

ENGINEERING PRACTICE STUDY

TITLE: Engineering Practice (EP) Study to Establish Group C Testing (Re-qualification)
Requirements for Product Originally Qualified by Similarity to Mil-C-83522

2 November 2012

PROJECT NUMBER 6060-2012-007

FINAL REPORT

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Documentation Standardization Unit

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I. OBJECTIVES:

- a. Develop a Group C test matrix, flowchart, and sample size breakdown for product that has been placed on the M83522/16 and/or /17 QPL through qualification by similarity.
- b. Include the Group C test matrix, flowchart, and sample size breakdown for product qualified by similarity in the next revisions to MIL-C-83522/16 and /17.

II. BACKGROUND:

- a. In planning for the Group C (requalification) process, it was brought to the attention of VQP that it should not be necessary for each item configuration qualified by similarity to MIL-C-83522/16 and /17 to go through every group C test.
- b. VAT, VQP and NSWCCD Dahlgren worked together to develop a draft test matrix, flowchart, and sample size breakdown. This draft information was circulated to users and manufactures for feedback.

III. RESULTS:

- a. Tom Cruz of AFSI called to state that "Coupling proof torque" and "Coupling mechanism retention force" should be "N/A". Checked the Basic and /16 and /17 and verified that "Coupling proof torque" and "Coupling mechanism retention force" should be "N/A".
- b. Because of other tests still in group III, neither the flowchart or the sample size will be affected by the change to "Coupling proof torque" and "Coupling mechanism retention force".
- c. Revise test matrix only to show "Coupling proof torque" and "Coupling mechanism retention force" as "N/A".

IV. CONCLUSIONS:

As a result of the feedback, the test matrix (see attachment A) has been revised. The flowchart (attachment B) and sample size (attachment C) are unchanged.

V. RECOMMENDATIONS:

Include the appropriate text and attachments A, B, and C in the next revisions to MIL-C-83422/16 and /17 to provide guidance to manufacturers that will be required to perform group C testing on product that was originally qualified by similarity.

ATTACHMENT - A

M83522 Group C Tests per MIL-C-83522 (Groups A and B tests required for all)	M83522/16-DNX Ni/Br	M83522/16-DNX SST	M83522/16-DNY Ni/Br	M83522/16-DNY SST	M83522/16-ANX Ni/Br	M83522/16-ANX SST	M83522/16-ANY Ni/Br	M83522/16-ANY SST	M83522/16-EN Ni/Br	M83522/16-EN SST	M83522/17-NY Ni/Br	M83522/17-NY SST	A = locking boot, long cap D = non locking boot, long or short E = protective cover N = normal temp. X = 125 um, MM Y = 125 um SM/MM S = space qualified
Group I (12 mated pairs)													REMARKS
Visual & mechanical	X	X	X	X	X	X	X	X	X	X	X	X	Group I inspections required
Weight	X	X	X	X	X	X	X	X	X	X	X	X	
Size	X	X	X	X	X	X	X	X	X	X	X	X	
Workmanship	X	X	X	X	X	X	X	X	X	X	X	X	
Insertion loss	X	X	X	X	X	X	X	X	X	X	X	X	
Ambient Light Susceptibility													
Return loss (SM only)			X	X			X	X			X	X	
Group II (4 mated pairs)													
Temperature			X				X				X		
Temperature-Humidity Cycling			X	X					X	X	X	X	
Submersion	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A per MIL-C-83522/16 & /17
Identification marking	X	X	X	X	X	X	X	X	X	X	X	X	
Group III (4 mated pairs)													
Tensile Loading			X	X			X	X			X		
Cable Strain Relief	X	X	X	X	X	X	X	X					
Flex Life			X				X				X		
Twist			X	X							X		
Force to engage/disengage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A per MIL-C-83522/16 & /17
Coupling proof torque	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					N/A per MIL-C-83526/16 & /17
Coupling mechanism retention force	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					N/A per MIL-C-83526/16 & /17
Mating durability													
Impact			X				X				X		
Thermal Shock			X		X		X				X		
Vibration			X								X		
Shock	X	X	X	X	X	X	X	X			X	X	
Ozone Exposure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A per MIL-C-83522/16 & /17
Temperature Life			X								X		
Marking													
Group IV (2 mated pairs)													
Mating Durability		X	X								X	X	
Pressure Altitude			X								X		
Thermal Shock			X								X	X	
Temperature/humidity cycling													
Salt Spray			X	X			X*	X*			X	X	
Dust (fine sand)			X								X		
Fluid immersion	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A per MIL-C-83522/16 & /17
Temperature Cycling			X	X			X				X	X	
Nuclear Radiation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A per MIL-C-83522/16 & /17
Marking			X								X		
Group V (2 mated pairs)													
Flammability			X	X			X*				X	X	
Fungus									X	X			
Group VI (SPACE ONLY)													For space rated parts only per MIL-C-83522
Thermal Vacuum Outgassing													
Residual Magnetism													
Odor													
Toxicity (off gassing)													

