

2021

INTEREP EJ Installation Guide



Storing Expansion Joints



Performance and longevity of an expansion joint (EJ) are affected by storage & environmental conditions. While most forms of environmental attack will have little effect upon a typical EJ while in storage, they are susceptible to accidental damage and storage best-practices must be followed in order to avoid plant-process issues after installation.

Length of Storage



INTEREP warranties storage for 12 months in specified conditions unless the customer requests otherwise. Contact INTEREP for inspection if storage period exceeds one year. Inspections should be made at least sixty (60) days before anticipated installation. Notify the manufacture if the start-up date is to be more than twelve (12) months after the installation of the expansion joints.

Notify INTEREP, regardless of storage time, if any unusual appearances are noticed when unpacking or installing the expansion joints. In case of storage over one year, re-inspection by INTEREP can assure that performance will not be affected. In cases of storage abuse, expansion joint warranties may be invalid. Special storage methods should be used when long term field storage is anticipated for spare expansion joints.



Indoor Storage Recommendations

- EXPANSION JOINTS SHOULD BE STORED IN THEIR ORIGINAL SHIPPING PACKAGE OR CONTAINER, AND KEPT IN A COOL, DRY PLACE WITH TEMPERATURES ACCEPTABLE FOR HUMAN OCCUPANCY (15°F TO 150°F) AND FREE OF HEAT SOURCES, MOISTURE, DIRT, AND PETROLEUM-BASED CHEMICALS
- EXPANSION JOINTS CONTAIN VARIOUS TYPES OF INSULATION WHICH WILL ABSORB WATER. THEY SHOULD BE KEPT DRY AND OFF OF THE GROUND, MOISTURE ABSORPTION CAN CAUSE EJ FAILURES AND PROCESS ISSUES AT STARTUP.
- UNPACKED EXPANSION JOINTS SHOULD BE STORED ON A PALLET AND PROTECTED AGAINST PHYSICAL DAMAGE DURING TRANSPORTATION AND STORAGE.
- STORE EJS AWAY FROM HEAVY-TRAFFIC AREAS
- LEAVE INTEREP EXPANSION JOINTS IN THEIR ORIGINAL SHIPPING CONTAINERS UNTIL READY FOR INSTALLATION.
- LEAVE EXPANSION JOINT SHIPPING BARS ATTACHED UNTIL EJ IS FULLY INSTALLED IN PIPING OR DUCTING SYSTEM
- DO NOT STORE OTHER OBJECTS ON TOP OF AN EXPANSION JOINT.



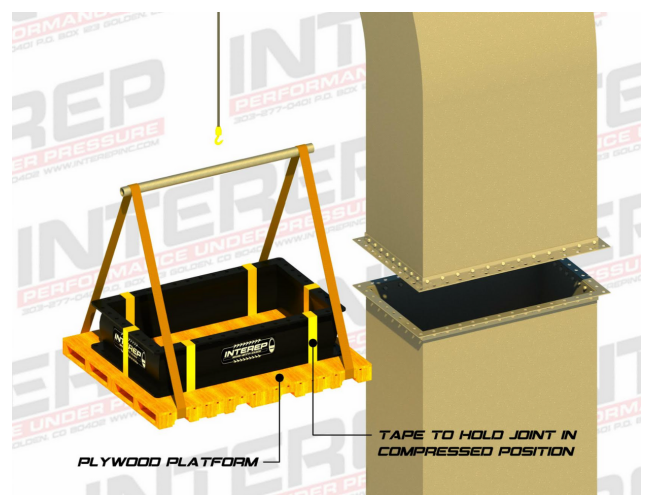
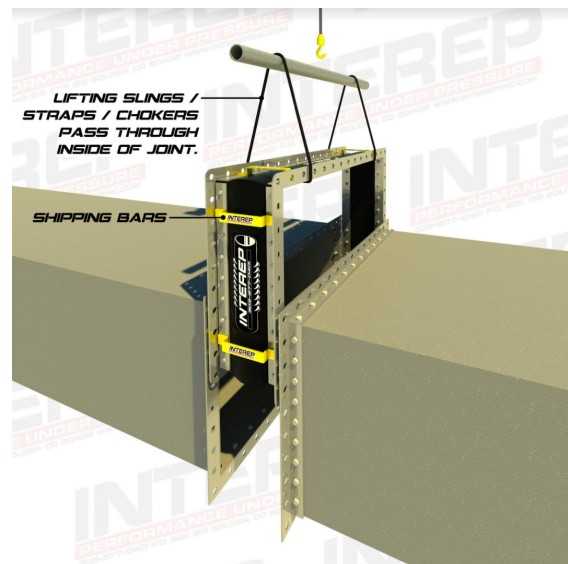
Outdoor Storage Recommendations

