



American Petroleum Institute

Individual Certification Programs: ICP™



API Qualification for Long Seam Pipeline (LSP)

Candidate Orientation

Effective: 2020

Purpose

The information in this handout is intended to provide an outline for the API LSP practical exam. This is intended to provide a brief overview for each Test Candidate regarding test administration and candidate preparation. The information contained with this handout is subject to change; therefore, all candidates will receive an additional orientation from Performance Demonstration (PD) Personnel prior to the start of each qualification session.

Application/Test Scheduling:

Candidates must apply for the exam through ICP's portal, <https://inspector.api.org>, prior to the window's deadline. Candidates may only attend the exam window that they have applied for. No "walk-ins" are allowed.

Candidates will have identified during the application process one primary NDT method from the list provided, plus supplementary NDT methods as desired. Primary NDT methods shall be used to detect, size, and characterize features in the long seam welds. Supplemental methods may be used to validate and/or size primary NDT method findings. The methods identified by the candidate will be included in the roster, and the candidate must use those identified during the application process. The LSP exam is timed, candidates should only select supplementary methods that they are knowledgeable of and comfortable with calibrating and using.

Qualification Requirements:

The candidate shall be a certified Level II or above within one or more of the following international NDT certification schemes: ASNT employer-based certification or ACCP, any ISO 9712 accredited NDE certification, CGSB or PCN

Candidates may only bring the equipment related to the methods they have applied for during the exam application. If Candidates fail to bring a piece of equipment, that method will be removed from their exam and reported back to API. The equipment used on the exam will be recorded on an equipment inventory sheet.

Testing Accommodations:

If a candidate needs a testing accommodation, they must contact API prior to the exam. If an accommodation is agreed to, API will inform the PD Personnel in advance of the test. Test Accommodations cannot be requested onsite.

Check-In Procedure:

The Candidate must present one form of non-expired, government-issued, photo- and signature-bearing ID to test. The Candidate's name on their ID should match the name provided to API. PD personnel will check the ID against the roster.

Appropriate IDs would include:

- driver's license
- passport
- state or government-issued ID

Late arrivals: Candidates who arrive more than **30 minutes late** shall not be admitted to the exam.

NDA: Candidates must sign an NDA prior to entering the designated testing area for every exam regardless of whether they have previously signed one, even if the Candidate is taking multiple exams in the same testing window.

Candidate's Personnel Items:

Candidate's personnel items, not explicitly allowed, will be stored in a designated area and candidates shall not have access to those items during the exam. This includes all cellphones.

Candidates shall remove smart watches, fitness trackers, bulky jewelry, sunglasses (not reading glasses) and store them in the designated area.

Candidates shall remove reading glasses for PD Personnel to inspect.

Candidates must turn out their pockets, roll up their sleeves and lift the hem of their pants, at the PD Personnel's request to demonstrate that no aids are being brought in.

The candidate Shall bring in the following equipment and supplies into the designated testing area;

- NDT Procedures
- NDT Instruments
- Instrument Cables
- Special Feature Sizing Transducers/Search Units
- Special Calibration Blocks with Notches or Side Drilled Holes
- Reference Standards (IIW, Rompas, DSC)
- Rulers
- Calculator (non-programable)
- Couplants

All equipment and documentation are subject to inspection by the PD Personnel.

Candidate Equipment:

Technician will select the testing method(s) that they will use during the exam (that was identified during the application process). Technicians may only bring NDE instruments associated with those methods to the testing center. Any additional instruments must be stored outside the testing area or in the designated area for personal belongings.

Test Candidates or candidate's organizations are responsible for supplying **ALL** the equipment

needed for each demonstration. This includes NDE equipment.

Calibration blocks with known notch depths or side drilled holes (SDH) should be used to establish appropriate depth calibrations.

Prior to the start of the exams, PD personnel will ensure that candidate's machines are cleared of all data, including calibration data, and returned to factory settings.

