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|---|---|---|
| PRI Qualification<br>161 Thorn Hill Road<br>Warrendale, PA 15086-7527 | **Program Document CPBoK** | **PD 6103**<br>**CPBoK-005/OP-1 REV. A**<br>Issued: **10-2014**<br>Revised: **09-2018**<br>Superseding: **N/A** |

## BODY OF KNOWLEDGE:

**ROLE DESCRIPTION:** OPERATOR
**SPECIAL PROCESS**: CHEMICAL PROCESSING
**METHOD:** ANODIZING

All PRI Qualification[SM] program examinations are created using the applicable PRI Qualification[SM] program 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 BoKs are created by subject matter experts who participate in the PRI Qualification[SM] Body of Knowledge Review Boards. All BoKs are updated periodically according to the latest revision of PRI Qualification[SM] program documentation (PD6100: Industry Managed Special Process Bodies of Knowledge) to ensure consistency with current industry practice.

## 1. INTRODUCTION

This document has been created by the PRI Qualification[SM] Chemical Processing Body of Knowledge Review Board (CP-BoKRB) according to the requirements of PD6100.

This document constitutes the PRI Qualification[SM] program BoK for Chemical Processing Anodizing including Chromic Acid Anodizing, Sulphuric Acid Anodizing, Hardcoat/Hard Anodizing, Phosphoric Acid Anodizing, Anodizing for Bonding, Titanium Anodizing, Magnesium Anodizing, Boric Sulphuric Acid Anodizing, Tartaric Sulphuric Anodizing for the Operator 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 version 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 PRI Qualification[SM] program examination candidate preparation

- Chemical Processing Examination Review Board (CP-ERB) for the development of PRI Qualification[SM] program examinations
- Candidates taking PRI Qualification[SM] program examinations who wish to prepare in advance

## 2. REFERENCES

PRI Qualification[SM] program documents:

| | |
|---|---|
| PD6000 | Governance & Administration of PRI Qualification[SM] 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 PRI Qualification[SM] 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 version of PD 6000 for definitions.

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. Skill is 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 PRI Qualification[SM] program examination candidates are recommended to read all documents referenced in section 2 of this document.

As stated in PRI Qualification[SM] program document PD6200, every exam question shall relate directly to and be derived from the information as detailed in the current version of the BoK.

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

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 Approved Training Providers can be found at https://p-r-i.org/)

Records of all qualified personnel shall be maintained and include:

- Date of Qualification
- Results of Written Exam
- Results of Practical Exam (if applicable)
- Summary of Experience (Owner level only)

**PRI Qualification[SM] Body of Knowledge:** Chemical Processing, Chromic Acid Anodizing, Sulphuric Acid Anodize, Hardcoat/Hard Anodizing, Anodizing for Bonding, Titanium Anodize, Magnesium Anodize, Boric Acid Anodizing, Tartaric Sulphuric; Operator

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**5. LEVELS**

| Level | | | |
|---|---|---|---|
| ***Descriptors*** | ***Operator (OP)/Technician(T)***<br><br>***For descriptions, please refer to current version of PD6000*** | ***Planner (PL)***<br><br>***For descriptions, please refer to current version of PD6000*** | ***Owner (OW)***<br><br>***For descriptions, please refer to current version of PD6000*** |
| **Anodize Process Specific Criteria** | No additional criteria for the Anodize process. | No additional criteria for the Anodizing | No additional criteria for the Anodizing process |
| **Technical Knowledge** | Basic knowledge of the Anodizing process, its main processes, methods and tools. | Good level of knowledge in all aspects of the Anodizing process, all its processes, methods and tools.<br><br>Ability to coach others on contents and methods in the context of their workplace. | High or extensive knowledge in all aspects of the Anodizing process, all its processes, methods and tools to assess and validate improvements.<br><br>Able to contribute to set externally recognized standards.<br><br>Ability to define contents and methods for using knowledge effectively in influencing and |
| **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, | |
| **Skills** | | Describes the activities necessary to perform each level of job function to comply with the Anodizing Body of Knowledge | |
| **Non-Special Process Related Requirements** | | Health & Safety, Environmental, Quality System Requirements. | |

