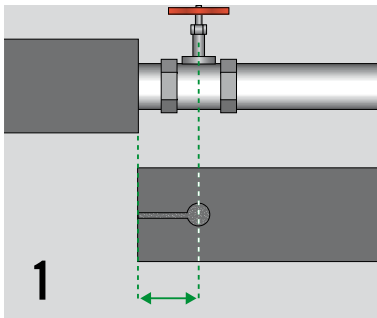
Trim the joint to fit between the two adjacent tubes and then glue all the edges together.

STOPCOCKS K-FLEX® TUBES (SMALL DIAMETER PIPES)

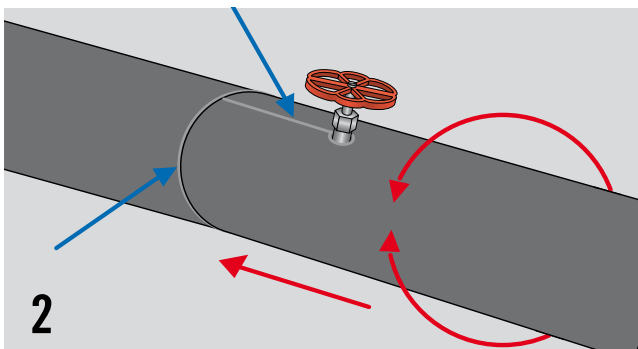
K-FLEX USA offers K-FIT® pre-fabricated grooved fittings to fit any of the products and pipe sizes offered. Pre-fabricated grooved fittings offer advantages in performance, time, and appearance. For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference Technical Bulletins at www.kflexusa.com.



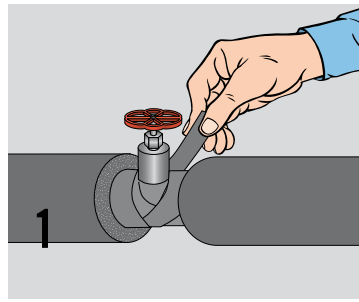
These can be insulated in a number of ways, depending on the type of stopcock.



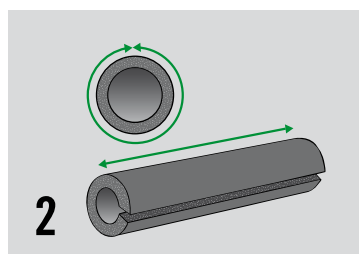
SMALL VALVE STEM
From the edge of the tube, make a cut long enough to house the stopcock and punch a hole to fit the stem.



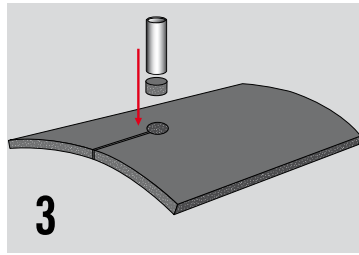
Fit the tube snugly around the stopcock and glue the edges together with K-FLEX® Contact Adhesive. Then attach the edges of the tubing to the next section.



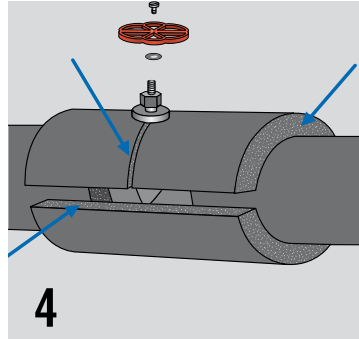
LARGE DIAMETER VALVE STEM
Insulate the pipe right up to the stopcock on both sides. Wrap K-FLEX® Elastomeric Foam tape around the base of the stopcock.



Cut a section of K-FLEX® tubing the same internal diameter as the external diameter of the tubing already in place, and cut it along its length.

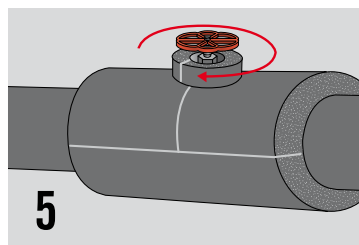


Flatten the tube out and make a longitudinal cut with a hole punched at its end to take the stopcock housing.



Position this around the stopcock so that the sleeve overlaps the ends of the two underlying tubes.

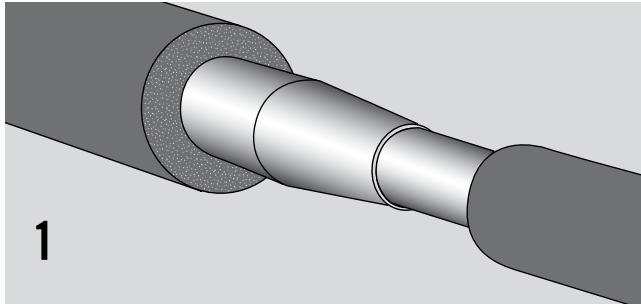
If necessary, remove the stopcock if it gets in the way.



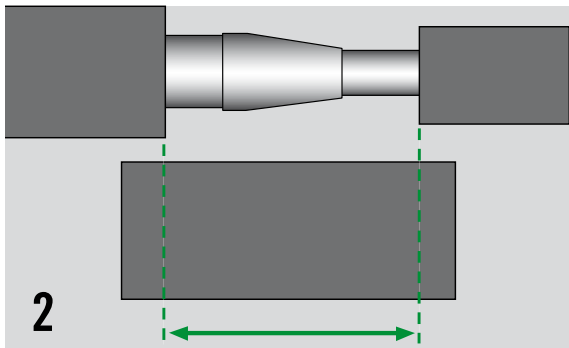
Glue and stick the sleeve's edges. If necessary, the stem of the stopcock can also be insulated by applying a ring-shaped section from one of the off-cuts.

COLLARS K-FLEX® TUBES (SMALL DIAMETER PIPES)

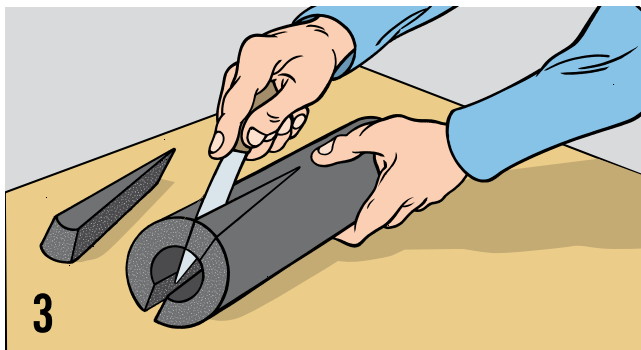
For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



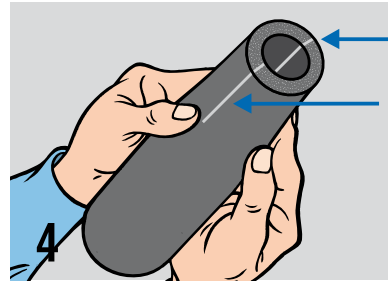
INSULATING A COLLAR
When insulating a collar that connects two pipes of different diameters, leave sufficient space between the sections of tubing on either side of it.



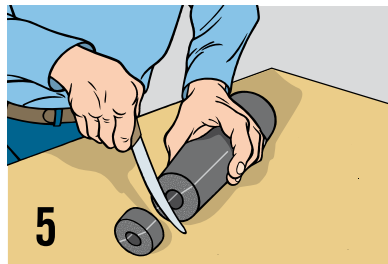
Take a piece of K-FLEX® tube, the same diameter as the larger of the two pipes, and cut it slightly longer than the space left between the two sections of tubing already in place.



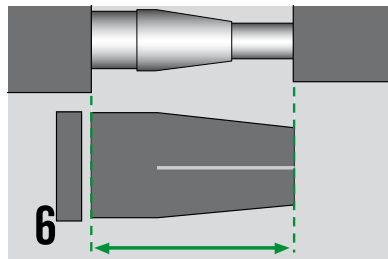
At one end, cut out two equally-sized wedges opposite each other to create a reduction in circumference that will fit the smaller tube.



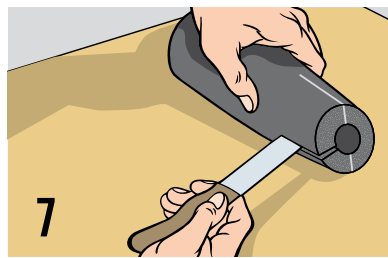
Glue the edges of the cut-outs together so that it reduces the diameter of the tubing.



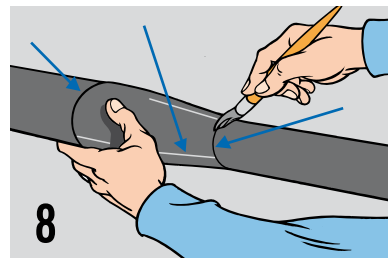
Trim the smaller end to the length at which its diameter matches that of the smaller tube.



Shorten the other end so that the coupling can be inserted neatly into the space left between the two existing sections.



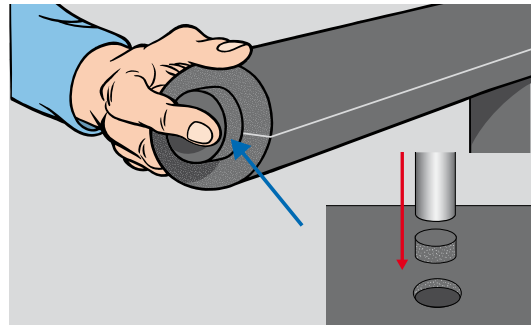
Cut the coupling along its length to install it on the pipe.



After positioning it on the pipe, glue the edges of the lengthwise cut with K-FLEX® Contact Adhesive and bond the edges of the sleeving to the other two sections of tubing.

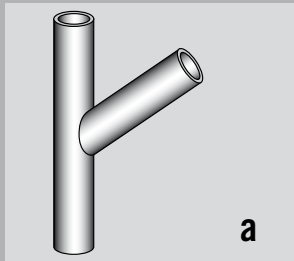
BLOCKING OFF ENDS OF PIPES (SMALL DIAMETER PIPES)

For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

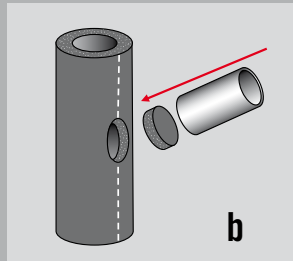


Using the correct size punch, make a plug from a spare piece of K-FLEX® sheet. Glue all the facing surfaces and insert in the open end of the tube.

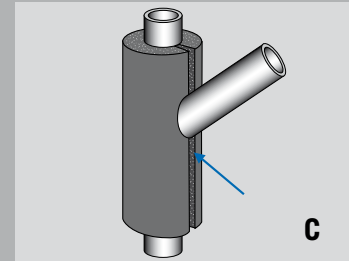
INSULATING “Y” BRANCHES



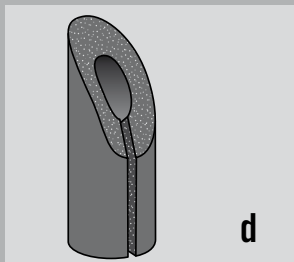
a) Cut a section of K-FLEX® tubing to the right length.



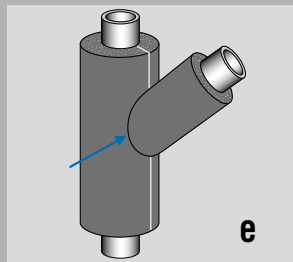
b) Use a punch to pierce a hole at the angle required.



c) Cut the tube along its length, position it on the “Y” branch and glue the edges together with K-FLEX® Contact Adhesive.



d) Using a second piece of tubing, cut out a U-shaped indent at the correct angle and cut the tube along one side to attach it to the branch.



e) Fit the tubing on the “Y” branch and glue it in place with K-FLEX® Contact Adhesive.

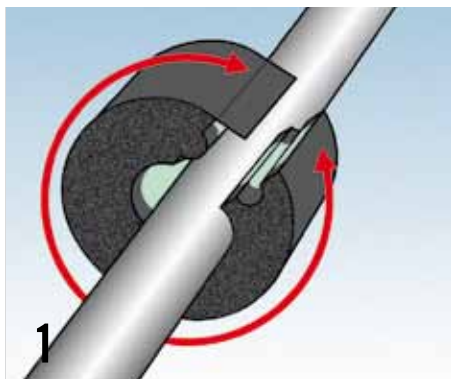
PIPE HANGERS



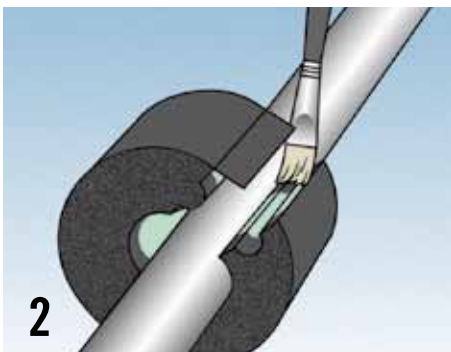
K-FLEX USA offers K-FLEX® 360 Insulated Pipe Support to prevent compression of insulation for pipes supported using pipe hangers and/

or saddles. K-FLEX® 360 Insulated

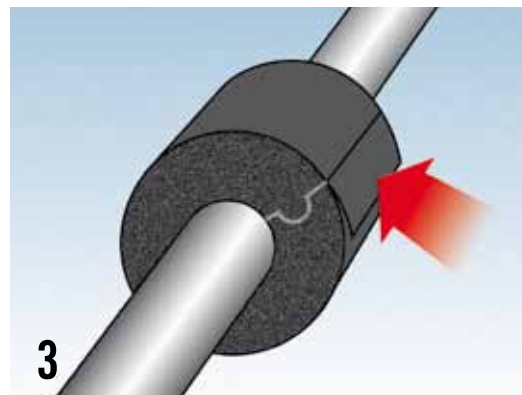
Pipe Support features a 360° rigid polyurethane core, tongue-and-groove closure system, elastomeric bonding surface and an outer PVC jacket with “peel and stick” overlapping tab. Proper pipe support and thickness compensation will ensure the performance of the system. For more information, please reference our *Technical Bulletins* on page 64.



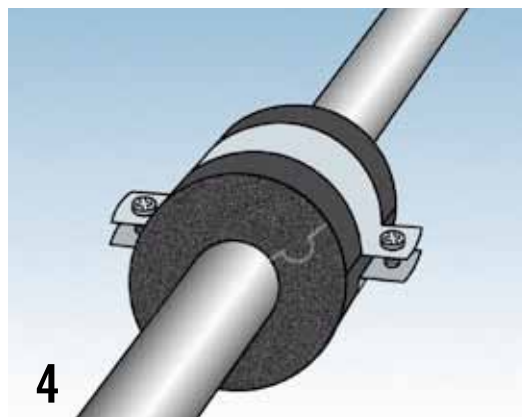
1
Open the two halves of the support and place it around the pipe in correspondence with the suspension point.



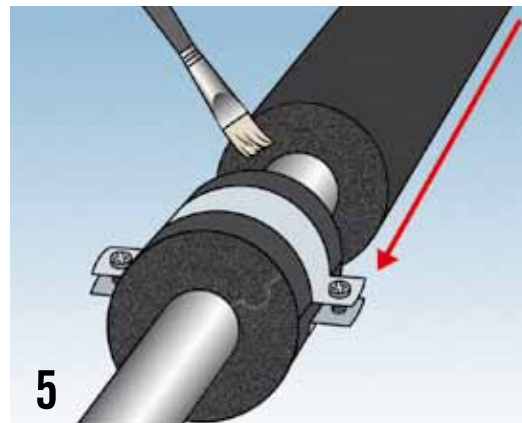
2
Glue support edges with K-FLEX® Contact Adhesive and join the two halves on the pipes.