Note: Candidates should clear all proprietary/work related data from their equipment prior to attending the exam. The equipment will be returned to factory settings and all stored data deleted.

PD Personnel will ensure that all transmission capabilities, including Wi-Fi and Bluetooth capabilities are shut off. These capabilities shall not be turned on until all testing materials have been turned in and the PD Personnel has finished checking the candidate out, and returning their equipment back to factory setting at the end of the exam.

Sharing of equipment will not be allowed during the exam.

Procedure:

The Applicant may use their company procedure, or the API Minimum Procedure Requirements based on the minimum procedure requirements in developed by API.

Ultrasonic procedure requirements in the API Minimum Procedure Requirements were developed during test specimen and test set validation (fingerprinting). The procedure requirements also define the equipment and techniques that have been proven successful and efficient for detecting, characterizing, and sizing features in the test specimens. Use of this procedure requirement is not mandatory, however, it is strongly recommended.

Candidates may use the NDE procedure of their choosing in lieu of the API Minimum Procedure Requirements. A copy of these procedures shall be submitted with the API LSP Examination data and shall become a non-graded part of the Test Candidates examination.

Note: If the candidate uses a company supplied procedure, they will be expected to bring a calibration block related to that procedure.

Required Paperwork:

All demonstration paperwork shall be completed on yellow paper provided by the PD Personnel to facilitate demonstration security requirements. Copying facilities will be available for candidates that arrive with pre-filled out inventory sheets. It is requested that all pre-filled paperwork be completed on white paper. No other paper or materials will be allowed at the testing station. The following demonstration paperwork will be required as a minimum:

Equipment Inventory

Ultrasonic instruments, software versions, search units, search unit wedges if applicable and other equipment essential to the examination system shall be inventoried and documented on the Equipment Inventory Sheet prior to the start of the qualification test.

All non-inventoried equipment shall be stored in an area unrelated to the operation of the examination system. All subsequent inclusions of equipment for qualification purposes shall be documented on the sheet and verified by PD Personnel.

Blank inventory sheets are supplied in this document and can be completed prior to the demonstration but will be verified prior to the start of the demonstration.

If the make model, frequency, size, or shape cannot be readily determined, the candidate shall ensure the equipment certification is available at the demonstration.

Calibration Data Sheet

Calibration data record(s) shall be completed for each method being used. PD Personnel will review all calibration data sheets to ensure that they contain sufficient information to properly document the equipment was used during the demonstration and to document procedure compliance.

The calibration data sheet will not be used as a pass-fail criterion but shall be evaluated to determine correlation between successful and unsuccessful candidates.

Data Report Form

For each Test Sample, reportable flaws or geometric anomalies shall be reported on the Data Report Form as well as the flaw/anomaly type, characterized as being ID or OD surface connected or an embedded flaw, flaw length if greater than 0.250 in., flaw height if greater than 10% wall thickness and remaining ligament to the pipe OD surface. . The Calibration Data Sheet set-up numbers for detection and sizing of each reportable flaw shall be recorded on the Data Report Form.

The Candidate is responsible to ensure that all required fields are legibly filled out in their entirety.

Calibration Protocol

Candidates must calibrate their own equipment prior to the start of the exam, as part of the demonstration. Ultrasonic instrument calibrations should include both sound path and sensitivity calibrations based on signal amplitudes from known calibration reflectors such as side drilled holes or ID/OD notches.

PD Personnel will confirm that the Candidate has correctly calibrated the equipment for their primary method. Equipment for supplementary methods must be calibrated by the candidate but will

not be checked for accuracy by the PD Staff.

- If a technician is unable to calibrate their primary NDT method equipment, that equipment will not be allowed for evaluating exam samples.

PD Personnel must provide candidates with the following parameters relevant to system setup and calibration, such as:

- material type
- nominal thickness
- specimen orientation or placement
- exam start/stop locations on each specimen
- typical representations of weld configurations
- identification of examination volumes in sufficient detail to facilitate the advance preparation.

