161Thorn Hill Road Warrendale, PA 15086-7527	**Program Document CPBOK**	**PD 6103** CPBoK-004/OW-3 Rev. A Issued: 05-MAY-14 Revised: 06-MAR-17 Superseding: 05-MAY-14

BODY OF KNOWLEDGE:

ROLE DESCRIPTION: ETCH and ETCH INSPECTOR OWNER
SPECIAL PROCESS: Chemical Processing
METHOD: Nital, Temper, Blue Etch Anodize, Electrolytic (Anodic), Macrostructure, Pre-Penetrant

All eQuaLified examinations are created using the applicable eQuaLified Body of Knowledge (BoK), which defines the baseline knowledge and experience required to be considered competent to perform the specified job role in aerospace special process manufacturing.

All eQuaLified BoKs are created by subject matter experts who participate in the eQuaLified Body of Knowledge Review Boards. All eQuaLified BoKs are updated periodically according to the latest revision of eQuaLified PD6100 to ensure consistency with current industry practice.

1. INTRODUCTION

This document has been created by the eQuaLified Chemical Processing Body of Knowledge Review Board (CP BoKRB) according to the requirements of eQuaLified Program Document PD6100 Industry Managed Special Process Bodies of Knowledge.

This document consitutes the eQuaLified BoK for Chemical Processing Etch Inspection / Nital, Temper, Blue Etch Anodize, Electrolytic (Anodic), Macrostructure and Pre-Penetrant Etch, Owner level. It defines the baseline knowledge and experience required to be considered competent to perform this role.

Unless otherwise stated, the CP BoKRB has followed guidelines as detailed in the current revision of International Aerospace Quality Group (IAQG) Guidance PCAP 001 (Competence Management Guideline) to develop this BoK.

The information in this BoK will provide guidance for the following:

- Training providers who wish to develop training courses intended to support eQuaLified examination candidate preparation
- Chemical Processing Examination Review Board (CP-ERB) for the development of eQuaLified examinations
- Candidates taking eQuaLified examinations who wish to prepare in advance

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2. REFERENCES

eQuaLified documents:

PD6000	Governance & Administration of eQuaLified Program
PD6100	Industry Managed Special Process Bodies of Knowledge
PD6200	Industry Managed Special Process Examinations System

IAQG documents:

IAQG Guidance PCAP 001 Competence Management Guideline

3. DEFINITIONS

Definitions described within are specific to the Special Process BoK. For program-specific definitions, please refer to either the PD 6000 or the eQuaLified Dictionary.

BODY OF KNOWLEDGE (BoK): Baseline knowledge and experience required to be considered competent for a target position.

GENERAL EXAMINATION: The General Examination is designed to ascertain the candidate's general knowledge required for a particular job, role or activity. All of the questions will be derived from the corresponding BoK.

EXPERIENCE: The accumulation of knowledge or skill that results from direct participation in events or activities over a period of time.

KNOWLEDGE: Information / understanding acquired over a period of time. Information acquired through study and retained over that period of time (education, training, experience etc.) The combination of data and information, to which is added expert opinion, skills and experience, to result in a valuable asset which can be used to aid decision making and problem solving.

LEVEL: A class or division of a group based on education, training and experience. There are 3 levels: Operator/Technician, Planner and Owner. Please refer to the current revision of PD 6000 for definitions of these levels.

METHOD: A well-defined division of a SPECIAL PROCESS widely recognized by industry. A specific area of a special process for example anodizing within Chemical Processing

NON-SPECIAL PROCESS RELATED REQUIREMENTS: Miscellaneous requirements such as Health and Safety, Environmental, etc.

PERSONAL ATTRIBUTES: A quality or characteristic expected and required for a particular job, role or activity.

PRACTICAL EXAMINATION: The Practical Examination shall consist of a demonstration of proficiency in performing tasks that are typical of those to be accomplished in the performance of the candidate's duties. The examination content is derived from the corresponding BoK.

