API 6A - 21st Edition
Specification for Wellhead and Tree Equipment

Publication Date: November 2018
Effective Date: November 2019

For Reference Only

6AV1
3rd Ed

ISO 10423

6A
21st Ed.

6X
2nd Ed


6AV1
3rd Ed

6A
21st Ed.

6X
2nd Ed

- 6AV1 (3rd Ed)
- 6A (21st Ed)
- 6AR (2nd Ed)
- 6X (2nd Ed)

- 6AV1 3rd Ed
- 6AR 2nd Ed
- 6X 2nd Ed

Repair and Remanufacture of Wellhead and Tree Equipment

API STANDARD 6AR
SECOND EDITION, SEPTEMBER 2019

- **6AV1** 3rd Ed
- **6AR** 2nd Ed
- **6X** 2nd Ed
- **TR6RT** 1st Ed.

Tools

Guidelines for Design and Manufacture of Surface Wellhead Running, Retrieving and Testing Tools, Clean-out Tools and Wear Bushings

API TECHNICAL REPORT 6RT FIRST EDITION, XXXX 2019


Awaiting Publishing

- 6AV1 3rd Ed
- 6AR 2nd Ed
- 6X 2nd Ed
- TR6RT 1st Ed

Need to add bibliographic reference when published

6A
21st Ed.

TR6RT
1st Ed

6AR
2nd Ed

6AV1
3rd Ed

6X
2nd Ed

6A
21st Ed.

6AV1
3rd Ed

6X
2nd Ed

6AR
2nd Ed

TR6RT
1st Ed

20
Normative
A,E,F

- 6AV1 3rd Ed
- 6X 2nd Ed
- TR6RT Tools
- 6AR 2nd Ed
- 20 Bibliographic B,C,D,H
- 20 Normative A,E,F

- ISO15614-1,7
- ISO15609
- 6AV1 3rd Ed
- 6X 2nd Ed
- TR6RT Tools
- 6AR 2nd Ed
- 20 A,E,F
- 20 B,C,D,H

6A 21st Ed.

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- 6X 2nd Ed
- 6AR 2nd Ed
- TR6RT Tools
- ISO15614-1,7
- ISO15609
- 6ACRA
- 20 B,C,D,H
- 20 A,E,F
Modifications to 6A - 21st Edition since publishing

6A
21st Ed.

Errata 1
Issued April 2019
Modifications to 6A - 21\textsuperscript{st} Edition since publishing

- **Errata 1**: Issued April 2019
- **Errata 2 Working**

6A
21\textsuperscript{st} Ed.
Modifications to 6A - 21st Edition since publishing

- Errata 1
  - Issued April 2019
- Addenda 1
- Errata 2 Working

6A
21st Ed.
Modifications to 6A - 21st Edition since publishing

Errata 1
Issued April 2019

Addenda 1

Items Identified

Errata 2 Working

8 current Issues
Modifications to 6A - 21st Edition since publishing

Errata 1
Issued April 2019

14 Items
Ballot Passed
Addenda 1
Comment Review
Needs Comment Review

Errata 2
Working
6A
21st Ed.
# Modifications to 6A - 21st Edition since publishing

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## Addenda 1 – Ballot / Comment Review

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Eric Wehner Idea for Categorization of Assemblies

