

Commonwealth of Virginia
Department of General Services
Division of Consolidated Laboratory Services
Richmond, Virginia

Tuning Fork Laboratory Inspection Checklist

Facility Name: _____ VELAP ID: _____					
Assessor Name: _____ Analyst Name: _____ Inspection Date: _____					
Certification(s): _____ Conventional Mechanical Tuning Fork Certification _____ Eagle 3 Electronic Tuning Fork Certification					
REFERENCE DOCUMENT					
DCLS Document #2364: Protocol for the Certification of Laboratories Performing Certification of Tuning Forks					
NOTE					
The following attachments are required for a complete assessment packet:					
<ul style="list-style-type: none"> ○ Laboratory Personnel List, #6960 or equivalent ○ Laboratory Equipment List, #6959 or equivalent ○ Laboratory Quality Manual Checklist, #6957 					
Relevant Aspect of Standards	Reference	Y	N	N/A	Comments
Equipment					
1) Does the laboratory ensure that all appropriate Ka band reference tuning forks are available prior to performing certification testing? <i>NOTE: Ka-band radar devices approved for use in the Commonwealth of Virginia may operate at 33.8 GHz, 34.7 GHz, or 35.5 GHz.</i>	§IV.E				
2) Does the laboratory <u>not</u> make adjustments to customers' tuning forks that fail to meet acceptance criteria?	§IV.G				
3) Does the equipment list provided by the laboratory correspond to the equipment observed to be in use on site?	§V.B.5				
4) Is equipment calibration and maintenance performed on schedules specified in the quality manual?	§V.B.8				
5) Is documentation of equipment calibration and maintenance available?	§V.B.8				
6) Does documentation include the dates and types of service performed on each piece of equipment during the past three years?	§V.B.8				
Recordkeeping (General)					
7) Were the following tuning fork certification records retained for at least three years? ○ Maintenance logs ○ Calibration records ○ Sample observation records	§V.B.14.a.i §V.B.14.a.ii §V.B.14.a.iii				
8) Were analyst training records maintained for a minimum of three years?	§V.B.14.a.iv				
Notes/Comments:					

Relevant Aspect of Standards	Reference	Y	N	N/A	Comments
9) Were training records, including an initial demonstration of capability, available for each analyst performing tuning fork certification testing?	§V.B.13				
10) <u>Conventional TF</u> : Did the initial demonstration of capability include a minimum of 20 consecutive frequency observations for each reference tuning fork?	§V.B.13.a				
11) <u>Conventional TF</u> : Were the mean and standard deviation of the measurements of each reference tuning fork calculated?	§V.B.13.a				
12) <u>Conventional TF</u> : Was the frequency of oscillation of each reference tuning fork within $\pm 0.5\%$ of certified value?	§V.B.13.a				
13) <u>Eagle 3 ETF</u> : Did the initial demonstration of capability document correct identification of TP5 and ground on the remote control device?	§V.B.13.b				
14) <u>Eagle 3 ETF</u> : Did the analyst perform a minimum, of 5 consecutive cycles recording 2 frequency readings per cycle?	§V.B.13.b				
15) <u>Eagle 3 ETF</u> : Was the mean calculated with review against evaluation criteria?	§V.B.13.b				
16) Did the laboratory have a log of the printed names, initials and signatures of all analysts performing tuning fork certification testing, data review, and/or certificate notarization?	§V.B.4				
17) Were all raw data recorded in ink or entered directly into a computer program?	§V.B.14.b.i				
18) Were corrections to records documented with a single line through the original entry, and dated and initialed by the person who made the correction?	§V.B.14.b.ii,iii				
19) Were analysts interviewed knowledgeable of the laboratory's procedures for labeling and management of tuning forks, should they be rejected <u>before</u> testing per the laboratory's sample rejection policy?	§V.B.11.b,c				
20) Were analysts interviewed knowledgeable of the laboratory's procedures for customer notification, labeling, and disposition of tuning forks that fail the certification testing?	§V.B.11.h				
Test Procedures and Record Review					
21) Were sample receiving and tracking procedures described in the laboratory's quality manual consistently followed?	§V.B.11.a				
22) Were conventional tuning forks allowed to come to temperature equilibrium with the test environment prior to testing?	§V.B.11.e.i				
23) Were the reference tuning forks tested prior to beginning testing and at the conclusion of each day?	§V.B.11.e.ii				
24) Were the data for the reference tuning forks evaluated to verify that the frequency of oscillation was within $\pm 0.5\%$ of that specified by the manufacturer or the most recent independent certification?	§V.B.11.e.iii				
25) Was the temperature of the test environment recorded at beginning and end of each certification test batch of conventional tuning forks?	§V.B.11.e.iv				
Notes/Comments:					

