



Micro-hydrogen leak detection composite film

**Hydrogen leakage detection black technology
Specifically solve the problem of locating and searching for
trace hydrogen leaks**

Dedicated to building a convenient and intuitive field of hydrogen leakage detection, which is intrinsically safe, overcoming detection blind spots and false negative pain points.

PRODUCT INTRODUCTION

Hydrogen leakage monitoring composite patches are advanced functional materials based on hydrogen-sensitive color-changing mechanisms, specifically designed for rapid visual positioning of hydrogen-leakage. This product is composed of high-selectivity hydrogen-sensitive chromogenic polymers and strong and tough viscoelastic substrates, featuring high sensitivity, high contrast, excellent interfacial adhesion.

When hydrogen molecules diffuse into the film, the hydrogen-sensitive chromogenic centers undergo reversible coordination reactions, causing an instantaneous change in the optical band, which macroscopically manifests as a rapid color change from light yellow to grayish black. Its color-changing threshold is as low as $\leq 1\%$ volume ratio of hydrogen (H_2), with a response time of only ≤ 3 seconds, and a positioning accuracy of 1 millimeter.

This product can be firmly attached or wrapped high-risk leakage parts such as pipeline joints, flanges, welds, etc., to achieve real-time, in-situ, and passive visual monitoring of hydrogen, significantly improving the efficiency and accuracy of hydrogen leakage positioning.



PRODUCT STRUCTURE



- 1-Base protective layer
- 2-Hydrogen-sensitive reaction layer
- 3- Original color
- 4- Color after changing
- 5- Carrier film layer

PERFORMANCE PARAMETERS

- Good adhesion:** Strong adhesive force, not easy to fall off, peeling strength 5N/25mm, can be firmly pasted on various surfaces.
- Good weather resistance:** The temperature range of the using environment is from -30to 150, with good weather resistance, adapting a variety of environments.
- Sensitive response:** The color change time is less than 30 seconds, and it can quickly respond to hydrogen leakage.

ADVANTAGES AND FEATURES

- Hydrogen sensitive color change:** Quickly locate leaks, intuitive and easy to identify.
- ppm level detection:** Wind and interference resistance precise detection.
- Passive sensing:** >1000 cycles, no power source required.
- High viscosity rolls:** No peeling on curved, millimeter level coverage.

USAGE METHOD



Clean

Clean the areas where the pipeline joints, flange connections, etc., which need to be pasted with the color-changing film, to ensure that the is clean.



Measure
and cut

Measure the size of the pasting position, and measure the circumference of a single layer of the ring position. Cut the color-changing film according to the.



Paste

Peel off the protective film. Stick the color-changing film on the designated position, the film can be flat or wrinkled, the wrinkled effect is.

APPLICATION SCENARIOS

The hydrogen leakage monitoring composite patch covers the entire chain of “production-storage-transportation-application” of hydrogen, and is widely used in industries. In the production process, it can be attached to key parts such as pipelines and reactors to monitor hydrogen leakage in real time and ensure production safety.

In the storage process the patch can be firmly attached to the surface of equipment such as high-pressure hydrogen storage tanks and liquid hydrogen storage containers to monitor hydrogen leakage in real time. During transportation, the can be used on the storage tanks of transportation pipelines and high-pressure gaseous transport vehicles to monitor the leakage status and ensure transportation safety.

In the application process, it applicable to industries such as metallurgy, chemical industry, petroleum, electronics, electricity, aerospace, research institutes, and new energy, providing reliable protection for the safe application hydrogen in these fields, and contributing to the widespread application and sustainable development of hydrogen energy.

HYDROGEN GUARDIAN

