



NCAMP Authorized Inspection Representative (AIR) Qualification Plan

NCAMP Document No.: NQP 100 Rev A

Minimum Requirements:

1. The applicant must have sufficient command of the English language, both oral and written.
2. The applicant must possess a high degree of integrity, sound judgment, and a cooperative attitude.
3. The applicant must have the ability to maintain the highest degree of objectivity while performing authorized functions.
4. The applicant 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 applicant must have the ability to read engineering drawings with geometric dimensioning and tolerancing.
6. The applicant candidate must have a minimum of 6 years experience in quality control methods and techniques, including at least 1 year experience in composite manufacturing and/or composite test specimens.
7. The applicant's job position must not report to Manufacturing or Sales team.
8. The applicant must have sufficient prior knowledge in and able to perform the inspection activities described in the form (applicants who do not possess knowledge in all the areas may be guided by a qualified AIR or NCAMP staff).

AIR Qualification Process:

1. Minimum requirements listed in the previous page must be met.
2. Select the applicable section of this NCAMP AIR Application Form

[Section 1: For Prepreg Materials](#) Page 3

[1.A. Test Panel Fabrication](#)

[1.B. Lamina and Laminate Test Specimen Inspection Verification](#)

[Section 2: For Additive Manufacturing Materials](#) Page 7

[2.A. Test Specimen Fabrication](#)

[2.B. Test Specimen Inspection Verification](#)

[Section 3: For Ceramic Matrix Composite Materials](#) Page 11

[3.A. Test Panel Fabrication](#)

[3.B. Lamina and Laminate Test Specimen Inspection Verification](#)

[Section 4: For Adhesive Materials](#) Page 15

[4.A. Test Panel Fabrication](#)

[4.B. Test Specimen Inspection Verification](#)

3. Submit the completed NCAMP AIR Application Form to NCAMP for review.
4. Consultant NCAMP AIR (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 AIR prior to December 2008 are automatically considered a qualified AIR.

Section 1: For Prepreg Materials

NCAMP Authorized Inspection Representative (AIR) 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

1.A. For Test Panel Fabrication:	
Do you have knowledge in and able to perform the following inspection activities?	
I. Controlled contamination area requirements for composite layup and other processing requirements in accordance with governing process specification.	Yes/No
II. Identify material used to build panel matches that specified in approved test plan and that there is traceability of material to panel	Yes/No
III. Review receiving inspection tests results and that results are within acceptance specification limits.	Yes/No
IV. Check to see that the certificate of conformance from the vendor shows the manufacturing date.	Yes/No
V. Check to see that temperature recorders (on material storage freezers) are maintained per the specifications.	Yes/No
VI. Check to see that all materials used are within their storage temperature and out time limits.	Yes/No

VII.	Check to see that frozen materials are protected in sealed bags, have followed specified handling procedures to avoid condensation before use, and that the bags are resealed and water tight before refreezing.	Yes/No
VIII.	Verify that the tool used matches that required to produce the part specified in the test plan. All the tools should be flat except for interlaminar tension test per ASTM D6415 which requires a curved tool.	Yes/No
IX.	Verify that the tool surface quality is acceptable (i.e. smooth and able to hold vacuum).	Yes/No
X.	Verify that ply orientation, lay-up, and stacking sequence is per test plan. Panels that are warped may have wrong/unsymmetrical layup.	Yes/No
XI.	Verify that thermocouple placement is in accordance with the governing process specification guidelines.	Yes/No
XII.	Review plan for ply lay up and orientation and verify operations completed satisfactorily and accepted by Quality Assurance and/or Engineering.	Yes/No
XIII.	Verify that vacuum bagging meets the requirements of the governing process specification and verify operations completed satisfactorily and accepted by Quality Assurance and/or Engineering.	Yes/No
XIV.	Verify that material mechanical and handling out times were not exceeded prior to cure.	Yes/No
XV.	Verify Cure Time/Temperature/Pressure meet the governing process specification requirements.	Yes/No
XVI.	Verify that the panels for each batch were cured in a minimum of two separate cure cycles.	Yes/No
XVII.	Verify NDI requirements called for in the governing process specification have been accomplished satisfactorily.	Yes/No
XVIII.	Inspect the panels to verify panels meets the test plan's dimensional and naming requirements.	Yes/No
XIX.	Review and verify Quality Assurance and/or Engineering has accepted the panels.	Yes/No
XX.	Review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
XXI.	Verify personnel qualification as applicable.	Yes/No
XXII.	Verify that the measuring instruments such as temperature, pressure, and vacuum transducers are calibrated. These instruments may be located on larger equipment such as an autoclave or oven.	Yes/No