3
Seal the support by overlapping the self adhesive band.

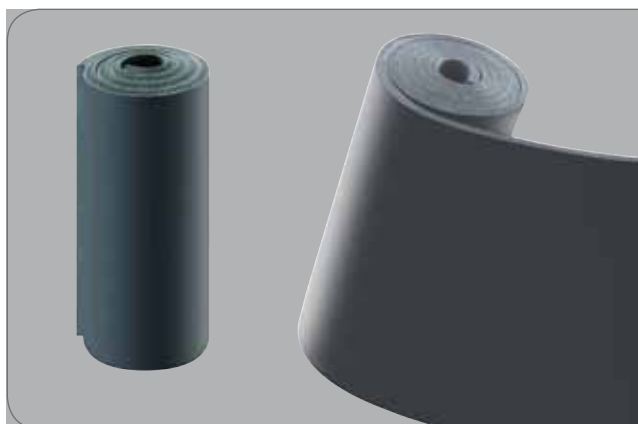


4
Fix clamp to suspension system.



5
Join after gluing (using K-FLEX® Contact Adhesive) the edges of K-FLEX® pipes to the support.

LARGE DIAMETER PIPES / ROUND DUCTS



K-FLEX USA recommends sheets/rolls for application on large diameter pipes/round ducts. K-FLEX 48" wide sheets/rolls are available in thicknesses from 1/8" to 2".

NOTE: For outdoor applications, make sure to apply protective coating or jacketing. Factory-applied K-FLEX CLAD® AL / WT Sheets perform best when installed on flat surfaces. For most round applications (large diameter duct or pipe), CLAD® AL / WT rolls should be field-applied to the insulation as described in this manual. Contact K-FLEX Technical Support to discuss specific design conditions. Reference "Practical Tips" on page 12-13 for all applications. For more information, reference Technical Bulletins at www.kflexusa.com.

Due to the wide range of outdoor environments, K-FLEX can't provide specific installation instructions for all systems in a general guideline. Contact K-FLEX Technical Support for specific applications, including those involving process fluids below -40°F.

SHEET YIELD CHART

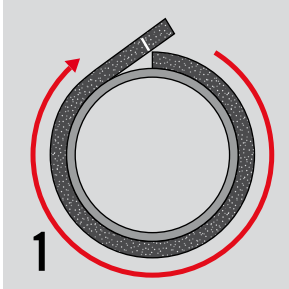
PIPE SIZE (ACTUAL O.D.,)	INSULATION THICKNESS (IN.)	WIDTH (IN.) PIPE CIRCUMFERENCE*	SHEET LENGTH (IN) (CONFIGURATION)	YIELD, LINEAR FEET OF PIPE WORK PER 3' X 4' SHEET
5" IPS (~4-9/16")	1/2	20-5/8	36	6
	3/4	22-1/4	36	6
	1	23-3/4	36	6
6" IPS (6-5/8")	1/2	24	36	6
	3/4	25-5/8	48	4
	1	27-1/8	48	4
8" IPS (8-5/8")	1/2	30-1/4	48	4
	3/4	31-7/8	48	4
	1	33-3/8	48	4
10" IPS (10-3/4")	1/2	37	36	3
	3/4	38-1/2	36	3
	1	40-1/8	36	3
12" IPS (12-3/4")	1/2	43-1/4	36	3
	3/4	44-3/4	36	3
	1	46-3/8	36	3
14" IPS (14")	1/2	46-1/2	36	3
	3/4	Rolls		
	1	Rolls		

Above recommendations are based on the following formula: (pipe O.D. + 2x insulation thickness) x 3.14 = sheet length. Rolls can offer better yield than sheet. *Outer circumference of insulation when installed on pipe. Add 1/2" for looser fit (may affect yield).

For pipe sizes below 5" IPS, K-FLEX recommends using tube insulation for faster insulation, reduced seams (eliminates longitudinal seam that subsequently prevents seams opening), and to prevent the tension and stress cracking that can occur when using sheet insulation on smaller pipe sizes.

LARGE DIAMETER PIPES / ROUND DUCTS

NOTE: Because of variable environmental conditions (i.e. temperature variations), outdoor round piping / ductwork requires special consideration when being insulated to account for the interaction of the normal expansion/contraction of the insulation with the jacketing. As diameters and insulation thicknesses become larger, they require more care.

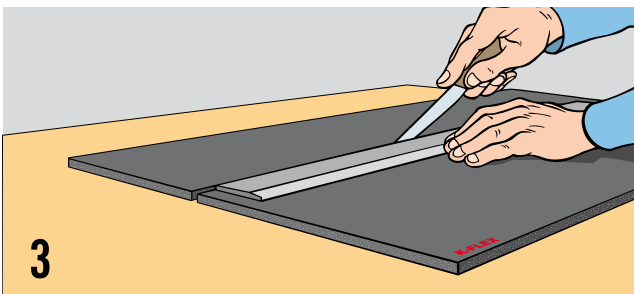


Wrap a strip of K-FLEX material in the same thickness as that to be used and measure the exact length required. Sheet should fit loosely (no stress on seam), with approximately 1/4" space between the insulation and the pipe. Never stretch the insulation to make it fit.

In demanding conditions for chilled water / refrigerant systems, apply a band of contact adhesive to the pipe and sheet insulation inner surface for at least 1/2" on either side of all butt joints.



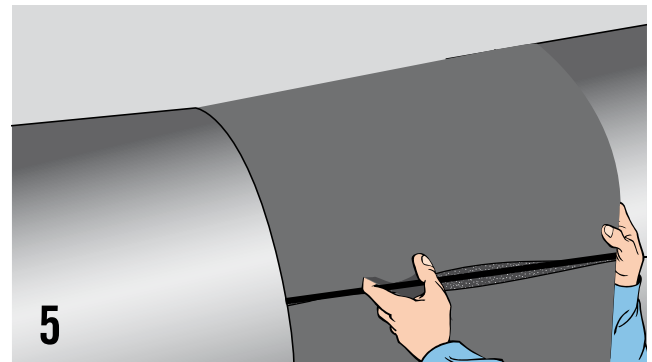
Mark out the length required on a K-FLEX® sheet.



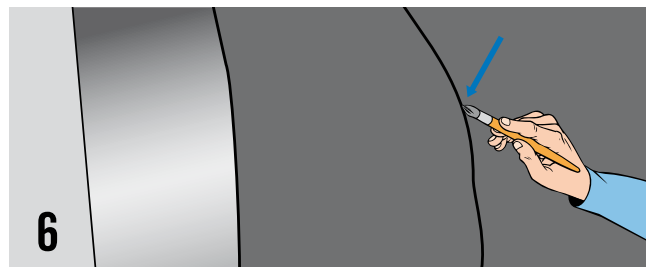
Cut carefully along the line. *To ensure accurate results, use a metal ruler.*



Apply a brush coat of K-FLEX® Contact Adhesive to both seams. Fully adhering the sheet to the pipe or duct is not recommended. For 12" O.D. and larger, the sheet should be adhered to the bottom 1/3 of the horizontal surface to minimize the possibility of the insulation sagging.



Install the insulation at a temperature that is midway between the normal operating and ambient range, thus minimizing the effects of temperature on expansion/contraction of the insulation during normal operating conditions. Place the insulation around the duct and firmly press the seams together. Join opposite ends first, and then work towards the center. (This ensures straight edges at the ends for better butt joints.)

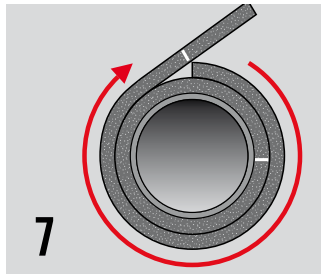


Apply K-FLEX® Contact Adhesive to butt joints and press adjoining insulation sections firmly together.

To minimize sagging and buckling on vertical piping / ductwork, it is recommended that the insulation be adhered in specific areas. Adhere the insulation to the pipe/duct at every butt joint around the circumference, using 4" of adhesive on either side of the joint.

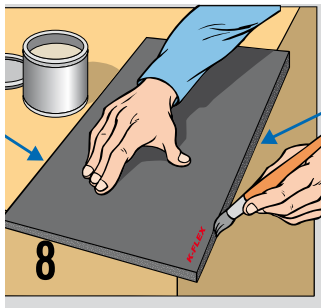
LARGE DIAMETER PIPES / ROUND DUCTS

MULTI-LAYER INSULATION

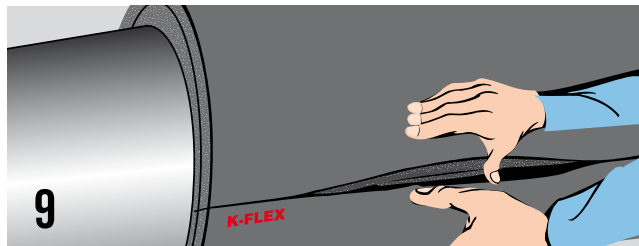


Clean the surface of the 1st insulation layer. Measure the overall diameter with the first sheet in place. Cut the 2nd sheet to the size required.

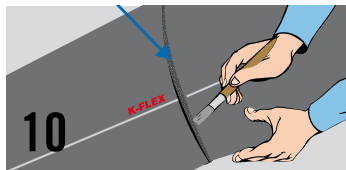
For extreme refrigeration or cryogenic applications, apply a seam tape along the longitudinal seam of the 1st layer of rubber to give additional support and strength to the glued seam. K-FLEX recommends 2" wide heavy-duty duct tape by GRIP, # 37062.



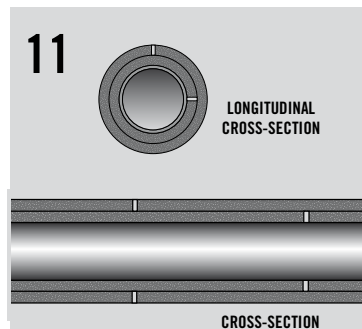
Glue the edges of the sheet to be fitted. Do not adhere the two layers together, as the individual sheets may be subject to different degrees of expansion or contraction when the system is operational.



Wrap the 2nd (top) insulation sheet around the 1st layer, ensuring that the seam does not overlap that of the underlying insulation.

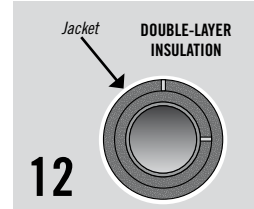


Adjacent sections of insulation should be glued at their respective ends.

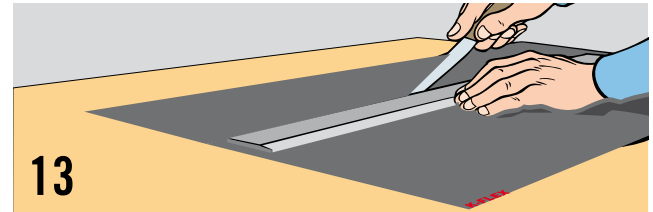


When installing the 2nd layer, make sure that the seams do not overlap those underneath (stagger the seams). This ensures that when the system is operational, maximum insulating properties are maintained as the materials expand or contract.

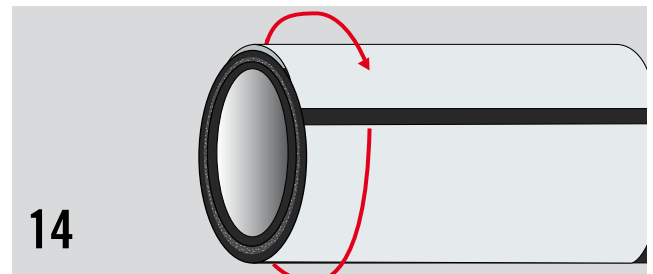
PROTECTIVE JACKETING - OUTDOOR APPLICATIONS



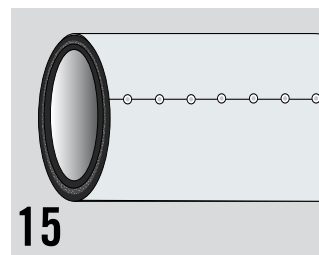
All insulation installed outdoors must be jacketed. Selecting the correct jacket for the application and installing the jacket correctly are critical. Jacketing options include metal, K-FLEX CLAD®, and other flexible multi-layer products.



Measure and cut the jacket to fit around the insulation with a minimum of 4" longitudinal overlap.



Adhere the 1st 2" of the jacket to the insulation and wrap the jacket around the insulation. (Do not adhere the jacket 100% directly to the insulation.) Adhere and secure the jacket overlap section directly to the jacket. This allows for more movement between the jacket and the insulation. Installing the jacket loose will allow for some expansion of the insulation. The jacket closure/seam must be strong enough to resist the expansive forces of the insulation.



Apply mechanical fasteners (rivets) into the overlap jacket to enhance the seam strength.

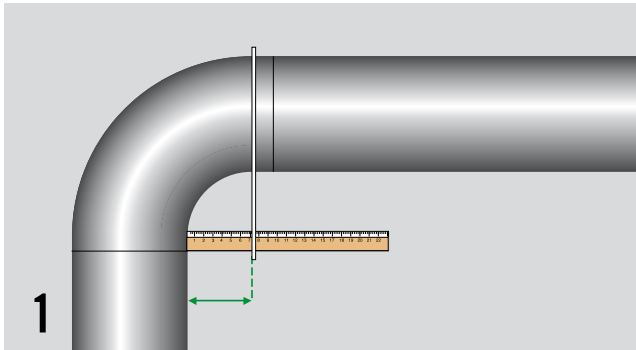
Apply jacking tape (4" wide minimum) to the longitudinal seam and butt joints for a completely sealed system.

For adjacent sections, measure & cut the jacket to allow for a 4" minimum longitudinal overlap and 2" circumferential overlap into the already installed jacket section. Adhere the circumferential edge of the 2" overlap section to the installed jacket section and repeat steps 14 and 15.

For applications subject to heavy moisture, such as wash down areas, K-FLEX recommends caulking all seams. Call K-FLEX technical support for more information.

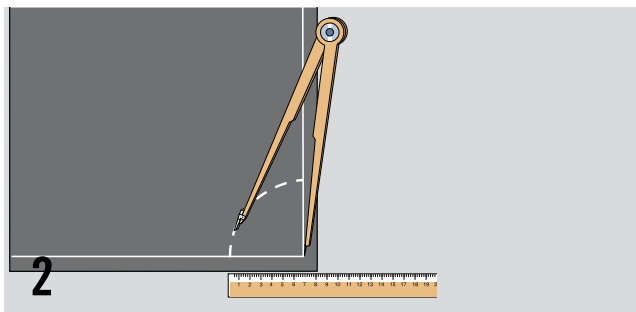
BENDS - LARGE PIPE K-FLEX® SHEETS

For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference "Practical Tips" on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

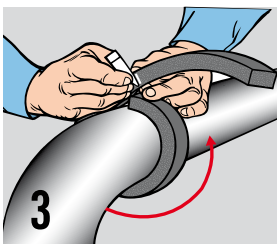


To insulate a bend on a large-diameter pipe, calculate its radius and mark it out on a K-FLEX® sheet.