If the candidate uses the API Procedure Guideline, they will be expected to use the API provided calibration block or equivalent.

If the candidate uses a company supplied procedure, they will be expected to bring a calibration block related to that procedure.

Test Protocol

Performance Demonstration exams will take place in a designated testing location. Candidates will be continuously monitored by PD Personnel and may also be monitored by closed circuit TV.

All demonstrations are scheduled to be completed during a single eight-hour day (0800 –1700). Breaks are at the discretion of the candidate. **Only one test candidate will be allowed to leave the testing area at any time**, including lunch and bathroom breaks. Lunch may be brought in a clear plastic bag into the testing location.

The following projected schedule is provided for candidate reference. The actual practical demonstration (test sample evaluation) times identified below can be affected because of candidate readiness. It is strongly recommended that candidates become familiar with the qualification protocol, specifically the data reporting forms and examination procedure to increase efficiency.

0800 – 0830	Candidate orientation
0830 – 1000	Equipment Inventories and Calibrations
1000 – 1200	Practical Demonstration
1200 – 1300	Lunch Break – In Room (optional)
1300 – 1600	Practical Demonstration
1600 – 1700	Post demonstration paperwork and reporting

Each candidate will be given a unique test set consisting of approximately 10 specimens or

specimen areas. Candidates must work independently and are not allowed to discuss specimen or examination information during or after the demonstration. In general, there will be no single sample time limit established, however, if a Test Sample requires sharing between multiple candidates, additional exam time may be granted at the discretion of the exam proctor if necessary.

All paperwork must be completed and turned into the designated PD Personnel by end of day. Time extensions will not be authorized except for time extensions needed for sample sharing. Candidates that fail to complete the examination in the allotted time will be considered unsuccessful.

Test Specimen Re-looks:

Candidates may re-look at any specimen they have completed provided they are within the time limits of the test or they have not turned in their specimen data for grading.

Long Seam Specimen Presentation

The PD Personnel will ensure that the sample is oriented correctly, and should the candidate have any question, may confirm with the session monitor regarding the orientation of the sample.

Sample orientation will be identified by an “X” and an “O” in opposite corners and a flow direction for Candidates.

The specific API Test Sample identification shall be obscured. Candidates may not access the inside surface of the sample.

Test specimens shall consist of long seam pipeline samples that are at or between 8 inches to 36 inches in diameter and 0.160 in. (4 mm) and 0.500 in. (13 mm) thick. Specimen results will not be disclosed. Candidates are not allowed to view unmasked specimens during or after the performance demonstration.

- Long seam test samples may include: Low frequency ERW welds
- SAW welds
- DSAW welds
- Flash welds

Long seam weld conditions may include:

- Samples in field condition
- Samples with relevant and non-relevant geometric features.
- Samples with non-featured welds.
- Welds will not be identified on samples

Test Set and Test Specimen Design

- Each candidate will be supplied a list defining the test specimens that make up their test set.
- Test specimens are typically pipe cut outs 36 inches long and 12 inches wide.
- Welds are typically centered in the sample width

- Some specimens are full circumference pipe 36 inches in length
- All specimens are from the field with real manufacturing or in-service defects

NOTE: API does not allow marks to be made directly on the test samples/specimens.