- LEAVE INTEREP EXPANSION JOINTS IN THEIR ORIGINAL SHIPPING CONTAINERS UNTIL READY FOR INSTALLATION. KEEP AT LEAST ONE (1) FOOT ABOVE THE GROUND IN A DRY AREA.
- COVER EXPANSION JOINTS AND SHIPPING CONTAINER WITH HEAVY PLASTIC TO PROTECT THEM FROM WATER, DUST, AND UV RADIATION.
- EXPANSION JOINTS CONTAIN VARIOUS TYPES OF INSULATION WHICH WILL ABSORB WATER. THEY SHOULD BE KEPT DRY AND OFF OF THE GROUND, MOISTURE ABSORPTION CAN CAUSE EJ FAILURES AND PROCESS ISSUES AT STARTUP.
- IN A LOW TEMPERATURE ENVIRONMENT (32°F-0°C), EXPANSION JOINTS HAVE AN INCREASED RESISTANCE TO BENDING. UNDER THESE CONDITIONS IT IS RECOMMENDED THAT THE EXPANSION JOINT SHOULD BE STORED INSIDE A WARMER ENVIRONMENT IMMEDIATELY PRIOR TO INSTALLATION.
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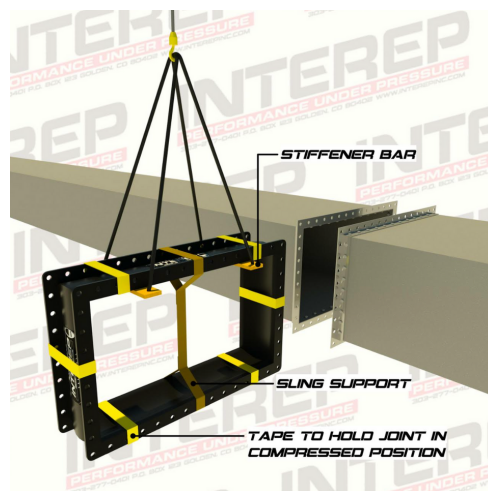


Handling and Installation

- EXPANSION JOINTS WILL BE PACKAGED TO ARRIVE ON-SITE IN GOOD CONDITION. ONCE THEY HAVE BEEN RECEIVED, CUSTOMER SHOULD VERIFY THAT ALL PARTS ON PURCHASE ORDER AND PACKING SLIP MATCH. INTEREP INCLUDES DETAILED STORAGE AND INSTALL INSTRUCTIONS WITH EACH SHIPMENT. PLEASE FOLLOW THESE TO ENSURE EXCELLENT PERFORMANCE AND SERVICE LIFE.
- TAKE CARE UNPACKING THE EJ, AVOID DROPPING, MANIPULATING WITH MACHINES, OR DRAGGING. FOLLOW HOISTING INSTRUCTIONS.
- CHECK THE FLOW ARROWS MARKED ON THE EXPANSION JOINT OR FLOW LINERS. EJ MUST BE INSTALLED WITH THE FLOW ARROWS POINTING IN THE DIRECTION OF FLOW (INTERNAL LINER GAP SHOULD BE ON THE DOWNSTREAM SIDE OF THE EJ). TEXT OR PAINT/MARKINGS SHOULD FACE OUTSIDE.
- HEAVY OR BULKY EXPANSION JOINTS MUST BE SUPPORTED DURING INSTALLATION ACCORDING TO THE DIAGRAMS SHOWN HERE (FOLLOW LIFTING BEST-PRACTICES)
- EXPANSION JOINTS SHOULD NOT BE LIFTED BY ATTACHING A LIFTING DEVICE (CHAIN-FALL, STRAP, HOOK, ETC.) DIRECTLY TO THE FLEXIBLE ELEMENT. REST THE EJ ON A SUPPORT-BASE, AND ATTACH LIFTING DEVICE TO THAT BASE.
- SHOP-ASSEMBLED INTEREP EXPANSION JOINTS ARE TO BE LIFTED BY THE SPECIFIED LUGS AND NOT BY THE SHIPPING-BARS UNLESS INTEREP SPECIFIES OTHERWISE.
- LEAVE SHIPPING WRAP OR COVER ON UNTIL INSTALLATION IS READY TO BEGIN
- WELD-SPATTER AND SHARP OBJECTS WILL PUNCTURE BOTH METAL AND FABRIC EXPANSION JOINTS



- HAND-TIGHTEN BACKUP-BARS, BOLTS, AND OTHER HARDWARE BEFORE FINAL TORQUE IS APPLIED (SEE TABLE BELOW)
- BOLT TORQUE SPECIFICATION DEPENDS ON THE TYPE OF EXPANSION JOINT, BOLT DIMENSIONS, BOLT LUBRICATION, BOLT DISTANCE, ETC. PLEASE SEE BOLT LOADING GUIDE (TABLE G-A BELOW). FROM FSA TECHNICAL HANDBOOK 4TH ED.



- THE HOLES IN THE EXPANSION JOINT FLANGE SHOULD NEVER BE USED AS A LUG TO LIFT THE EXPANSION JOINT.
- REMOVE SHIPPING BARS AFTER THE EXPANSION JOINT IS INSTALLED, THEY WILL PROTECT FLEXIBLE ELEMENT UNTIL INSTALL IS COMPLETE.
- NEVER WALK ON EJ OR PLACE EXTERNAL WEGHT UPON IT
- FABRIC-ONLY EXPANSION JOINTS USUALLY REQUIRE A FIELD SPLICE. THIS MUST BE PERFORMED BY INTEREP OR OTHER QUALIFIED TECHNICIANS. THE EJ "SPLICE KIT" CONSISTING OF CLEAR PFA FILM AND A SMALL SECTION OF EXTRA BELT MATERIAL SHOULD BE CAREFULLY TRACKED AND STORED.
- IF INSTALLING AN "OPEN-ENDED" EXPANSION JOINT WHICH REQUIRES A FIELD-SPLICE, SEE INSTRUCTIONS ON PAGE 12.

