



# Using Ultrasonic Testing in industries exposed to explosive atmospheres

**The cost of equipment failure within oil, gas and chemical industries (including fuel depots, processing plants and LPG/LNG vessels) on workers, shareholders, equipment, and the environment is often devastating.**

This is a very real, very common risk, as the hazardous nature of substances handled daily puts enormous, corrosive pressure on the equipment's structural

integrity. A catalogue of historical equipment failures has led to the strict preventative safety testing and regulations we have today.

Whilst increased awareness is good, these industries are experiencing huge growth in demand, creating a 'every second (and penny!) counts' culture that is struggling to strike a balance that meets safety standards and production targets.

These time and financial strains have seen equipment frequently pushed beyond its intended capacity and lifespan. However, it is in fact the opposite approach that protects profits and secures a more sustainable future. A regular safety inspection regime will help put such companies on a stronger stance in an increasingly sustainable world.

## Ultrasonic Testing – a solution to the safety vs. productivity battle

The simplicity, speed and accuracy of Ultrasonic Testing (UT) can significantly relieve pressures to meet these seemingly conflicting demands, saving companies time, money and their reputation, as well as providing peace of mind. Here, the advantages are divided into two key pressures.

### *Maintaining productivity*

Time is precious to the production chain and the equipment inspector. The good news is ultrasonic testing can be applied to a system in operation, meaning production is unaffected. For the inspector, however, many systems run on a colossal scale with numerous key parts, from welds and pipes to pressure and storage vessels. Time is money, so speed and efficiency are essential with vast areas to cover. Ultrasonic testing achieves both.

It is easy to use even without an NDT qualification; it is fully portable and highly flexible in measuring an array of materials and accessing tight, awkward spaces, and it only requires access to one side of a structure. Some gauges accommodate multiple probe sizes, shapes, and angles to accomplish this, and advanced data-logging capability provides instant results that are automatically saved, eliminating manual data recording.

### *Guaranteeing accuracy*

Accuracy is key when performing inspections in such demanding environments because time and efficiency must be extremely tight. Ultrasonic testing is expected to see huge growth in the coming years due to its high sensitivity, efficiency, and impressive precision in determining wastage or damage. When applied to thickness measurement, it detects signs of corrosion in their early stages, preventing significant damage and loss.

To really maximise speed and accuracy, the Multiple-Echo technique was

developed, becoming the industry standard for through-coating material thickness measurement and is required by classification societies for ultrasonic thickness measurements. It gives error-checked, reliable remaining metal thickness and guarantees crucial savings in time and money as it eliminates the need to remove and reapply coatings. What's more, it avoids the risk of exposing the material under test to further corrosion.

## Explosive atmospheres

The term Ex is recognized globally for explosive atmospheres and the schemes used to prevent explosions. Hazardous Areas are locations where there is a risk of fire or explosion, due to the presence of ignitable or flammable substances in the air. These substances include gases, vapours, and dusts that are present in the air, at concentrations high enough to produce an ignitable mixture.

Like the term 'Ex', these schemes are named as such that they too can be recognized globally. 'IEC' is a UN-endorsed standard used to provide a common point of reference for understanding the variety of different Ex rating standards that are used around the world. The 'IECEx system' is a certification to standards relating to equipment for use in explosive atmospheres. Regions like the European ATEX Standard and the North American NEC/UL Standards use the IEC 60079 Standard as a source.

It's important to ensure the equipment you use in an explosive atmosphere meets the stringent Ex schemes and standards. This means that when adopting Ultrasonic Testing equipment to be used in an explosive environment, it is necessary to ensure the equipment you use is fully certified to the relevant standard. ■

<b>NEC / UL Scheme (North America)</b>	<b>UL 60079</b>
<b>ATEX scheme (European)</b>	<b>EN 60079</b>
<b>UKEX Scheme (United Kingdom)</b>	<b>BS EN 60079</b>
<b>INMETRO Scheme (Brazil)</b>	<b>EN 60079</b>



Image: Cygnus Instruments