Grading Criteria

Candidate performance will be evaluated as follows:

- All identified specimens or specimen examination areas shall be evaluated.
- The entire length of the Test Specimen or test specimen area shall be examined.
- All reportable weld or weld heat affected zone flaws or geometric anomalies shall be reported.
- The flaw or geometric anomaly shall be characterized as to flaw type, ID or OD surface breaking or embedded flaws.
- The reportable flaw start distance from the zero-inch reference edge shall be reported.
- The reportable flaw stop distance from the zero-inch reference edge shall be reported.
- The flaw length shall be calculated from the flaw start and stop positions and reported.
- Flaw lengths >0.250 in. shall be measured and reported.
- Flaw length interaction rule shall be reported when applicable: Flaws separated by less than 1.00 inch shall be combined and noted as a single interacting flaw length.
- Maximum flaw height measurements shall be reported if flaws are greater than 10% of the pipe wall thickness.
- Remaining flaw ligament length shall be reported for non-OD surface breaking flaws.
- Geometric anomalies such as weld offset, weld under trim or weld over trim shall be reported when depth or height exceeds 10% of the pipe wall thickness.
- Internal or external metal loss greater than 10% of the pipe wall thickness
- Non-flawed grading units of the weld shall not have reported flaws. A grading unit is approximately each 3 in. increments of the specimen examination weld length.
- Some specimens may contain no reportable flaws or geometric anomalies.

The Grading Criteria is as follows:

The grading criteria shall consist of the following error categories:

- Flaw Detection: A reportable flaw or geometric anomaly is reported.
- Flaw Characterization: A reportable flaw or geometric anomaly is characterized as to flaw type, ID or OD surface breaking or embedded, See Reportable Flaw List below.
- Flaw Sizing: A reportable flaw is height sized, length sized, and remaining ligament measured if non-OD surface breaking

- False Calls: A flaw is reported in a non-flawed grading unit of the weld.

Reportable Flaw List

Flaw Type	Code
Crack	CR
Hook Flaw	HF
Lack of Fusion	LOF
Inclusion	INC
Lamination	LAM
Selective Seam Corrosion	SSWC
Internal/External Metal Loss*	IML/EML
Offset	OS
Under/Over Trim*	UTR/OTR
Contact Marks	CM

* if >10% nominal thickness

A successful candidate shall pass the API-LSP exam for the primary method selected and utilized during the exam if 80% of each of the flaws in the exam set are successful within the four error categories:

- 80% of reportable flaws or geometric anomalies detected
- 80% of reportable flaws characterized
- 80% of reportable flaws sized within 0.025-in. flaw height
- 80% of reportable flaws sized within 0.025-in. remaining ligament
- 80% of reportable flaws sized within $\pm 50\%$ of actual flaw length
- Less than 20% of non-flawed grading units have reported flaws

Test Results

Test results will **not** be given to candidates upon completion of the demonstration. Testing paperwork will be reviewed at the end of the session for completeness and legibility. All grading will be done post session and forwarded to API for review and concurrence. Results will be forwarded from API to the candidate.

Re-Testing

Any unsuccessful candidate must apply to API for re-testing. Candidates will retake the full exam; no partial retests are given.

Security

1. Monitoring

The demonstration will be continuously monitored by the PD personnel. Continuous testing area surveillance will be maintained. Video and audio recording may be used for a limited time if needed. Entry into and out of the testing area will be restricted. The testing area will be monitored during lunch to allow candidates time for testing if they choose not to take a lunch break.

Candidates may only bring the equipment specifically allowed into the testing location. Personal items shall be stored in a location specified by the session monitor and will be secured to prevent theft or loss during testing. Purses, backpacks, or briefcases will not be allowed at the candidates testing stations and will also be stored in a designated area. Additionally, no cellular telephones, personal pagers, or laptop computers will be allowed in the testing area.

2. Equipment and Data Review

Prior to the exam, the PD Personnel will access the candidates' NDE equipment and reset to factory settings.

All scans taken as part of the exam must be stored in one, easily accessible, file location identified to the proctor. Candidates shall not hide scans during the exam.

Following the exam, the PD personnel will transfer necessary data needed for grading off the equipment and again reset the equipment to factory settings.

Candidates, following the directions of the monitor, must turn off my equipment's transmission capabilities for the duration of the exam and may only be reconnected once the PD Personnel have completed the post exam review of equipment and data.