Table G-A: Bolt Loading Guide

Imperial (inches)								
Width of Clamp Bar	1 1/2		2		2 1/2		3	
Thickness of Clamp Bar	1/4	3/8	1/4	3/8	3/8	1/2	3/8	1/2
Bolt Spacing	4		4 - 6		4 - 6		4 - 6	
Bolts	3/8	1/2	1/2	5/8	5/8	3/4	5/8	3/4
Recommended Tightening Torque (ft.lbs):								
Loading for Fabric Expansion Joint	36	59	74	88	85	103	96	118
Loading for Elastomeric Expansion Joint	31	44	55	66	66	81	74	92

Metric (mm)								
Width of Clamp Bar	50		60		70		80	
Thickness of Clamp Bar	8	10	10	12	10	12	12	
Bolt Spacing	100		100		120		120	
Bolts	M12	M16	M16	M20	M16	M20	M16	M20
Recommended Tightening Torque (Nm):								
Loading for Fabric Expansion Joint	60	80	100	120	115	140	130	160
Loading for Elastomeric Expansion Joint	50	65	75	90	90	110	100	125

Bolted Flange

- ENSURE DUCTWORK BREACHING AND ADJACENT AREAS ARE FREE OF ANY DEBRIS THAT IS HARD, SHARP, ABRASIVE, ETC.
- VERIFY THAT THE INTERNAL FLOW-LINER OF THE EJ DOES NOT INTERFERE WITH THE MATING FLANGE ID (DOWNSTREAM).
- USE GASKET BETWEEN EXPANSION JOINT AND MATING FLANGE THAT IS IDENTICAL TO THOSE GASKETS USED ELSEWHERE IN PIPING OR DUCTING SYSTEM (ASSUMING PROPER GASKET FOR PRESSURE, TEMP, AND CHEMICAL MEDIA).
- DO NOT INSTALL BOLTS WITH THREADS POINTING OUT FROM DUCTWORK OR TOWARD FLEXIBLE ELEMENT
- LUBRICATE BOLT THREADS BEFORE INSTALLATION OF NUTS IN ORDER TO ENSURE PROPER TORQUE SPEC AND ALLOW FOR FUTURE UNINSTALLATION.
- SEE TABLE ABOVE (PAGE 7. FOR HARDWARE TORQUE SPECS)

Welded Flange

- THE METAL FRAME OF A FABRIC EXPANSION JOINT CAN BE WELDED DIRECTLY TO MATING DUCT-FLANGE TO PROVIDE A ZERO LEAKAGE SEAL BETWEEN FLANGES. HOWEVER, THE FOLLOWING PRACTICES SHOULD BE FOLLOWED IF DOING SO:
- COMPLETELY COVER THE FLEXIBLE ELEMENT OF THE EJ WITH WELDING BLANKET TO ENSURE ZERO WELD SPATTER TOUCHES THE ELEMENT. SPATTER, ABRASIVES, SCRATCHES, ETC. CAN DECREASE EJ LIFESPAN DRAMATICALLY.
- IF LINEAR FOOTAGE OF WELD IS GREAT ENOUGH TO HEAT FLANGE ABOVE 600F THROUGHOUT, EXPANSION JOINT FLEXIBLE ELEMENT SHOULD BE REMOVED BEFORE WELDING BEGINS AND REPLACED ONCE FLANGES ARE WELDED. WE RECOMMEND AN INTEREP TECHNICAL REPRESENTATIVE BE ON-SITE TO OVERSEE THIS PROCESS

Tolerances

- FABRIC EXPANSION JOINTS CAN HANDLE MISALIGNMENT, LATERAL, AXIAL, ANGULAR, AND EVEN SOME TORSIONAL MOVEMENTS. INTEREP CAN DESIGN THEM TO MEET YOUR NEEDS, BUT THE DEFAULT MISALIGNMENT VALUES FOR A FABRIC EJ ARE: AXIAL +1/4" (6MM), -1/2" (13MM); LATERAL 1/2" (13MM).

Commissioning

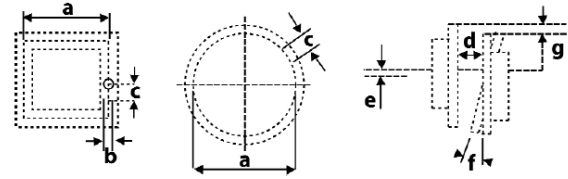
- MOST INSTALLERS PREFER TO HAVE AN INTEREP TECHNICAL REPRESENTATIVE PERFORM A FINAL INSPECTION OR "WALK DOWN" OF ALL EXPANSION JOINT INSTALLATIONS PRIOR TO START-UP IN ORDER TO VERIFY DIMENSIONS, CHECK FOR SIGNS OF INSTALLATION ERRORS OR UNFORESEEN ISSUES, ETC. TO HELP ENSURE A SMOOTH STARTUP.

