Ameritube LLC 1000 N. Hwy 77, Hillsboro TX 76645	Revision Level: A	Procedure No. SOP – 402
	Revision Date: 10/26/2015	Page No. 1 of 3
EXPANSION TEST	This Document expires one day after printing Last Printed: March 8, 2017	

Date	***Description Of Change***	***Signature***	***Rev. Level***
10/26/2015	***New***	***Nicholas Girard***	***A***

Procedure Approval: Company Title: Date:

1. PURPOSE

This test method establishes the requirements for the expansion pin test for copper & copper alloy pipe & tubing in sizes up to and including 4 in.

2. APPLICATION

This procedure applies to all personnel required to follow the procedure the proper method of measuring materials per specification and purchase order. This procedure provides data for research & development, engineering design, quality control, & acceptance or rejections in specifications.

3. Apparatus

- Conical pin with 60 degree angle made of carbide or tool steel that has been hardened and ground to prescribed angle, smooth to the touch, and free of abrasion.
- Hydraulic manual pump press
- 6” – 12” caliper for measurement.

4. PROCEDURE

Identification and allocation of received materials based on Purchase Order and Heat Identification must be maintained to provide accurate, traceable results. This, and proper execution of testing according to Purchase Order requests & standard procedure are what encompasses a quality product.

4.1. Testing

4.1.1. Obtain test specimens cut to specification from finishing.

4.1.2. Polish both ends of specimen and lubricate the inside of the tube to ensure desirable results without any outside interference.

4.1.3. Place test specimen in “holding block” based off preexisting holes made at various diameters. Please be sure to observe the seating of tube to make sure the longitudinal axes of the pin and test sample coincide

4.1.4. Place test specimen under hydraulic press in-line with the plunger used to press the conical pin into the tubes inner diameter.

4.1.5. With a consistent speed, pump the hydraulic press until the pin begins to penetrate the inner diameter of the tube, causing an overlap or expansion of the tubes outer diameter.

4.1.6. Continue this process until the OD reaches the predetermined expansion rate based off table 3 in sb-111.

4.1.7. Expansion rate shall be determined by caliper readings of the outside diameter once complete.

4.1.8. Release the hydraulic pressure by rotating the knob located at the rear end of the pump.

4.1.9. Remove the test specimen and observe the physical characteristics changed by the test being conducted.

4.1.10. Test specimens should be observed by an unaided eye and free of cracks or ruptures caused by expansion testing.

4.1.11. Write down these observations and any additional information of value on testing work order.

4.2. **RE-Testing**

4.2.1. In the case of testing failure, resampling material from the same heat is allowed in accordance with the requirements of the specification. Document all observations of the failed test & report to your superior before attempting to allocate a new specimen for testing.

4.3. Work Order

Expansion Test

5215-3646

				Work Order Date	**10/29/2015**
				Purchase Order #	**P256-395**
Metal Type				**Customer**	
Material	C70600	**OD**	0.375	**Energy & Process**	
Standard	SB-111	**Avg Wall**	0.035		
					Annealing Batch #

			CHOOSE GROUP		**3**	30%	
	GROUP	**1**	**2**			**3**	
	TEMPER	O61	O61	H55	HR 50	O61	H80
	ALLOY	C28000	C23000,C44300, C44400,C44500, C60800, C61300, C61400, C68700	C10100, C10200, C10300, C10800, C12000, C12200, C14200, C19200, C70400, C70600, C70620, C72200	C71500, C71520, C71640	C19200, C70400, C70600, C70620	C10100, C10200, C10300, C10800, C12000, C12200, C14200, C19200
	EXPANSION	**15%**	**20%**			**30%**	

45-30% looking for

Work instructions

1. From each heat cut a (3") Inch test specimen to be expanded.

2. Each test specimen shall be expanded in a press at the specified percentage as per ASME SB111 or ASTM B111. The expansion plug diameter will be specified below .

3. Evaluate each flattened tube without magnification for signs of cracks.

4. Input the results in the spaces provided below, If surface flaws are observed list the total number of pieces associated in the heat provided.

Date	Operator ID	TAG#	Expansion Diameter	PASS	FAIL	Comments
		3649	0.4875			
		3649	0.4875			
		3649	0.4875			
		3649	0.4875			