

H2 Indikator Tape 4 pipes



Product description

Nitto DX2106H Hydrogen Detection Tape **enables the visual Hydrogen gas leak detection by permanent color change** upon contact with hydrogen gas.

- Tape **changes color**, from amber to black, within about 10 seconds when exposed to H₂ (depending on the flow rate, temperature, time and percentage of hydrogen)
- Provides an additional monitoring level for detecting gas leaks and reduces detection time by making it easier to find leaks
- Is **highly sensitive** and can detect hydrogen leaks that contain only **1% H₂ concentration**
- DX-2106H **will not return to its original color** after exposed to hydrogen gas
- **Easy to use**; applies like usual adhesive tape
- Can be used in most indoor or outdoor environments
- Usage of the tape shortens the detection time of leakage enormously compared to conventional portable or stationary sensors
- **Less influenced by wind, position, duration, skills**, etc.
- **Easy to check** vertical and bottom faces

Application

- Hydrogen detection tape can be easily applied to or wrapped around pipes, flanges, fittings, valves, access panels, etc. to immediately identify an exact hydrogen leak location.
- The permanent color-change identifies the exact leak location even if the H₂ line is shutdown.
- Possible uses include power and chemical plants, transport markets, hydrogen combined heat and power plants, gas stations, storage tanks, compressors, new energy markets and more.

Notes

- Once applied, the H₂ indicator tape can withstand temperatures from -40°C to 100°C; short-term exposure up to 200°C.
- Best stored between 10° C and 27° C, 25-50% relative humidity; protected from direct sunlight.
- For optimal adhesion, it is suggested to apply DX-2106H at ambient temperatures, 50% relative humidity, allowing at least 24 hours to obtain optimal adhesion strength.

Product construction

Polyimidefilm
Silicone adhesive with H ₂ detection



H2 Indikator Tape before use



After contact with hydrogen

H2 Indikator Tape	Art.-Nr.	VPE
50 mm x 4,57 m	14596	roll
22x22 mm Patches	14597	Sheet á 15 pcs.

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Properties, certifications and specifications

Backing Material	25my Polyimide Film
Pressure Sensitive Adhesive	Silicone with H ₂ Detection Properties
Color	Amber
Total Tape Thickness	0,06 mm
Adhesion to Steel	5 N / 25mm
Tensile Strength	158 N / 25mm
Elongation (%)	67%
Dielectric Strength	7.080 V (Voltage elevation speed 0,5 V/sec)
Autoignition Temperature*	About 455°C

Caution: The above are typical values and should not be used in writing specifications. Customer is responsible to ensure product meets intended application requirements before approved for use.

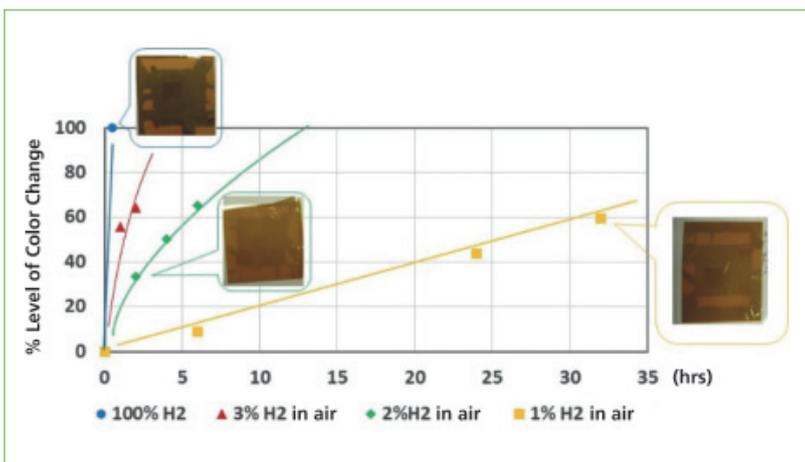
* Autoignition temperature for H₂ (CAS# 1333-74-0) is 500-571°C

Environmental Durability*

Condition	Duration	Color-change after aging	After aging, H ₂ Exposure
High Temperature	60°C x 6 months	No color-change	Reacted, black
Low Temperature	- 5°C x 6 months	No color-change	Reacted, black
High Humidity	40°C x 95 % rF x 6 months	No color-change	Reacted, black
Weather Resistance	Outdoor exposute 6 months under Florida sunshine	No color-change	Reacted, black
Water Immersion	Tape only (room temp.) x 6 months	No color-change	Reacted, black
	Tape on stainless steel (room temp.) x 6 months	No color-change	Reacted, black
	Tape on aluminum or galvanized Metal	Black color-change	N/A

* Tapes applied on SUS316 pipe were aged at various conditions and confirmed for color-change with H₂ at room temperature.

Color-Change Speed vs. H₂ Concentration



- Color-change was observed with 1%, 2%, 3% H₂ in air and 100% H₂ at room temperature and 100mL/min flow rate.
- With 100% H₂ full color-change at less than 5 minutes.
- With 1% H₂ in air, color-change can be observed in about 30 hrs.