Relevant Aspect of Standards	Reference	Y	N	N/A	Comments
26) Was the temperature of the test environment maintained within the range of 20° C [68° F] – 30° C [86° F] for conventional tuning forks?	§V.B.11.e.v				
27) Was each tuning fork identified by a serial number or other unique identifier?	§V.B.15.a				
28) Was each tuning fork subjected to a minimum of 2 observations that were averaged to calculate the mph equivalent?	§V.B.11.e.vi				
29) Were calculations performed accurately?	§V.B.11.e.vii				
30) Were calculations reproducible using the laboratory's raw data and calculation procedures described in the quality manual?	§V.B.11.e.vii				
31) Had analysts initialed and dated each page of their work?	§V.B.11.e.viii §V.B.11.f.ii				
32) Were completed certificates reviewed against raw data and sample submission information for calculation and/or transcription errors?	§V.B.11.g.ii				
33) Did the reviewer verify that measurements of the reference tuning forks were within the acceptance criteria of $\pm 0.5\%$ of the most recent certified values (conventional) or ± 5 Hz (Eagle 3 ETF)?	§V.B.11.g.i,iii				
34) Did the reviewer verify that each certificate was notarized?	§V.B.11.g.v				
35) Was each review documented with the date and signature or initials of the reviewer?	§V.B.11.g.iv				
36) Did each certificate include the following information? <ul style="list-style-type: none"> ○ The serial number of each tuning fork ○ The date testing was performed ○ The frequency at which the tuning fork was found to oscillate ○ The corresponding calculated MPH ○ The radar frequency band within which the tuning fork was to be used ○ The name and signature of the analyst who performed the testing ○ The date, seal, and signature of notarization 	§V.B.15				
Observation of Tuning Fork Certification Testing Procedure - CONVENTIONAL					
37) Were reference standards observed before and after the sample observation batch?	§V.B.11.e.i §V.B.11.e.ii				
38) Were the reference standards observed to oscillate within $\pm 0.5\%$ of their specified values?	§V.B.11.e.i §V.B.11.e.ii				
39) Was temperature recorded at the beginning and end of the sample observation batch?	§V.B.11.e.iii				
40) Was the test environment maintained between 20° C [68° F] and 30° C [86° F] throughout the period of the tests?	§V.B.11.e.iv				
41) Were the tuning forks struck on a nonmetallic object?	§V.B.11.d				
42) Was stable output observed prior to recording data?	§V.B.11.d				
43) Was raw data recorded in ink (or directly entered into a computer program)?	§V.B.14.b.i				
Notes/Comments:					

Relevant Aspect of Standards	Reference	Y	N	N/A	Comments
44) Was data reported as the average of a minimum of 2 observations of each tuning fork?	§V.B.11.e.v				
45) Were the correct calculations applied to the averages of the observed frequency counts?	§V.B.11.e.vi				
46) Was the calibration procedure performed as written?	§V.B.11				
Observation of Tuning Fork Certification Testing Procedure – EAGLE 3 ETF					
47) Was a minimum of two repetitions (cycles) of the procedure described in Service Bulletin 1765 Rev A performed, with recorded observations for two frequencies for each cycle?	§V.B.11.f.i				
48) If readings from two cycles did not agree, was a third cycle performed and values averaged?	§V.B.11.f.i				
49) Was raw data recorded in ink (or directly entered into a computer program)?	§V.B.14.b.i				
50) Was the calibration procedure performed as written?	§V.B.11				
Notes/Comments:					

RECORDS EXAMINED:		
Records Reviewed	Date	Analyst(s)
_____	_____	_____
_____	_____	_____
_____	_____	_____
Notes/Comments:		

METHOD CHECKLISTS ARE AN INTERVIEW TOOL USED BY ASSESSORS. ASSESMENT TO COMPLIANCE WITH THIS METHOD MAY REQUIRE REFERENCE TO THE PUBLISHED METHOD FOR ADDITIONAL DETAIL. REFER TO FULL PUBLISHED METHOD WHENEVER INTERNAL AUDITS ARE DONE. THE PUBLISHED METHOD MAY INCLUDE STATEMENTS REGARDING EXPECTED LABORATORY PRACTICES (INCLUDING BUT NOT LIMITED TO PHRASES DESIGNATED WITH “SHOULD”) WHICH MAY NOT BE CAPTURED IN THIS CHECKLIST. CHECKLISTS ARE SUBJECT TO CHANGE. PLEASE NOTIFY DCLS IMMEDIATELY BY EMAIL OF ANY IDENTIFIED ERRORS OR OMISSIONS. (Lab_Cert@dgs.virginia.gov)