Post Commissioning Inspection

- AFTER HEATING PIPING OR DUCTWORK (SUCH AS DURING PLANT START-UP), EXPANSION JOINT COMPONENTS SHIFT. THEREFORE, EXPANSION JOINT BOLTS SHOULD BE RE-TORQUED AFTER START-UP AND NO LATER THAN AT THE NEXT SHUT DOWN. TIGHTEN ONLY TO THE INTEREP RECOMMENDED BOLT TORQUE.
- TO ENSURE MAXIMUM LONGEVITY OF YOUR EXPANSION JOINTS, CONSIDER THEM TO BE WEARING PARTS, OR CONSUMABLES, LIKE A FAN OR PUMP-BEARING. PERFORM ANNUAL EXPANSION JOINT INSPECTIONS AND REPLACE WEARING PARTS BEFORE FAILURE TO AVOID COSTLY SHUT DOWNS AND EMERGENCY SITUATIONS.
- IDEALLY, FABRIC EXPANSION JOINTS ARE ZERO-MAINTENANCE ITEMS IF INSPECTED REGULARLY FOR SIGNS OF WEAR. WATCH FOR THE FOLLOWING: FLEXIBLE ELEMENT COATING MAY START TO DISCOLOR OR PEEL, ELEMENT MAY BE "HARD" TO THE TOUCH IN THE BOTTOM BUT NOT ON THE SIDES OR TOP, HARDWARE MAY BE MISSING, TEARING MAY BEGIN NEAR FLANGES. IF YOU SEE ANY OF THIS, SEND A PICTURE TO SALES@INTEREPINC.COM IMMEDIATELY.

Post Commissioning Inspection Steps

- INSPECT THE ENTIRE PIPING OR DUCTING SYSTEM FOR DEVIATIONS FROM DESIGNS DRAWINGS, DENOTE THESE. CHECK MOVEMENTS (ALIGNMENT, OFFSET, ETC.) OF INSTALLED EXPANSION JOINTS AND ENSURE THAT THEY ARE WITHIN INTEREP MANUFACTURER SPECS.



Bolt Hole Circle:	a = $\pm 1/8"$ ($\pm 3\text{mm}$) up to 60" (1.5m) $\pm 1/4"$ ($\pm 6\text{mm}$) over 60" (1.5m)
Bolt Hole Diameter:	b = -0, $+1/32"$ (-0, $+1\text{mm}$)
Bolt Pitch:	c = $\pm 1/16"$ ($\pm 1.5\text{mm}$)
FF Distance (Including "f"):	d = $\pm 1/2"$ ($\pm 13\text{mm}$)
Preset of Axis:	e = $\pm 1/8"$ ($\pm 3\text{mm}$)
Flange Alignment:	g = $\pm 1/2"$ ($\pm 13\text{mm}$)
Duct Internal Diameter:	ID = $\pm 3/16"$ ($\pm 5\text{mm}$) under 78" (2m) $\pm 5/16"$ ($\pm 8\text{mm}$) from 78" (2m) to 16' (5m) $\pm 1/2"$ ($\pm 13\text{mm}$) over 16' (5m)
Mating Flange Flatness:	FI-F = $\pm 1/16"$ ($\pm 1.5\text{mm}$) in any length of 40" (1m)

- VERIFY EJ TAG NUMBER INSTALL LOCATIONS, OVERALL LENGTH, AND FLOW-DIRECTIONS
- VERIFY THAT FLEXIBLE ELEMENT IS CLEAN, IN-TACT, AND FREE OF DEBRIS
- ENSURE AREA AROUND EJ HAS PROPER AIRFLOW TO VENTILATE FLEXIBLE ELEMENT, CHECK FOR PROTRUSIONS THAT MIGHT TOUCH EJ DURING SERVICE
- CHECK THAT BOLTS AND FLANGES ARE PROPERLY TORQUED
- ENSURE SHIPPING BARS HAVE BEEN REMOVED



Periodic In-Service Inspection

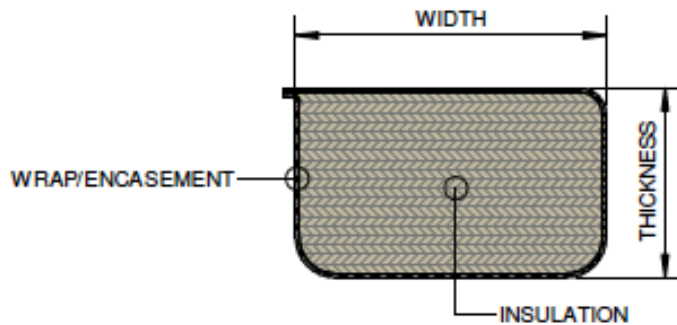
- PERFORM VISUAL INSPECTION ASAP ONCE SYSTEM HAS REACHED FULL TEMPERATURE TO ENSURE EJ MOVEMENTS ARE AS EXPECTED FOR HOT POSITION.
- REGULAR EXPANSION JOINT VISUAL INSPECTION SHOULD BE CONDUCTED AT LEAST ANNUALLY, BUT QUARTERLY IS PREFERRED. SYSTEM DESIGNER AND OWNER SHOULD ESTABLISH THEIR INSPECTION SCHEDULE IN CONJUNCTION WITH MAINTENANCE AND OPERATING SCHEDULES.



