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Program Document SPBOK

PD 6103

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BODY OF KNOWLEDGE:

ROLE DESCRIPTION: OPERATOR/TECHNICIAN

SPECIAL PROCESS: AEROSPACE COATINGS

METHOD: PREPARATION AND PAINTING OF EXTERIOR & STRUCTURAL AIRCRAFT SURFACES

All PRI QualificationSM program examinations are created using the applicable PRI Qualification 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 Body of Knowledge Review Boards. All BoKs are updated periodically according to the latest revision of PRI Qualification 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 program Aerospace Coatings Body of Knowledge Review Board (SP BoKRB) according to the requirements of PD6100.

This document constitutes the PRI Qualification program BoK for Aerospace Coatings, Preparation and Painting of Exterior & Structural Aircraft Surfaces, for the Operator/Technician Level. It defines the baseline knowledge and experience required to be considered competent to perform this role.

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

- Training providers who wish to develop training courses intended to support the PRI Qualification program examination candidate preparation
- Special Process Examination Review Board (SP-ERB) for the development of PRI Qualification program assessments, both written and practical.

2. REFERENCES

PRI Qualification program documents:

PD6000	Governance & Administration of PRI Qualification Program
PD6100	Industry Managed Special Process Bodies of Knowledge
PD6200	Industry Managed Special Process Examinations System
PD6300	Industry Managed Guidance for Coatings Applicator Review Board Operations

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 Dictionary.

AEROSPACE COATINGS APPLICATOR SPECIALIST (ACAS): The operator or technician performing the physical tasks of preparing and applying coatings to aircraft, aircraft components, or related substrates.

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 definition of these levels.

METHOD: A well-defined division of a SPECIAL PROCESS widely recognised 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.

REQUIRED READING (ADDENDUM 1): A list of international standards and reference documents for the special process described in the Body of Knowledge. Questions on the associated PRI Qualification theory assessment are based on the documents listed in this list, and the PRI Qualification exam candidate should be familiar with them before taking the theory assessment.

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

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

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

Candidates are strongly 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 PRI Qualification Approved Providers can be found at www.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

For more information on data retention, please see [PRI's privacy statement.](#)

PRI QualificationSM Body of Knowledge: Preparation and Painting of Exterior & Structural Aircraft Surfaces, for the Operator/Technician Level - 4 -

5. LEVELS

Descriptors	Level		
	Operator (OP)/Technician(T) <i>For descriptions, please refer to current version of PD6000</i>	Planner (PL) <i>For descriptions, please refer to current version of PD6000</i>	Owner (OW) <i>For descriptions, please refer to current version of PD6000</i>
Preparation and Painting of Exterior & Structural Aircraft Surfaces Specific Criteria	Additional criteria for ACAS certification in the discipline of Preparations and Painting of Exterior & Structural Aircraft Surfaces is defined in AS7489; Section 3.	No additional criteria for the Preparation and Painting of Exterior & Structural Aircraft Surfaces.	No additional criteria for the Preparation and Painting of Exterior & Structural Aircraft Surfaces.
Technical Knowledge	Basic to advanced knowledge of the Preparation and Painting of Exterior & Structural Aircraft Surfaces.	Good level of knowledge in all aspects of the Preparation and Painting of Exterior & Structural Aircraft Surfaces, 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 Preparation and Painting of Exterior & Structural Aircraft Surfaces, 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 and/or demonstrates 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.		

PRI QualificationSM Body of Knowledge: Preparation and Painting of Exterior & Structural Aircraft Surfaces, for the Operator/Technician Level - 5 -

6. TABLE 1

ROLE DESCRIPTION: Operator

SPECIAL PROCESS: Aerospace Coatings

METHOD: Preparation and Painting of Exterior & Structural Aircraft Surfaces

REFERENCE GUIDELINES: *Addendum 1 is a list of the International Standards and Reference Documents applicable to Preparation and Painting of Exterior & Structural Aircraft Surfaces processes.*