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<tr>
<th>Equipment Type</th>
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<th>Reference Section</th>
<th>Metallic Part Type</th>
<th>Part Classification</th>
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<tr>
<td>Flange, Loose</td>
<td>single-unit equipment</td>
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<td>body</td>
<td>pressure-containing</td>
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<td>Ring Gasket</td>
<td>single-unit equipment</td>
<td>14.2</td>
<td>ring gasket</td>
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<td>Threaded Connector</td>
<td>single-unit equipment</td>
<td>14.3</td>
<td>body</td>
<td>pressure-containing</td>
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<tr>
<td>Tee or Cross, Flanged</td>
<td>single-unit equipment</td>
<td>14.4</td>
<td>body</td>
<td>pressure-containing</td>
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<tr>
<td>Tee or Cross, Studded</td>
<td>assembled equipment</td>
<td>14.4</td>
<td>body studs &amp; nuts</td>
<td>pressure-containing</td>
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<tr>
<td>Bullplug</td>
<td>single-unit equipment</td>
<td>14.5</td>
<td>body</td>
<td>closure bolting</td>
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<tr>
<td>Valve-Removal Plug</td>
<td>single-unit equipment</td>
<td>14.6</td>
<td>body</td>
<td>pressure-containing</td>
</tr>
<tr>
<td>Top Connector</td>
<td>assembled equipment</td>
<td>14.7</td>
<td>body other</td>
<td>pressure-containing</td>
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<td>Crossover Connector</td>
<td>assembled equipment</td>
<td>14.8</td>
<td>body studs &amp; nuts</td>
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<td>Other End Connector, Loose</td>
<td>per manufacturer</td>
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<td>Adapter/Spacer Spool, Flanged</td>
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<td>Adapter/Spacer Spool, Studded</td>
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<td>14.10</td>
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<td>Valve</td>
<td>assembled equipment</td>
<td>14.11</td>
<td>body, bonnet stem</td>
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<td>Safety Valve</td>
<td>assembled equipment</td>
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<td>VBSM</td>
<td>pressure-controlling</td>
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<td>Back-Pressure Valve</td>
<td>assembled equipment</td>
<td>14.12</td>
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<td>pressure-controlling</td>
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<td>Mandrel Casing/Tubing Hanger</td>
<td>per manufacturer</td>
<td>14.13</td>
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<td>Casing or Tubing Head</td>
<td>assembled equipment</td>
<td>14.14</td>
<td>body</td>
<td>pressure-controlling</td>
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<td>Choke</td>
<td>assembled equipment</td>
<td>14.15</td>
<td>body</td>
<td>closure bolting</td>
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<td>assembled equipment</td>
<td>14.16</td>
<td>body, bonnet stem</td>
<td>pressure-controlling</td>
</tr>
</tbody>
</table>

FOOTNOTE

a Valve Bore Sealing Mechanism (e.g., gate, ball, plug, poppet, seats)
b Requirements for parts not listed are as specified by the manufacturer.
c If applicable (if supplied with studs and nuts installed).
d Includes tubing head adapters.

TechnipFMC
Modifications to 6A - 21st Edition since publishing

- **Errata 1**
  - Issued April 2019

- **Errata 2**
  - Working

- **Addenda 1**
  - Comment Review

- **Addenda 2**
  - Working

- Material Related

- Requirements misunderstood

- Flow Chart Created

- Additional TG Sessions Required
6A 21st Edition Current Status

- **Errata 1**
  - Issued April 2019

- **Addenda 1**
  - Comment Review

- **Addenda 2**
  - Working

- **Errata 2**
  - Working
# Eric Wehner Idea for QTC Size Requirement Clarification

## Table $\$: Summary of QTC Size Requirements for Bodies, Bonnets, End and Outlet Connectors of Forged Material, Batch Heat-Treated

<table>
<thead>
<tr>
<th>QTC Size Case (for reference only)</th>
<th>PSL 1 and PSL 2</th>
<th>PSL 3</th>
<th>PSL 4</th>
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<tbody>
<tr>
<td>ER of part as heat-treated (PHT)</td>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
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<tr>
<td>Weight of PHT</td>
<td>any weight</td>
<td>any weight</td>
<td>any weight</td>
</tr>
<tr>
<td>Minimum yield strength required</td>
<td>any $S_Y$</td>
<td>any $S_Y$</td>
<td>any $S_Y$</td>
</tr>
<tr>
<td>Are requirements for exception of 6.4.2.3.3 satisfied?</td>
<td>not relevant</td>
<td>not relevant</td>
<td>not relevant</td>
</tr>
<tr>
<td>Required Size: ER of QTC</td>
<td>$\geq$ ER of PHT</td>
<td>$\geq$ ER of PHT</td>
<td>$\geq$ ER of PHT</td>
</tr>
</tbody>
</table>