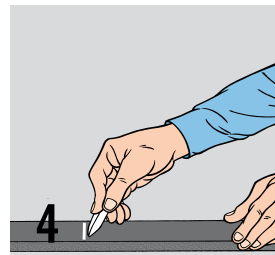
First, measure the internal radius of the curve using a ruler lying perpendicular to it.



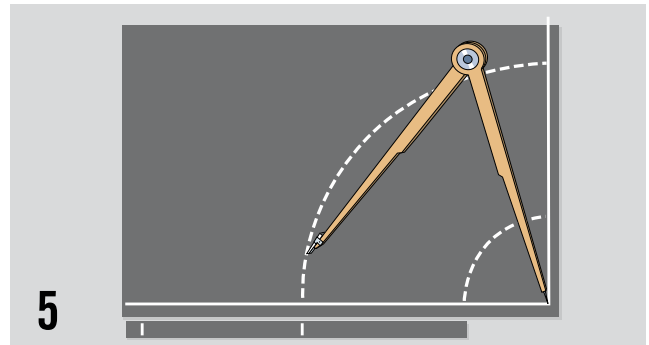
Using a compass, mark an outline of the internal radius on the K-FLEX® sheet, using the corner of the square marked out on the insulation as the axis.



Measure the exact circumference of the pipe using a strip of K-FLEX® sheet with the correct thickness (do not stretch the strip).



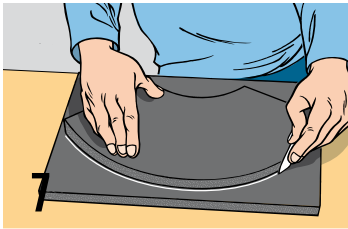
Divide the circumference by two and mark the middle of the strip accordingly.



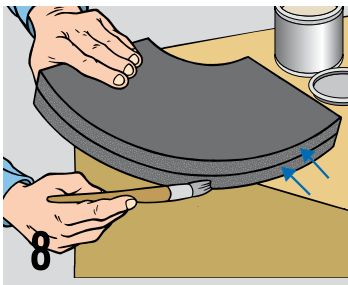
Add the outer radius to the measurement of the inner radius and, using the same axis, draw a semicircle onto the sheet with the compass.



Cut the sheeting accurately along the arc of the circle. If imperfections are found along the cut edges, smooth them slightly to assure a more precise match.



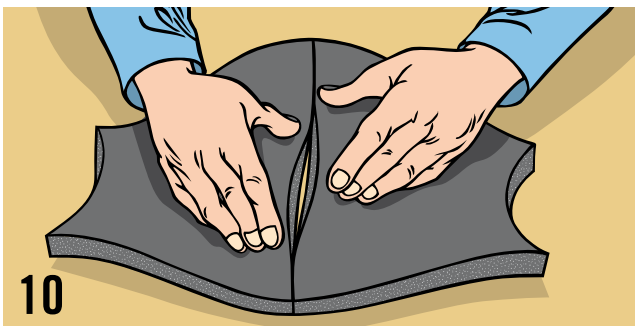
Place the section obtained on the reverse side of another sheet and use it as a template to cut out a second section.



Holding the two sections together with the smooth surface on the outside, apply glue to the outer edges.



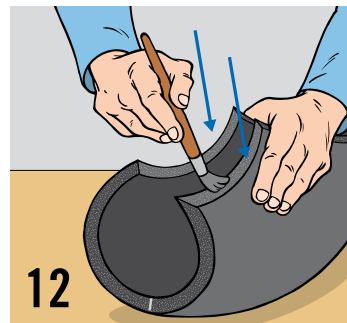
Allow the glue to dry and stick the edges together, starting from the two extremities.



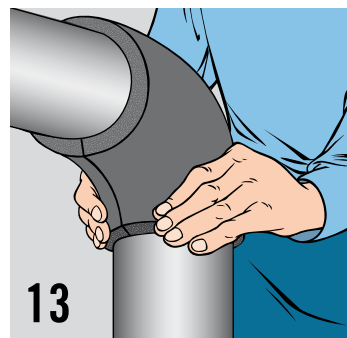
Apply pressure in the center.



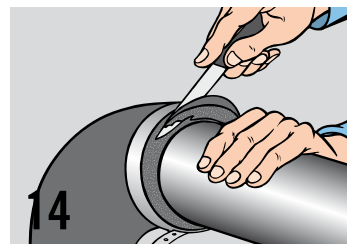
Make sure that the two sections have bonded securely on the inside, pressing with your fingers along the joint.



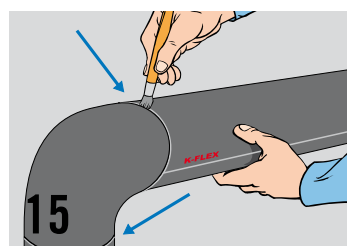
Next spread the glue along the inside edges and leave to dry.



Wrap the K-FLEX insulation around the pipe and press the edges tightly together.



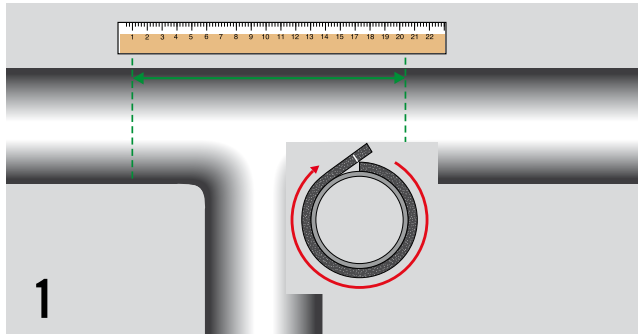
Use the metal band as a guide to trim the extremities ...



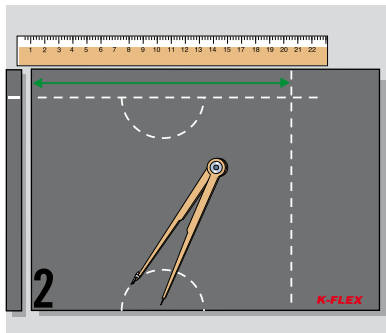
... so that they butt precisely up against the tubing to be fitted on either side.

INTERSECTIONS - LARGE PIPE K-FLEX® SHEETS

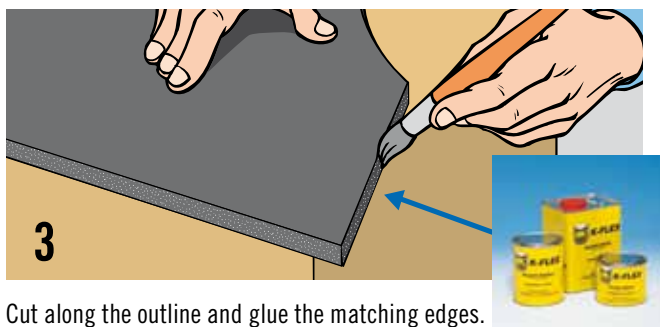
For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



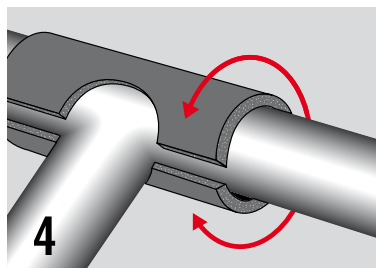
1 Take the measurements for the shape of the Tee-fitting.



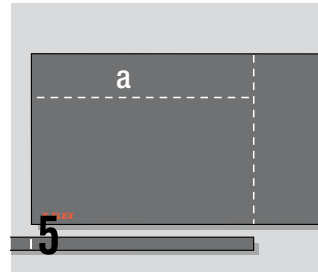
2 Mark the measurements on the sheet and trace the shape of the through-section. The radius of the semi-circle corresponds to that on the piping.



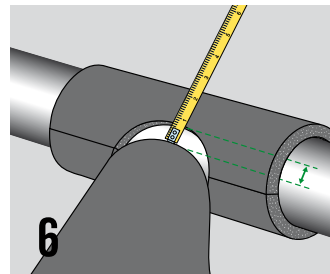
3 Cut along the outline and glue the matching edges.



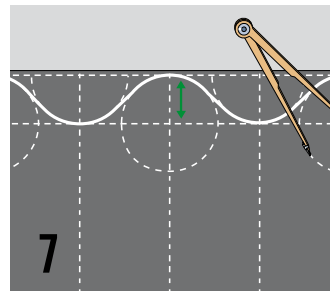
4 Position the through-section shape on the piping and join the glued edges.



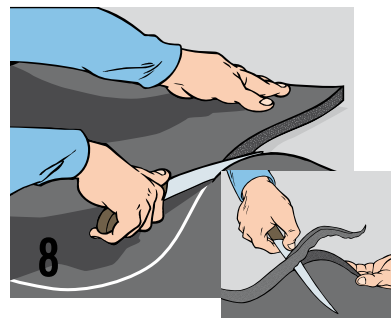
5 On another section of sheet, trace the shape of the coupling arm, leaving enough overlap for the next section (a).



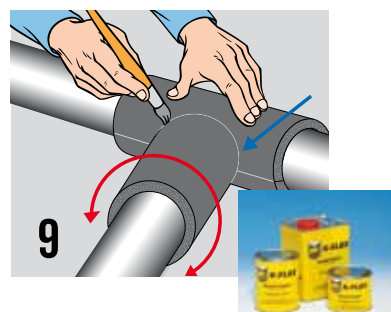
6 Take the measurements of the coupling arm section by resting the cut sheet on it as a basis for measuring.



7 Mark the measurements of the section on the overlap of the previous tracing and draw the circles which define the section's curve.



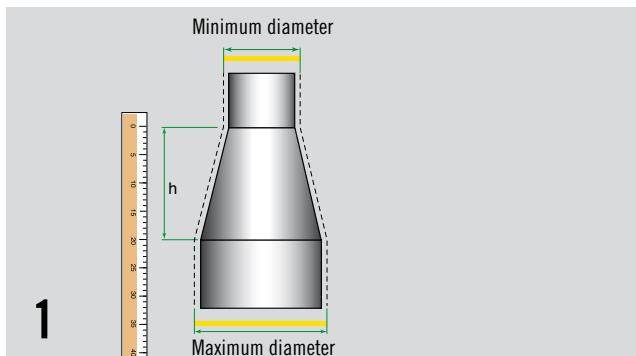
8 Cut along the final outline and glue the matching edges. Bevel the edges of the upper, convex curves, towards the sheet's inner surface.



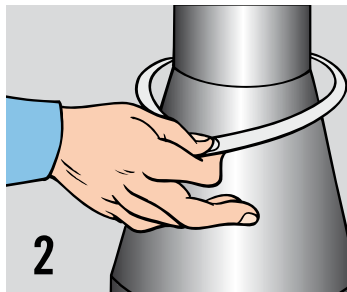
9 Position the prepared section on the coupling arm joining the parts of the Tee-fitting. Glue the beveled curves to the through-section.

COLLARS - LARGE PIPE K-FLEX® SHEETS

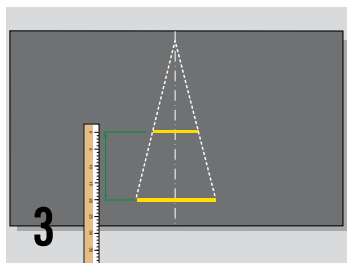
For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



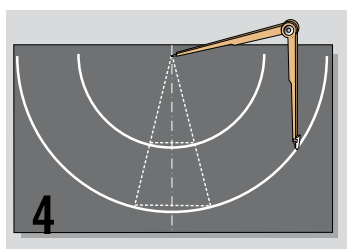
To insulate a collar section that connects pipes of different diameters, take measurements and mark them out on a K-FLEX® sheet. Measure the height of the collar section, including the welded joints.



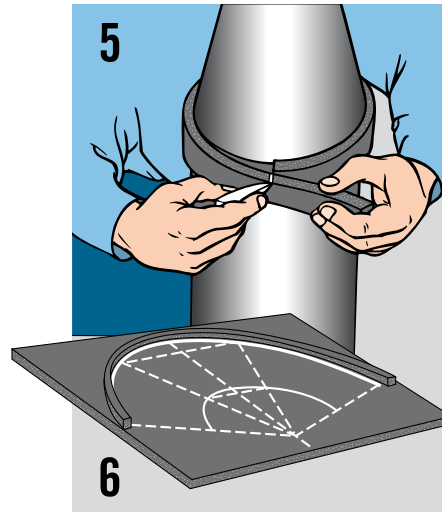
Use the calliper to measure the maximum and minimum pipe cross-sections and add twice the thickness of K-FLEX® sheet to each measurement.



Carry over all measurements (maximum diameter, minimum diameter, height) onto the sheet. Draw two lines from the ends of the measurements until they converge on a center point.

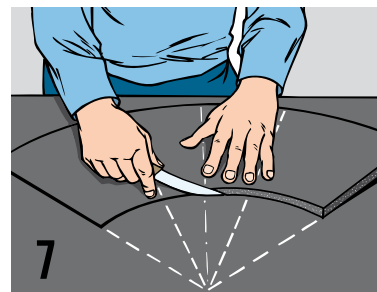


Using the compass, measure the distance between the point of intersection and the two diameters and draw two arcs.

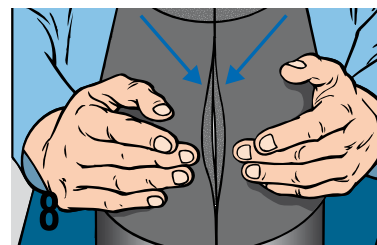


Measure the circumference of the widest pipe using a strip of K-FLEX® sheet of the same thickness as the sheet.

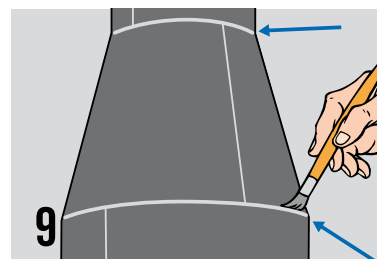
Mark the center of the circumference on the strip and line it up on the larger of the two arcs. Draw two lines from the ends of the strip to the center of convergence.



Carefully cut out.



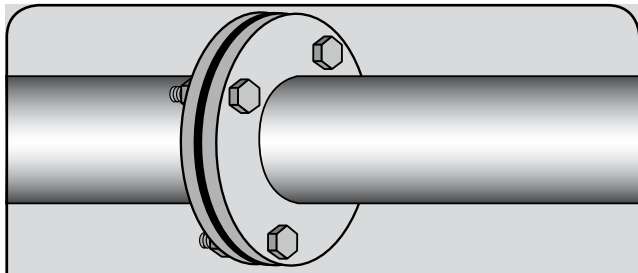
Glue the edges and, after they have dried, fit the insulation to the collar. Press the two edges together starting at the far ends.



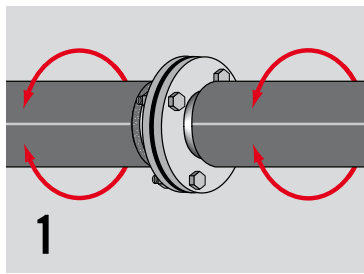
Glue the upper and lower edges and attach the other K-FLEX® sheet sections.