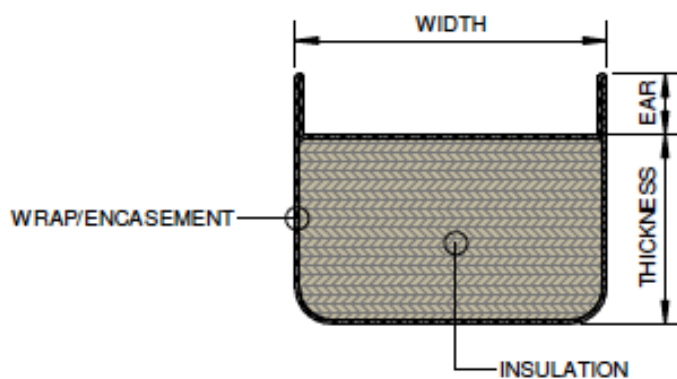
- PERIODICALLY CHECK FOR FLEXIBLE ELEMENT DISCOLORATION, HARDNESS, LEAKING, LOOSE BOLTS, CONDENSATION INDICATORS AND THOSE SIGNS MENTIONED HERE ON PAGE 10.
- CONTACT INTEREP IF ANY OF THESE SIGNS ARE PRESENT, OR IF YOU SUSPECT MALFUNCTION OF THE EXPANSION JOINT.

Field Splicing Instructions For Cavity Pillows

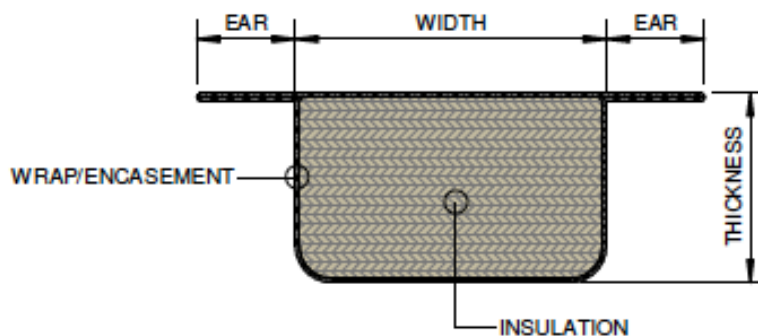
HOW TO FIELD-SPLICE A CAVITY INSULATION PILLOW



