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**FASTENERS AND METALS  
TEST METHOD SELECTION LIST**

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This application is divided into the five major testing areas described in NIST Handbook 150-18, *NVLAP Fasteners and Metals*. Under the appropriate major area of testing, test group, and subgroup, write in the **complete** designation (e.g., ASTM E1473-92, SAE J418, MIL-STD-753C, etc.) and title of the test method, standard, or specification for which you are requesting accreditation.

An asterisk (\*) beside the area, test group, or subgroup indicates that proficiency testing is required for test methods in that area, group, or subgroup. If you request accreditation under one or more of these categories, contact Collaborative Testing Services for enrollment information. See the Proficiency Testing Instructions on page 26 of this application for more information.

**NVLAP Test  
Method Code**

**Test Method  
Designation**

**Test Method Title**

21/A

**MECHANICAL AND PHYSICAL TESTING AND INSPECTION**

<i>For NVLAP use only</i>

**Aerospace nut tests**

Flareability test of clinch and shank nuts

_____	_____
_____	_____
_____	_____
_____	_____

Permanent set test of self-locking nuts

_____	_____
_____	_____
_____	_____
_____	_____

Push out test of floating plate nuts, gang channel nuts, and anchor nuts

_____	_____
_____	_____

<i>For NVLAP use only</i>	<i>Test Method Designation</i>	<i>Test Method Title</i>
	_____	_____
	_____	_____
		Reusability test of self-locking internally threaded fasteners
	_____	_____
	_____	_____
	_____	_____
	_____	_____
		Room temperature of three cycles test of floating plate nuts, gang channel nuts and anchor nuts
	_____	_____
	_____	_____
	_____	_____
	_____	_____
		Torque-out test
	_____	_____
	_____	_____
	_____	_____
	_____	_____
		Wrench torque test of externally wrenched nuts of spline and hexagon and double hexagon (12 point) wrenching configuration
	_____	_____
	_____	_____
	_____	_____
	_____	_____

<i>For NVLAP use only</i>	<i>Test Method Designation</i>	<i>Test Method Title</i>
	<b>Adhesion</b>	
	Adhesion of metallic coatings on fasteners	
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	<b>Bend</b>	
	Bend test of full size eyebolts	
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	<b>Coating/plating thickness</b>	
	Measurement of fastener coating thickness - eddy-current method	
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	Measurement of fastener coating thickness - magnetic methods	
	_____	_____
	_____	_____
	_____	_____
	_____	_____

*For NVLAP  
use only*

**Test Method  
Designation**

**Test Method Title**

Measurement of fastener coating thickness - microscopical method


Measurement of fastener coating thickness - weight of coating


Measurement of fastener coating thickness - beta backscatter method


Measurement of fastener coating thickness - coulometric method


Measurement of fastener coating thickness - dimensional change method


<i>For NVLAP use only</i>

**Test Method  
Designation                      Test Method Title**


Measurement of fastener coating thickness - X-ray methods


**Corrosion**

Salt spray testing of fasteners


Humidity testing of fasteners


Stress corrosion of fasteners


*For NVLAP  
use only*

***Test Method  
Designation***

***Test Method Title***

Intergranular corrosion susceptibility in austenitic stainless steel fasteners - nitric acid test


Intergranular corrosion susceptibility of austenitic stainless steel fasteners - oxalic acid etch test


CASS test (copper-accelerated acetic acid-salt spray test) of fasteners


Water immersion test - test for anodic surface contaminants on corrosion resistant fasteners


*For NVLAP  
use only*

***Test Method  
Designation***

***Test Method Title***

Copper sulfate test - test for free iron on the surface of corrosion resistant fasteners


**Elevated temperature testing**

Elevated temperature testing capability


**Embrittlement**

Hydrogen embrittlement (stress durability) of externally threaded fasteners


Hydrogen embrittlement (stress durability) of internally threaded fasteners (nuts)


<i>For NVLAP use only</i>	<b><i>Test Method Designation</i></b>	<b><i>Test Method Title</i></b>
		Test for embrittlement of metallic coated externally threaded fasteners
	<b>Fatigue</b>	
		Fatigue of full-size threaded fasteners
	<b>Hardness</b>	
		Brinell hardness of fasteners
		Microhardness of fasteners





*For NVLAP use only*

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<i><b>Test Method Designation</b></i>	<i><b>Test Method Title</b></i>
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\* Rockwell hardness of fasteners


Rockwell superficial hardness of fasteners


Vickers hardness - test forces from 9.807 to 1176 N (1 to 120 kgf)


**Impact**

Charpy impact (v-notch) testing


<i>For NVLAP use only</i>

***Test Method  
Designation***

***Test Method Title***

Charpy impact (u-notch) testing


**Magnetic permeability**

Magnetic permeability of fasteners using a low-mu permeability indicator


**Prevailing torque**

Prevailing torque of full-size prevailing-torque type nuts


**Proof**

Cone proof load of internally threaded fasteners (nuts)


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**Test Method Designation**

**Test Method Title**

Proof load of full-size externally threaded fasteners

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Proof load of full-size eyebolts

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Proof load of internally threaded fasteners (nuts)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Rotational capacity**

Rotational capacity of full-size threaded fasteners

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*For NVLAP  
use only*

***Test Method  
Designation***

***Test Method Title***

**Screw tests**

Clamp load test

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Drill-drive test

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Drive test

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Ductility test of thread rolling and self-drilling tapping screws