**PRI Qualification[SM] Body of Knowledge:** Chemical Processing, Chromic Acid Anodizing, Sulphuric Acid ،Anodize, Hardcoat/Hard Anodizing, Anodizing for Bonding, Titanium Anodize, Magnesium Anodize, Boric Acid Anodizing, Tartaric Sulphuric; Operator

## 6. TABLE 1

| 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 | Understand how to determine if there has been damage to the part surface. Ability to recognize common anodizing problems such as burning, poor contact, etc. | 10 | Written | AC 7108/8 |
| 2 | Full and complete understanding of Internal Work instructions | 10 | Written | AC 7108, AC 7108/8 |
| 3 | Understand Industry Standards (see Addendum 1 of this document) | 7 | Written | Addendum 1 |
| 4 | Knowledge and understanding of the Accept/Reject Criteria | 7 | Written | AC 7108/8 |
| 5 | Knowledge of the Surface Preparation procedures | 10 | Written | MIL-A-8625, General Industry |
| 6 | Basic understanding of the control and calibration requirements for equipment. | 7 | Written | AC 7108, General Industry |
| 7 | Know how to perform the Water Break Free Cleanliness Verification | 10 | Written | ASTM F22 |
| 8 | Knowledge and understanding of mathematics, including decimal and fractions | 3 | Written | General Industry |
| 9 | Know how to use precision measuring instruments and equipment | 7 | Written | General Industry |
| 10 | Know and understand Job Documentation including Fixed and Frozen Process requirements. | 7 | Written | AC 7108 |
| 11 | Know and understand General Cleaning, Mechanical Cleaning and Chemical Cleaning prior to Anodizing. | 10 | Written | MIL-A-8625 AC 7108/8 |
| 12 | Know and understand Sealing performance and process requirements. | 10 | Written | AC 7108/8 |
| 13 | Know and understand how to correct or adjust the Ramp Rate, Voltage and ASF for the Anodizing process. | 3 | Written | General Industry |
| 14 | Understand the need for pre-process checks (such as calibration status and solution temperatures). | 10 | Written | AC 7108/8 |
| 15 | Understand the mechanics and importance of Racking, Part Set-Up and Masking. | 10 | Written | AC 7108/8 |
| 16 | Thoroughly understand the Anodizing process. | 10 | Written | AC 7108/8 & MIL-A-8625 & General Industry |
| 17 | Know how to recognize unsafe and/or inappropriate work practices. | 7 | Written | OSHA & ILO & General Industry |
| 18 | Know and understand the effects and aspects of the Anodizing process on different alloys and materials (including chemicals, masking materials, tanks, work environment, etc.) | 3 | Written | MIL-A-8625 & AC 7108/8, General Industry |
| 19 | Understand how to deal with incorrect or inappropriate Anodizing. | 3 | Written | MIL-A-8625, AC 7108/8, General Industry |
| 20 | Knowledge and understanding about the selection of appropriate equipment for use in the Anodizing process. | 3 | Written | General Industry |
| 21 | Understanding of the significance of pH and grades of water purity and their measurement. | 7 | Written | MIL-A-8625, AC 7108, General Industry |
| 22 | General knowledge and understanding of all the Anodizing processes. | 3 | Written | MIL-A-8625, AC 7108/8, General Industry |
| 23 | CHROMIC ACID ANODIZING | | | |
| 24 | Understand “Accept & Reject” Criteria including thickness and color range. | 7 | Written | MIL-A-8625, AC 7108/8, General Industry |
| 25 | Know uses, features and applications for this type of Anodizing. | 3 | Written | MIL-A-8625, AC 7108/8, General Industry |
| 26 | Understand the limitations for this type of Anodizing. | 3 | Written | MIL-A-8625, AC 7108/8, General Industry |
| 27 | Understand the dyeing and sealing options and requirements. | 7 | Written | MIL-A-8625, AC 7108/8, General Industry |
| 28 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 29 | SULPHURIC ACID ANODIZING | | | |
| 30 | Understand “Accept & Reject” Criteria including thickness and color range. | 7 | Written | MIL-A-8625, AC 7108/8, General Industry |
| 31 | Know uses, features and applications for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 32 | Understand the limitations for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 33 | Understand the dyeing and sealing options and requirements for this type of Anodizing. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 34 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data |

