

FORM QEXP-1 TUBE EXPANDING PROCEDURE SPECIFICATION (TEPS)

1	Company Name:	By:	
2	Tube Expanding Procedure Specification No.	Date	Supporting TEPQR No.(s)
3	Revision No.	Date	
4	Expanding Process(es)	Driver Type(s)	
JOINTS			
5	Measurement and Control of Tube Hole		Tube Pitch
6	Tube Hole Diameter and Tolerance		Maximum Tube to Hole Clearance Before Expanding
7	Ratio Tube Diameter/Tube Wall Thickness		Minimum Ratio Drilling Pitch/Tube Diameter
8	Maximum % Wall Reduction		Minimum % Wall Reduction
9	Maximum Permissible Deviation From Specified Hole Diameter		Maximum Permissible % of Holes That Deviate
10	Details of Tube End Hole Enhancement and/or Tube End Enhancement		Minimum Ratio Tubesheet Thickness/Tube Diameter
11	Method of Fixing Tubes in Position		Length of Expansion
12	Setback From Front Tubesheet Face Before Start of Expanding		Setback From Rear Tubesheet Face After Expanding
13	Method of Removing Weld Droop		Method of Tube End and Hole Cleaning
14	Other Joint Details:		
EXPANDING EQUIPMENT			
15	Manufacturer(s), Model No.(s), Range of Tube Diameters and Thicknesses, Maximum Torque Output or Pressure.		
16	Expanding Tool Model and Description		
17	Expanded Length per Application of Expanding Mandrel		No. of Applications/ Expanded Length
18	Torque or Pressure Calibration System and Frequency		Explosive Charge and No.(s) of Applications
PROPERTIES			
19	Range of Tube Elastic Modulus		Range of Plate Elastic Modulus
20	Range of Tube Yield Stress (mill test report values)	Min.	Max.
21	Range of Tubesheet Yield Stress (mill test report values)	Min.	Max.
22	Minimum Tubesheet Yield Stress/Tube Yield Stress NOTE: Values below 0.6 require shear load testing.		
TUBES			
23	Diameter Range	Thickness Range	Maximum Ratio Tube Diameter/Thickness
24	Material Specifications		
TUBESHEETS			
25	Thickness Range	Minimum Ratio of Tubesheet Thickness to Tube Diameter	
26	Material Specifications		
27	REMARKS:		