SKILL: Ability to perform a particular task. The quality of being able to do something that is acquired or developed through training or experience.

SPECIFIC EXAMINATION: The Specific Examination shall cover requirements and use of the specifications, codes, equipment, operating procedures and test techniques the candidate may use in the performance of his/her duties with the employer. Examination content will be derived from the corresponding BoK where applicable.

WEIGHTING: The "weighting" of each line item, using a scale of 1, 3, 7, 10, (1 being least important; 10 being most important) indicates the relative importance of that aspect of the BoK and will determine the likelihood and frequency of a question on that topic appearing in the examination

4. GUIDANCE TO EXAMINATION CANDIDATES

All eQuaLified examination candidates are recommended to read all documents referenced in section 2 of this document.

As stated in eQuaLified PD6200, every eQuaLified exam question shall relate directly to and be derived from the information as detailed in the current revision of the BoK.

Re-assessment of candidates to this BoK is required every 5 years, unless otherwise specified.

NOTE: Industry Standards require various intervals of reassessment (3-5 years)

- Per MIL-STD-867C re-cert shall not exceed 3 years
- Physical tests (eye exam) are required annually
- However, ARP1923 states at qualification and each year thereafter, inspection personnel shall pass physical, written and practical examinations.

Candidates are therefore advised to ensure familiarity with all aspects of the BoK as detailed in Table 1. This can be done through:

- Self-study
- Completion of internal training
- Completion of external training (a list of eQuaLified approved providers can be found at www.eQuaLified.org)

Records of all qualified personnel (per MIL-STD-867C) shall be maintained and include:

- Date of Qualification
- Results of Physical (as required)
- Results of Written Exam
- Results of Practical Exam (if applicable)
- Summary of Experience

5. LEVELS

	Level		
Descriptors	**Operator (OP) / Technician (T)** *For descriptions, please refer to current version of PD6000*	**Planner (PL)** *For descriptions, please refer to current version of PD6000*	**Owner (OW)** *For descriptions, please refer to current version of PD6000*
Etch Inspection Specific Criteria	**N/A**	**N/A**	**N/A**
Technical Knowledge	Basic knowledge of the special process, its main processes, methods and tools.	Good level of knowledge in all aspects of the special process, all its processes, methods and tools. Ability to coach others on contents and methods in the context of their workplace.	High or extensive knowledge in all aspects of the special process, all its processes, methods and tools to assess and validate improvements. Able to contribute to set externally recognized standards. Ability to define contents and methods for using knowledge effectively in influencing and developing international processes. Ability to influence the process with one's knowledge.
Experience	Sufficient experience to deal with recurrent activity.	Has enough experience to deal with unforeseen issues.	Wide proven experience of the subject. Is recognized specialist within the special process.
Personal Attributes	Takes into consideration behavioral characteristics such as but not limited to: team working, communication, direction and purpose, innovation and problem solving, mutual trust and respect, confidentiality and trustworthiness.		
Skills	Describes the activities necessary to perform each level of job function to comply with the Body of Knowledge		
Non-Special Process Related Requirements	Health & Safety, Environmental, Quality System Requirements.		

6. TABLE 1

ROLE DESCRIPTION: ETCH INSPECTOR OWNER
SPECIAL PROCESS: CHEMICAL PROCESSING
METHOD: ETCH INSPECTION / Nital, Temper, Blue Etch Anodize, Electrolytic (Anodic), Macrostructure, Pre-Penetrant
REFERENCE GUIDELINES: Addendum 1 is a list of the International Standards and Reference Documents applicable to Etch and Etch Inspection

