

Cyl-Sonic Industrial Cylinder Inspection System



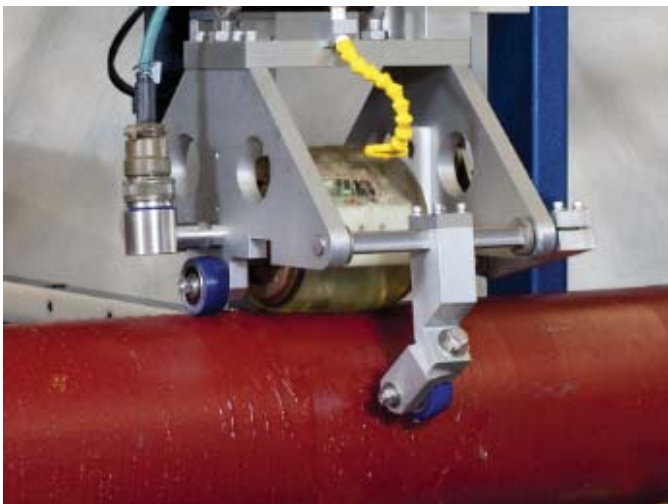
CYL-SONIC

The Cyl-Sonic Family

The Cyl-Sonic Cylinder Inspection Systems family can be used for either requalification or new cylinder manufacturing. The family includes the following products:

- **Cyl-Sonic Micro** - Performs Ultrasound examinations of cylinders with 3.2" - 8.0" outside diameters; less than 30" long, the Micro easily fits on a cart for maximum flexibility and portability
- **Cyl-Sonic Industrial** - Performs Ultrasound examinations of cylinders with 4" - 12" outside diameters
- **Cyl-Sonic Integrated Industrial** - Performs surface blasting and Ultrasound examinations of cylinders with 4" - 12" outside diameters
- **Cyl-Sonic Optimal** - Performs Ultrasound examinations of cylinders with 3.2" - 12" outside diameters. For small cylinders (3.2 to 8.0), maximum length is 30"; for industrial cylinders, maximum length is 72"
- **Cyl-Sonic Tonne** - Performs Ultrasound examinations of tonne containers with 18" - 26" outside diameters and up to 7.5' lengths
- **Cyl-Sonic TnT (Tube and Tonne)** - Performs Ultrasound examinations of tonne containers with 18" - 26" outside diameters and up to 7.5' lengths, and tubes with 9" - 12" outside diameters and up to 40' length
- **Available accessories** - Calibration standard, temperature control, pre-wet station, and cart

Range of products allows you to inspect cylinders with 3.2" - 26" outside diameters and up to 40' in length



Flaw testing, flawlessly done

The Cyl-Sonic Industrial system scans through paint and most clear coatings to detect potential pits, cracks, corrosion, and gouges. In addition, the system measures and detects lost cylinder wall thickness as well as identifies undesirable moisture inside the cylinders.

Wheel probe technology

The ultrasonic wheel probe includes nine complementary high-frequency transducers - the most integrated transducers in one unit in the industry - that search for flaws in traverse, longitudinal, and oblique directions. This ensures 100% coverage of required exam volume and area. The four oblique transducers excel in detecting any moisture droplets inside cylinders.

Safer for operators and environment

Unlike hydrostatic testing methods, ultrasonic examination eliminates the need to remove hazardous gases from cylinders, helping protect both your operators and the environment. The method does not require valve or O-ring removal, so there is less need for valve replacement as well as reduced cylinder neck thread damage.

Ultrasonic examination also eliminates the need to introduce water into the cylinders, helping prevent product contamination and eliminating or minimizing the number of post-requalification cylinder treatment processing steps.

Saves time and operating costs

The Cyl-Sonic Industrial saves on personnel costs. Since operators don't need to spend time drying and re-valving the cylinders, daily production levels can be much higher. In addition, the cost per cylinder test is lower for UE testing than hydrostatic testing.

