

# Eye-readable hydrogen detection system for metals

On field visual detection of hydrogen permeation into metallic material

## Overview

In order to prevent hydrogen embrittlement in which hydrogen penetrates into a material and degrades its mechanical property such as strength, it is effective to visualize distribution of hydrogen penetrated into the material. Silver decoration method and hydrogen microprint technique are known as conventional hydrogen observation methods, but these methods are not able to detect the time variation of the hydrogen distribution in real-time. In the past, Tohoku University made the real-time detection possible by using metallic oxide, but the sensitivity was low and could not detect the small amount of hydrogen atoms that migrate into the material due to corrosion.

This system is able to detect the hydrogen in real time with high sensitivity and high spatial resolution in an actual environment. This technology is effective for example to visually judge hydrogen permeation into plant equipment.

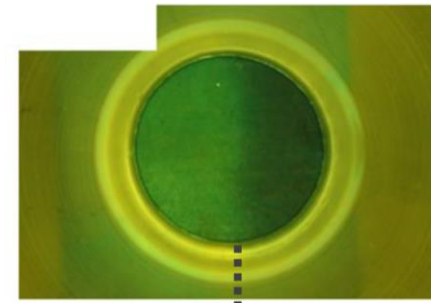
## Product Application

- Visualization of hydrogen permeation in plant facility, hydrogen embrittlement grasp
- Elucidation of hydrogen embrittlement mechanism
- Microscopic observation of hydrogen distribution in material

## IP Data

IP No. : JP2021/028591  
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 Admin No. : T21-064

Shot with a normal camera  $\hat{=}$  Visual observation



Hydrogen permeation side

Non-hydrogen permeation side

## Features・Outstandings

As the patent has not yet been published, disclosing information and commercializing can be done after concluding an agreement that includes a confidentiality clause such as an option agreement. Please feel free to contact us.

## Related Works

[1] KAKINUMA Hiroshi, AJITO Saya, HOJO Tomohiko, KOYAMA Motomichi, HIROMOTO Sachiko, AKIYAMA Eiji: "Analysis of hydrogen permeation behavior into pure Fe by hydrogen imaging", C-302, 68th Zairyo-to-Kankyo meeting abstract

## Contact