Row #	COMPETENCE	Weight (1,3,7,10)	Exam Type Written / Practical	Reference Guidelines
	KNOWLEDGE: **The basic knowledge of the special processes, methods and tools**			
1	**GENERAL KNOWLEDGE:**			
2	Understand how to perform the inspection necessary to detect any damage that may have been caused	10	W	General Industry; AC7108/2: 3.1.1.6.1, 4.4.2, A.5
3	Full and complete understanding of Internal Work Instructions	10	W	General Industry; AC7108/2: 3.1, 4.4
4	Knowledge how to access customer specifications and requirements (i.e. where to find them).	10	W	General Industry; AC 7108/2:4.4.3, A7.1.1.1, A7.1.1.3, A71.1.4, A7.1.1.5, A71.1.2
5	**Understand how to interpret customer specifications and requirements in the context of the inspection carried out**	10	W	General Industry: AC 7108/2: 4.4.3, A7.1.1.1, A7.1.1.3, A7.1.1.4., A7.1.1.5, A7.1.1.2
6	Understanding of Industry Standards	10	W	Addendum 1 (all documents); General Industry: AC 7108/2:4.4
7	Knowledge and understanding of the Accept/Reject Criteria	10	W	General Industry; AC7108/2:3.1.1.6.9, A5, 7.1.2.5.3, A7,1.4
8	Knowledge of Surface Preparation procedures	10	W	AC7108/2 :3.1.1.6.2,3.1.1.6.7, 4.6, 4.7, A1
9	Knowledge and Understanding of the Post Bake Requirements and other Post Inspection operation/procedures	10	W	MIL-STD-867; AC 7108/2: 4.9, 4.10, A6, A7.2.2.7, A7.2.4
10	**Basic understanding of control and calibration requirements of Post Bake Ovens**	7	W	AC 7108/2: AC 7108/2: 4.9, 4.10, A6, A7.2.2.7,A7.2.4
11	Water Break Free Cleanliness Verification	10		Addendum 1 List of Standards: AC7108/2: 3.1.1.6.5, A1.3, B1.2, C1.3, D1.3
12	Knowledge and understanding in mathematics, including decimals and fractions	10	W	General Industry; AC 7108/2: 3.1, 3.1.1.2
13	Use of precision measuring instruments and equipment.	10	W	General Industry; AC 7108/2: AC 7108/2: 3.101, 4.8, 4.9, 4.10, 5.1.1.3, A2, A5.2
14	Knowledge and Understanding of Job Documentation including Fixed / Frozen Process	10	W	AS9100, AC7108/2: 3.1, 3.1.1.2 General Industry
15	Knowledge and Understanding of proper chemistry usage and application	10	W	AC7108/2: 4.3.2.3, 4.3.6, 4.3.9, 5.1.4.6
16	Knowledge and Understanding of the General Cleaning, Mechanical Cleaning and Chemical Cleaning prior to Etching	10	W	AC 7108/2: 3.1.1.6.2, 4.5, 4.6
17	Knowledge and Understanding of Etch Rate and Stock Removals	10	W	AC7108/2 5.1 – 5.1.13
18	**Knowledge and Understanding of how to correct or adjust Etch Rate and Stock Removals**	10	W	AC 7108/2: 5.1.3, 5.1.4.4 – 5.1.13
19	**Knowledge and Understanding of Local Etch Stock Solutions and correct chemistry application and removal**	10		AC 7108/2:5.1.3, 5.1.1.4 – 5.1.13
20	Knowledge and Understanding of Laboratory Procedures	10	W	AC7108 4.1, AC7108/2: 5.1, 5.1.3
21	Knowledge and Understanding of Analytical requirements & limits	10	W	AC 7108/2: 5.1.4.8
22	**Knowledge and Understanding to review and act on analytical data & limits**	10	W	AC7108/2:5.1
23	Understand the need for pre-process checks (such as calibration status, temperatures & light levels	10	W	AC7108 3.10, AC 7108/2: 4.5.1, 4.8.1, A7.1.3.12
24	Understanding of Racking and part set-up	10	W	AC 7108/2: 3.1.1.6.4
25	Thorough understanding of the appropriate etch process	10	W	AC 7108/2: A7, B7, C7, D7; AC 7108/15
26	**Knowledge and Ability to write and review internal procedures and practices**	10	W	AC7108/2: 4.4
27	**Knowledge to recognize unsafe and/or inappropriate work practices**	10	W	Occupational Safety and Health

