



QASF Co. Ltd.

DOCUMENT COVER PAGE

Road No. 12,
Dong Xuyen Industrial Park,
Rach Dua ward,
Vung Tau City,
Vietnam.
Tel/Fax : +84 64 614299

Document Title **TUBE EXPANDING**

Document Number **STD-07**

Included Forms

Department **Engineering**

Type **Procedure**

Revision **0**

Date **15 Sep 2023**

Responsible person(s) **Engineering Manager**

APPROVAL

NAME: _____ POSITION: _____

SIGN: _____ DATE: _____



TUBE EXPANDING

1 INTRODUCTION

- 1.1 This procedure explains the method and controls to expand tubes to tube sheets by a roller expansion tool.
- 1.2 For this procedure the reference tool used shall be: "Powermaster Tube Expanding Drive" Model MPG-2 or equivalent, coupled to a "Powermaster Torque Control Panel" Model TCW-09-CE-E.
- 1.3 The Engineering Manager is responsible for the implementation of this procedure.

2 REVISIONS

Rev.	Date	Nature of Changes	Approved By
0	15.9.23	Issued for use	NHD

3 CLEANING AND PREPARATION

- 3.1 The Expansion Drive Expander and the tube internal must be clean and free of dust or oil.
- 3.2 Prepare a method for marking tubes that have been expanded.
- 3.3 Set up the expanding tool to meet the job requirements.
- 3.4 Complete form Tube Expanding Specification (Section 5).

4 PROCEDURE

- 4.1 Prepare the Expansion Drive with the correct Expander for the task. (See Tube Expansion Procedure Specification TEPS-18-01.
- 4.2 Connect the Expansion Drive power cable to the Torque Control Panel.
- 4.3 Switch on the Torque Control Panel and check setting.
- 4.4 Run the Expansion Drive to ensure correct operation.
- 4.5 Insert the expanding tool in each tube and perform the expanding process.
- 4.6 Each tube that has been expanded shall be marked clearly.
- 4.7 Check each expanded tube against requirements.



5 FORMS

Tube Expanding Specification



QASF Co. Ltd.

TUBE EXPANDING SPECIFICATION

TEPS-99

Road No. 12,
Dong Xuyen Industrial Park,
Rach Dua ward,
Vung Tau City,
Vietnam.
Tel/Fax : +84 64 614299

Reference Document: Tube Expanding Procedure STD-07

Expanding Process		Driver Type	
JOINTS			
Control Equipment		Tube Pitch	
Hole Dia.		Max clearance before expanding	
Ratio Dia - WT		Min ratio drilling pitch/tube Dia	
Max % WT reduction		Min % WT reduction	
Max allowed deviation from hole diameter		Max allowed % of holes to deviate	
Tube end/end hole enhancement detail		Min ratio Tube sheet Thk/Tube Dia	
Method of fixing tubes in position		Length of expansion	
Offset from front Tube sheet face before expanding		Offset from rear Tube sheet face before expanding	
Method of removing weld droop		Tube end and hole cleaning method	
Other joint details			
EXPANDING EQUIPMENT			
Expanding tool model and description			
Expanding length per application of expanding mandrel		No. of applications/expanded length	
Torque or pressure calibration system and frequency			
PROPERTIES			
Range of tube elastic modulus		Range of plate elastic modulus	
Range of Tube Yield Stress (Mill Test Report Values)		Min	Max
Range of Tube sheet Yield Stress (Mill Test Report Values)		Min	Max
Minimum Tube sheet Yield Stress/Tube Yield Stress			
Note: Values below 0.6 require shear load testing			
TUBES			
Diameter range		Max ratio Tube Dia/Thk	
Thickness range			
Material Spec			
TUBESHEETS			
Thickness range		Max ratio Tube sheet Thk to tube Dia.	
Material Spec			
Remarks			
Prepared by		Reviewed by	
Sign		Sign	
Date		Date	