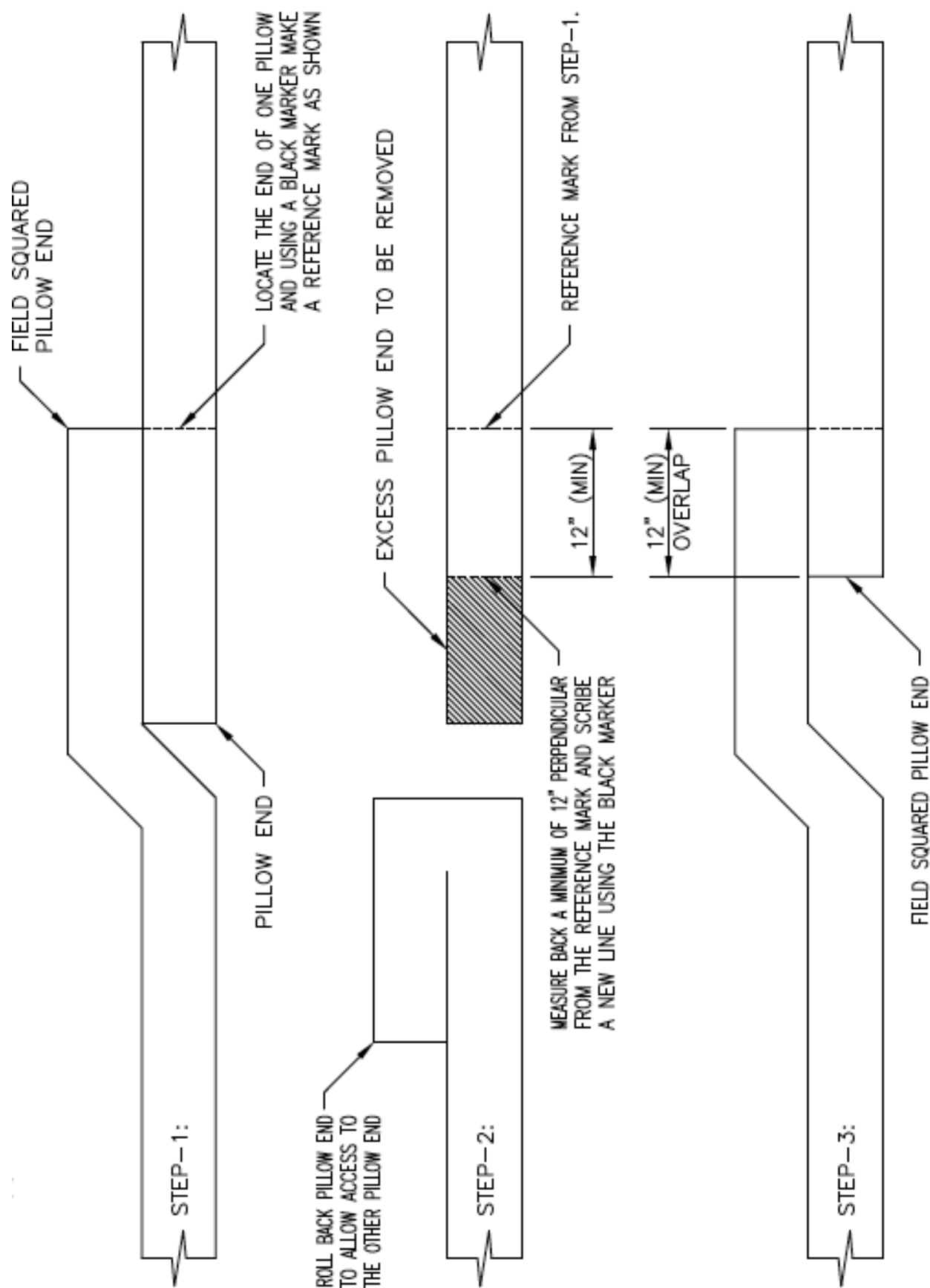
DETAIL #1 (NO EARS) PILLOW DETAIL

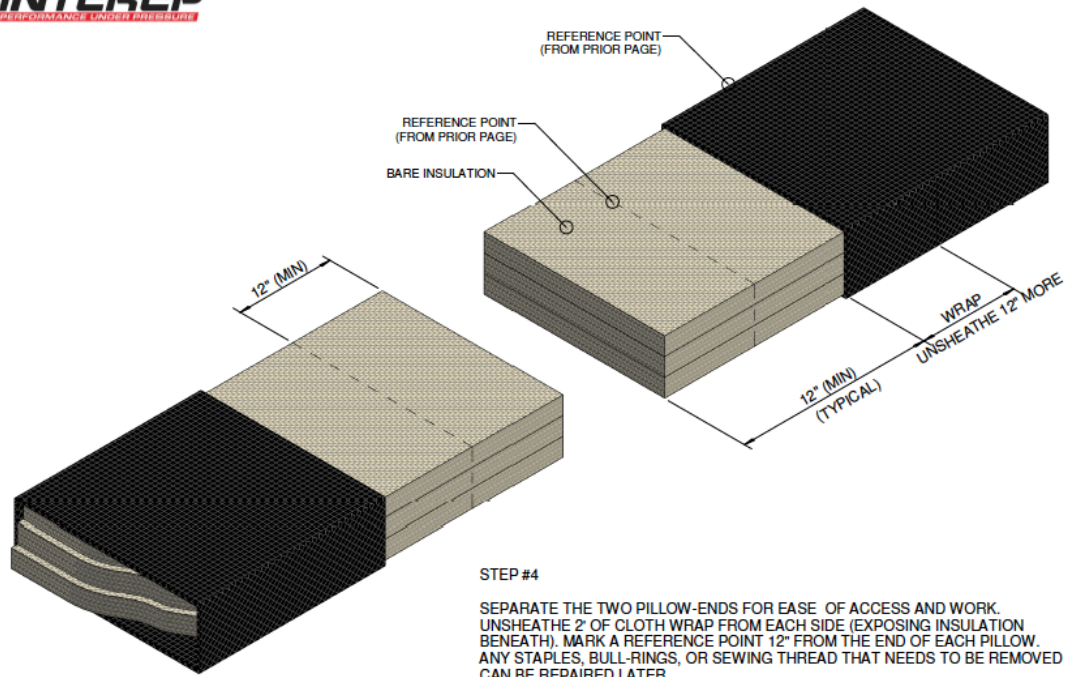


DETAIL #2 (MOLDED CORNER EJ PILLOW)