				Administration (OSHA); Environmental laws and regulations
28	**Knowledge and Understanding of the effect of all aspects of the etching process on different alloys and materials (including masking materials, tanks, work environment etc.).**	**10**	**W**	AC7108 3.4, 3.6.1
29	**Understand how to deal with incorrect or in appropriate etch processing**	**10**	**W**	AC 7108: 3.4, 4.2.2
30	**Knowledge and Understanding of the selection of appropriate plant and equipment for use in etch inspection**	**10**	**W**	AC 7108: 5.1, 5.3
31	**Understanding of the significance pH and grades of water purity and their measurement**	**7**	**W**	AC 7108: 4.5, 4.5.4.6,
32	**Knowledge and Understanding of appropriate lighting levels and their measurement**	**10**	**W**	AC 7108: 3.7.1, A5.1 – A5.4
33	**General Knowledge and Understanding of all the etch inspection processes (including their strengths and weaknesses)**	**7**	**W**	AC 7108/2: A1, B1, C1, D1; AC 7108/15
34	**Knowledge and Understanding to select appropriate inspection methods**	**10**	**W**	AC 7108/2: A1, B1, C1, D1; AC 7108/15
35	**NITAL AND TEMPER ETCH:**			
36	**Accept / Reject Criteria**	**10**	**W**	AC 7108/2: D5.5, D7.2.4.1
37	Understanding the effects of heat being applied to metal during the cutting, grinding and forming	**10**	**W**	General Industry; AC 7108/2: D7.1
38	A conforming etched surface will exhibit a matte gray etched surface	**10**	**W**	Addendum 1; AC7108/2: D7.1
39	Temper Etch Inspection is used for inspection of Low Alloy Steels (Group A), Tool Steels (Group B), Limited Access or Swab Etch, Ammonium Persulfate Swat Etch	**10**	**W**	MIL-STD-867; AC 7108/2: D7.1
40	Understand the importance of proper equipment set-up and use	**10**	**W**	MIL-STD-867 / AMS 2649; AC 7108: 5.1, 5.3
41	Understand the use and control of known defect samples	**10**	**W**	MIL-STD-867 / AMS 2649;
42	**Knowledge and Understanding to review known defect data**	**10**	**W**	MIL-STD-867; AC 7108/2: D7.2.2
43	Understand surface preparation techniques and requirements	**10**	**W**	General Industry; AC 7108/2: D1
44	Understand process requirements	**10**	**W**	General Industry; AC 7108/2: D7.1.6.1
45	Understand post process requirements	**10**	**W**	General Industry; AC 7108/2: D6
46	Understand Local Swa**b** Etch Process	**10**	**W**	General Industry; AC 7108/2: D4.4
47	**Knowledge and Understanding to identify susceptibility of parts to corrosion and/or embrittlement**	**10**	**W**	AC 7108/2 D7.2.2.2; MIL-STD-867
48	**Knowledge and Understanding of sampling plans**	**10**	**W**	AC 7108/2: D4, MIL-STD-867
49	**Understanding of defects, their causes and their appearance after etching**	**10**	**W**	AC 7108/2 D7.1.4.6; MIL-STD-867
50	**Knowledge and Understanding to create and sign off Process Technique Sheets and Data Cards**	**10**	**W**	AC 7108/2: D7.1.4.8
51	**Knowledge and Understanding of the significance of indications and etched appearance**	**10**	**W**	AC 7108/2 D7.1.4.6; MIL-STD-867
52	**BLUE ETCH ANODIZE AND ELECTROLYTIC (ANODIC) ETCHING:**			
53	Accept / Reject Criteria – Uniform color and appearance, segregation, laps, folds, cracks, inclusions, arc outs, pitted areas, inconclusive macrostructure, microstructure evaluation	**10**	**W**	SAE AMS 2642
54	Thorough understanding of the Blue Etch Anodize or Anodic Etch processes used	**10**	**W**	SAE AMS 2642; AC 7108/2: B
55	Acid salt immersion time and required stock removal	**10**	**W**	SAE AMS 2642
56	Anodize rectifier parameters, voltage, amperage, time, ramp rate	**10**	**W**	SAE AMS 2642; AC 7108/2: B2
57	Thorough understanding of the significance of rack construction and size, location and cleanliness of contact points	**10**	**W**	SAE AMS 2642; AC 7108/2: B3.1
58	Back strip immersion time and acceptable color range	**10**	**W**	SAE AMS 2642
59	**Thorough understanding of handling and processing Titanium**	**10**	**W**	AC 7108/2: C4.4
60	**Understanding of defects, their causes and their appearance after BEA or anodic etching**	**10**	**W**	SAE AMS 2642; AC7108/2: B5.5 – 5.8
61	**Knowledge and Understanding to create and sign off Process Technique Sheets and Data Cards**	**10**	**W**	AC 7108/2: B7.1.1.1.1, B7.1.4.7
62	**Knowledge and Understanding of the significance of indications and etched appearance**	**10**	**W**	SAE AMS 2642, AC7108/2: B5.5 – 5.8
63	**MACROSTRUCTURE ETCH:**			
64	Accept / Reject Criteria	**10**	**W**	General Industry; AC 7108/2:C7.1.4 ASTM 340; ASTM A 646
65	Thorough understanding of the Macrostructure Etch process	**10**	**W**	General Industry; ASTM 340; ASTM A 646; AC 7108/2:C
66	Wet inspection and temporary marking	**10**	**W**	General Industry
67	Definition of a detectable and rejectable indications	**10**	**W**	General Industry; AC 7108/2:C; ASTM 340; ASTM A 646
68	Understand Local Swab Etch Process	**10**	**W**	General Industry; AC 7108/2: C4
69	**Understanding of Metallographic structure (grains, boundaries, phases etc.)**	**10**	**W**	ASTM 340
70	**Understanding of defects, their causes and their appearance after etching**	**10**	**W**	ASTM 340;AC 7108/2: C5.1