FLANGES - LARGE PIPE K-FLEX® SHEETS

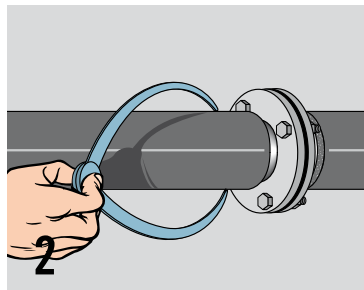
For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®. Reference "Practical Tips" on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



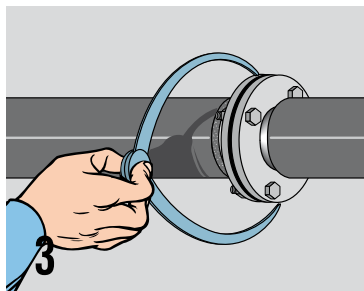
Insulating a flange is reasonably simple, but requires the K-FLEX® sheet to be accurately cut into two rings.



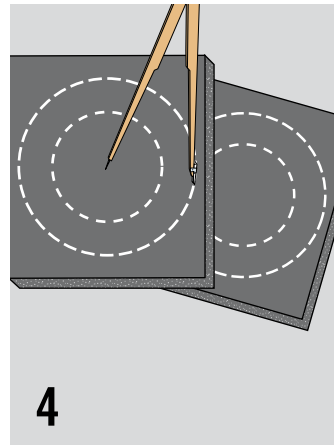
1 First, insulate the pipes up to the flange on either side.



2 Measure the pipes' circumference with the K-FLEX® sheet around it...

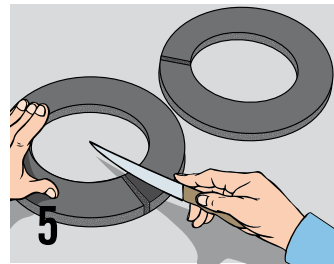


3 ... along with that of the flange. Use the measurements of the two diameters to calculate the respective inner and outer radii.

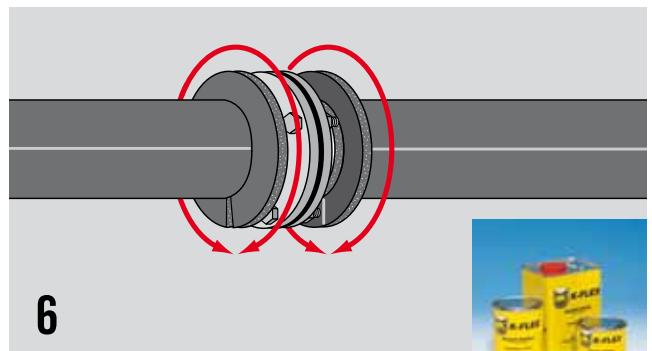


4 After calculating the two radii, draw the inner and outer circumferences of the rings on two separate squares of K-FLEX® sheet.

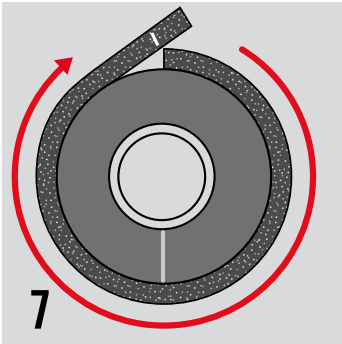
Attaching a sharp blade to the tip of the compass allows the first incision to be made so that a knife can then be used to cut out the ring. However, a knife alone can give acceptable results.



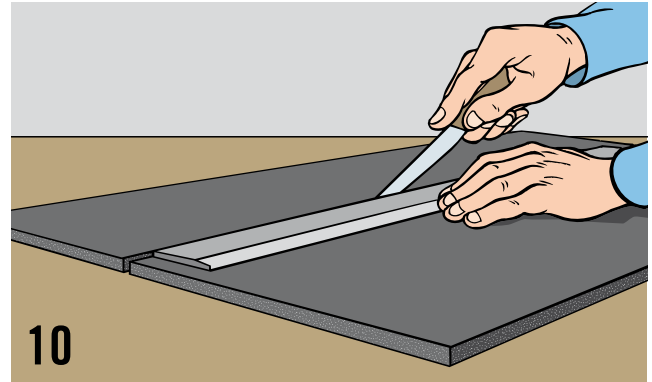
5 Cut the rings out and make an opening on one side to attach them around the pipes.



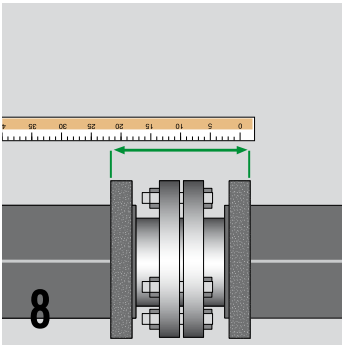
6 Position the rings around the ends of the tube and glue the opening with K-FLEX® Contact Adhesive.



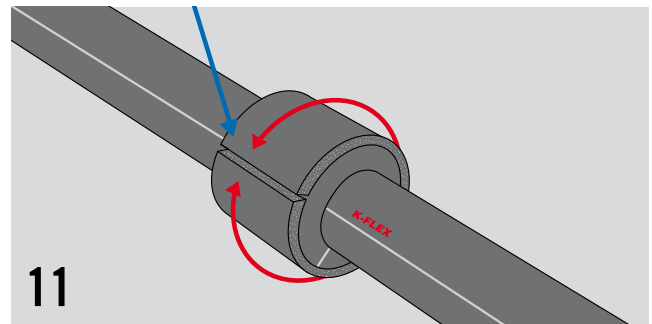
Use a strip of K-FLEX® sheet of the same thickness to measure the circumference of the insulating rings.



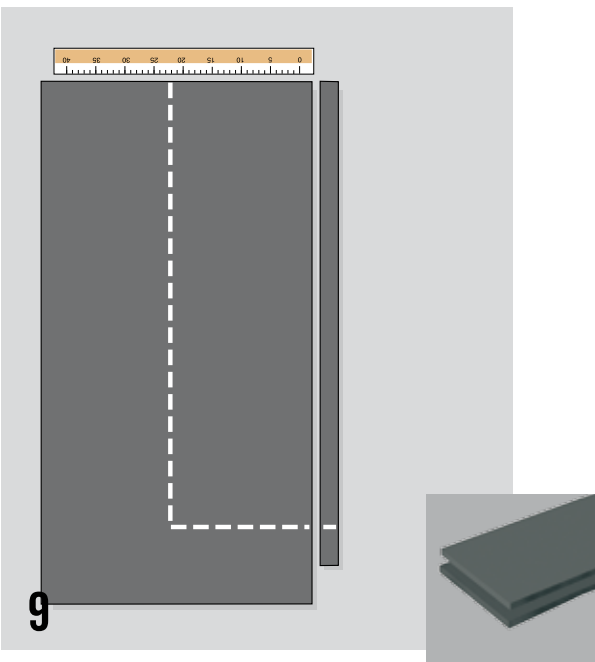
Cut the sleeve section out.



Measure the distance between the two rings, including the thickness of the insulating material itself.

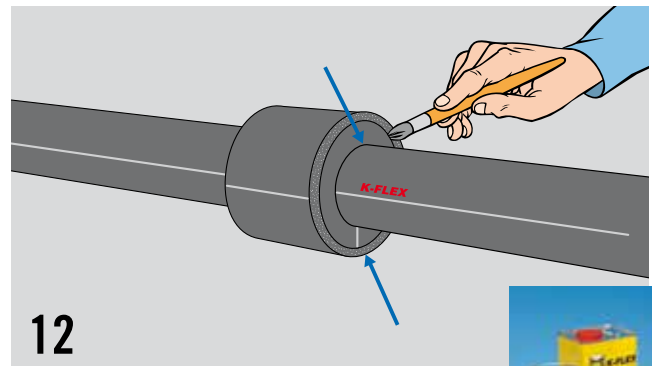


Mount it around the rings and glue the edges.



Draw the measurements out onto a K-FLEX® sheet to get the outline of the sleeve that will complete the flange's insulation.

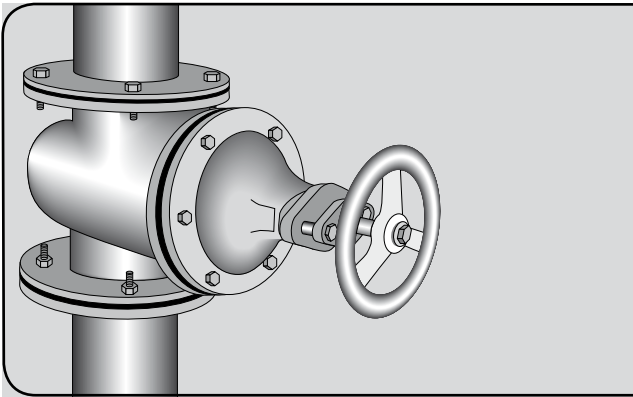
If required to reduce material scrap, use a strip of K-FLEX® sheet of proper dimension.



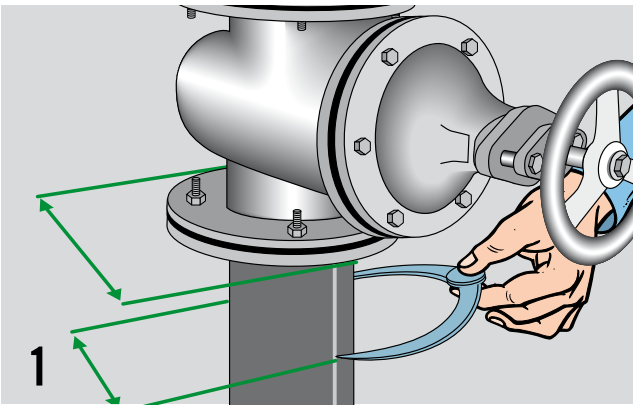
Stick the sleeve section to the outer edges of the rings, then stick the inner surface of the rings to the ends of the adjacent tubing.



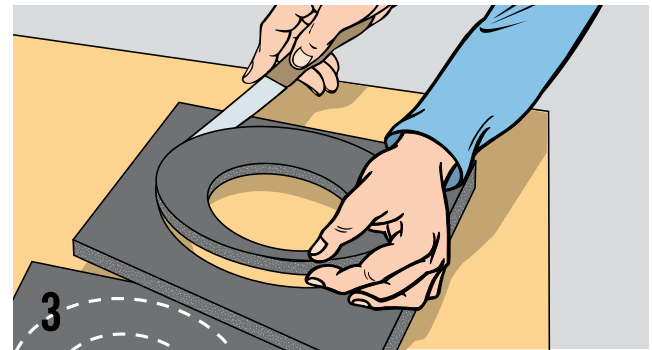
STOPCOCKS - LARGE PIPE K-FLEX® SHEETS



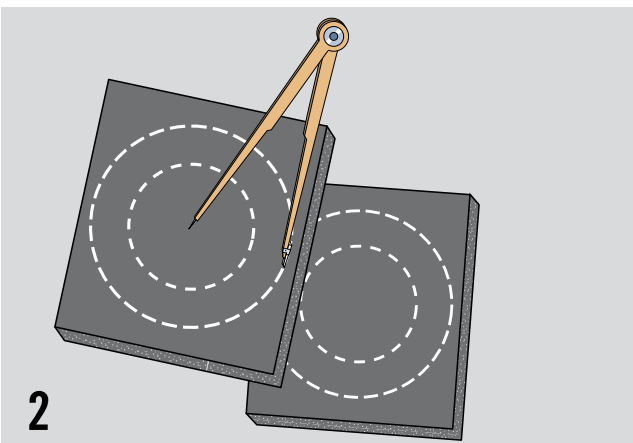
Before starting to insulate the stopcock housing, first fit tubing to the pipes to either side of it. **For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®.** Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



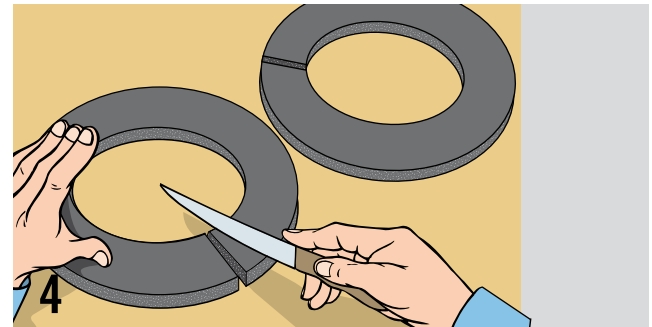
Measure the diameter of the insulated pipes and flanges. Use these measurements to calculate the relevant radii.



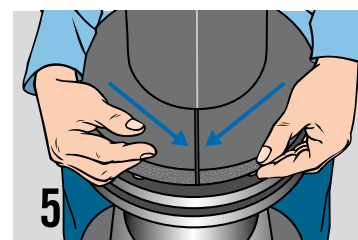
Carefully cut out the rings.



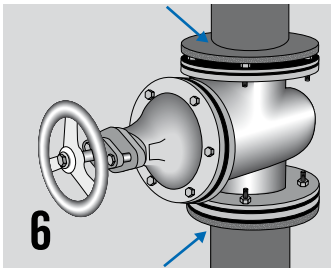
After calculating the radii, mark out the respective inner and outer circumferences on two separate squares of K-FLEX material of the same thickness.



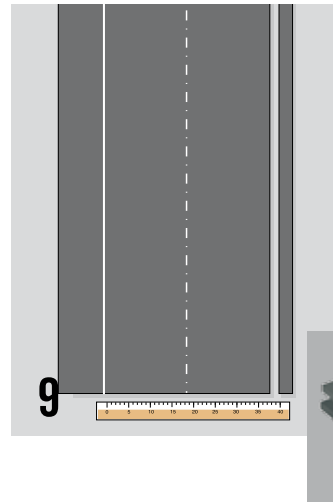
Make an opening so that they can be fitted over the pipes.



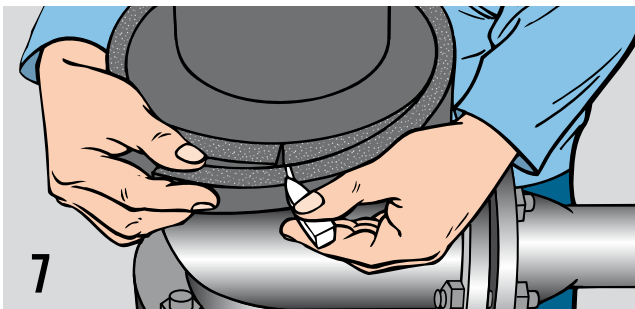
Put a ring on the outside of each flange and glue their edges together with K-FLEX® Contact Adhesive.



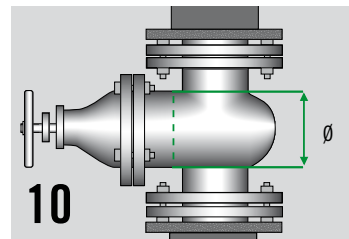
Stick the inner surfaces of the rings to the ends of the tubing covering the pipes.



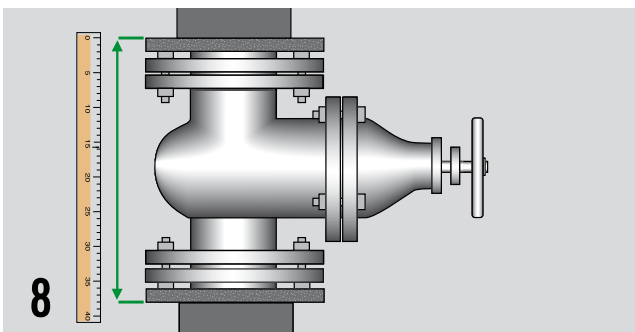
Draw the outline of the sleeve section measurements onto a K-FLEX® sheet and draw a line down the middle.