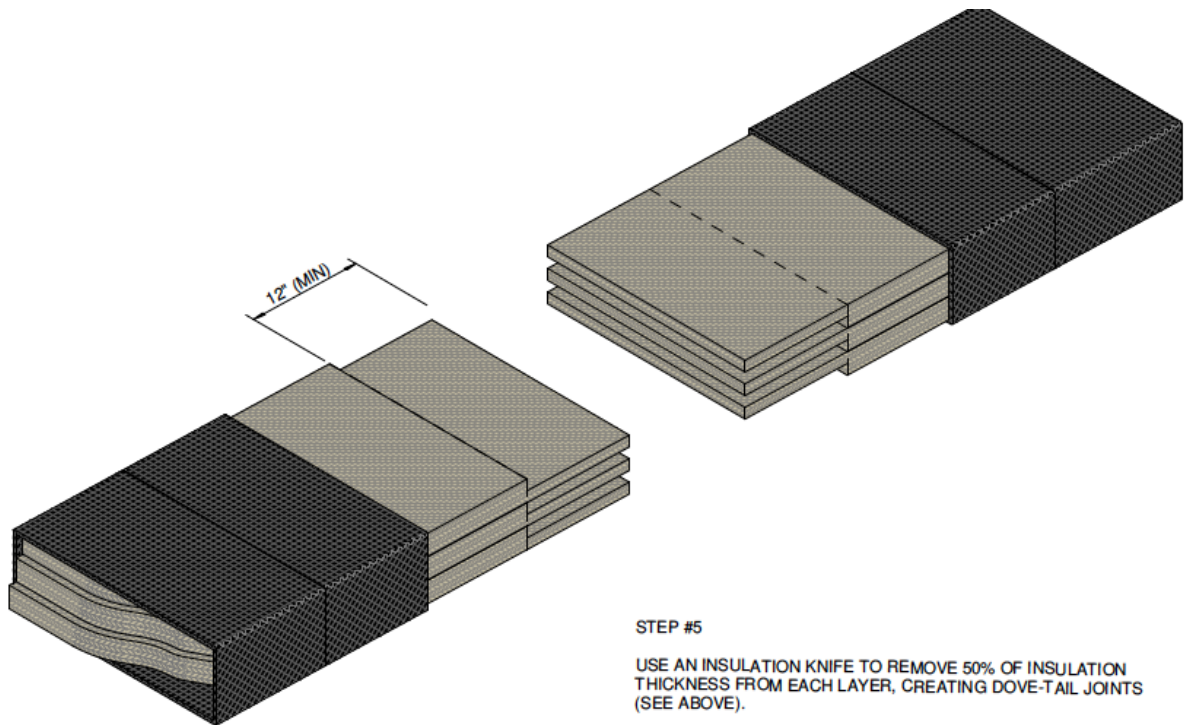
DETAIL #3 (FLAT BELT EJ PILLOW)





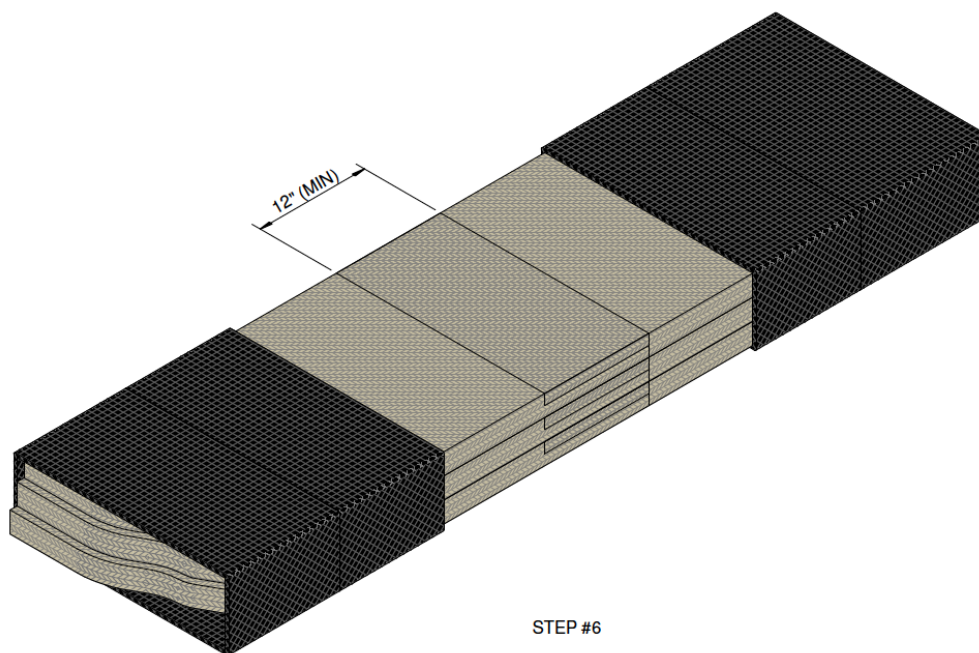
STEP #4

SEPARATE THE TWO PILLOW-ENDS FOR EASE OF ACCESS AND WORK. UNSHEATH 2' OF CLOTH WRAP FROM EACH SIDE (EXPOSING INSULATION BENEATH). MARK A REFERENCE POINT 12" FROM THE END OF EACH PILLOW. ANY STAPLES, BULL-RINGS, OR SEWING THREAD THAT NEEDS TO BE REMOVED CAN BE REPAIRED LATER.