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For NVLAP use only	<i>Test Method Designation</i>	<i>Test Method Title</i>
	Proof torque test	
	_____	_____
	_____	_____
	_____	_____
	Torsional strength test of thread rolling and self-drilling tapping screws	
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	<b>Shear</b>	
	Single shear of externally threaded fasteners	
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	Double shear of externally threaded fasteners	
	_____	_____
	_____	_____
	_____	_____
	_____	_____

*For NVLAP use only*

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***Test Method Designation                      Test Method Title***

**Stress Rupture**

Stress rupture of fasteners

_____	_____
_____	_____
_____	_____
_____	_____

**Tensile**

\* Axial tensile strength of full-size threaded fasteners

_____	_____
_____	_____
_____	_____
_____	_____

Breaking strength of full-size eyebolts

_____	_____
_____	_____
_____	_____
_____	_____

Tension testing of machined specimens from externally threaded fasteners

_____	_____
_____	_____
_____	_____
_____	_____

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use only

*Test Method  
Designation*

*Test Method Title*

Total extension at fracture of externally threaded fasteners


\* Wedge tensile strength of full-size threaded fasteners


Yield strength of full-size externally threaded fasteners


**Torque/tension**

Torque-tension of full-size threaded fasteners


<b><i>For NVLAP use only</i></b>

***Test Method  
Designation                      Test Method Title***

Recess strength test in both the installation and removal directions


**Vibration**

Vibration of full-size threaded fasteners


**Washer tests**

Compression load of compressible-washer-type direct tension indicators


Embrittlement test of washers




*For NVLAP use only*

***Test Method Designation***                      ***Test Method Title***

Recovery test of washers


Temper test of lock washers


Twist test of lock washers


*For NVLAP use only*

**21/B**

*Test Method Designation*                      *Test Method Title*

**METALLOGRAPHY**

Decarburization and case depth measurement in fasteners


Determination of grain size of fasteners


Macroscopic examination of fasteners by etching


Microscopic examination of fasteners by etching


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<i>For NVLAP use only</i>
<b>21/C</b>

**Test Method  
Designation**

**Test Method Title**

Surface discontinuities of externally threaded fasteners

_____	_____
_____	_____
_____	_____
_____	_____

Surface discontinuities of internally threaded fasteners (nuts)

_____	_____
_____	_____
_____	_____
_____	_____

**NONDESTRUCTIVE INSPECTION**

Liquid penetrant inspection of fasteners

_____	_____
_____	_____
_____	_____
_____	_____

Magnetic particle inspection of fasteners

_____	_____
_____	_____
_____	_____
_____	_____

<i>For NVLAP use only</i>
<b>21/D</b>

<b><i>Test Method Designation</i></b>	<b><i>Test Method Title</i></b>
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**DIMENSIONAL INSPECTION**

External thread parameters - system 21


External thread parameters - system 22


External thread parameters - system 23


External thread parameters - SAE fastener with MJ metric screw threads


For NVLAP use only	

**Test Method  
Designation**

**Test Method Title**

External thread parameters - ISO


Internal thread parameters - system 21


Internal thread parameters - system 22


Internal thread parameters - system 23


Internal thread parameters - SAE fastener with MJ metric screw threads


<i>For NVLAP use only</i>

***Test Method Designation***                      ***Test Method Title***

Internal thread parameters - ISO

Dimensions of general purpose fasteners and high-volume machine assembly fasteners

Dimensions of special purpose fasteners and fasteners for highly specialized engineered applications

Dimensions of ISO grade A and B fasteners

<i>For NVLAP use only</i>	

***Test Method  
Designation***

***Test Method Title***

Dimensions of ISO grade C fasteners

_____	_____
_____	_____
_____	_____
_____	_____

Dimensions of fasteners - hexagon and double hexagon (12 point) and spline sockets

_____	_____
_____	_____
_____	_____
_____	_____

Dimensions of fasteners - gaging for slotted nuts

_____	_____
_____	_____
_____	_____
_____	_____

Dimensions of fasteners - flange screw heads and flange nuts

_____	_____
_____	_____
_____	_____
_____	_____

Dimensions of fasteners - straightness

_____	_____
_____	_____

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<b>21/E</b>

***Test Method  
Designation***

***Test Method Title***

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Dimensions of fasteners - bearing surface squareness

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\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Surface texture

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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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\_\_\_\_\_  
\_\_\_\_\_  
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**\* CHEMICAL ANALYSIS**

Solution chemical analysis

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\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
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Combustion analysis for carbon, sulfur, oxygen, nitrogen, and hydrogen

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\_\_\_\_\_  
\_\_\_\_\_  
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<i>For NVLAP use only</i>		

***Test Method  
Designation***

***Test Method Title***

Optical emission spectrochemical analysis

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X-ray fluorescence (XRF) spectrochemical analysis

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Energy dispersive X-ray analysis

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Spot test analysis

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## PROFICIENCY TESTING INSTRUCTIONS

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Laboratories seeking accreditation in those areas, groups, or subgroups that require proficiency testing must enroll in the Collaborative Testing Services (CTS) fasteners and metals program for those areas, groups, or subgroups.

Laboratories must apply directly to CTS for proficiency testing within 14 calendar days of applying to NVLAP for accreditation.

CTS can be contacted at:

Collaborative Testing Services  
P.O. Box 1049  
Herndon, VA 22070  
Phone: (703) 742-9107  
Fax: (703) 481-0375.