**PRI Qualification[SM] Body of Knowledge:** Chemical Processing, Chromic Acid Anodizing, Sulphuric Acid Anodize, Hardcoat/Hard Anodizing, Anodizing for Bonding, Titanium Anodize, Magnesium Anodize, Boric Acid Anodizing, Tartaric Sulphuric; Operator

| | | | | |
|---|---|---|---|---|
| | | | | Sheets), WHMIS (Canada), General Industry |
| 35 | Knowledge of "Thin-film Sulfuric Acid Anodizing" and similar options. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 36 | **HARDCOAT OR HARD ANODIZING** | | | |
| 37 | Understand "Accept & Reject" Criteria including thickness. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 38 | Know uses, features and applications for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 39 | Understand the limitations for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 40 | Understand the dyeing and sealing options and requirements for this type of Anodizing. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 41 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 42 | **PHOSPHORIC ACID ANODIZING** | | | |
| 43 | Understand "Accept & Reject" Criteria. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 44 | Know uses, features and applications for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 45 | Understand the limitations for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 46 | Understand the dyeing and sealing options and requirements for this type of Anodizing. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 47 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 48 | **ANODIZING FOR BONDING** | | | |
| 49 | Understand "Accept & Reject" Criteria | 7 | Written | **MIL-A-8625, AC 7108/3,** General Industry |
| 50 | Know uses, features and applications for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/3,** General Industry |
| 51 | Understand the limitations for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/3,** General Industry |
| 52 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 53 | What type of base materials are used for this type of Anodizing? | 3 | Written | **MIL-A-8625, AC 7108/3,** General Industry |
| 54 | Type of surface preparations used for Anodizing bonding. | 3 | Written | MIL-A-8625, AC 7108/3, General Industry |
| 55 | **TITANIUM ANODIZING** | | | |
| 56 | Understand "Accept & Reject" Criteria. | 7 | Written | SAE AMS 2488, General Industry |
| 57 | Know uses, features and applications for this type of Anodizing. | 3 | Written | SAE AMS 2488, General Industry |
| 58 | Understand the limitations for this type of Anodizing. | 3 | Written | SAE AMS 2488, General Industry |
| 59 | Understand the differences between achieving color on Titanium and other metals, such as aluminum. | 7 | Written | SAE AMS 2488, General Industry |
| 60 | Know cleaning restrictions when using Titanium. | 7 | Written | SAE AMS 2488, General Industry |
| 61 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada) General Industry |
| 62 | **MAGNESIUM ANODIZING** | | | |
| 63 | Understand "Accept & Reject" Criteria. | 7 | Written | AMS-M-45202**, AC 7108/8,** General Industry |
| 64 | Know uses, features and applications for this type of Anodizing. | 3 | Written | AMS-M-45202**, AC 7108/8,** General Industry |
| 65 | Understand the limitations for this type of Anodizing. | 3 | Written | AMS-M-45202**, AC 7108/8,** General Industry |
| 66 | Understand the dyeing and sealing options and requirements. | 7 | Written | AMS-M-45202**, AC 7108/8,** General Industry |
| 67 | Understand the environmental, worker safety and health concerns associated with this type of | 3 | Written | AMS-M-45202, OSHA |