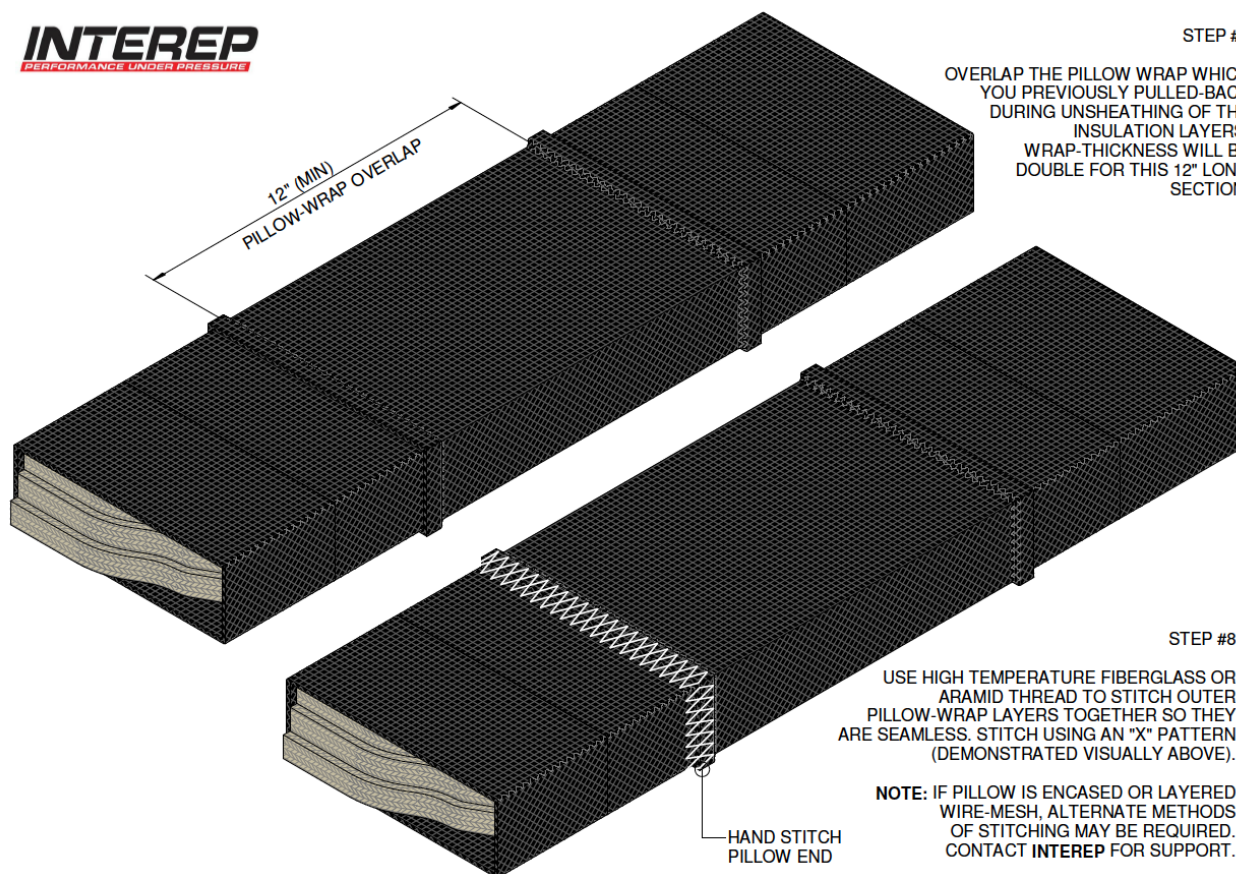
STEP #5

USE AN INSULATION KNIFE TO REMOVE 50% OF INSULATION THICKNESS FROM EACH LAYER, CREATING DOVE-TAIL JOINTS (SEE ABOVE).



STEP #6

PRESS DOVE-TAILED PILLOW ENDS TOGETHER SO THERE ARE NO AIR-GAPS BETWEEN OR AROUND THEM.



STEP #7

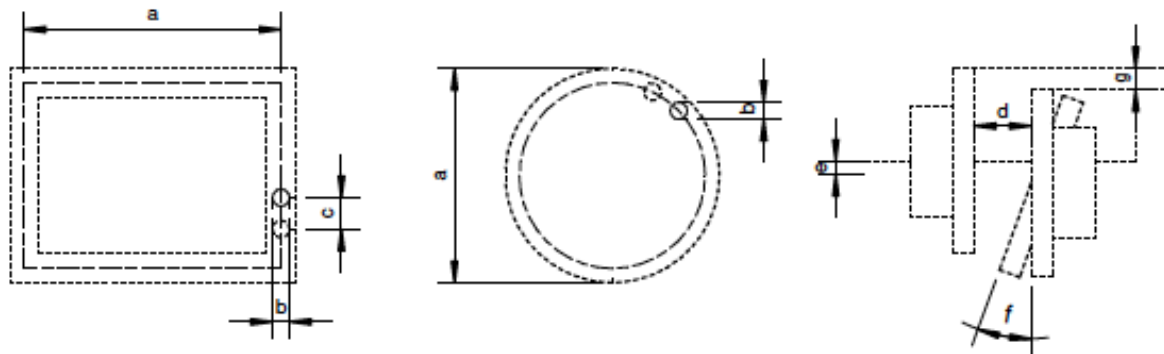
OVERLAP THE PILLOW WRAP WHICH YOU PREVIOUSLY PULLED-BACK DURING UNSHEATHING OF THE INSULATION LAYERS. WRAP-THICKNESS WILL BE DOUBLE FOR THIS 12" LONG SECTION.

STEP #8

USE HIGH TEMPERATURE FIBERGLASS OR ARAMID THREAD TO STITCH OUTER PILLOW-WRAP LAYERS TOGETHER SO THEY ARE SEAMLESS. STITCH USING AN "X" PATTERN (DEMONSTRATED VISUALLY ABOVE).

NOTE: IF PILLOW IS ENCASED OR LAYERED WIRE-MESH, ALTERNATE METHODS OF STITCHING MAY BE REQUIRED. CONTACT INTEREP FOR SUPPORT.

HAND STITCH
PILLOW END



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