- **Table Values**:
  - (a) $< 2.5$ in. ($< 63$ mm)
  - (b) $\geq$ 2.5 in. ($\geq 63$ mm)
  - (c) $< 5.0$ in. ($< 125$ mm)
  - (d) $\geq 5.0$ in. ($\geq 125$ mm)
  - (e) $\geq 5.0$ in. ($\geq 125$ mm)
  - (f) $\geq 5.0$ in. ($\geq 125$ mm)
  - (g) $\geq 5.0$ in. (125 mm) and $\leq$ 10 in. (250 mm)
  - (h) $> 10$ in. ($> 250$ mm)
  - (i) any size
  - (j) any weight
  - (k) $< 75$ ksi ($< 517$ MPa)
  - (l) $\geq 75$ ksi ($\geq 517$ MPa)
  - (m) $\geq 75$ ksi ($\geq 517$ MPa)
  - (n) any $S_Y$
  - (o) not relevant
  - (p) ER of PHT
  - (q) $\geq$ ER of PHT
  - (r) $\geq$ ER of PHT
  - (s) $\geq$ ER of PHT
  - (t) $\geq$ ER of PHT
  - (u) $\geq$ ER of PHT
  - (v) $\geq$ ER of PHT
  - (w) $\geq$ ER of PHT
  - (x) $\geq$ ER of PHT
  - (y) $\geq$ ER of PHT
  - (z) $\geq$ ER of PHT

- **Notes**:
  - TechnipFMC
Queries & Potential Future Work

- Equivalent Round
- QTC Requirements Table
- Weld-Neck Flange Marking Question
- Actuator Seals Requirements
- 1/2 " LP Language
- Normative References E428 to E127
- Slip Hanger Addendum Items
- Closure bolting on multi-piece valves
- "X" Dimension 6B flange (poll manufacturers)
- Bolting Errata Missed
- 6A Threading Changes Addenda (Proposed)
- Assembly / Single Piece Table
Questions?
API 6A 21st Addendum 2

Materials Work Group f/ Items 6, 17, 19, 20
Sterling Lewis - ExxonMobil
Activity

Two meetings held

• August 12
• October 17

23 Members, 14 meeting participants
Summary of Items to Address

- **Item 6a:** Batch-type Furnace Heat Treatment (size) Use DAC
- **Item 6b:** Clarification of QTC requirements/applicability (Example of PSL3 HT Lot)
- **Item 17:** Martensitic Steel applicability to HT requirements
- **Item 19:** ER maximum critical wall section versus thickest section (exception allows critical cross section) Use critical wall section(s)
- **Item 20:** Deposited weld metal impact properties in HAZ (must meet specified mechanical properties for part)

- **New RFI:** Equivalent round requirements for bar in batch furnace. Batch heat treat requirements apply

New: **Item 8 Composition Limits**
**New RFI**: Equivalent round requirements for bar in batch furnace

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<td>Subject</td>
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<tr>
<td><strong>Background</strong></td>
<td>6.4.2.3.2 breaks down the required Equivalent Round (ER) requirements of the forging QTC for various PSL levels. I have always considered forged bar stock to be a forging, which seems uncontroversial, but the paragraph as copied below raises a question as to how to apply this to section sof pre-heat treated barstock that are cut to make a final part. &quot;For PSL 3, for bodies that require a yield strength of 75ksi or greater and where the parts weight during heat treat is greater than 454kg (1000 lbs), the QTC ER shall be the same or greater than the part it qualifies but is not required to exceed 250mm (10 in.) ....&quot; The weight limit doesn't even make sense to me if you are talking about a continuous furnace... I have talked to a couple metal distributors who can't figure it out either and are planning on responding &quot;no bid&quot; to RFQ's because of it.</td>
</tr>
<tr>
<td><strong>Question</strong></td>
<td>For bar stock, what defines the 454 kg / 1000 lb limit of applicability of this section? 1. Is it the weight of the entire length of the bar as processed at the mill? (it was quite possibly done in a continuous furnace) 2. The weight of cut bar that the final body will be made from? 3. The weight of the finished body?</td>
</tr>
</tbody>
</table>
New RFI: Equivalent round requirements for bar in batch furnace

**Proposed Response October 17**

Requirements for continuous heat treatment process and batch heat treatment furnace are considered clear. If a bar is cut and heat treated in a batch type furnace then the batch heat treatment requirements are applicable. If the bar is heat treated as a single piece in a continuous heat treatment processes then the continuous heat treatment process requirements are applicable. Bar heat treated in a continuous heat treatment process then a portion of the bar reheated in a batch heat treated process would require the OTC of the reheated bar to be subjected to both heat treatment cycles of the full bar and batch heat treatment cycle.
Include item 19 – critical section “a qualification forging or a sacrificial part is used to document that the part meets the Charpy impact requirements of this specification at a depth of 63 mm (2.5 in.) or T/4 of the thickest section of the parts, whichever is less; and”

Look at moving material section to 6
14.13.3 has heat treat section for hangers
14.2.3 has heat treat section on ring gaskets