Ideal for integration with other processes

The Cyl-Sonic Industrial can be customized to integrate with any or all of the following operational processes:

- Surface blasting
- Painting
- Marking
- Database barcoding

Calibration standards ensure accuracy

Each system uses a calibration cylinder standard with simulated flaws. This allows accurate testing and comparison against known simulated flaws.



Auto mode = speed & productivity

The Cyl-Sonic Industrial system includes a deck that allows simultaneous loading/unloading while the automated testing process continuously operates — meeting your high-volume, high-productivity needs.

Software control and record retention

Integrated software allows the operator to control all axis motion, including position, rotation and sensitivity. Calibration setups are stored and reused.

The software displays real-time scanning test results showing the locations of any detected flaws; the system also alerts the operator about a cylinder's pass/fail status.

Meets all regulatory requirements

The Cyl-Sonic Industrial system complies with the requirements of the following regulatory agencies:

- **DOT** - Meets US Department of Transportation cylinder requalification requirements (SP 14920)
- **TC** - Meets Transport Canada cylinder requalification requirements (SU 10807)
- **ISO** - Meets International Organization for Standardization requirements (ISO 10461 & 6406)

One machine, many cylinder types

The Cyl-Sonic Industrial system handles a wide range of outside diameters, lengths, and materials, which means you can inspect most cylinder types using a single machine.

Inspection systems are only the beginning

Nordco also offers a full range of services to keep your processes running smoothly:

- Operator training
- System verification services
- System maintenance and repairs
- Replacement parts
- Remote access assistance

In addition, Nordco also offers oversight and consulting services:

- Development and implementation of in-house UE requalification programs
- Turnkey start-up, management, staffing, and operation of in-house requalification facilities
- Provision of special permit or equivalency certificate and DOT Senior Review Technologist (SRT) services for training, certification, and oversight of in-house cylinder requalification operations

What is Ultrasonic Examination...

Ultrasonic Examination (UE) provides an exciting technology alternative to hydrostatic testing for cylinder recertification.

UE tests measure the thickness of cylinder walls over their sidewall full lengths. Cylinders do not pass the test if, at any point, the thickness of their walls falls below the established minimum.

In addition, UE identifies small faults, such as cracks, corrosion, pits and gouges, that are not always found during a standard hydrostatic test.

UE also eliminates the need to drain residual contents or remove valves and O-rings.

Ultrasonic examination eliminates problems inherent in hydrostatic testing for cylinders used in high-end specialty gas and electronic services. These cylinders receive special surface treatments and, after hydrostatic tests, must have those treatments re-applied, followed by a thorough drying of the cylinder interior.

Ultrasonic examination also results in fewer rejected cylinders than hydrostatic testing, since many of the testing errors, including leaking seals, operator mis-interpretations, and inaccurate burette readings, are no longer factors.

Since ultrasonic examination has been determined to be extremely accurate in detecting cylinder flaws, the US Department of Transportation has:

- Waived the need for internal visual examination of cylinders used in certain services, and
- Approved the extension of certain cylinder requalification periods

Specifications

Category	Specification Type	Description
General	Length	130" (10' 10")
	Width	46" (3' 10")
	Height	85" (7' 1")
	Weight	~600 lbs.
Cylinder Inspection	Tested products	Steel (DOT 3A and 3AA), Aluminum (DOT 3AL) and other exemption steel cylinders per US DOT and ISO 4606 & 10461 specifications
	Diameter range	4" to 10.5" outside diameter
	Wall thickness	0.080" to 1.0"
	Length	11" to 60"
	Exam coverage	110% with a 0.250 helix
	System performance	98%+ system uptime
	Configurations	Multiple load/unload configurations available
Utilities	Electric	220/110 VAC, 60 Hz, 25A
	Pneumatic	80 psi

Estimated System Throughput

Cylinder Model	Outside Diameter	Length w/o valve and cap	Estimated Throughput
Medical E (3AL)	4.3"	25.75"	27-30 cylinders/hour (operator dependent)
20 (3AA)	5.25"	14"	48-60 cylinders/hour (operator dependent)
300 (3AA)	9.25"	55"	27-30 cylinders/hour (operator dependent)

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