X = testing required

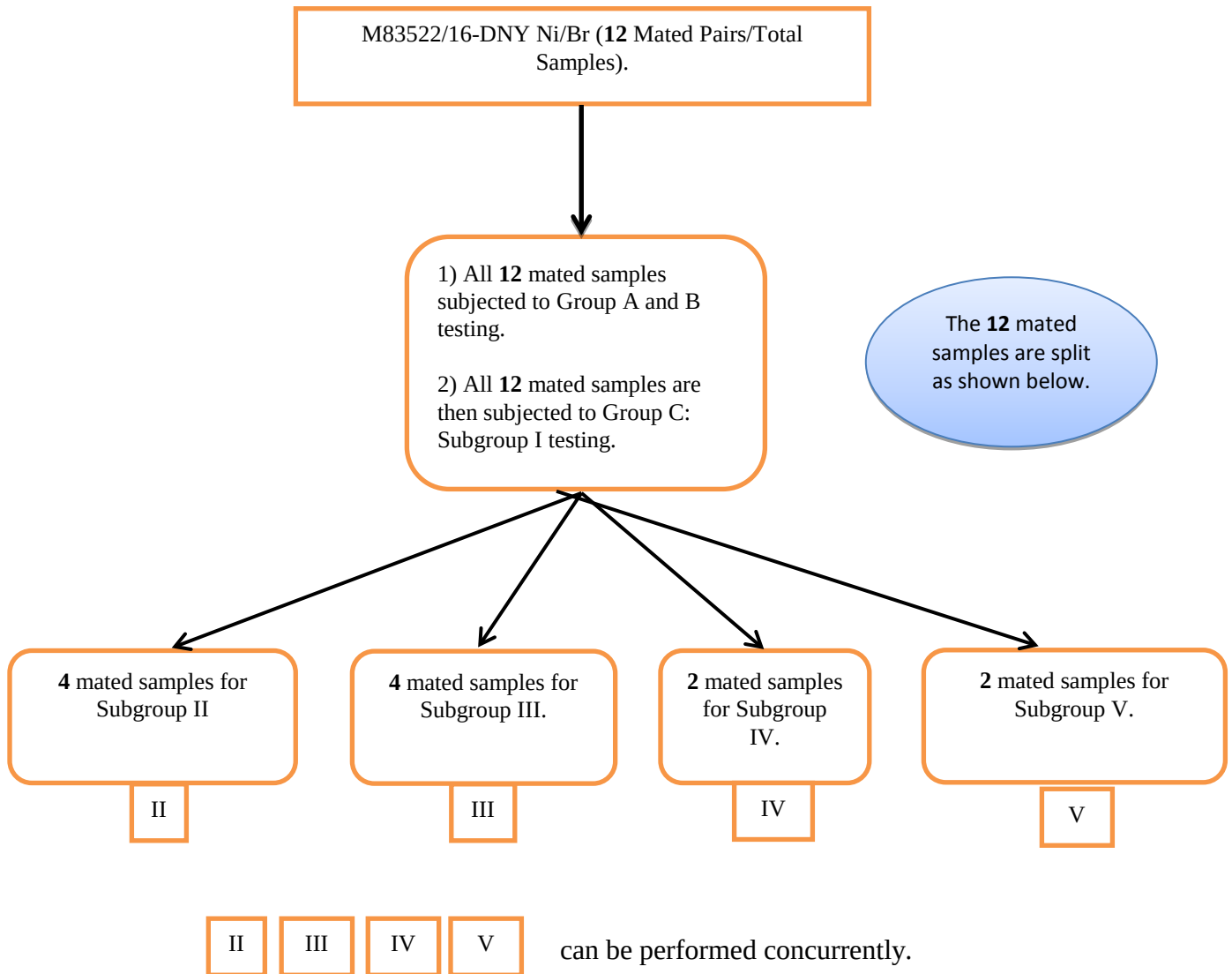
*: if there is a change in material, not needed same metallic parts as DNx

Proposed FLOWCHART

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Revised M83522 Group C Testing Flowchart Example

(All samples are assumed to have passed Group AB testing which is separate from Group C: Subgroup I)



This flowchart would also be relevant to:

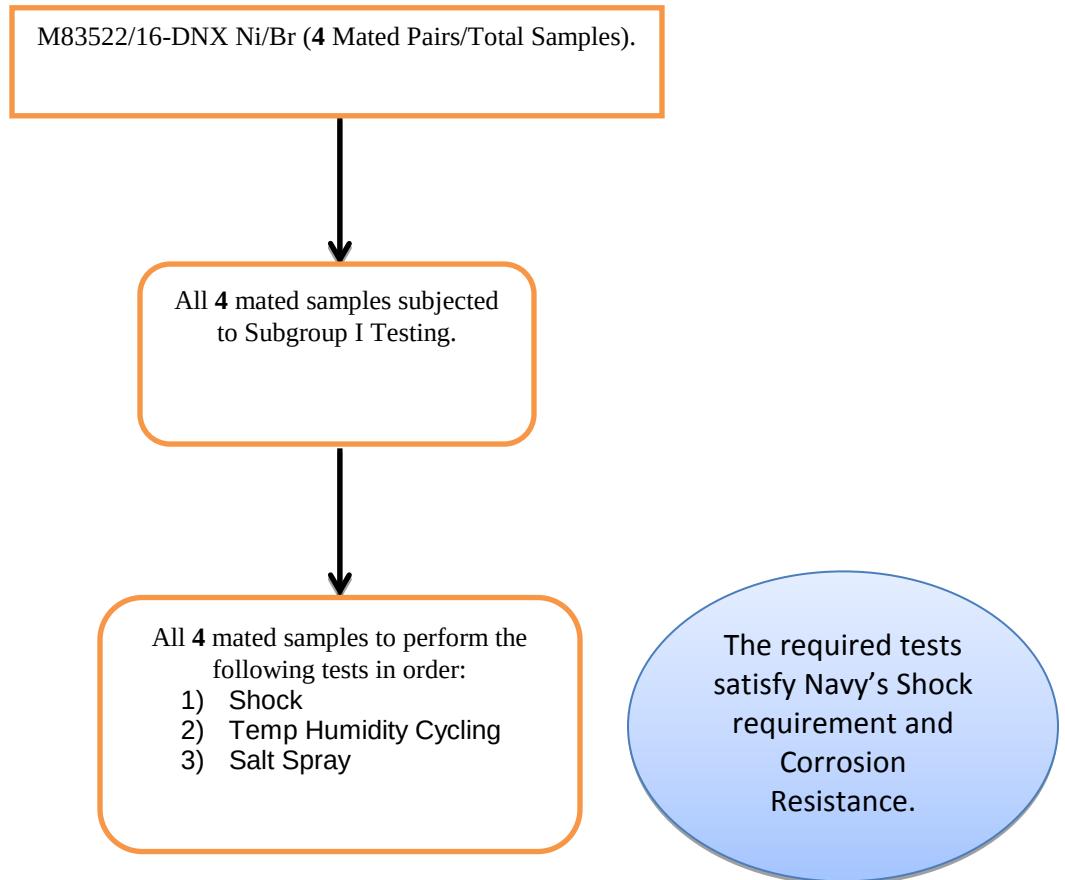
M83522/16-DNY SST

M83522/16-ANY Ni/Br (**10** total mated pairs, No Group C: Subgroup V tests required)M83522/16-ANY SST (**10** total mated pairs, No Group C: Subgroup V tests required)*M83522/17-NY Ni/Br (more samples may be required to complement all /16 samples)**M83522/17-NY SST (more samples may be required to complement all /16 samples).*

Proposed FLOWCHART

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Revised M83522 Group C Requalification by Similarity



This flowchart would also be relevant to:

M83522/16-DNX SST

M83522/16-ANX Ni/Br

M83522/16-ANX SST.

Summary

Using this format, M83522 will require at least **60** samples of /16 and /17. This comes to **120 total** samples and **60 total** mated pairs.

This would be the minimum number of samples for Group C requalification testing considering the multiple part numbers.

ATTACHMENT - C

Proposed Sample Size Breakdown

Part Number	Finish	Sample Size
M83522/16-DNY	Ni/Br	12
M83522/16-DNY	SST	12
M83522/16-DNX	Ni/Br	4
M83522/16-DNX	SST	4
M83522/16-ANY	Ni/Br	10
M83522/16-ANY	SST	10
M83522/16-ANX	Ni/Br	4
M83522/16-ANX	SST	4
		60

Total /16 Sample Size

Part Number	Finish	Sample Size
M83522/17-NY	Ni/Br	30
M83522/17-NY	SST	30
		60

Total /17 Sample Size

Total /16 Sample Size 60
 Total /17 Sample Size 60
Total Sample Size 120