71	**Understand the use of classification charts**	**10**	**W**	ASTM 340
72	**Knowledge and Understanding of etch solutions and processes and the appropriate selection of etch processes**	**10**	**W**	AC 7108/2: C4
73	**Knowledge and Understanding to create and sign off Process Technique Sheets and Data Cards**	**10**	**W**	AC 7108/2: C5.3
74	**Knowledge and Understanding of the significance of etched appearance**	**10**	**W**	ASTM 340
75	**PRE-PENETRANT ETCH:**			
76	Determine an acceptable etch.is presented to NDT	**10**	**W**	General Industry: AC 7108/15
77	Understand Qualified Materials for etch process	**10**	**W**	General Industry: AC 7108/15
78	Thorough understanding of the Pre-Penetrant Etch process.	**10**	**W**	ASTM E 1417; AC 7108/15
79	Understands the effects of the etch processes	**10**	**W**	General Industry; AC 7108/15
80	Understands visual appearance results of the etch process	**10**	**W**	General Industry: AC 7108/15
81	Understands proper handling of solutions and parts	**10**	**W**	General Industry: AC 7108/15
82	Understand Local Swab Etch Process	**10**	**W**	General Industry: AC 7108/15
83	**Understands the effects of etch rate on different alloys**	**10**	**W**	General Industry: ASTM E 1417; AC 7108/15
84	**Knowledge and Understanding of Fluorescent Penetrant Inspection**	**7**	**W**	ASTM E 1417; AC 7108/15
	SKILLS: **Defined within these rolls describes the range of skills. The skills required to perform a particular special process task**			
85	**READ AND UNDERSTAND WRITTEN INSTRUCTIONS:**			
86	Ability to understand specification requirements and customer flow-down requirements	**10**	**W**	General Industry; AC7108 :2.4, 3.1.2, 3.4.1
87	Apply Inspection Techniques appropriately	**10**	**W**	General Industry; AC 7108/2: AC7108 3.2, AC 7108/2:4.4, 5, 7.1.4, 7.2.2
88	Verify and validate the accuracy of the results	**10**	**W**	General Industry; AC 7108/2: 3.3.1.11
89	Properly document nonconformance's	**10**	**W**	General Industry; AC 7108/2: 3.4.2, 3.8,
90	Apply technical knowledge in a skillful way in solving problems	**10**	**W**	General Industry; AC 7108/2: 3.1, 3.2
91	Familiar with the scope and limitations of the method.	**10**	**W**	General Industry; AC 7108/2: AC 7108/2: A7, B7, C7, D7
92	Use appropriate equipment for inspection of process	**10**	**W**	General Industry; AC 7108/2: ; AC 7108/2: 5, 7.1.4, 7.2.2
93	Ability to follow instructions	**10**	**W**	General Industry; AC 7108/2: AC7108: 3.1.2, 3.3.1.6, 4.4
94	**Ability to write Work Instructions and procedures**	**10**	**W**	AC 7108/2: 3.1, 4.4.1, 4.4.2.10
95	Interpretation of an acceptable etch process	**10**	**W**	General Industry; AC 7108/2: AC 7108/2: 4.1, 4.4.2.5
96	Must be able to read drawings and specification	**10**	**W**	General Industry; AC 7108/2: 3.4.1,
97	Must be able to interpret specification requirements	**10**	**W**	General Industry; AC 7108/2: 3.4.1
98	Must be able to understand and interpret shop traveler	**10**	**W**	AC7108/2: 3.1.2
99	**Ability to identify training needs and plan their correction**	**10**	**W**	General Industry: AC 7108/2: 3.0.3, 3.2
100	**Ability to identify strengths and weaknesses in the personnel that report to them**	**10**	**W**	General Industry: AC 7108/2:3.2
	Sequencing			
101	Has an appropriate understanding of where this process falls in the sequence of events.	10	W	AC 7108/2: A7, B7, C7, D7; AC 7108/15
	PERSONAL ATTRIBUTES: **Are statements that will enable judgment of the person's personal attributes**			
102	Must be able to work independently with minimum supervision	**10**	**P**	**General Industry**
103	Have a high degree of integrity	**10**	**P**	**General Industry**
104	Attentive to details	**10**	**P**	**General Industry**
105	Flexibility	**10**	**P**	**General Industry**
106	Stress Tolerance	**10**	**P**	**General Industry**
107	Conflict Resolution	**10**	**P**	**General Industry**
108	Decision making	**10**	**P**	**General Industry**
109	Team Work	**10**	**P**	**General Industry**
110	Ethical Behavior	**10**	**P**	**General Industry**
111	**Leadership**	**10**	**W/P**	**General Industry**
	EXPERIENCE: **Are the minimum experience requirement expected to demonstrate their competence.**			
112	**EDUCATION:**			
113	16 hours of classroom training, as applicable	**10**	**P**	NAS410; or Training to gain the necessary knowledge (General Industry)
114	High School Diploma or GED	**10**		
115	Apprenticeship	**10**		
116	Secondary Education	**7**		

