

<b>CIRCOR</b>					Rev
Heat Treatment Quality Plan Requirements					1
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<b>Quality Plan No. / Revision</b>	<b>Heat Treatment QP-05 / Rev 0</b>
<b>Purchase Order No.</b>	<b>Standard Plan- See Purchase Order</b>
<b>Material Specification No. / Revision</b>	<b>As defined by the Casting or Forging Specification and Purchase Order</b>

The following Quality Plans are mandatory and are required to be followed with this Quality Plan:

- ✓ MSF 1.8-1, Calibration Service Quality Plan Requirements
- ✓ MSF 1.8-7, NDE Quality Plan Requirements (if NDE is applicable)

**Identify Applicability**  
(place an X in the appropriate box)

<input checked="" type="checkbox"/>	Required procedures are submitted for review by the applicable <b>CIRCOR</b> API Manufacturing Location Engineering and/or Quality Departments or by a Subject Matter Expert (SME)
<input checked="" type="checkbox"/>	Required procedures are reviewed Onsite by competent <b>CIRCOR</b> Supply Chain location personnel
<input checked="" type="checkbox"/>	Technical audit
<input type="checkbox"/>	API Specification 6A is applicable, Annex M, Informative
<input checked="" type="checkbox"/>	API Specification 6D is applicable, Annex F, NORMATIVE

Purchasing agreements shall include the following provisions identified by this Quality Plan.

Only vendors that are in good standing in the Approved Vendors List shall be used. Refer to **MSPM 1.8, Purchasing Control** for other purchasing order requirements that may be required.

1. The vendor is required to submit to **CIRCOR** for review:
  - a. A copy of the heat treatment procedure including:
    - i. The vendor's criteria for the qualification and approval of process(es). This also includes provisions for process re-validation.
    - ii. Requirements for:
      1. Times and temperatures
      2. Ramp-up time
      3. Ramp-down time
      4. Quench media
      5. Duration of quench

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- iii. Visual and/or NDE inspection requirements and acceptance criteria
  - b. Copies of the heat treatment operator qualification records
  - c. Copies of calibration records for inspection, test, monitoring and measurement equipment used in the performance of heat treatment activities
- 2. The vendor shall submit any proposed changes heat treatment procedure to for **CIRCOR** review prior to using it on **CIRCOR** orders when changes are proposed.
- 3. The vendor shall provide a Certificate of Conformance(s) to document:
  - a. The vendor's heat treatment procedure number and revision level;
  - b. heat treatment operator and evidence of meeting experience requirements
  - c. Inspection equipment current calibration (traceable to NIST or equivalent national or international standard).
- 4. The following heat treatment records are required:
  - a. Temperature charts showing the times and temperatures, including cooling speed and period
  - b. Testing results (e.g., hardness inspection, physical testing), if and when specified
- 5. Conformance to the requirements stated herein provides sufficient evidence of equipment approval.
- 6. The vendor shall not subcontract the performance of any heat treatment activities to a sub-vendor without **CIRCOR** approval.
- 7. The vendor shall notify **CIRCOR** if any portions of the activities covered by this PO are going to be subcontracted, including mechanical or chemical testing.

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Quality Plan Required Documentation - HEAT TREATMENT			
Quality Plan Reference Requirement	What is required?	Circor Review Required	
		Yes	No
1a	Heat Treatment Procedure	X	
1b	Personnel Qualification Records	X	
1c	Calibration records for equipment used in heat treatment activities	X	
3	Certificate of Conformance	X	
4a	Temperature Charts	X	
4b	Testing Results	X	
Attachment I	Including records specified by MSF 2.3.1-1, Supplier Documentation Requirements for this Quality Plan	X	

CIRCOR Supply Chain Location Approval Mike Evans 2/28/18  
*Signature* *Date*

CIRCOR API Manufacturing Site Approval Carlos Castillo 2/28/2018  
*Signature* *Date*

CIRCOR API Manufacturing Site Approval [Signature] 2/28/18  
*Signature* *Date*