NCAMP Authorized Engineering Representative (AER) Qualification Plan

NCAMP Document No.: NQP 200 Rev C

Minimum Requirements:

1. The candidate must have sufficient command of the English language, both oral and written.

2. The candidate must possess a high degree of integrity, sound judgment, and a cooperative attitude.

3. The candidate must have the ability to maintain the highest degree of objectivity while performing authorized functions.

4. The candidate has been in a responsible position in connection with advanced material qualification and material property acquisition type of work and is cognizant of related technical requirements and problems related to aerospace applications.

5. The candidate has basic engineering knowledge in aircraft structures, materials, processes, and material testing, as demonstrated by a minimum of 6 years of progressively responsible engineering experience beyond a bachelor of engineering degree, or equivalent.

AER Qualification Process:

1. Minimum requirements listed in the previous section must be met.

2. Candidate is to fill out the applicable section(s) of this NCAMP AER Application From based on the designated program:

   Section 1: For Composite Materials

   Section 2: For Additive Manufacturing (AM) Materials

   Section 3: For Ceramic Matrix Composite Materials

   Section 4: For Adhesive Materials

3. Submit the completed NCAMP AER Application Form to NCAMP with the required documentation. In order to become an AER, the candidate must have knowledge in and able to perform the engineering tasks outlined in the form (candidates who do not possess knowledge in all the areas may be guided by a qualified AER or NCAMP staff).

4. The candidates' application will be reviewed by the NCAMP Manufacturers Advisory Board (MAB), which consists of original equipment manufacturers and Tier-1 suppliers. The NCAMP MAB may interview the candidates. At least one NCAMP MAB member must respond to the application, at least 75% of those who responded must concur with the appointment. The NCAMP MAB's responses to NCAMP staff will be confidential.

5. Consultant NCAMP AER (non-direct employees) must have a Terms and Conditions Agreement with NCAMP/NIAR/Wichita State University.
   https://www.niar.wichita.edu/media/Terms.pdf

Note. Individuals who have been performing the functions of an NCAMP AER prior to December 2008 are automatically considered a qualified AER

Section 1: For Composite Materials

NCAMP Authorized Engineering Representative (AER) Application Form

First Name	Middle Initial	Last Name
Street Address	City	State
Home Phone	Work Phone	Mobile Phone
Email		

EDUCATION	DEGREE or Credit Hours

WORK EXPERIENCE	START/END DATES

Do you have knowledge and experience in the following?	
I. Preparing or reviewing material qualification test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No
II. Preparing or reviewing material allowable test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No

III. Preparing or reviewing material specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No
IV. Preparing or reviewing process specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No

1.A. General Composite Material Mechanical Testing

Are you familiar with the following test methods, particularly with issues related to test interferences, apparatus, specimen preparation, equipment calibration, environmental conditioning, hot/cold testing, test procedures, failure modes identification, and specimen/data obviation?

a. ASTM D2344 – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates.	Yes/No
b. ASTM D3039 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials.	Yes/No
c. ASTM D3518 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45º Laminate In-Plane Shear Strength and Modulus.	Yes/No
d. ASTM D5766 – Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates.	Yes/No
e. ASTM D5961 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates.	Yes/No
f. ASTM D6415 – Standard Test Method for Measuring the Curved Beam Strength of a Fiber-Reinforced Polymer-Matrix Composite.	Yes/No
g. ASTM D6484 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates.	Yes/No
h. ASTM D6641 – Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture.	Yes/No
i. ASTM D6742 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates.	Yes/No
j. ASTM D7136 – Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event.	Yes/No
k. ASTM D7137 – Standard Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates.	Yes/No

If you answered yes to any of the above questions, please elaborate:

Please provide three verifiable technical references:

Please provide any additional relevant information here:

Two of the following must be attached and submitted to NCAMP with the completed NQP 200 form:

- ☐ Cover letter and Resume.
- ☐ Endorsed qualification statements by the employer (the letter may be written by the candidate).
- ☐ Two letters of recommendations by the upper management within the same employer.
- ☐ Published technical research report(s)/article(s).
- ☐ FAA Designated Engineering Representative (DER) delegation letter and the list of the authorized areas.
- ☐ Organization Designation Authorization (ODA) letter(s) and the list of the authorized areas.
- ☐ Proof of an active member and involvements in aerospace related committee(s): ASTM, NADCAP, CMH-17, CACRC, SAE, MMPDS, ISO, etc.
- ☐ Other documents; to support that the candidate is qualified to take NCAMP AER roles.