3. Candidate Expectations

Candidates are expected to behave in a professional manner for the duration of the exam. Unruly behavior will not be tolerated and may result in dismissal from the exam. Candidates are expected to comply with the directions of the PD Personnel.

Candidates are expected to adhere to the security rules as specified in this guideline as well as the NDA agreed to prior to the exam. Candidates are prohibited from discussing, disclosing, publishing, reproducing, or transmitting any information about the exam or the samples in whole or in part to any other person or entity for any purpose.

Candidates are prohibited from using testing aids during their exam. All personal property, except for the equipment defined and listed on the inventory, must be left outside the designated testing area and cannot be accessed until after the exam has been completed and the PD Personnel have completed their post exam collection and review of data and equipment.

Candidates may not speak to each other during the exam and may not share testing equipment during the exam.

Candidates must remain at their tables unless they are taking a bathroom break.

Any violations of the security rules may be cause for terminating the Candidate's test and results being withheld, as well as being barred from future API exams.

4. Additional Security Rules

Additional security measures will be implemented as necessary to ensure the integrity of the testing program. Additional security will be covered in the orientation portion of the demonstration.

5. Dispute Resolution

Candidates who wish to document their concerns regarding the test or testing environment should contact API directly by emailing ICPEXAMCoordinator@api.org for review.

FREQUENTLY ASKED QUESTIONS

1. What NDE equipment will be needed?

- A. During the application process, Candidates will select the primary and supplementary methods they will use during the exam. Candidates must bring the equipment needed to perform the methods they selected.

Candidates may bring in the following into the testing area:

- NDT Instruments, related to the methods listed on the roster
- Instrument Cables
- Special Feature Crack Sizing Transducers/Search Units
- Special Calibration Blocks with Notches or Side Drilled Holes
- Reference Standards (IIW, Rompas, DSC)
- Rulers
- Calculator (non-programable)
- Couplants
- Liquid Penetrant supplies
- Magnetic Particle supplies
- Non-powered surface preparation tools

2. What type of calibration blocks will be needed?

- A. If the candidate is using the API procedure guidance, the calibration blocks will be provided.

If the candidate chooses to use the procedure of their choosing, they are expected to bring the calibration block called for in their procedure.

3. Do I have to follow the API provided procedure guidance?

- A. No, the use of alternative (company specific) techniques is allowable provided the methods and techniques are clearly identified in a procedure supplied to the PD Personnel. The use of the API developed procedure guidance is recommended, as it has proven both successful and efficient in performing examinations on these samples.

Calibration records and equipment inventory records will be used to record the equipment used.

4. Are all test sets similar?

- A. Yes. All Test Samples and Test Sets have been ultrasonically validated. The degree of difficulty has been adjusted for fairness. The test sets do differ from sample to sample in flaw number, types, sizes, and locations. Each test set is created with equal difficulty with similar challenges features.

5. What happens if I do not finish the test in the prescribed time?

- A. Candidates that fail to complete the examination in the allotted time will be considered

unsuccessful. Future attempts will require a complete re-test.

6. Is there anything beneficial I can do prior to the start of testing?
 - A. Yes. Becoming familiar with this testing protocol document, Characterization Guide and all the examination data records will be a great benefit. Additionally, inventory records may be filled out and documented in advance on white paper. Copying facilities will be available to transfer these records onto yellow paper.
7. Is training a prerequisite for taking the API Long Seam Pipeline Examination?
 - A. Training is recommended but is not a prerequisite for any ICP performance demonstration exams.
8. Do I have to provide proof of identity?
 - A. Yes. The Candidate must present one form of non-expired, government-issued, photo- and signature-bearing ID to test.

A driver's license with picture or an equivalent proof of identification is necessary.
9. Can I leave the facility during lunch?
 - A. No. Once testing has started the security requirements are put in place and Candidates may not leave. Candidates are encouraged to bring lunch and can eat lunch in the exam room.