MsS High Temperature Pipeline Inspection

Temperature Capabilities

The MsS system can handle temperatures up to 930°F, making it suitable for high-temperature pipelines in industries like petrochemicals and solar thermal power plants. This capability exceeds the limits of traditional piezoelectric methods, which often fail above 650°F.

Application in High-Temperature Environments

High-temperature pipelines are critical in industries such as oil and gas, petrochemicals, and solar thermal power plants, where pipelines may carry hot fluids or operate in elevated temperature environments. Traditional inspection methods, such as those using piezoelectric transducers often face limitations due to their Curie temperature, typically around 650°F which are prone to de-pole and lose functionality. In contrast, MsS (magnetostrictive sensor) system is particularly suited for these conditions with its ability to operate effectively up to 930°F enabling operation in extreme heat.

System Operation

The installation process varies from a dry-coupled sensor to a multi-step epoxy-based process utilizing design. These designs ensures effective coupling at high temperatures, creating the torsional motion generated in high magnetic permeability of iron-cobalt (FeCo), with a Curie temperature of 938°C to further support high-temperature applications.

Advantages

MsS guided wave testing for high-temperature pipelines is non-intrusive, allowing inspection without shutting down operations, which is crucial for maintaining plant safety and minimizing downtime. It is also cost-effective, as it reduces the need for extensive excavation or direct examination, particularly for insulated or buried pipelines. The method's ability to detect defects like corrosion and cracking, even in challenging environments, enhances its utility for structural health monitoring.