1.B. For Lamina and Laminate Test Specimen Inspection Verification:**Do you have knowledge in and able to perform the following inspection activities?**

I. Verify that NCAMP Form 168-1 for the panel fabrication process has been completed.	Yes/No
II. For test specimen inspection verification, verify that the specimen dimensions are in accordance with the drawings in the test plan (or the test methods called out by the test plan). At minimum, QA must have inspected at least one specimen per panel per test method for all the dimensions specified in the drawing such as perpendicularity, parallelism, hole size and location, etc. (this assumes that all the specimens are processed at the same time using the same jig setup and technician). In addition, NCAMP AIR should physically measure selected dimensions of representative specimens at a frequency of his/her discretion.	Yes/No
III. When specimen dimensions fail to meet one or more of the drawing requirements, review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
IV. When conducting specimen inspection verification per item (II), the following test methods are typically used:	Yes/No
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 $\pm 45^\circ$ 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

Please provide three verifiable technical references:

Please provide any additional relevant information here:

Comments by NCAMP (for office use only):

Section 2: For Additive Manufacturing Materials
NCAMP Authorized Inspection Representative (AIR) 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

2.A. For Test Specimen Fabrication:	
Do you have knowledge in and able to perform the following inspection activities?	
I. Controlled contamination area requirements for composite layup and other processing requirements in accordance with governing process specification.	Yes/No
II. Identify material used to build coupon matches that specified in approved test plan and that there is traceability of material to specimen.	Yes/No
III. Review receiving inspection tests results and that results are within acceptance specification limits.	Yes/No
IV. Check to see that the certificate of conformance from the vendor shows the manufacturing date.	Yes/No
V. Check to see that temperature recorders (on material storage freezers) are maintained per the specifications.	Yes/No
VI. Check to see that all materials used are within their storage temperature and out time limits.	Yes/No

VII.	Check to see that materials are protected in sealed bags, have followed specified handling procedures to avoid condensation before use, and that the bags are resealed and water tight before placing back into storage.	Yes/No
VIII.	Verify that coupon build orientation and thickness are per test plan	Yes/No
IX.	Verify that thermocouple placement is in accordance with the governing process specification guidelines.	Yes/No
X.	Review plan for build location and orientation and verify operations completed satisfactorily and accepted by Quality Assurance and/or Engineering.	Yes/No
XI.	Verify that material mechanical and handling out times were not exceeded prior to build.	Yes/No
XII.	Verify Time/Temperature/Pressure meet the governing process specification requirements.	Yes/No
XIII.	Verify NDI requirements called for in the governing process specification have been accomplished satisfactorily .	Yes/No
XIV.	Inspect the coupons to verify coupons meet the test plan’s dimensional and naming requirements.	Yes/No
XV.	Review and verify Quality Assurance and/or Engineering has accepted the coupons.	Yes/No
XVI.	Review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
XVII.	Verify personnel qualification as applicable.	Yes/No
XVIII.	Verify that the measuring instruments such as temperature, pressure, and vacuum transducers are calibrated.	Yes/No

2.B. For Test Specimen Inspection Verification:**Do you have knowledge in and able to perform the following inspection activities?**

I. Verify that NCAMP Form 168-1 for the specimen fabrication process has been completed.	Yes/No
II. For test specimen inspection verification, verify that the specimen dimensions are in accordance with the drawings in the test plan (or the test methods called out by the test plan). At minimum, QA must have inspected at least one specimen per test method for all the dimensions specified in the drawing such as perpendicularity, parallelism, hole size and location, etc. (this assumes that all the specimens are processed at the same time using the same jig setup and technician). In addition, NCAMP AIR should physically measure selected dimensions of representative specimens at a frequency of his/her discretion.	Yes/No
III. When specimen dimensions fail to meet one or more of the drawing requirements, review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
IV. When conducting specimen inspection verification per item (II), the following test methods are typically used:	Yes/No
a. ASTM D638 – Standard Test Method for Tensile Properties of Plastics	Yes/No
b. ASTM D790 – Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials	Yes/No
c. ASTM D695 – Standard Test Method for Compressive Properties of Rigid Plastics	Yes/No
d. ISO 15310 – Fibre-reinforced plastic composites -- Determination of the in-plane shear modulus by the plate twist 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 D6415 – Standard Test Method for Measuring the Curved Beam Strength of a Fiber-Reinforced Polymer-Matrix Composite	Yes/No
h. ASTM D6484 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates	Yes/No
i. 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
j. ASTM D6742 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates	Yes/No
k. ASTM D256 – Standard Test Methods for Determining the IZOD Pendulum Impact Resistance of Plastics	Yes/No