Note. *NCAMP MAB consists of aerospace companies that are Original Equipment Manufacturers (OEMs), primes, Tier-1 suppliers. Therefore, candidate must not include any proprietary information.*

Comments by NCAMP (for office use only):

Section 2: For Additive Manufacturing (AM) Materials

NCAMP Authorized Engineering Representative (AER) Application Form

First Name	Middle Initial	Last Name
Street Address	City	State
Home Phone	Work Phone	Mobile Phone
Email		

EDUCATION	DEGREE or Credit Hours

WORK EXPERIENCE	START/END DATES

Do you have knowledge and experience in the following?	
I. Preparing or reviewing material qualification test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No
II. Preparing or reviewing material allowable test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No

III. Preparing or reviewing material specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No
IV. Preparing or reviewing process specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No

2.A. General Additive Manufacturing Material Mechanical Testing

Are you familiar with the following test methods, particularly with issues related to test interferences, apparatus, specimen preparation, equipment calibration, environmental conditioning, hot/cold testing, test procedures, failure modes identification, and specimen/data obviation?

a. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.	Yes/No
b. ASTM D695 – Standard Test Method for Compressive Properties of Rigid Plastics.	Yes/No
c. ASTM D790 – Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.	Yes/No
d. ASTM D5379 – Standard Test Method for Shear Properties of Composite Materials by V-notched Beam Method.	Yes/No
e. ASTM D5766 – Standard Test Method for Open-Hole Tensile Strength of Polymer Matrix Composite Laminates.	Yes/No
f. ASTM D5961 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates.	Yes/No
g. ASTM D6484 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates.	Yes/No
h. ASTM D6742 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates.	Yes/No
If you answered yes to any of the above questions, please elaborate: _____ _____ _____	

Please provide three verifiable technical references:

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Please provide any additional relevant information here:

Two of the following must be attached and submitted to NCAMP with the completed NQP 200 form:

- ☐ Cover letter and Resume.
- ☐ Endorsed qualification statements by the employer (the letter may be written by the candidate).
- ☐ Two letters of recommendations by the upper management within the same employer.
- ☐ Published technical research report(s)/article(s).
- ☐ FAA Designated Engineering Representative (DER) delegation letter and the list of the authorized areas.
- ☐ Organization Designation Authorization (ODA) letter(s) and the list of the authorized areas.
- ☐ Proof of an active member and involvements in aerospace related committee(s): ASTM, NADCAP, CMH-17, CACRC, SAE, MMPDS, ISO, etc.
- ☐ Other documents; to support that the candidate is qualified to take NCAMP AER roles.

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Comments by NCAMP (for office use only):

Section 3: For Ceramic Matrix Composite Materials

NCAMP Authorized Engineering Representative (AER) Application Form

First Name	Middle Initial	Last Name
Street Address	City	State
Home Phone	Work Phone	Mobile Phone
Email		

EDUCATION	DEGREE or Credit Hours

WORK EXPERIENCE	START/END DATES

Do you have knowledge and experience in the following?	
I. Preparing or reviewing material qualification test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No
II. Preparing or reviewing material allowable test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No

III. Preparing or reviewing material specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No
IV. Preparing or reviewing process specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No

3.A. General Ceramic Matrix Composite Material Mechanical Testing

Are you familiar with the following test methods, particularly with issues related to test interferences, apparatus, specimen preparation, equipment calibration, environmental conditioning, hot/cold testing, test procedures, failure modes identification, and specimen/data obviation?