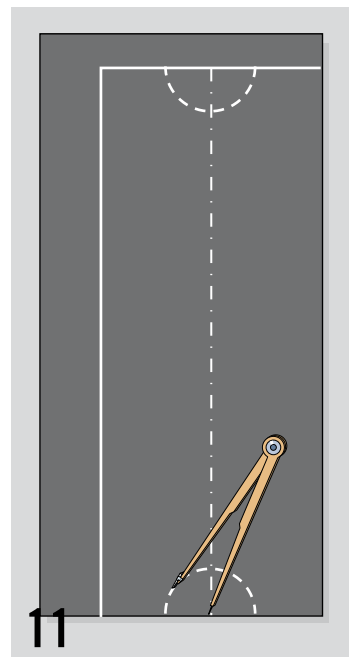
Using a strip of insulation of the same thickness, measure the circumference of the rings.



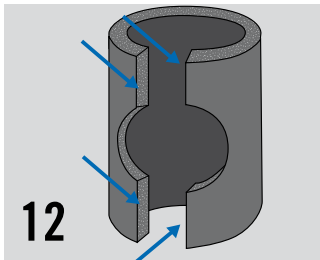
Measure the diameter of the stopcock housing.



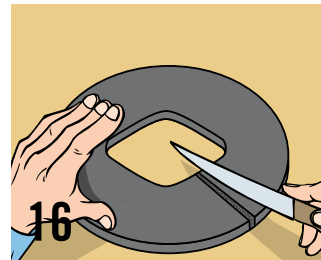
Measure the distance between the rings, including the thickness of the rings themselves.



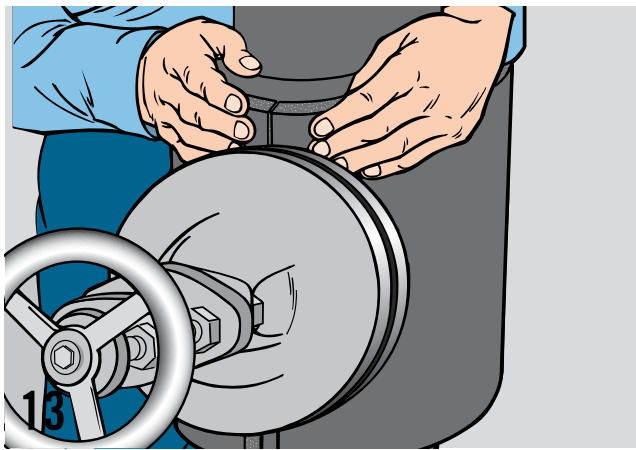
Divide the diameter by two to get the radius. Place the compass at the end of the sleeve's center line and draw a semicircle at each end.



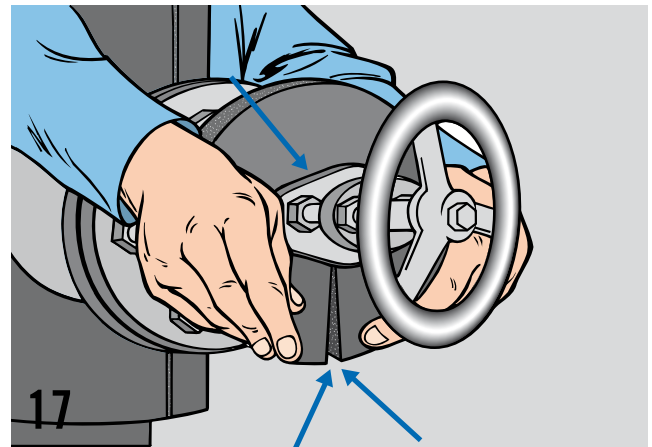
If there are any imperfections along the cut edges, smooth them slightly so that they bond precisely.



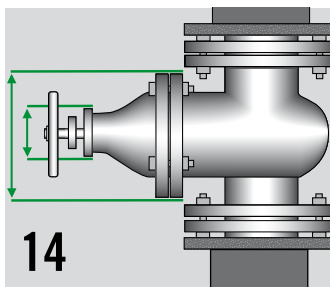
Make an opening so that the disc can be fitted over the face plate.



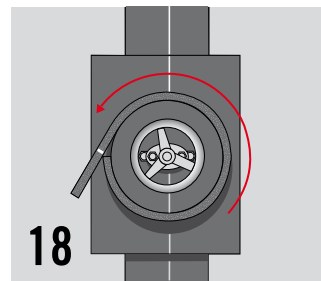
Once the glue is dry, fit the sheeting around the rings and stick the edges together.



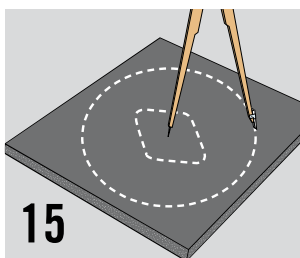
Position the disc and stick the edges together with K-FLEX® Contact Adhesive. Make sure to stick the inside edges to the face plate.



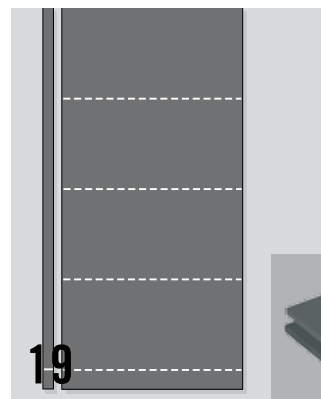
Next, calculate the shape of the disc for the front flange. Measure the circumference of the supporting flange and the form of the face plate around which the disc must fit.



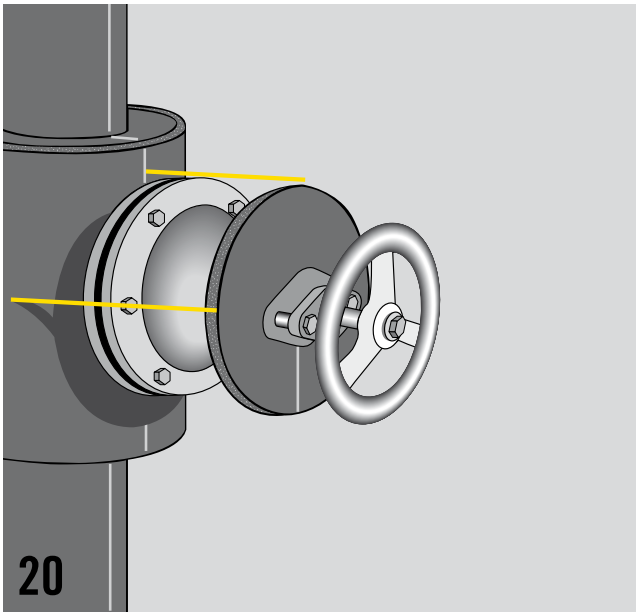
Once it is in position, measure the circumference of the disc.



Mark out the measurements on a piece of K-FLEX® sheet and cut the disc out.

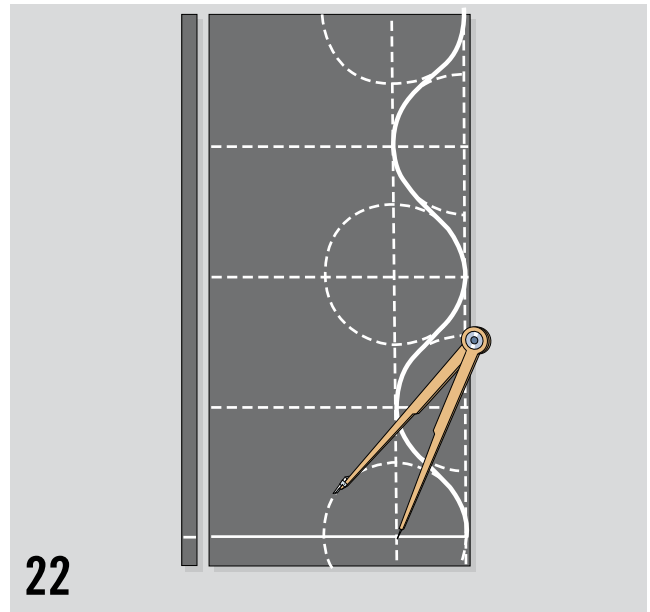


Mark the measurement out on a piece of K-FLEX® sheet of the same thickness and divide its length into four equal parts.



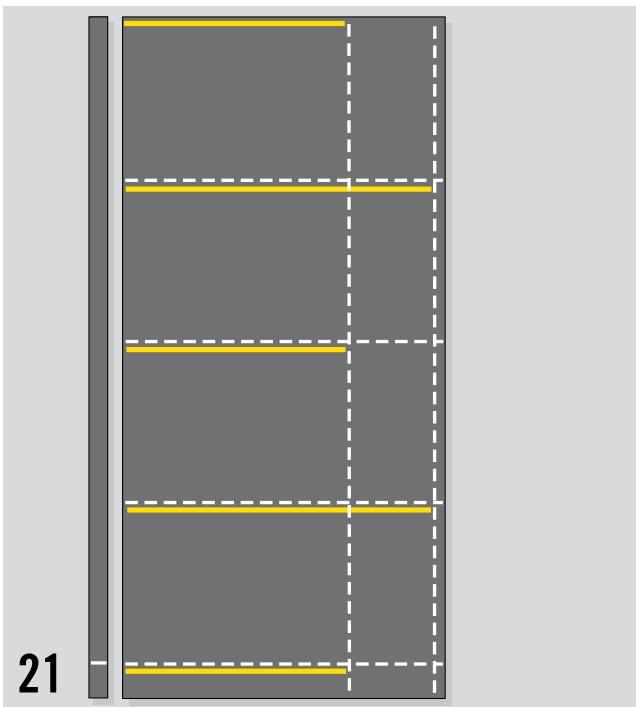
20

Measure the distance between the disc and the existing insulation at its nearest and furthest points.



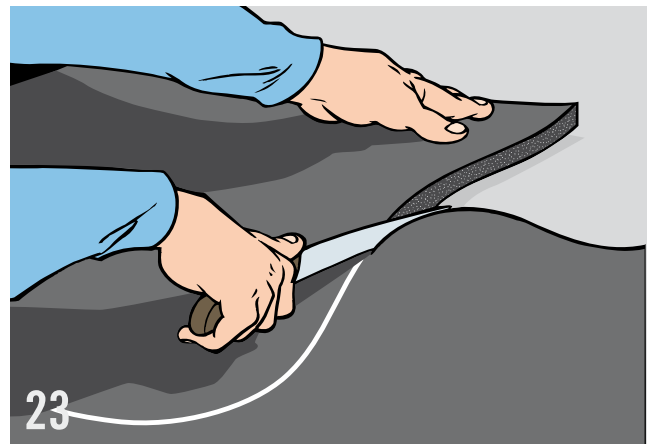
22

Using the difference in the two lengths as a radius, draw circles around the ends of the lines. Using the arcs of the circles, draw a continuous line linking them up.



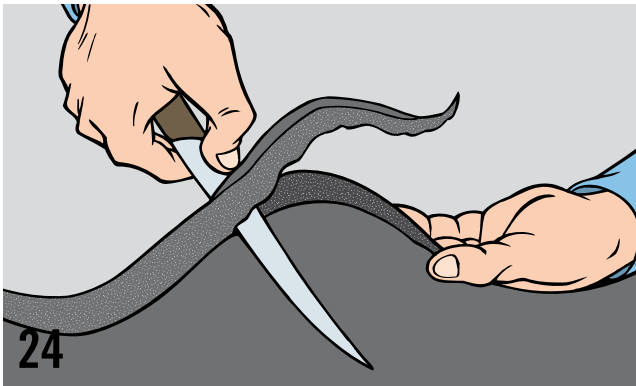
21

Mark the two different measurements on the dividing lines of the tracing, then draw the intersecting lines from one end of the shape to the other.

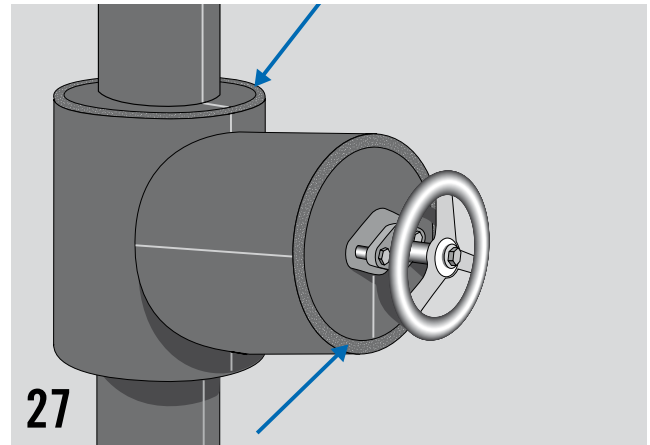


23

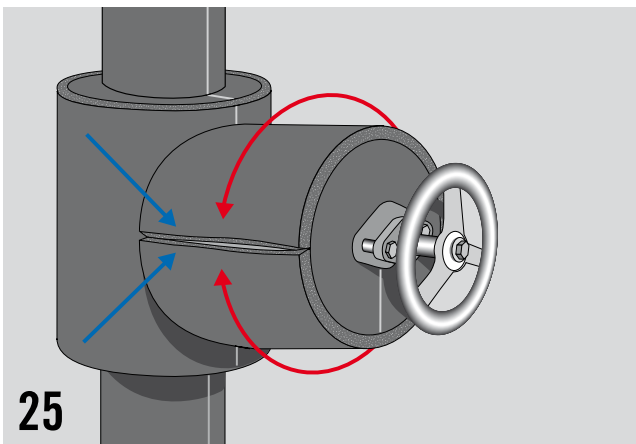
Carefully cut along the line



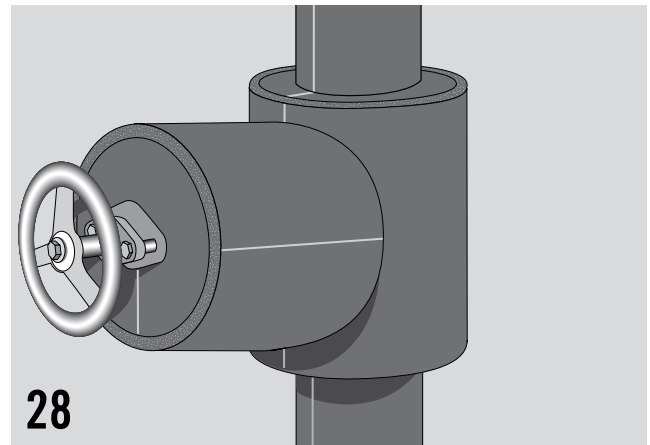
24
Bevel the edges of the upper, convex curves towards the sheet's inner surface.



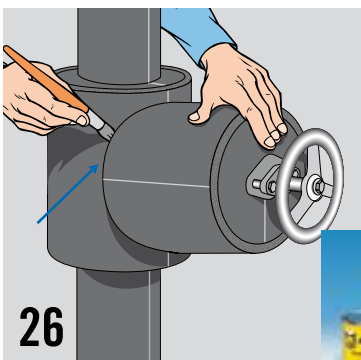
27
Check the various parts which haven't been stuck together yet. Use a brush to insert glue between the surfaces to be stuck together and press them together.



