

Key Features

- Technical Infrastructure
- Ultrasonic Examination Oversight
- Calibration Standards
- Technical Support
- Maintenance
- Training



Technical Infrastructure

Nordco's Cyl-Sonic division has been approved by special permit (DOT SP-14920) to perform 100% ultrasonic examination testing in lieu of hydrostatic testing. This special permit is current and available for review on the US Department of Transportation website. It defines the requirements for your ultrasonic testing procedures, including:

- Each cylinder must be examined by a standardized (calibrated) UE system, using an appropriate reference cylinder and test setup
- A copy of the operating test procedure for performing UE testing of cylinders must be at each facility performing cylinder re-qualifications
- The system must be calibrated and re-calibrated at the start and end of the test interval
- The rotational speed of the reference cylinder must be sufficient to allow all simulated defects to be detected, measured, and recorded
- The rotational speed of cylinder being tested cannot exceed the rotational speed used during the calibration process

The pulse rate must be adjusted to ensure a minimum of 10% overlap for each helix. Cyl-Sonic also provides customers with a copy of the operator manual for each product model. The manual explains machine setup and operation. In addition, Cyl-Sonic supplies customers with a copy of required ultrasonic testing procedures.

Ultrasonic Examination Oversight

Nordco's Cyl-Sonic special permit requires our Senior Review Technologist (SRT) to conduct mandatory oversight required to perform periodic re-qualification of compressed gas cylinders using ultrasonic examination. We achieve this through several means such as annual on-site audits, assessments and surveillances, which include:

- Witnessing operators/processes conducting duties and UE (surveillance observations)
- Assessing compliance to regulatory requirements, in particular, the processes required by the special permit
- Confirm UE system performance
- Document and record the audit results. All results are reported to the customer; failed tests are reported to DOT

In addition, our proprietary oversight software allows us to perform administrative functions, screen customer testing data for specific criteria, and generate auditing reports. Please note that all testing data and reports are kept for ten years, even if your oversight contract is for a shorter period.

Administrative tasks include the set up of testing sites, users and checking of operator certification levels. Consumer testing data may be screened for cylinder testing records by operator and errors for serial number, date, 3AL or LER. Oversight staff generates audit reports for monthly and annual production tests, failure reports, shift reports and shift detail analysis. Finally, our service includes the generation of all required DOT annual reports.

Calibration Standards

The Cyl-Sonic special permit defines the requirements for the reference cylinder, known as the calibration standard. The UE reference cylinder is a cylinder, used as a standard reference, that has similar acoustic properties, surface finish, and metallurgical conditions as the cylinders being tested.

As part of the Cyl-Sonic special permit requirements to provide appropriate calibration standards for different cylinder types, Cyl-Sonic offers 16 calibration standards (five aluminum and eleven steel), including three exemption standards.

Our calibration standards meet the following requirements:

- A known minimum design wall thickness (t_{min}), less than or equal to the cylinder being tested.
- For cylinders less than or equal to 6 inches (154 mm) in diameter, the standard has the same nominal diameter as the cylinder being tested.
- For cylinder greater than 6 inches (152 mm) in diameter, the standard conforms to the ranges shown below.

Test Cylinder Outside \varnothing	Standard Range Min to Max Outside \varnothing
7.00" (178 mm)	6.30" to 10.50" (160 mm to 267 mm)
7.50" (191 mm)	6.75" to 11.25" (171 mm to 286 mm)
9.00" (229 mm)	8.10" to 13.50" (206 mm to 343 mm)
9.25" (235 mm)	8.33" to 13.88" (212 mm to 353 mm)
10.00" (254 mm)	9.00" to 15.00" (229 mm to 381 mm)
12.00" (305 mm)	10.80" to 18.00" (274 mm to 457 mm)

All Cyl-Sonic calibration standards include the following artificial defects:

- Two minimum thickness wall patches (t_{min}), representing wall thinning.
- Two longitudinal defects, including one inside diameter flaw and one outside diameter flaw.
- Two circumferential defects, including one inside diameter flaw and one outside diameter flaw.
- One flat bottom hole, representing pitting. The depth 1/8" or 1/4" (3.175 mm or 6.35 mm) is dependent on the cylinder diameter (33% of t_{min}). The standard may include additional flat bottom holes based on the desired periodicity levels.

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Technical Support

Cyl-Sonic offers you two types of technical support:

Remote Access The Cyl-Sonic support team can remotely connect and take control of your system for the purpose of diagnosing software and hardware issues. If on-site support is required, a member of the Cyl-Sonic support team is dispatched to your facility to locate and fix the problem.

Telephone Support The Cyl-Sonic support team works with your staff to diagnose software and hardware issues. If on-site support is required, the support team dispatches a technician.

Maintenance

Cyl-Sonic offers multiple system maintenance options:

On-Site A Cyl-Sonic technician, specially trained in diagnosing and repairing Cyl-Sonic systems, will come to your site and perform repairs on your system. This service may result from technical support calls or customer-identified maintenance needs.

Preventive Maintenance A Cyl-Sonic technician will perform the following procedures (preventive maintenance testing takes approximately one full day per system):

- Perform a visual inspection
- Check all system voltages
- Verify operation accuracy (job setups)
- Confirm measurement compliance with ASTM E317
- Replace any failing parts

Refurbishment A Cyl-Sonic technician will inspect and replace any failing, corroded, or damaged key system parts.

Training

Cyl-Sonic offers multiple levels of training. Level I and Level II training classes are in accordance with the American Society for Non-Destructive Testing (ASNT) Recommended Practice ASNT-TC-1A.

Level I Includes 40 hours of classroom training, covering ultrasonic testing theory and principles; also includes examinations for Level I ASNT certification.

Level II Includes 40 hours of hands-on, product specific training, covering efficient and accurate system usage; also includes examinations for Level II ASNT certification.

Advanced Includes a review of critical theory, system diagnostics (diagnosing head and pressure issues), understanding system electronics, and "if/then" troubleshooting scenarios.

Maintenance Includes a review of maintenance procedures, such as how to zero the probe head or diagnose bad boards.