| | | | | |
|---|---|---|---|---|
| | Anodizing. | | | (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 68 | **BORIC SULPHURIC ACID ANODIZING (BSAA)** | | | |
| 69 | Understand "Accept & Reject" Criteria. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 70 | Know uses, features and applications for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 71 | Understand the limitations for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 72 | Understand the dyeing and sealing options and requirements. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 73 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 74 | **TARTARIC SULPHURIC ACID ANODIZING** | | | BS EN 4704 |
| 75 | Understand "Accept & Reject" Criteria. | 7 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 76 | Know uses, features and applications for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 77 | Understand the limitations for this type of Anodizing. | 3 | Written | **MIL-A-8625, AC 7108/8,** General Industry |
| 78 | Understand the environmental, worker safety and health concerns associated with this type of Anodizing. | 3 | Written | OSHA (USA), MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| | **SKILLS:** Defined within these rolls describes the range of skills. The skills required to perform a particular special process task | | | |
| 79 | **READ AND UNDERSTAND WRITTEN INSTRUCTIONS:** | | | |
| 80 | Apply Anodizing techniques appropriately | 10 | Practical | **MIL-A-8625, AC 7108/8,** General Industry |
| 81 | Verify and validate the Anodizing results. | 3 | Practical | **MIL-A-8625, AC 7108, AC 7108/8,** General Industry |
| 82 | Properly report non-conformances | 10 | Practical | **AC 7108**, General Industry |
| 83 | Use of appropriate equipment for the Anodizing process. | 3 | Practical | General Industry |
| 84 | Ability to follow instructions | 10 | Practical | General Industry |
| 85 | Interpretation of an acceptable Anodizing process | | Practical | **MIL-A-8625, AC 7108/8,** General Industry |
| 86 | Must be able to set-up operations (select appropriate equipment, determine or enter rates, set timers & read and record temperatures) including alternate procedures as appropriate | 3 | Practical | General Industry |
| 87 | Must be able to understand and interpret shop travelers | 7 | Practical | **AC 7108,** General Industry |
| | **PERSONAL ATTRIBUTES:** Are statements that will enable judgment of the person's personal attributes | | | |
| 88 | Be able to work independently with a minimum of supervision | 3 | N/A | General Industry |
| 89 | Must have a high degree of integrity | 10 | N/A | General Industry |
| 90 | Be attentive to details | 10 | N/A | General Industry |
| 91 | Be flexible | 3 | N/A | General Industry |
| 92 | Tolerate stress | 7 | N/A | General Industry |
| 93 | Exhibit conflict resolution | 3 | N/A | General Industry |
| 94 | Decision making ability | 3 | N/A | General Industry |
| 95 | Team Worker | 10 | N/A | General Industry |
| 96 | Ethical Behavior | 10 | N/A | General Industry |
| | **EXPERIENCE:** Are the minimum experience requirement expected to demonstrate their competence? | | | |
| 97 | **EDUCATION:** | | | |
| 98 | High School Diploma, GED or Secondary Education | 7 | N/A | General Industry |
| 99 | Apprenticeship | 3 | N/A | General Industry |
| 100 | Industry Training or Courses | 3 | N/A | General Industry |
| **101** | **TRAINING / HANDS-ON-EXPERIENCE:** | | | |
| 102 | Complete on the job training: Minimum number of hours- | | | |
| 103 | OPERATOR – 160 Hours | 10 | N/A | General Industry |
| | **NON-SPECIAL PROCESS RELATED REQUIREMENTS:** Defined within these rolls are other general or pre-requisite needed | | | |
| 104 | Capability to lift up to 30 lbs. (13 kg) | 7 | Written | General Industry |
| 105 | Able to deal with repetitive bending and stooping | 10 | Written | General Industry |