25
Glue the leading, straight edges, let them dry, then fit the resulting sleeve around the disc.



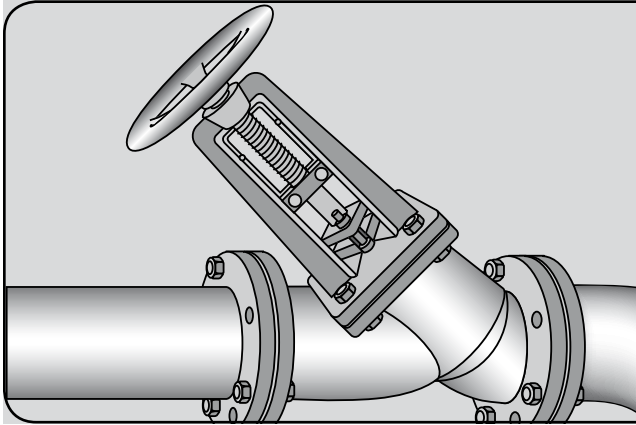
28
The stopcock is now completely sealed.



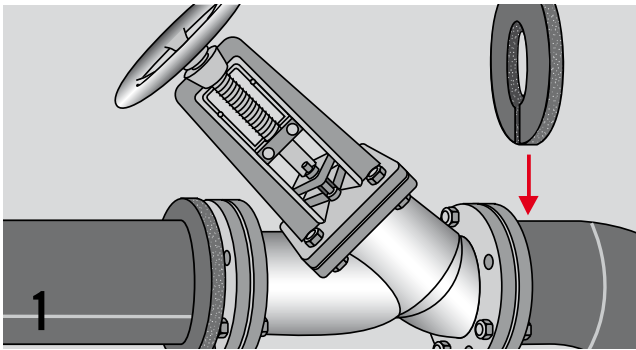
26
Stick the sleeve onto the insulation around the main stopcock housing using K-FLEX® Contact Adhesive.



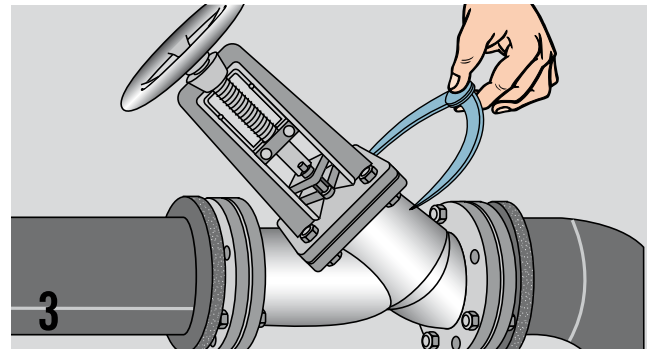
ANGLED STOPCOCKS - LARGE PIPE K-FLEX® SHEETS



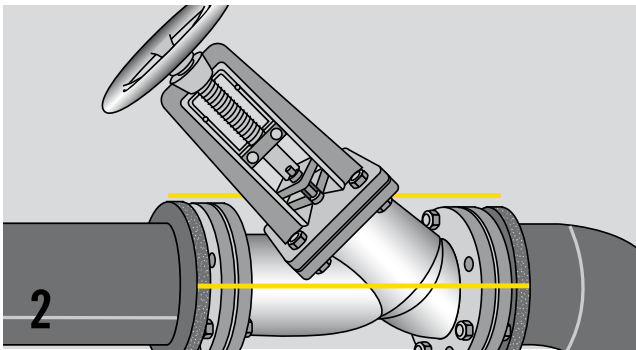
Before insulating an angled stopcock, first insulate the pipes on either side of the flange. For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating. Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



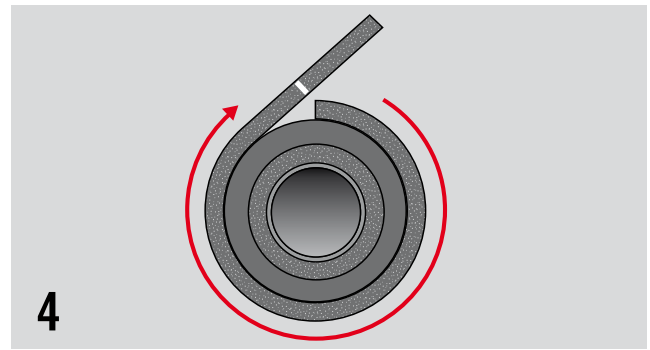
1 Following the same procedure as insulating flanges, make two rings of a K-FLEX® sheet and fit them over the tubing next to the flanges.



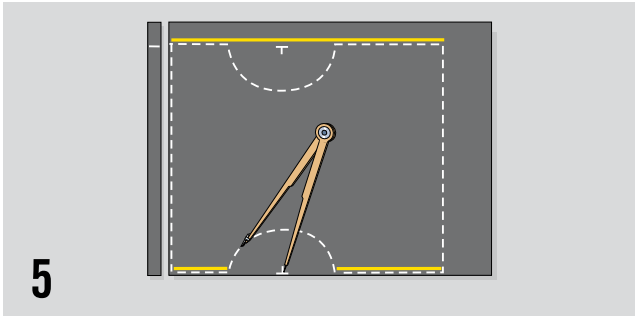
3 Measure the diameter of the base of the stopcock housing. Use this to calculate the radius needed to draw the circumference in point 5.



2 Measure the distance between the two K-FLEX® sheet rings, including the material itself, and the distance between each ring and the stopcock housing.

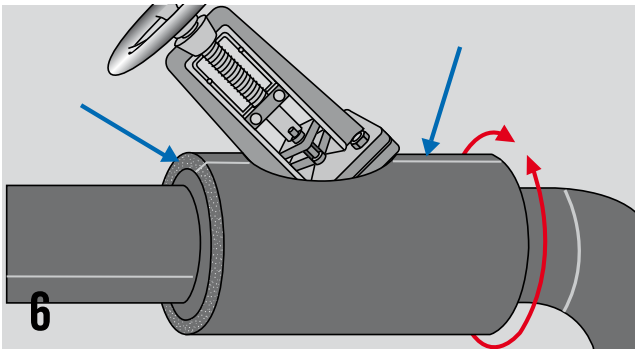


4 Measure the circumference of the rings.



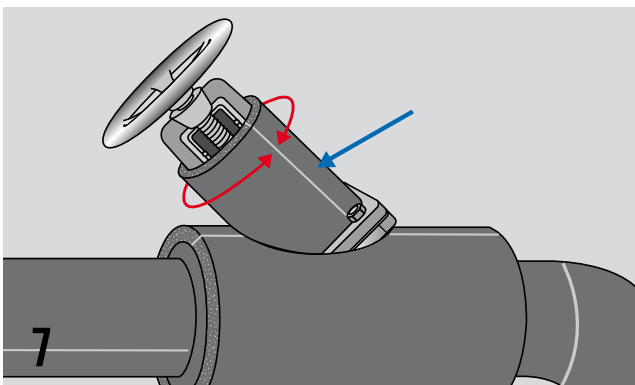
5

Mark the measurements of the rings' circumference out on a K-FLEX® sheet (figure 4), along with the semicircles for the base of the housing (figure 3) positioned along the length of the sleeve according to the measurements taken in figure 2.



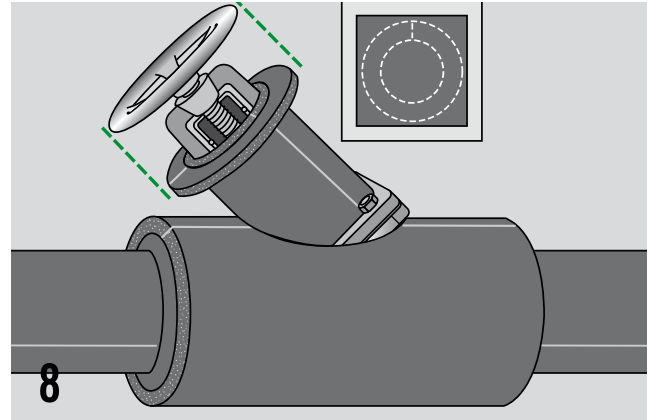
6

After cutting the piece out, wrap it around the rings to seal the central stopcock housing, then stick the edges together using K-FLEX® Contact Adhesive.



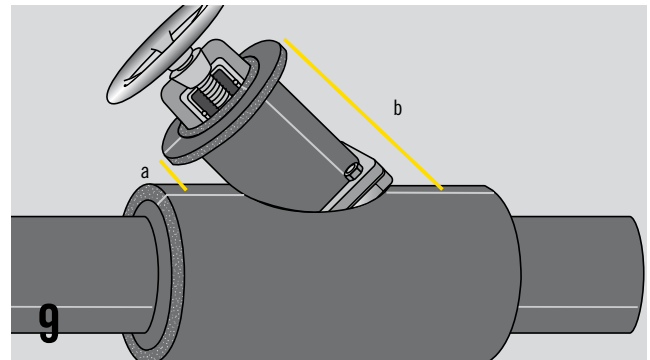
7

Cut out a second sleeve section to fit around the stopcock mechanism.



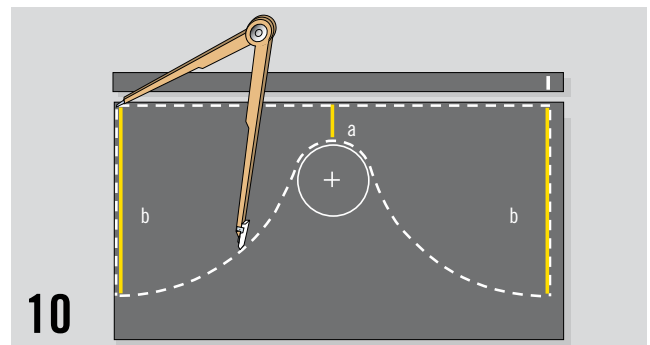
8

Cut out a ring of K-FLEX® sheet in the size of the stopcock wheel. The inner diameter should be the same as the outer circumference of the sleeve already attached.



9

Measure the distance between the ring and main housing insulation at the two points, a and b.



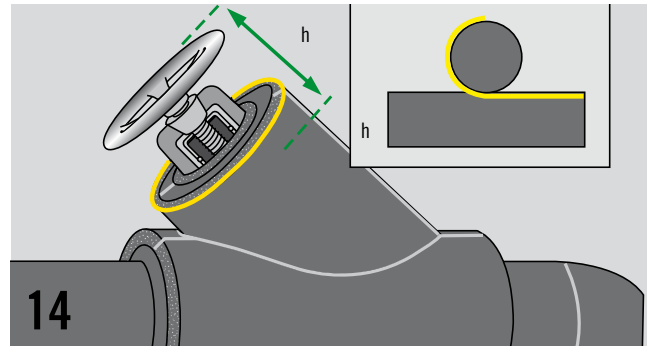
10

Draw the shape of the sleeve on a K-FLEX® sheet, using a compass and the measurements taken. The reference circle in the middle has a radius equivalent to a quarter of the diameter of the stopcock housing already insulated (see figure 6).



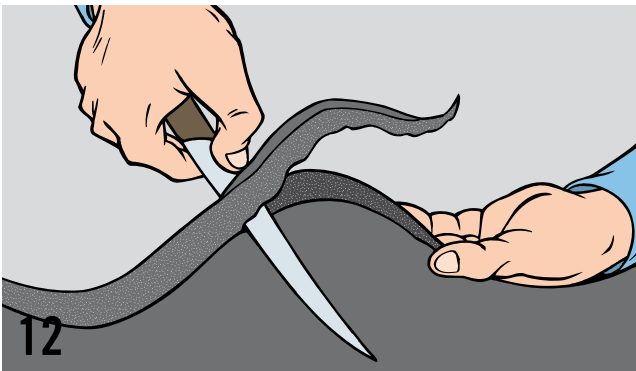
11

Join the two semicircles and cut along the line.



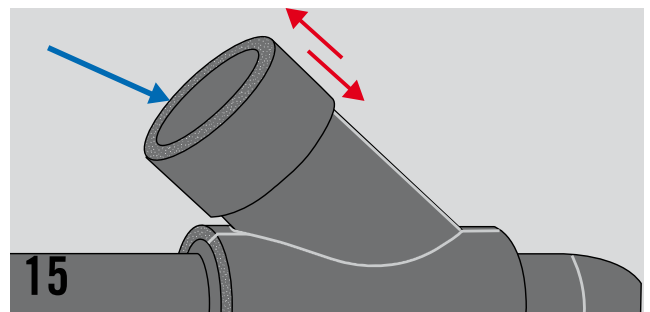
14

Make a cylindrical, removable cap with a strip of K-FLEX® sheet. The dimensions to use are shown in the figure.



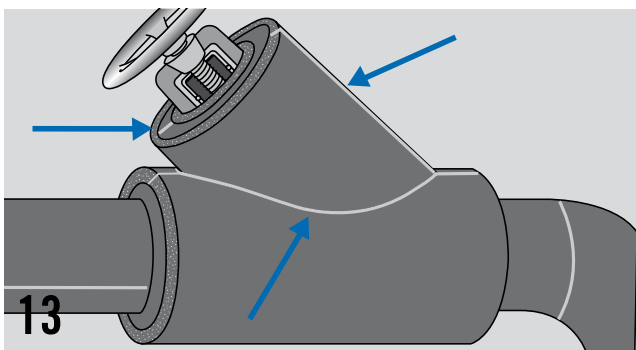
12

Bevel the curved edge towards the inner surface.



15

The cap should slide on and off easily. Once this is ensured, stick the edges together with K-FLEX® Contact Adhesive.



13

Attach the insulation around the ring and glue all the surfaces it comes into contact with.

DUCT WRAPS - RECTANGULAR K-FLEX® SHEETS & K-FLEX CLAD®



NOTE: Insulation used on outdoor duct work would require protection from mechanical abuse and UV resistance, i.e. K-FLEX® 374 Coating, jacketing, or cladding. For outdoor applications, using K-FLEX CLAD® Sheet with PSA allows for faster installation and eliminates odors from contact adhesive fumes. K-FLEX CLAD® is dent-resistant and easier to use than metal and doesn't require metal brakes or tin snips.

For horizontal ducts, create a pitch (as illustrated by the system designer) to prevent water from ponding on top of the duct. For applications subject to heavy moisture, such as wash down areas, K-FLEX recommends caulking all seams. Call K-FLEX technical support for more information.

Reference "Practical Tips" on page 12-13 for all applications. For more information, reference *Technical Bulletins* at www.klfexusa.com.



CUTTING INSTRUCTIONS

STEP 1: Cut the bottom piece first, making it flush with the edge.

STEP 2: Cut both side pieces to overlap bottom section of insulation and keep flush with top of duct.

STEP 3: Cut the top piece so that it extends over the side pieces to create a watershed.

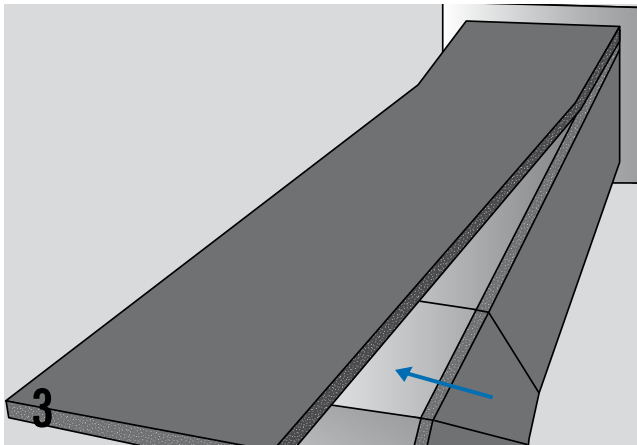
K-FLEX® SHEET S2S OR K-FLEX CLAD®

1

Thoroughly clean the surface to be insulated. Insulation is not recommended where there is incrustation or other flaws that could prevent the sheet from sticking perfectly.