Please provide three verifiable technical references:

Please provide any additional relevant information here:

Comments by NCAMP (for office use only):

**Section 3: For Ceramic Matrix Composite Materials
NCAMP Authorized Inspection Representative (AIR) 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

3.A. For Test Panel Fabrication:	
Do you have knowledge in and able to perform the following inspection activities?	
I. Controlled contamination area requirements for composite layup and other processing requirements in accordance with governing process specification.	Yes/No
II. Identify material used to build panel matches that specified in approved test plan and that there is traceability of material to panel.	Yes/No
III. Review receiving inspection tests results and that results are within acceptance specification limits.	Yes/No
IV. Check to see that the certificate of conformance from the vendor shows the manufacturing date.	Yes/No
V. Check to see that temperature recorders (on material storage refrigerator) are maintained per the specifications.	Yes/No
VI. Check to see that all materials used are within their storage temperature and out time limits.	Yes/No

VII.	Check to see that refrigerated materials are protected in sealed bags, have followed specified handling procedures, and that the bags are resealed and water tight before being placed back into the refrigerator.	Yes/No
VIII.	Verify that the tool used matches that required to produce the part specified in the test plan. All the tools should be flat.	Yes/No
IX.	Verify that the tool surface quality is acceptable (i.e. smooth and able to hold vacuum).	Yes/No
X.	Verify that ply orientation, lay-up, and stacking sequence is per test plan. Panels that are warped may have wrong/unsymmetrical layup.	Yes/No
XI.	Verify that thermocouple placement is in accordance with the governing process specification guidelines.	Yes/No
XII.	Review plan for ply lay up and orientation and verify operations completed satisfactorily and accepted by Quality Assurance and/or Engineering.	Yes/No
XIII.	Verify that vacuum bagging meets the requirements of the governing process specification and verify operations completed satisfactorily and accepted by Quality Assurance and/or Engineering.	Yes/No
XIV.	Verify that material mechanical and handling out times were not exceeded prior to cure.	Yes/No
XV.	Verify Cure Time/Temperature/Pressure meet the governing process specification requirements.	Yes/No
XVI.	Verify Sinter Time/Temperature meet the governing process specification requirements.	Yes/No
XVII.	Verify that the panels for each batch were cured in a minimum of two separate cure/sinter cycles	Yes/No
XVIII.	Verify NDI requirements called for in the governing process specification have been accomplished satisfactorily	Yes/No
XIX.	Inspect the panels to verify panels meets the test plan's dimensional and naming requirements.	Yes/No
XX.	Review and verify Quality Assurance and/or Engineering has accepted the panels.	Yes/No
XXI.	Review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
XXII.	Verify personnel qualification as applicable.	Yes/No
XXIII.	Verify that the measuring instruments such as temperature, pressure, and vacuum transducers are calibrated. These instruments may be located on larger equipment such as an autoclave, oven, or furnace.	Yes/No

3.B. For Lamina and Laminate Test Specimen Inspection Verification:

Do you have knowledge in and able to perform the following inspection activities?

I. Verify that NCAMP Form 168-1 for the panel fabrication process has been completed.	Yes/No
II. For test specimen inspection verification, verify that the specimen dimensions are in accordance with the drawings in the test plan (or the test methods called out by the test plan). At minimum, QA must have inspected at least one specimen per panel per test method for all the dimensions specified in the drawing such as perpendicularity, parallelism, hole size and location, etc. (this assumes that all the specimens are processed at the same time using the same jig setup and technician). In addition, NCAMP AIR should physically measure selected dimensions of representative specimens at a frequency of his/her discretion.	Yes/No
III. When specimen dimensions fail to meet one or more of the drawing requirements, review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
IV. When conducting specimen inspection verification per item (II), the following test methods are typically used:	Yes/No
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 Ceramic 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 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 ± 45° Laminate In-Plane Shear Strength and Modulus	Yes/No
j. ASTM D5379 – Standard Test Method for Shear Properties of Composite Materials by the 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

Please provide three verifiable technical references:

Please provide any additional relevant information here:

Comments by NCAMP (for office use only):

Section 4: For Adhesive Materials

NCAMP Authorized Inspection Representative (AIR) 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

4.A. For Test Panel Fabrication:

Do you have knowledge in and able to perform the following inspection activities?