| | | | | |
|---|---|---|---|---|
| 106 | **SAFETY & ENVIRONMENTAL REQUIREMENTS:** | | | |
| 107 | Knowledge and understanding of safety and handling of hazardous material, chemicals, etc. including safe storage, interpretation of Health & Safety Data Sheets and Regulatory Requirements | 10 | Written | OSHA (USA), EU MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 108 | Understand Safety Data Sheets (SDS) and Personal Protective Equipment ({{E) Requirements: When and how to use appropriate personal protective equipment (goggles, gloves, rubber boots, aprons, etc.) | 10 | Written | OSHA (USA), EU MSDS, MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 109 | Understand which personal protective equipment to use, when and why. | 10 | Written | OSHA (USA), EU MSDS, MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 110 | Understand the safe storage, shelf life and mixing of chemicals. | 10 | Written | OSHA (USA), EU MSDS, MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |
| 111 | Ability to recognize symbols associated with chemicals and their usage. | 10 | Written | OSHA (USA), EU MSDS, MSDS (Material Safety Data Sheets), WHMIS (Canada), General Industry |

## 7. DOCUMENT REVISION HISTORY

| REVISION DATE | SUMMARY |
|---|---|
| 27 December 2019 | Updated to new BoK Template |
| 6 April 2018 | Updated color scheme |
| 27 September 2018 | Reviewed by eQualified Content Developer to ensure it was up to date. |
| 3 December 2019 | Editorial revision to update program name from eQualified to PRI Qualification[SM.] |

**PRI Qualification[SM] Body of Knowledge:** Chemical Processing, Chromic Acid Anodizing, Sulphuric Acid Anodize, Hardcoat/Hard Anodizing, Anodizing for Bonding, Titanium Anodize, Magnesium Anodize, Boric Acid Anodizing, Tartaric Sulphuric; Operator

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**ADDENDUM 1**

**LIST OF INTERNATIONAL STANDARDS & REFERENCE DOCUMENTS FOR CHEMICAL PROCESSING**

| SPECIAL PROCESS | DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|---|
| Chemical Process | Audit Criteria for Chemical Processing | AC7108 |
| Chemical Process | Audit Criteria for Surface Preparation Prior to Metal Bond | AC 7108/3 |
| Chemical Process | Audit Criteria for Anodizing | AC 7108/8 |
| Chemical Process | Hard Anodic Coating Treatment of Aluminum Alloys | AMS 2468 |
| Chemical Process | Hard Anodic Coating on Aluminum and Aluminum Alloys | AMS 2469 |
| Chemical Process | Anodic Treatment of Aluminum Alloys, Chromic Acid Process | AMS 2470 |
| Chemical Process | Anodic Treatment of Aluminum Alloys Sulfuric Acid Process, Undyed Coating | AMS 2471 |
| Chemical Process | Anodic Treatment of Aluminum Alloys, Sulfuric Acid Processes, Dyed | AMS 2472 |
| Chemical Process | Titanium Anodizing, Type I & II | AMS 2488 |
| Chemical Process | Magnesium Alloys, Anodic Treatment of | AMS-M-45202 B |
| Chemical Process | Standard Test Method for Hydrophobic Surface Films by the Water-Break Test | ASTM F22 |
| Chemical Process | Aerospace series. Tartaric-Sulphuric-Acid anodizing of aluminium and aluminium wrought alloys for corrosion protection and paint pre-treatment (TSA) | BS EN |
| Chemical Process | Anodic Coatings for Aluminum and Aluminum Alloys | MIL-A-8625 |
| Chemical Process | Chemical Conversion Coatings on Aluminum and Aluminum Alloys | MIL-DTL-5541 |

**PRI Qualification[SM] Body of Knowledge:** Chemical Processing, Chromic Acid Anodizing, Sulphuric Acid Anodize, Hardcoat/Hard Anodizing, Anodizing for Bonding, Titanium Anodize, Magnesium Anodize, Boric Acid Anodizing, Tartaric Sulphuric; Operator

**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.
- 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)