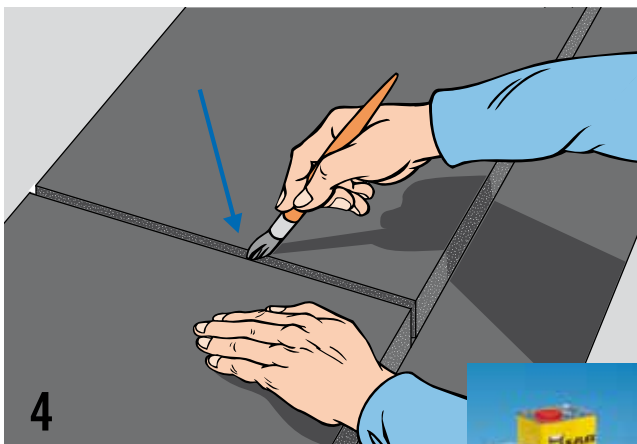
2

Mark the measurements of the surfaces to be insulated on the sheet and cut the required size out of the roll. **See Cutting Instructions.**



Apply K-FLEX® Contact Adhesive to the surface that has to adhere to the conduit and to the conduit surface.

In the example given, for the best results we recommend first insulating the lower surface of the conduit, then the side walls and lastly the top. This will prevent the penetration of humidity.



Use K-FLEX® Contact Adhesive to join the edges together.

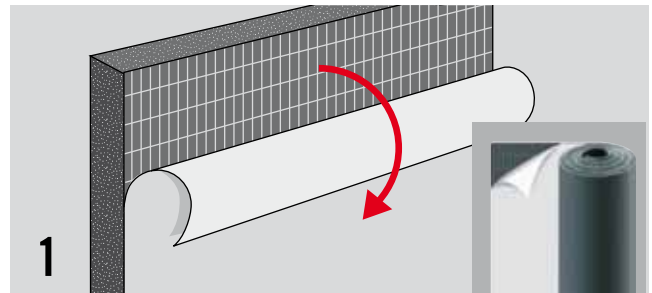
***NOTE:** If using K-FLEX CLAD®, finish up by applying K-FLEX CLAD® Tape over all seams and unfinished edges to prevent water intrusion. Use a 2" wide tape for all seams and wider tape for edges and corners, folded to cover both sides (see chart for recommended sizes). Go over tape with a plastic squeegee to eliminate wrinkles and air pockets.

Recommended tape sizes for edges and corners vary depending on thickness of insulation used:

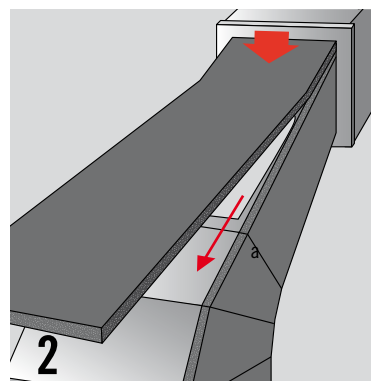
INSULATION THICKNESS	TAPE WIDTH
½"	4"
1"	6"
1-1/2"	6"
2"	6"

Note: K-FLEX® Elastomeric Foam Tape, K-FLEX CLAD® Tape - AL, and K-FLEX CLAD® Tape - WT are available.

K-FLEX® SHEET WITH PSA OR K-FLEX CLAD®

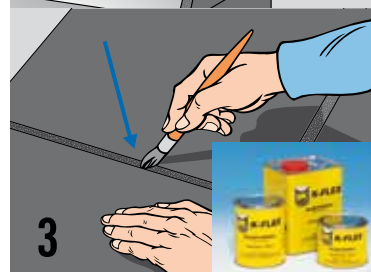


Using self-adhesive sheets, carry out the same cleaning and cutting procedures as indicated for standard sheets. The backing paper must be removed from the adhesive side before sticking it to the conduit surface. Start by pinching the foam and peeling back liner 1-2".



Position the uncovered edge at the starting point. Pull the backing paper off gradually, pressing the material down evenly as you go.

In the example given, K-FLEX recommends first insulating the lower surface of the conduit, then the side walls and lastly the top. This will prevent the penetration of humidity.



Use K-FLEX® Contact Adhesive to join the edges together.

DUCT LINING - RECTANGULAR K-FLEX DUCT® LINER GRAY

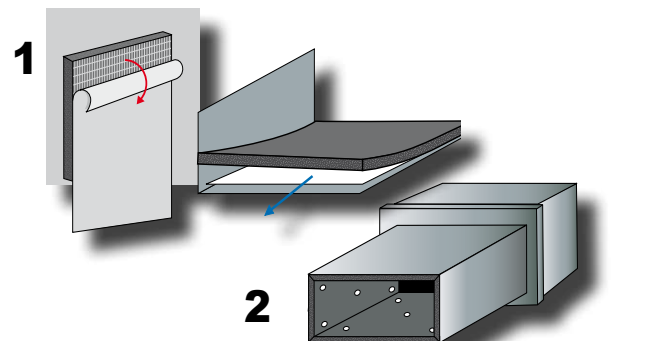
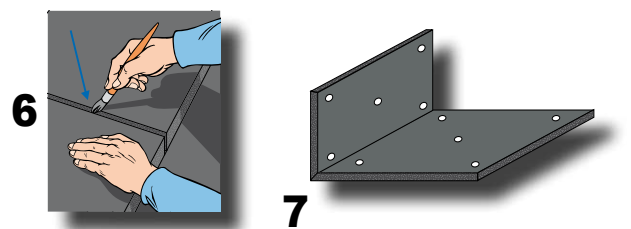
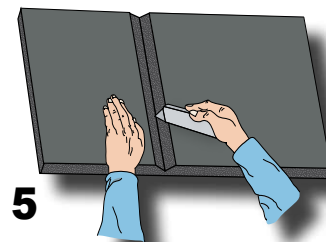
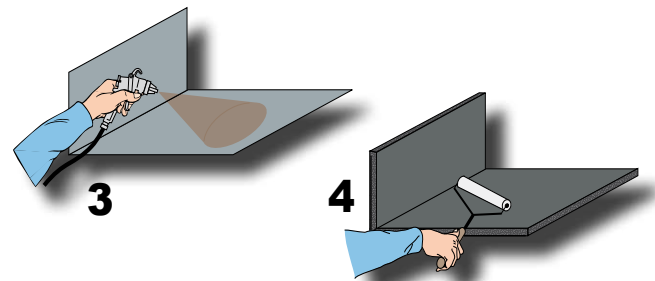
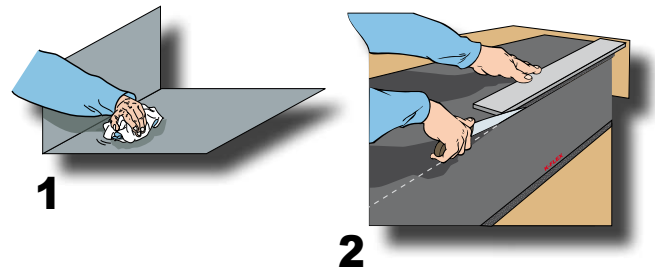
Using Contact or Hot Melt Adhesive

1. Thoroughly clean the surface to be insulated.
2. Cut K-Flex Duct® Liner Gray to the correct size (refer to installation guidelines available on our website). Always cut oversize (1/8") to provide a slight compression fit. Avoid stretching the material. Because of its flexibility and ease of cutting, elastomeric sheet is ideal for insulating irregular shapes.
3. Apply approved contact or hot melt adhesive (refer to technical bulletins available on our website) to both surfaces by brush, roller or spray. Minimum coverage rate should be 90%. Allow adhesive to become tacky before mating surfaces. Note: some spray adhesives provide acceptable adhesion with a one sided application (to the sheet metal only). We recommend testing to determine acceptability of this method.
4. For best results, use a roller to apply uniform pressure to ensure full contact to the sheet metal after the insulation has been applied.
5. On some coil lines, the insulation material can be bent along with the sheet metal. As an alternative, a v-groove cut one half the depth of the insulation can be made where the bend occurs, to avoid overcompressing the insulation.
6. Where liner is installed to individual sections, adjoin adjacent liner sections using approved adhesive.
7. Apply mechanical fasteners in accordance with HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE, pp 2.24-2.27 published by SMACNA (second edition). Note: Use caution when using weld pins with solvent based adhesives.

Contact K-Flex USA for additional information.

Using Rolls with PSA

1. Follow cleaning and cutting procedures as outlined above. Partially remove the release liner, exposing 8-10" of the adhesive. Carefully align and install the liner on the sheet metal. Remove remaining release liner and install liner. Follow procedures as outlined in items 4 thru 6 above.
2. Apply mechanical fasteners as outlined above.



DUCT LINING - ROUND K-FLEX DUCT® LINER GRAY

Double-Wall Construction

1. Thoroughly clean the surface to be insulated.
2. Gauge K-FLEX Duct® Liner Gray to ensure that, when installed, the OD of the inner duct is less than the ID of the outer duct layer. This allows the two layers to fit over each other.
3. Duct lengths may have to be shortened to 4' or 6' maximum lengths to allow for insertion into the outer shell.
4. Cut the insulation to fit around the inner duct such that the ends meet to make a seam (no overlap).
5. Apply adhesive (hot melt or solvent-based) to both ends of the insulation sheet.
6. Adhere the inner duct to the insulation sheet and roll the insulation onto the duct.
7. Mate the ends of the insulation. The seams should be glued, although the double wall will prevent the insulation from moving.
8. Slide the inner duct (with insulation) into the outer duct. A slight gap between the two layers is acceptable.

Contact K-Flex USA for additional information.



Single-Wall Construction

Double-wall construction is not mandatory when using K-FLEX Duct® Liner Gray.

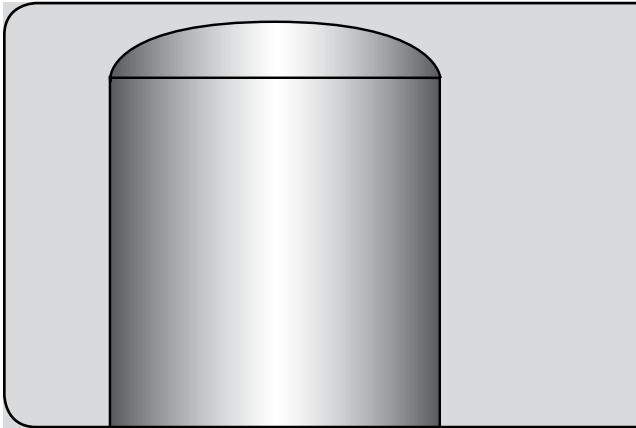
1. Follow cleaning procedures as outlined above.
2. Adhere the insulation to the inner wall using approved contact adhesives. The length of the duct sections may have to be shortened to 4' or 6' maximum lengths to allow the liner to adhere to the duct. Water-based adhesives can be used, but extended time must be allowed for the adhesive to dry.

Ideally, the liner seam should run longitudinally along the duct as this limits the duct length to a maximum of 5 feet, which is the maximum width of the liner.

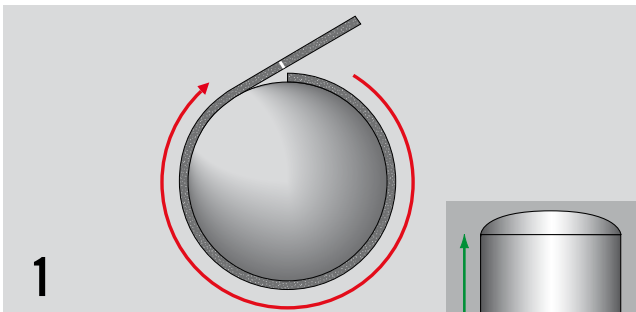
3. Seal the longitudinal seam with solvent-based contact adhesive.



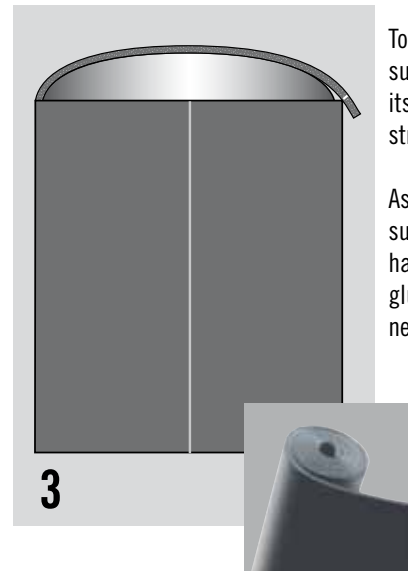
TANKS K-FLEX® SHEETS



Before insulating, clean the whole surface carefully. **For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®.** Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.

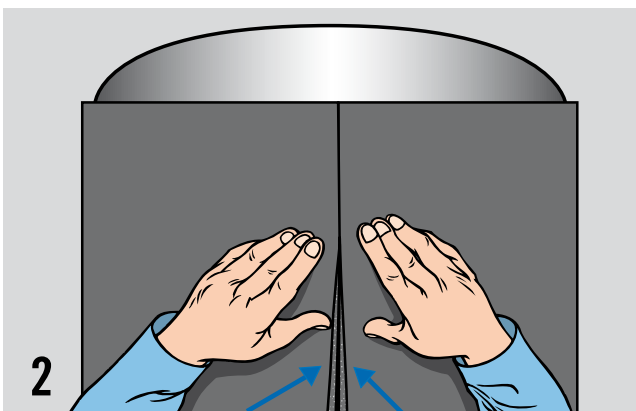


1
First, insulate the tank walls. Use the same method as with piping. Measure the circumference of the tank with a strip of K-FLEX® sheet and measure the height.

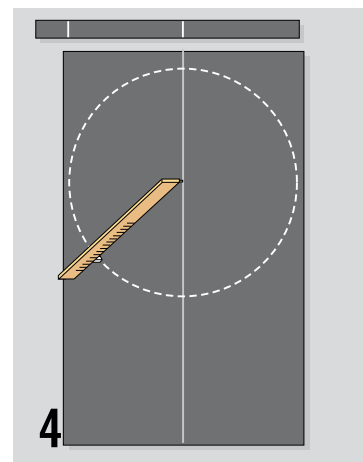


To insulate the domed surface, first measure its overall diameter with a strip of K-FLEX® sheet.

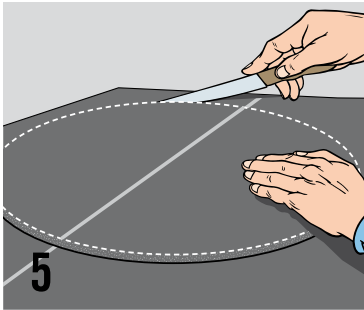
As the area to cover is substantial, ensure you have enough insulation, gluing sheets together if necessary.