117	**TRAINING / HANDS-ON EXPERIENCE:**			
118	Complete on the job training (Minimum # of hours required) Level 2 PT - Level 1 + 270 hours = 400 hours, total MT - Level 1 + 400 hours = 530 hours, total RT/UT/ET - Level 1 + 1200 hours = 1600 hours, total	**10**	**P**	NAS410 or Training to gain the necessary knowledge (General Industry)
119	Experience or Basic understanding of the potential hazards / damage that the process can cause to parts	**10**	**W**	General Industry
120	Training must include Practical Examination according to Industry requirements	**10**	**P**	NAS410
121	Temper Etch Inspection personnel shall pass a physical, written and practical test.	**7**	**W/P**	MIL-STD-867C & ARP1923
122	Pre-Penetrant Etch (Level 2) Formal Training 32 hours total (Level 1 + 16 hours)	**10**	**W**	NAS410
123	Pre-Penetrant Etch (Level 2) Experience 400 hours total (Level 1 + 270 hours**)**	**10**	**P**	NAS410
124	Trained and certified in accordance with ARP 1923 (or equivalent)	**10**	**W**	ARP 1923
	NON-SPECIAL PROCESS RELATED REQUIREMENTS: **Defined within these rolls are other general or pre-requisite needed**			
125	Capability to lift up to 30 lbs. (e.g. up to 14 kg)	**3**	**P**	General Industry
126	Capability to deal with repetitive bending and stooping	**3**	**P**	General Industry
127	General understanding of Quality Systems (AS9100) or equivalent	**10**	**W**	General Industry
128	Vision Examination Pre-requisite: Jaeger No. 1 or equivalent, not less than 30 cm/12 inches in at least one eye, natural or corrected	**10**	**P**	NAS410
129	Color Perception: Able to adequately distinguish / differentiate colors used in the process involved	**10**	**P**	NAS410
130	**SAFETY & ENVIRONMENTAL REQUIREMENTS:**			
131	Knowledge and understanding of safety and handling of hazardous materials, chemicals, UV light etc. **including safe storage, interpretation of Health & Safety Data Sheets and** Regulatory Requirements	**10**	**W**	Environmental laws and regulations
132	Understand SDS and PPE Requirements: When and How to use appropriate personal protective equipment (PPE) (goggles, gloves, rubber boots, aprons, etc.)	**10**	**W**	Occupational Safety and Health Administration (OSHA)
133	**Ability to prepare and administer appropriate safety and environmental procedures and controls**	**10**	**W**	Occupational Safety and Health Administration (OSHA)
134	**Additional Safety & Environmental Requirements**	**10**	**W**	Addendum 2

