Linking Technical Requirements beyond PLM vault

Model-Based Enterprise Summit 2018

3 April 2018
Getting to the Right Requirements...

NOTES:
1. SPEC MIL-W-13855 AWS ANSI Y14.5M-1982 APPLY.
2. MATERIAL: STEEL, BAR, ALLOY 4320 OR 8620.
3. UNLESS OTHERWISE SPECIFIED, ALL EXTERNAL SHARP EDGES SHALL BE BROKEN 0.05 TO 0.25; INTERNAL EDGES R0.2 MAX.
4. UNLESS OTHERWISE SPECIFIED, ALL SURFACE FINISH IS 3.2/
5. PROTECTIVE FINISH: FINISH 5.3.1.1 OR 5.3.2.1 OF MIL-STD-171.
6. QUALITY ASSURANCE PROVISION REQUIREMENTS PER DRAWING 12993884 APPLY.
7. APPLY CONTRACTORS CAGE CODE WHERE APPLIES.

Each team member needs to do a rework.

* 5.3.1  Manganese phosphate base MIL-DTL-16232, type M
  5.3.1.1 Class 1, supplementary preservative treatment or coating, as specified.
  5.3.1.2 Class 2, supplementary treatment with lubricating oil conforming to MIL-PRF-3150
  5.3.1.3 Class 3, with no supplementary treatment
  5.3.1.4 Class 4, Chemically converted (may be dyed to color as specified) with no supplementary coating or with supplementary coating as specified

* 5.3.2  Zinc phosphate base, MIL-DTL-16232, type Z
  5.3.2.1 Class 1, supplementary preservative treatment or coating, as specified
  5.3.2.2 Class 2, supplementary treatment with preservative conforming to


...Faster
Complex Web of Concepts

**INSIDE THE ENTERPRISE**

- Drawing Notes
  - Drawing number 12993884
  - 9 pages

**OUTSIDE THE ENTERPRISE**

- MIL-W-13855
  - 20 pages
- MIL-STD-171
  - 56 pages
- Implicitly Referenced Documents
- ASTM E18
- MIL-DTL-16232
- MIL-A-8625
- ASTM B117
- MIL-DTL-53072
- ... 
  - >500 pages

Compile Relevant Concepts from Referenced Documents
SWISS®: Smart, Connected, Documents

**CONNECTED DOCUMENT**

**TRADITIONAL DOCUMENT**

**BENEFITS**

- Faster time to market
- Reduced risk
- Cost savings from less rework
- Consistency across enterprise and supply chain
- IP protection

'WHO', 'WHY', AND 'STATE'

Part

Material

Process
Semantic Linking: “Who” am I pointing to and “why”

FROM DOCUMENTS

- ASTM D380
- MIL-DTL-13444
- Section 1
  - SCOPE
- Section 27.2
  - OZONE TEST
- Text

TO UNIQUELY IDENTIFIABLE CONCEPTS

- Subject
- Part
- Material
- Process
- Testing

- Environmental Testing
- Electrical Testing
- Ozone Testing

hasLinkTo

OZONE RESISTANCE

IsAbout

NAVIGATE HERE
1.0 **SCOPE**

This process specification provides the minimum requirements that govern the manual arc welding of titanium alloy flight and non-flight hardware. Procedural and quality assurance requirements are given. All work instructions and Welding Procedure Specifications (WPS) used during welding shall satisfy the requirements of this process specification and its applicable documents.

a. **Class A** — Applies to welds in critical load bearing elements that are not fail-safe. Class A welds are typically used in primary load bearing connections. Failure of a Class A weld in service is expected to be catastrophic and would likely result in the loss of life system(s) control, or major components. Alternatively, if it is determined from appropriate engineering analyses that a weld has a Factor of Safety (FS) vs ultimate tensile strength of the calculated minimum weld throat cross section of <2.0, it shall be designated as a Class A weld.

b. **Class B** — Applies to welds in load bearing elements that are fail-safe. Class B welds are typically used in secondary load bearing (i.e. shared load) connections. Failure of a Class B weld in service is expected to be serious and potentially catastrophic.

<table>
<thead>
<tr>
<th>GAS</th>
<th>DESCRIPTION</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argon</td>
<td>Gas</td>
<td>MIL-A-18455</td>
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<tr>
<td>Argon</td>
<td>Type II, Grade B (Liquid)</td>
<td>CGA G-11.1</td>
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<tr>
<td>Helium</td>
<td>Type I, Grade A</td>
<td>MIL-P-27407</td>
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<tr>
<td>Helium</td>
<td>Grade A</td>
<td>BB-H-1168</td>
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</table>
Change management in the engineers’ environment

Unlinked PDF document: - No knowledge of dependencies or their status

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APPROVED DATE 20 MAR 2012
APPROVED VERSION B
APPROVED BY WILL DO
PROPRIETARY

NUT, PLAIN, CAP, HIGH CROWN

1. Scope. This specification depicts the requirements for Nut, Plain, Cap, High Crown, coarse or fine threads, Class 2.

2. Salient characteristics.

2.1 Materials:

2.1.1 Steel, carbon. Types UNS (G10180) thru (G10400), (G11160) thru (G11370) or (G12120) thru (G12144).

2.1.2 Steel, corrosion resistant 300 series. Types UNS (3XXXX) series.

2.1.3 Copper alloys UNS (C23000) thru (C64600).

2.1.4 Aluminum alloys UNS (A92017), (A92117), (A96061), or (A96262).

2.1.5 Nylon in accordance with ASTM D4066. Group 1. Class 1 or 2 color natural white. Protective finish.

2.2.1 Carbon steel cap nuts shall be cadmium plate in accordance with QQ-P-336. Type II, Class 2. Cadmium plate cap nuts should be used only on aerospace applications.
Extending the view: SWISS® Intelligent Objects

Expanding structure by creating relationships to concepts in external Standards SWISS objects ‘know’ their status and meaning.

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Evaluation of impact of changes

Smart Connected Document: Changes can be reviewed and compared

SWISS enables engineers to determine if changes are significant enough

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Next Steps

Even Smarter Standards

Deeper integration with DoD systems

Exploration of interoperability and linking with other frameworks and technologies
Questions