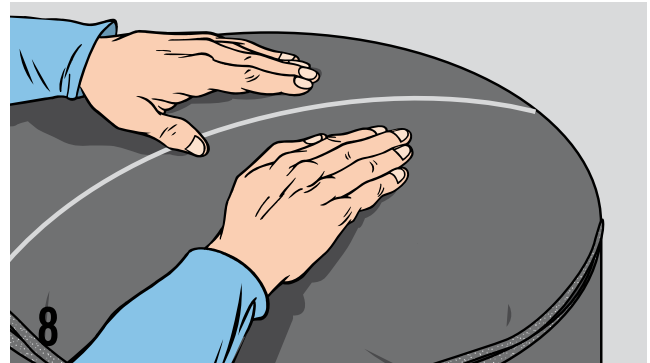
2
Mark the dimensions out on a K-FLEX® sheet and cut out. Spread K-FLEX® Contact Adhesive over the entire surface of the sheet with a flexible squeegee and over the walls of the tank with a brush. Glue the edges of the sheet, then stick the insulation to the tank, joining the edges together.



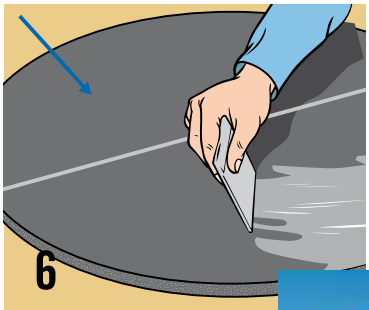
Use the diameter to calculate the radius and draw the complete circumference.



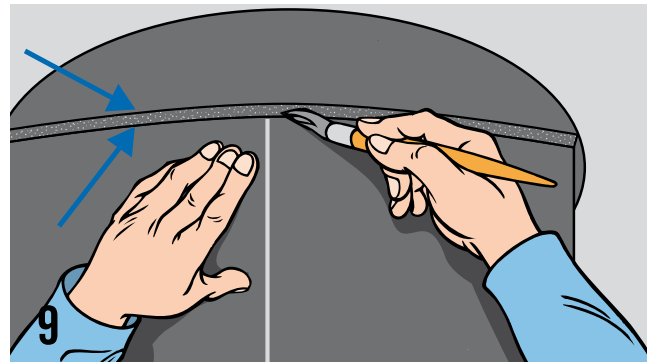
Cut the circle out accurately.



Place the K-FLEX® sheet disc on the top of the tank and press it down firmly from the center outwards to keep it from moving.



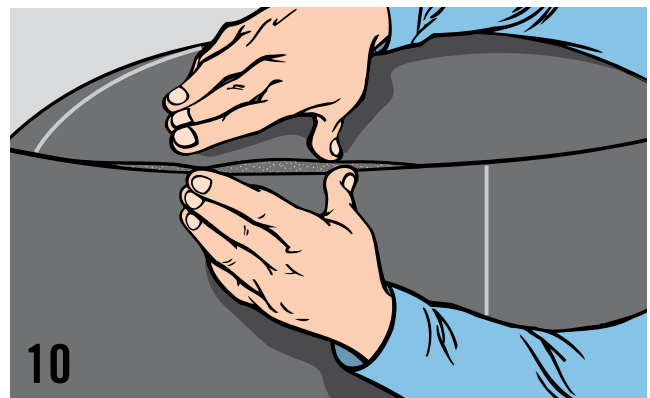
Coat the disc ...



When the sheet has stuck, glue the edges all the way around.

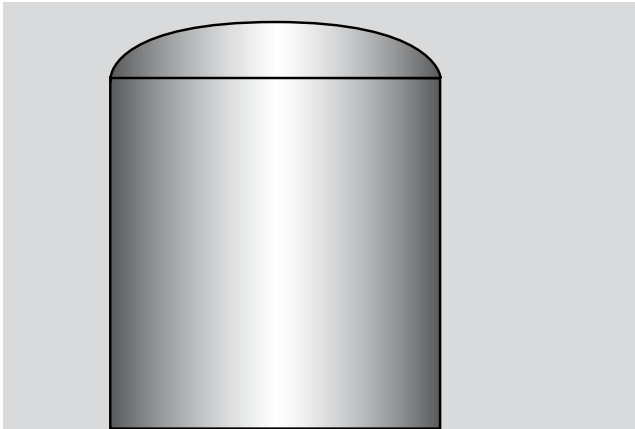


...and the top of the tank with K-FLEX® Contact Adhesive.

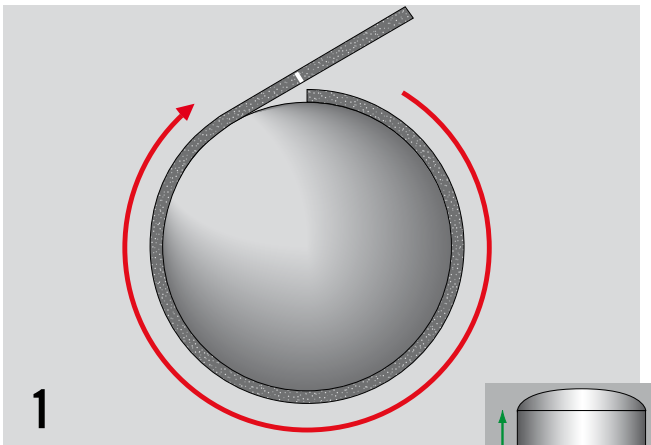


Leave to dry, then press firmly together.

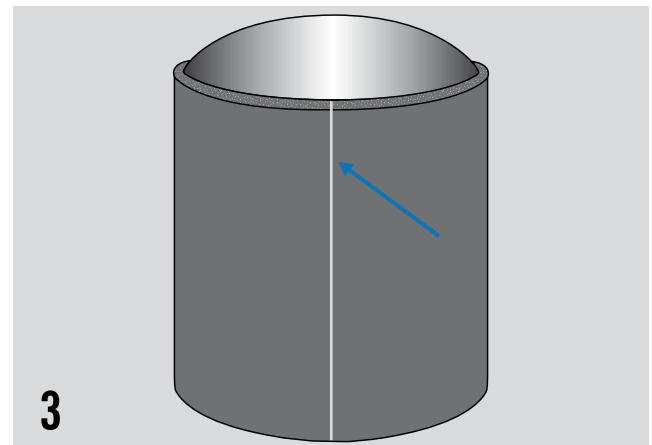
TANKS SELF-ADHESIVE K-FLEX® SHEETS



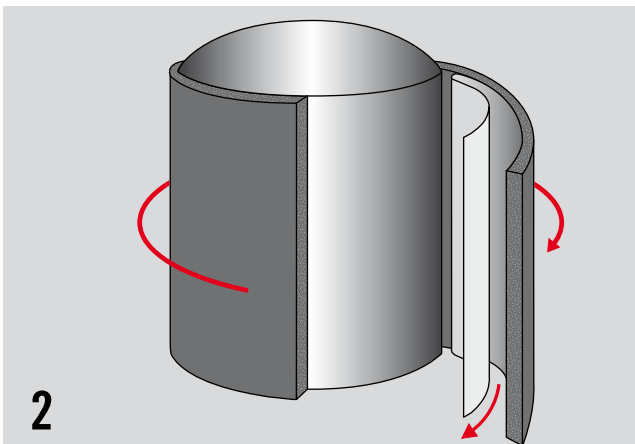
Before insulating, clean the whole surface carefully. **For outdoor applications, make sure to apply K-FLEX® 374 Protective Coating or use K-FLEX CLAD®.** Reference “Practical Tips” on page 12-13 for all applications. For more installation tips, reference *Technical Bulletins* at www.kflexusa.com.



1
Measure the height and circumference. After marking the dimensions on the self-adhesive sheet, cut out the portion needed to insulate the tank.



3
When the cylindrical wall is completely covered, join the edges with K-FLEX® Contact Adhesive. The domed surface will be insulated following the indications for non self-adhesive sheeting. The only difference lies in removing the backing paper.



2
Fix one end at the starting point and remove the backing paper, placing the adhesive liner onto the cylindrical surface.



NESTING SIZES

To use the chart below, find the nominal insulation ID for the first layer of insulation in the far left column. Read across to the first layer insulation thickness column to find the nominal ID needed for the second layer of insulation.

K-FLEX® STANDARD INSULATION

Insulation (1 st layer) Nominal ID	IPS Nominal	3/8" Wall (1st layer)	1/2" Wall (1st layer)	3/4" Wall (1st layer)	1" Wall (1st layer)	1-1/4" Wall (1st layer)	1-1/2" Wall (1st layer)	2" Wall (1st layer)
1/4"		1-1/8"	1-3/8"	2"	2-3/8"	2-7/8"	3-1/2"	4-1/8"
3/8"	--	1-3/8"	1-5/8"	2"	2-3/8"	3-1/8"	3-1/2"	4-1/2"
1/2"	1/4"	1-3/8"	1-5/8"	2"	2-5/8"	3-1/8"	3-5/8"	4-1/2"
5/8"	3/8"	1-5/8"	2"	2-3/8"	2-7/8"	3-1/2"	--	4-1/2"
3/4"		1-7/8"	2"	2-5/8"	2-7/8"	3-1/2"	4-1/8"	Sheet
7/8"	1/2"	2"	2-1/8"	2-5/8"	3-1/8"	3-1/2"	4-1/8"	Sheet
1-1/8"	3/4"	2-1/8"	2-3/8"	3-1/8"	3-1/2"	4-1/8"	4-1/2"	Sheet or 5-1/8"
1-3/8"	1"	2-3/8"	2-5/8"	3-1/2"	3-5/8"	4-1/8"	4-1/2"	Sheet or 5-5/8"
1-5/8"	1-1/4"	2-7/8"	2-7/8"	3-1/2"	4-1/8"	4-1/2"	Sheet	Sheet or 6-1/8"
2"	1-1/2"	3-1/8"	3-1/2"	4"	4-1/2"	Sheet	Sheet	Sheet or 6-1/8"
2-1/8"	--	3-1/2"	3-1/2"	4-1/8"	4-1/2"	Sheet	Sheet	Sheet
2-3/8"	2"	3-1/2"	3-5/8"	4-1/2"	Sheet	Sheet	Sheet or 5-5/8"	Sheet or 6-5/8"
2-5/8"		4"	4"	4-1/2"	Sheet	Sheet or 5-5/8"	Sheet	Sheet
2-7/8"	2-1/2"	4-1/8"	4-1/8"	Sheet	Sheet	Sheet or 5-5/8"	Sheet or 6-1/8"	Sheet
3-1/8"		4-1/2"	4-1/2"	Sheet	Sheet or 5-5/8"	Sheet or 6-1/8"	Sheet or 6-5/8"	Sheet
3-1/2"	3"	--	Sheet	Sheet or 5-5/8"	Sheet	Sheet	Sheet	Sheet
3-5/8"		--	Sheet	Sheet or 5-5/8"	Sheet or 6-1/8"	Sheet or 6-5/8"	Sheet	Sheet
4-1/8"		--	Sheet or 5-5/8"	Sheet or 6-1/8"	Sheet or 6-5/8"	Sheet	Sheet	Sheet or 8-5/8"
4-1/2"	4"	--	Sheet or 6-1/8"	Sheet or 6-5/8"	Sheet	Sheet	Sheet	Sheet
5-5/8"	5"	--	Sheet	Sheet	Sheet	Sheet or 8-5/8"	Sheet	Sheet
6-1/8"		--	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet
6-5/8"	6"	--	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet
8-5/8"	8"	--	Sheet	Sheet	Sheet	Sheet	Sheet	Sheet

NESTING SIZES

K-FLEX ECO™

Insulation (1 st layer) Nominal ID	IPS Nominal	1/2" Wall (1st layer)	3/4" Wall (1st layer)	1" Wall (1st layer)
3/8"	--	2"	2-3/8"	2-7/8"
1/2"	1/4"	2"	2-3/8"	2-7/8"
5/8"	3/8"	2-1/8"	2-5/8"	3-1/2"
7/8"	1/2"	2-3/8"	2-7/8"	3-1/2"
1-1/8"	3/4"	2-7/8"	3-1/2"	3-1/2"
1-3/8"	1"	2-7/8"	3-1/2"	4"
1-5/8"	1-1/4"	3-1/2"	3-1/2"	4"
2"	1-1/2"	3-1/2"	4"	4-1/2"
2-1/8"	--	3-1/2"	4"	4-1/2"
2-3/8"	2"	4"	4-1/2"	Sheet
2-7/8"	2-1/2"	4-1/2"	Sheet	Sheet
3-1/2"	3"	Sheet	Sheet	Sheet
4"	3-1/2"	Sheet	Sheet	Sheet
4-1/2"	4"	Sheet	Sheet	Sheet
5-5/8"	5"	Sheet	Sheet	Sheet
6-5/8"	6"	Sheet	Sheet	Sheet
8-5/8"	8"	Sheet	Sheet	Sheet

Sheet insulation length is given below where no nesting size is specified. Sheet length is an estimate, and should be adjusted to actual installation requirements. Nested insulation may fit loosely, with trimming required for a proper fit. Air space between layers of insulation will not adversely effect performance as long as butt joints are properly sealed. For pipe ODs below 5" IPS, K-FLEX recommends using tube insulation to prevent the tension and stress cracking that can occur when using sheet insulation on smaller pipe sizes.

SHEET LENGTH ESTIMATES

Insulation Size	Sheet Thickness (inches)			
	20-1/8	21-5/8	23-1/4	24-3/4
4-1/2" x 1/2"	20-1/8	21-5/8	23-1/4	24-3/4
4-1/2" x 1"	23-5/8	25-1/2	26-3/4	28-3/8
5-5/8" x 1/2"	23-1/4	24-3/4	26-3/8	29
5-5/8" x 3/4"	25-1/4	26-7/8	28-3/8	30
6-5/8" x 1"	30-7/8	31-7/8	33-1/2	35
8-5/8" x 1/2"	33	34-5/8	36-1/8	37-3/4
8-5/8" x 3/4"	35-1/8	36-5/8	38-1/4	39-3/4
8-5/8" x 1"	36-5/8	38-1/8	39-3/4	41-3/8



TECHNICAL RESOURCES

K-FLEX USA offers technical expertise related to the application, specification and performance of elastomeric insulation. Below is a listing of resources, and representative examples of each, that are available either as a service or for download at www.kflexusa.com.

Technical Bulletins (Application and Specification):

- Installation Tools and Techniques
- In-depth Application Details
- Freeze Prevention / Temperature Ranges / Shelf Life
- Insulation IDs and Fit
- Comparison of elastomeric versus other insulation types
- Building Codes Information
- Compliance with Industry Standards
- Review of Test Methods
- Product Contents
- Third Party Certifications
- Calculation of k-factor and R-values
- Building Specification Guidelines

Material Safety Data Sheets (MSDS) & Technical Data Sheets:

Available for all K-FLEX USA products

Technical & Product Performance Application Brochures:

- Chilled Water
- Ammonia
- Duct Liner
- Duct Cover
- Refrigeration
- Storage Tanks
- Oil & Gas

Installation Guides:

- ASTM C 1710, *Installation of Flexible Closed-Cell Preformed Insulation in Tube and Sheet Form*
- K-FLEX USA Installation Manual
- K-FLEX USA Installation Videos
- Installation Expert on staff for trainings

Technical Calculators:

- ISOCALC: Thickness Calculations for Thermal Insulation Applications
- Product Energy & Cost Calculator
- NIA Certified Insulation Appraiser on staff