Row #	COMPETENCE	Weight (1,3,7,10)	Exam Type Written/ Practical	Reference Guidelines
	KNOWLEDGE:			
	The basic knowledge of the special processes, methods and tools			
	AS7489 COURSE I REQUIREMENTS – ENTRY LEVEL			
1	Understand the common hazards/detriments associated with the aerospace coatings process	10	Written	AS7489
2	Understand the typical exposure potentials & effects of detriments in the aerospace coatings process	10	Written	AS7489
3	Be aware of the physical methods of entry of hazardous materials upon exposure	10	Written	AS7489
4	Be aware of allowable Personal Exposure Limits associated with hazardous materials	10	Written	AS7489
5	Be aware of the necessary PPE required to perform aerospace coatings tasks safely	10	Written	AS7489
6	Understand how environmental conditions affect aerospace paint Quality	7	Written	AS7489
7	Know of the various facility Quality checks, which pertain to the aerospace coatings process	7	Written	AS7489
8	Distinguish between the various types of aerospace coatings Engineering sources	7	Written	AS7489
9	Understand the importance of ACAS compliance to approved Engineering specifications	10	Written	AS7489
10	Understand the theory behind “surface energy” and how it affects coatings adhesion	10	Written	AS7489
11	Understand the differences between various surface contaminants and their impact upon the aerospace coatings process	7	Written	AS7489
12	Understand the different methods & materials used to sand or abrade aircraft surfaces	7	Written	AS7489
13	Distinguish between the different types of chemistry of various cleaning agents and how they work	7	Written	AS7489
14	Distinguish between the chemical differences & physical properties of common aerospace coatings	7	Written	AS7489
15	Know the anatomy and component functions of spray equipment commonly used to apply aerospace coatings	7	Written	AS7489
16	Know the basic anatomy and functionality of the aircraft exterior	7	Written	AS7489
	AS7489 COURSE II REQUIREMENTS – SURFACE PREP & DE-PAINTING			
17	Know the physical characteristics associated with common aerospace substrates	7	Written	AS7489
18	Understand dissimilar metal effects theory as it relates to the aerospace coatings process	7	Written	AS7489
19	Understand how to mitigate the formation of corrosion during the aircraft surface preparation process	10	Written	AS7489
20	Understand the purpose of conductive mesh in structural composites as it relates to lightning strike	10	Written	AS7489
21	Understand the critical precautions needed when prepping composite with conductive mesh	10	Written	AS7489
22	Understand why de-painting of the aircraft or aircraft components is necessary	10	Written	AS7489
23	Distinguish the theory between mechanical and chemical de-painting methods	7	Written	AS7489
24	Know the different chemicals used for de-painting an aircraft chemically	7	Written	AS7489
25	Know what type of PPE (Personal Protective Equipment) is required when de-painting the aircraft	10	Written	AS7489
26	Understand what type of masking materials are required for de-painting aircraft substrates	10	Written	AS7489
27	Understand the importance of maintaining stripper tanks when immersion de-painting is used	7	Written	AS7489
	AS7489 COURSE III REQUIREMENTS – CORROSION INHIBITORS			
28	Know the different ways that surface energy is measured and verified	7	Written	AS7489
29	Know the differences between chromated and non-chromated coatings packages	7	Written	AS7489
30	Understand the mechanisms of corrosion prevention on alloy materials used in aerospace	10	Written	AS7489
	AS7489 COURSE IV REQUIREMENTS – TOP COAT			
31	Understand the adverse effects of excessive Dry Film Thickness (DFT) of a cured coatings package	10	Written	AS7489
32	Understand the failure modes associated with improperly mixed coatings	7	Written	AS7489
33	Understand how and where to find the proper Zahn specifications for a coating	7	Written	AS7489
34	Understand the failure modes associated with non-conforming Zahn values	7	Written	AS7489
35	Understand the potential adverse environmental effects associated with non-conforming Zahn values	7	Written	AS7489
36	Understand what induction times are and why and when they are necessary	7	Written	AS7489
37	Understand the failure modes associated with improper induction times	7	Written	AS7489
38	Understand how an HVLP spray gun should be set-up and adjusted	7	Written	AS7489
39	Understand the basic theory of how an electrostatic spray gun works	7	Written	AS7489
40	Understand the basic theory of how a pressure pot works	7	Written	AS7489
41	Understand the basic theory of how airless and air-assisted airless spray equipment work	7	Written	AS7489
42	Know which defects are created by over-applying coatings materials by their technical terms	7	Written	AS7489
43	Know which defects are created by under-applying coatings materials by their technical terms	7	Written	AS7489

PRI QualificationSM Body of Knowledge: Preparation and Painting of Exterior & Structural Aircraft Surfaces, for the Operator/Technician Level - 6 -