I. Controlled contamination area requirements for composite layup and other processing requirements in accordance with governing process specification.	Yes/No
II. Identify material used to build panel matches that specified in approved test plan and that there is traceability of material to panel	Yes/No
III. Review receiving inspection tests results and that results are within acceptance specification limits.	Yes/No
IV. Check to see that the certificate of conformance from the vendor shows the manufacturing date.	Yes/No
V. Check to see that temperature recorders (on material storage freezers) are maintained per the specifications.	Yes/No
VI. Check to see that all materials used are within their storage temperature and out time limits.	Yes/No

VII.	Check to see that frozen materials are protected in sealed bags, have followed specified handling procedures to avoid condensation before use, and that the bags are resealed and water tight before refreezing.	Yes/No
VIII.	Verify that the tool used matches that required to produce the part specified in the test plan.	Yes/No
IX.	Verify that the tool surface quality is acceptable (i.e. smooth and able to hold vacuum).	Yes/No
X.	Verify that substrate material, substrate thickness, surface preparation, and expected bondline thickness are per test plan.	Yes/No
XI.	Verify that thermocouple placement is in accordance with the governing process specification guidelines.	Yes/No
XII.	Review plan for ply lay up and orientation and verify operations completed satisfactorily and accepted by Quality Assurance and/or Engineering.	Yes/No
XIII.	Verify that vacuum bagging meets the requirements of the governing process specification and verify operations completed satisfactorily and accepted by Quality Assurance and/or Engineering.	Yes/No
XIV.	Verify that material mechanical and handling out times were not exceeded prior to cure.	Yes/No
XV.	Verify Cure Time/Temperature/Pressure meet the governing process specification requirements.	Yes/No
XVI.	Verify that the panels for each batch were cured in a minimum of two separate cure cycles.	Yes/No
XVII.	Verify NDI requirements called for in the governing process specification have been accomplished satisfactorily.	Yes/No
XVIII.	Inspect the panels to verify panels meets the test plan's dimensional and naming requirements.	Yes/No
XIX.	Review and verify Quality Assurance and/or Engineering has accepted the panels.	Yes/No
XX.	Review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
XXI.	Verify personnel qualification as applicable.	Yes/No
XXII.	Verify that the measuring instruments such as temperature, pressure, and vacuum transducers are calibrated. These instruments may be located on larger equipment such as an autoclave or oven.	Yes/No

4.B. For Lamina and Laminate Test Specimen Inspection Verification:

Do you have knowledge in and able to perform the following inspection activities?

I. Verify that NCAMP Form 168-1 for the panel fabrication process has been completed.	Yes/No
II. For test specimen inspection verification, verify that the specimen dimensions are in accordance with the drawings in the test plan (or the test methods called out by the test plan). At minimum, QA must have inspected at least one specimen per panel per test method for all the dimensions specified in the drawing such as perpendicularity, parallelism, hole size and location, etc. (this assumes that all the specimens are processed at the same time using the same jig setup and technician). In addition, NCAMP AIR should physically measure selected dimensions of representative specimens at a frequency of his/her discretion.	Yes/No
III. When specimen dimensions fail to meet one or more of the drawing requirements, review any MRA/MRB documents for engineering acceptance, including NCAMP AER concurrence when necessary.	Yes/No
IV. When conducting specimen inspection verification per item (II), the following test methods are typically used:	Yes/No
a. 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
b. 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
c. ASTM D3165 – Standard Test Method for Strength Properties of Adhesives in Shear by Tension Loading of Single-Lap-Joint Laminated Assemblies	Yes/No
d. ASTM D3433 – Standard Test Method for Fracture Strength in Cleavage of Adhesives in Bonded Metal Joint	Yes/No
e. ASTM D7905 – Standard Test Method for Determination of the Mode II Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites	Yes/No
f. ASTM D3167 – Standard Test Method for Floating Roller Peel Resistance of Adhesives	Yes/No
g. ASTM D897 – Standard Test Method for Tensile Properties of Adhesive Bonds	Yes/No

Please provide three verifiable technical references:

Please provide any additional relevant information here:

Comments by NCAMP (for office use only):
