

How Equotip Leeb & UCI play a vital role in safety of hydrogen infrastructure

Ensuring the Integrity of Hydrogen Infrastructure with Advanced Hardness Testing

As the global push for sustainable energy intensifies, hydrogen infrastructure is expanding rapidly. This growth brings a new set of challenges, particularly in ensuring the integrity of metal structures used to store and transport hydrogen. Portable metal hardness testing on installed structures, such as those found at hydrogen car charging stations, storage tanks and electrolyzers has become an essential part of maintaining safety and reliability.

Addressing Material Testing Challenges

Hydrogen can cause embrittlement in metals, which compromises their strength and durability. This makes regular testing critical. The portable nature of metal hardness testers allows for in-situ evaluations, crucial for structures already in use. Given the diverse configurations and orientations of hydrogen tanks and pipes, the testing method employed must be versatile and reliable under varying conditions.

Ultrasonic Contact Impedance (UCI) Method: Ideal for Thin-Walled Pipes

Hydrogen pipelines typically have a wall thickness ranging from 5 to 10 mm. For such thin-walled components, the [Ultrasonic Contact Impedance \(UCI\)](#) method is particularly effective. This technique is not influenced by gravity, making it ideal for testing from various angles. The UCI method's success in inspecting hydrogen pipes lies in its precision and adaptability, ensuring accurate hardness measurements irrespective of the pipe's orientation. Additionally pipes and vessels are welded, whereby metal joints require safety assessment of brittleness through [Heat Affected Zone measurement](#). For this particular purpose, the UCI method is primarily chosen.

Leeb Method: Suitable for Thicker Components

For thicker components, such as hydrogen storage tanks, the Leeb method proves more suitable. Automatic compensation for impact direction can be used to accommodate different measurement angles. The Leeb method's makes it a reliable choice for testing the more substantial parts of hydrogen infrastructure.

Equotip 550: Versatile and Durable Testing Solution

The Equotip 550 is an excellent choice as it supports both UCI and Leeb probes, making it a versatile solution for inspecting a range of components. The device's user-friendly interface, available in multiple languages, enhances its accessibility. Advanced features, such as direct conversion to other hardness scales, add to its utility, providing immediate, actionable data. Moreover, the Equotip 550's high durability ensures it can withstand the demanding conditions of fieldwork. Its resilience feature set make it an indispensable tool for maintaining the safety and integrity of hydrogen infrastructure.

Conclusion

As hydrogen infrastructure continues to grow globally, the need for effective testing becomes ever more critical. The integration of advanced portable hardness testing methods, such as UCI for thin-walled pipes and the Leeb method for thicker components, ensures correct monitoring of metal integrity.



Find out more about UCI and metal hardness testing in our [Tech Hub](#).



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