a. ASTM C1275 – Standard Test Method for Monotonic Tensile Behavior of Continuous Fiber-Reinforced Advanced Ceramics with Solid Rectangular Cross-Section Test Specimens at Ambient Temperature.	Yes/No
b. ASTM C1292 – Standard Test Method for Shear Strength of Continuous Fiber-Reinforced Advanced Ceramics at Ambient Temperatures.	Yes/No
c. ASTM C1341 – Standard Test Method for Flexural Properties of Continuous Fiber-Reinforced Advanced Ceramics Composites.	Yes/No
d. ASTM C1358 – Standard Test Method for Monotonic Compressive Strength Testing of Continuous Fiber-Reinforced Advanced Ceramics with Solid Rectangular Cross-Section Test Specimens at Ambient Temperatures.	Yes/No
e. ASTM C1359 – Standard Test Method for Monotonic Tensile Strength Testing of Continuous Fiber-Reinforced Advanced Ceramics with Solid Rectangular Cross-Section Test Specimens at Elevated Temperatures.	Yes/No
f. ASTM C1425 – Standard Test Method for Interlaminar Shear Strength of 1-D and 2-D Continuous Fiber-Reinforced Advanced Ceramics at Elevated Temperatures.	Yes/No
g. ASTM C1468 – Standard Test Method for Trans-thickness Tensile Strength of Continuous Fiber-Reinforced Advanced Ceramics at Ambient Temperature.	Yes/No
h. ASTM D2344 – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates.	Yes/No
i. ASTM D3518 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45º Laminate In-Plane Shear Strength and Modulus.	Yes/No
j. ASTM D5379 – Standard Test Method for Shear Properties of Composite Materials by V-notched Beam Method	Yes/No
k. ASTM D5766 – Standard Test Method for Open-Hole Tensile Strength of Polymer Matrix Composite Laminates.	Yes/No

l. ASTM D5961 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates.	Yes/No
m. ASTM D6484 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates.	Yes/No
n. ASTM D6641 – Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture.	Yes/No
o. ASTM D6742 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates.	Yes/No
p. ASTM D7136 – Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event.	Yes/No
If you answered yes to any of the above questions, please elaborate: _____ _____ _____	

Please provide three verifiable technical references:

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Please provide any additional relevant information here:

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Two of the following must be attached and submitted to NCAMP with the completed NQP 200 form:

- ☐ Cover letter and Resume.
- ☐ Endorsed qualification statements by the employer (the letter may be written by the candidate).
- ☐ Two letters of recommendations by the upper management within the same employer.
- ☐ Published technical research report(s)/article(s).
- ☐ FAA Designated Engineering Representative (DER) delegation letter and the list of the authorized areas.
- ☐ Organization Designation Authorization (ODA) letter(s) and the list of the authorized areas.
- ☐ Proof of an active member and involvements in aerospace related committee(s): ASTM, NADCAP, CMH-17, CACRC, SAE, MMPDS, ISO, etc.
- ☐ Other documents; to support that the candidate is qualified to take NCAMP AER roles.

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Comments by NCAMP (for office use only):

Section 4: For Adhesive Materials

NCAMP Authorized Engineering Representative (AER) Application Form

First Name	Middle Initial	Last Name
Street Address	City	State
Home Phone	Work Phone	Mobile Phone
Email		

EDUCATION	DEGREE or Credit Hours

WORK EXPERIENCE	START/END DATES

Do you have knowledge and experience in the following?	
I. Preparing or reviewing material qualification test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No
II. Preparing or reviewing material allowable test plans? *If yes, please elaborate:* _____ _____ _____	Yes/No

III. Preparing or reviewing material specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No
IV. Preparing or reviewing process specifications? *If yes, please elaborate:* _____ _____ _____	Yes/No

4.A. General Adhesive Material Mechanical Testing

Are you familiar with the following test methods, particularly with issues related to test interferences, apparatus, specimen preparation, equipment calibration, environmental conditioning, hot/cold testing, test procedures, failure modes identification, and specimen/data obviation?

a. ASTM C297 – Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.	Yes/No
b. ASTM D897 – Standard Test Method for Tensile Properties of Adhesive Bonds.	Yes/No
c. ASTM D1002 – Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).	Yes/No
d. ASTM D3165 – Standard Test Method for Strength Properties of Adhesives in Shear by Tension Loading of Single-Lap-Joint Laminated Assemblies.	Yes/No
e. ASTM D3167 – Standard Test Method for Floating Roller Peel Resistance of Adhesives.	Yes/No
f. ASTM D3433 – Standard Test Method for Fracture Strength in Cleavage of Adhesives in Bonded Metal Joints.	Yes/No
g. ASTM D6484 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates.	Yes/No
h. ASTM D3528 – Standard Test Method for Strength Properties of Double Lap Shear Adhesive Joints by Tension Loading.	Yes/No
i. ASTM D5528 – Standard Practice for Mode I Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composite.	Yes/No
j. ASTM D5656 – Standard Test Method for Thick-Adherend Metal Lap-Shear Joints for Determination of the Stress-Strain Behavior of Adhesives in Shear by Tension Loading.	Yes/No
k. ASTM D7905 – Standard Test Method for Determination of the Mode II Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composite.	Yes/No

If you answered yes to any of the above questions, please elaborate:

Please provide three verifiable technical references:

Please provide any additional relevant information here:

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