7. PORTFOLIO REQUIREMENTS

Row #	COMPETENCE	Exam Type Written / Practical	Reference Guidelines
	PORTFOLIO REQUIREMENTS *(for OWNER LEVEL Qualification Only)* **Portfolio must include the following components for consideration**		
135	Planner Exam Score *(Must receive at least 80%)*	**W**	**PD 6103 Etch Planner Exam**
136	Planner Exam Validity *(Must be within 6 months of requalification)*	**W**	**PD 6103 Etch Planner Exam**
137	Experience Survey	**W**	**General Industry**
138	Resume of Experience *(Description of Current and Previous Jobs)*	**W**	**General Industry**
139	Employer / Client Verification *(Signed Statement of Corroboration by either current employer or client)*	**W**	**General Industry**
140	NOTE: The above components will be scored accordingly		

8. DOCUMENT REVISION HISTORY

REVISION DATE	SUMMARY
11 Nov 14	Editorial change made to formatting and to add sequencing
03 Jun 16	Editorial change made to update BoK with new template revisions
06 Mar 17	Updated reference paragraphs for AC7108 and AC7108/2 in reference columns – all line items Added document NAS410 to Addendum 1 Added document AS9100 to Addendum 1 Added Addendum 2 REACh Regulation Information Changed Anodic Etch to Electrolytic Etch – all line items