44	Understand the inherent problems associated with non-conforming coating cure times	7	Written	AS7489
AS7489 COURSE V REQUIREMENTS – DETAIL & MASTER CERTIFICATION REQUIREMENTS				
45	Understand the theoretical differences between curing mechanisms of different coating chemistries	7	Written	AS7489
46	Understand the basic theory for masking the aircraft	7	Written	AS7489
47	Know what steps to take to properly clean spray equipment used by ACAS personnel	7	Written	AS7489
48	Know what specialty coatings consist of as used in aerospace	7	Written	AS7489
49	Know the technical terms for common defects in cured aerospace topcoats	7	Written	AS7489
50	Understand the theory behind aerospace-grade paint defect remediation techniques	7	Written	AS7489
51	Know the relevant, applicable governmental agency placard requirements for each aircraft	7	Written	AS7489
52	Understand how to read basic blueprints for installing placards, door band, etc.	7	Written	AS7489
SKILLS:				
The skills required to perform a particular special process task				
Comprehension & Compliance				
53 READ AND COMPREHEND WRITTEN WORK INSTRUCTIONS				
54	Consistently perform aerospace prep & paint tasks per the intent of the engineering documentation	10	Practical	General Industry
55	Consistently works in a safe and compliant manner	10	Practical	General Industry
56	Demonstrate competency in interpreting a Safety Data Sheet (SDS) for a given product	10	Practical	General Industry
57	Demonstrate competency in interpreting a Technical Data Sheet (TDS) for a given product	10	Practical	General Industry
Core Competencies				
58	Demonstrate competency in performing a water break-free surface cleanliness evaluation	7	Practical	ASTM F22
59	Demonstrate proficiency in effectively masking an aircraft and/or its components	7	Practical	General Industry
60	Demonstrate proficiency in sanding the aircraft/components for topcoat application	7	Practical	General Industry
61	Demonstrate proficiency in performing aqueous cleaning methods using alkaline soaps solutions	7	Practical	General Industry
62	Demonstrate proficiency in performing solvent cleaning of aircraft substrates prior to topcoat	7	Practical	General Industry
63	Demonstrate proficiency in performing approved pretreatment application to prepared aircraft surfaces	7	Practical	General Industry
64	Demonstrate proficiency in mixing liquid, organic coatings conforming to AMS3095	7	Practical	AMS3095
65	Demonstrate proficiency in applying liquid, organic coatings conforming to AMS3095	7	Practical	AMS3095
66	Demonstrate competency in paint defect remediation using standard detail methods	7	Practical	General Industry
Quality				
67	Identify paint defect root cause for specific occurrences	7	Practical	General Industry
68	Identify optimal environmental conditions for prepping and painting aircraft and aircraft components	7	Practical	General Industry
69	Demonstrate how to properly perform an incoming & outgoing aircraft inspection for damage	7	Practical	General Industry
70	Demonstrate how to document defects, damage, and quality escapes on the aircraft or component	7	Practical	General Industry
71	Identify how to determine if Preventative Maintenance is up to date within a given facility	7	Practical	General Industry
72	Demonstrate how to read, and apply exterior aircraft placards to an engineering blueprint or drawing	3	Practical	General Industry
PERSONAL ATTRIBUTES:				
Are statements that will enable judgment of the person's personal attributes				
73	Be able to work independently with a minimum of supervision; self-motivated	3	NA	General Industry
74	Must have a high degree of integrity	10	NA	General Industry
75	Be attentive to details	10	NA	General Industry
76	Be flexible	3	NA	General Industry
77	Tolerate stress	7	NA	General Industry
78	Exhibits positive customer relationship skills	7	NA	General Industry
79	Effectively conform to direction from supervisory personnel	7	NA	General Industry
80	Works effectively within a team environment	7	NA	General Industry
81	Consistently exhibits ethical behavior	10	NA	General Industry
82	Exhibits sound critical thinking skills to solve routine or uncommon technical problems	10	NA	General Industry
83	Asks questions, when necessary; avoids making critical mistakes when performing the process	10	NA	General Industry
EXPERIENCE:				
Are the minimum experience requirement expected to demonstrate their competence.				
84	High School Diploma or GED or Secondary Education	7	NA	General Industry
85	Apprenticeship	3	NA	General Industry
86	Structured on-the-job training per a given organization's training department	3	NA	General Industry
87	Two years hands-on ACAS experience	3	NA	General Industry
88	Formal theoretical ACAS training from an Approved Provider	10	Written	AS7489;
89	ACAS Certification from an approved Certification Agency	10	Both	AS7489
NON-SPECIAL PROCESS RELATED REQUIREMENTS:				
Defined within these rows are other general duties or pre-requisites needed to perform the role described in this BoK				
90	Capability of lifting to 30 lbs. (e.g. up to 23 kg)	7	NA	General Industry
91	Is not afraid of heights exceeding six feet (e.g. up to 1.8 meters)	7	NA	General Industry
92	Must be ambidextrous	3	NA	General Industry
93	Capable of standing in one place for extended period of time	3	NA	General Industry
94	Understands and adopts ergonomic work practices whenever possible	7	Written	General Industry
95	Understands and complies with relative environmental law	7	Written	General Industry
96	Capable of wearing and using all required Personal Protective Equipment (PPE) without restriction	7	Practical	General Industry

7. DOCUMENT REVISION HISTORY

REVISION DATE	SUMMARY
00/00/0000	Initial Issue

ADDENDUM 1

LIST OF INTERNATIONAL STANDARDS & REFERENCE DOCUMENTS FOR AEROSPACE COATINGS

*****It is the responsibility of the PRI Qualification Exam Candidate to ensure they are using the most recent revision of the documents listed below. *****

SPECIAL PROCESS	DOCUMENT TITLE	DOCUMENT NUMBER
Aerospace Coatings	Paint, Gloss, Airline Exterior System	AMS3095
Aerospace Coatings	Standard Requirements for Aerospace Organic Coatings Applicator Certification	AS7489
Aerospace Coatings	Standard Test Method for Hydrophobic Surface Films by the Water-Break Test	ASTMF22