ADDENDUM 1

LIST OF INTERNATIONAL STANDARDS & REFERENCE DOCUMENTS FOR CHEMICAL PROCESSING / ETCH

SPECIAL PROCESS	DOCUMENT TITLE	DOCUMENT NUMBER
Chemical Process	Audit Criteria for Chemical Processes	AC 7108
Chemical Process/Etch	Audit Criteria for Etch Inspection Processes (Anodic, Blue Etch Anodize, Macrostructure, Nital/Temper) Appendix A, B, C, D	AC7108/2
Chemical Process/Etch	Audit Criteria for Pre-Penetrant Etch	AC 7108/15
NDT	Etch Inspection of High Strength Steel Parts	AMS 2649C
NDT	Pyrometry	AMS 2750
Chemical Process	Standard Methods of Analysis of Sulfochromate Etch Solution Used in Surface Preparation of Aluminum	ASTM D2674
Chemical Process	Liquid Penetrant Testing	ASTM E 1417
Macrostructure Etch	Standard Specification for Premium Quality Alloy Steel Blooms and Billets for Aircraft and Aerospace Forgings	ASTM A 646
Macroetch	Standard Practice for Macroetching Metals and Alloys	ASTM E 340
Etch Inspection	Method for the Etch Inspection of Metallic Material and Components	BSI SS M 37
Etch Inspection	Acid Etch Inspection for Steel Parts	HB7717
NDT	Nital Etch	MIL-STD-867
NDT	NAS CERTIFICATION & QUALIFICATION OF NONDESTRUCTIVE TEST PERSONNEL	NAS410
Chemical Process	Temper Etch Inspection	MIL-STD-867 C
Etch Inspection	Structural Examination of Titanium Alloys Etch-Anodize Inspection Procedure	SAE AMS2642D
Etch Inspection	Structural Examinations of Titanium Alloys Chemical Etch Inspection Procedure	SAE AMS2643E
Etch Inspection	Qualification & Certification of Etch Inspector	SAE ARP 1923 A
Quality	Quality Management Systems – Requirements for Aviation, Space and Defense Organizations	AS9100

ADDENDUM 2

ADDITIONAL SAFETY & ENVIRONMENTAL REQUIREMENTS

REACh REGULATION INFORMATION

Several metal finishing processes (painting, anodize, chromate conversion, passivate, electroplating) may have REACh regulated substances that are either used as process chemicals or are contained within the finished product after a process is completed. Chemical suppliers are obliged to provide a legislatively compliant safety data sheet.
Below are topics of concern that a chemical processing owner should be aware of and have adequate understanding if products are produced within or shipped to the European Union.

- REACh (Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals)
- Affects raw materials/substances that go into products either produced within or shipped to the European Union.
- Under EU REACh regulation, substances that are one of the following can be regarded as substance of very high concern (SVHC):
  - carcinogenic, mutagenic or toxic to reproduction (CMRs);
  - persistent, bio-accumulative and toxic (PBTs);
  - very persistent and bio-accumulative (vPvBs);
  - seriously and / or irreversibly damaging the environment or human health, as substances damaging the hormone system;
- The SVHC candidate list is a moving target that will continue to grow with 168 substances as of January 2016. This list is reviewed nominally twice a year by ECHA.
- Some typically used SVHC's contained in or used but not limited to during chemical processing are;
  - Cadmium
  - Strontium Chromate
  - Chromium trioxide
  - Sodium dichromate
- SVHC content is allowable up to 0.1% of an article produced within or shipped to the EU.
- Additionally, SVHC's may at some time be added to the Authorization List known as Annex 14 or XIV which contains a sunset date for each SVHC in this list.
- Chemical processing owner needs to be aware of sunset dates for SVHC's contained in the Authorization list. Once an SVHC from the Authorization List reaches the sunset date, it can no longer be used in the EU without specific authorization from ECHA (European Chemicals Agency).
- Manufacturing sites either located within or if shipping product to the EU must comply with all aspects of REACh. Chemical suppliers in the EU must provide safety data sheets that reflect any conditions of an authorization.
- Further information/current SVHC and Authorization list with sunset dates can be obtained by accessing (http://www.echa.europa.eu/web/guest/candidate-list-table)