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A warranty of 4 pipes is limited to replacement of faulty material only.
The suitability of the material for any application must be considered at your own responsibility

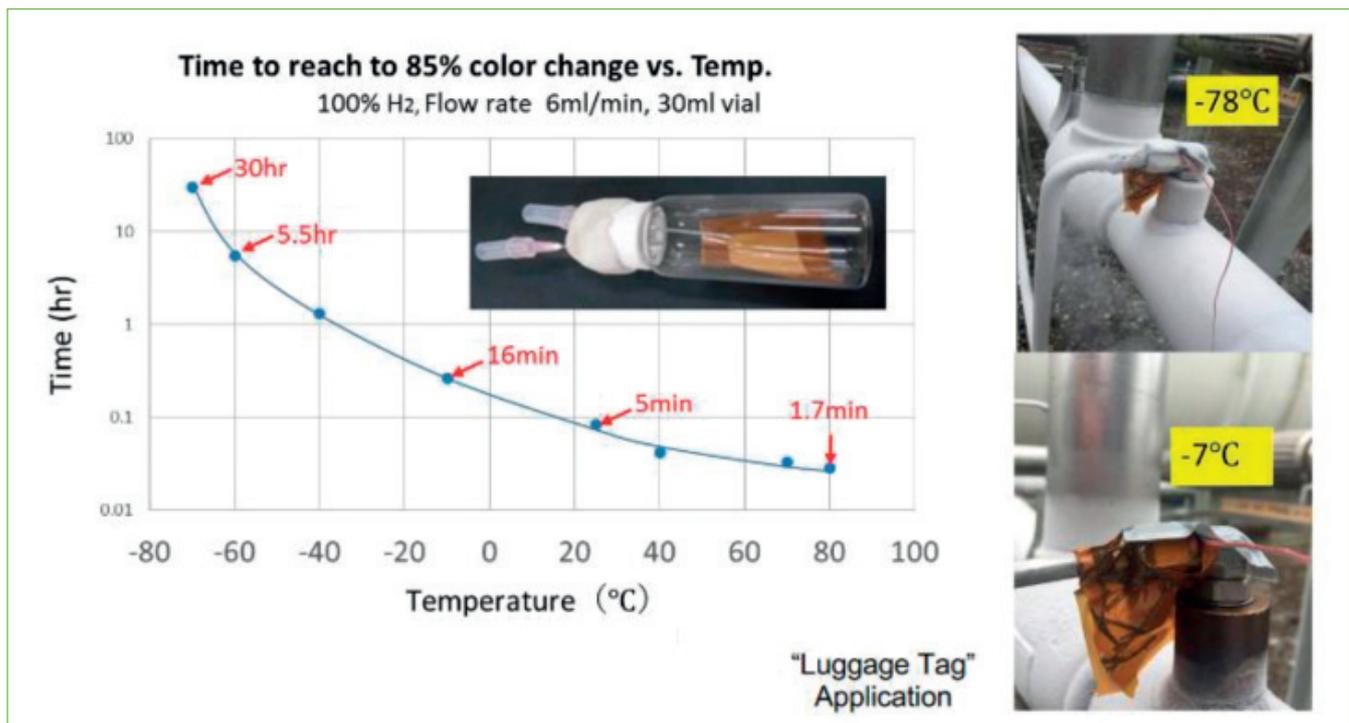
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Application techniques

- Ensure application surface is clean, dry and free of any debris, oils, loose particles, etc.
- Nitto's hydrogen detection tape is a Pressure Sensitive Adhesive (PSA) tape and requires pressure applied by hand or roller.
- Not every situation will allow for DX-2106H to be easily wrapped around. In challenging areas, apply DX-2106H using the "Butterfly Wrap" (shown right) method.
- This will help with encapsulating the surface and prevent hydrogen gas from escaping too quickly, allowing for a reliable leak detection.
- Wrinkles or pop-ups, when applying the tape, help to identify color-change more easily. This is because the gas has a larger contact area and the color change becomes irregular.
- To see contrast of the color-changed area versus the non-changed area, apply tape around an area larger than the expected leak location. If the color of the whole tape is changed, it may be difficult to recognize the leak point. It is better to apply the tape over a wider area.



Example „Butterfly Wrap“



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Please note

- This product is **intended for use as a localized hydrogen gas indicator**, and should be used as part of a comprehensive gas detection system. **DX-2106H will not prevent H2 leaks.**
- **When a color-change** is observed, it is **highly recommended to recheck** for hydrogen gas leak **with a hydrogen gas detector**.
- Color change speed depends on hydrogen gas % concentration, flow rate and temperature. **Higher concentration, flow rate and temperature cause a faster color-change.** 1% hydrogen balance in 99% air may not cause a change in color, depending on the condition.
- Although this tape has been tested for its hydrogen gas detection ability under 60°C, 40°C x 95% RH and -5°C for 3 months or more, the product is only warranted to conform to specifications defined by Nitto.
- **Under high temperatures (~ 200°C/ 392°F), organic materials** including but not limited to finger prints adsorb on the adhesive surface and can generate gases that **may potentially cause the tape to change color.**
- **"Spot" color-change may be observed under high temperature conditions or after long term outside UV exposure** (shown right). A "Spot" color-change is not caused by a hydrogen gas leak. In case of a gas leak, an "area" color-change is observed.
- **Certain pipe metals** at a continuous high operating temperature environment (greater than 100°C/ 212°F) **may cause a color-change** on the tape even if a gas leak is not present.
- **Longer term high operating temperature** (over 60°C/ 140°F) or outdoor operation where exposed to **UV and/or rain may cause tape color-change to be slower.** Also, it may generate adhesive residue. Adhesive residue can be easily removed by rubbing.
- When **foreign particles** such as dust, sand, rust, etc. adhere to the tape's surface, they **may cause the color-change to be slower.**
- **Once DX-2106H is applied** on a surface, **do not remove and re-apply** it as it may introduce foreign particles onto the adhesive, influencing adhesion and Hydrogen detection performance.
- In case tape is applied on non-stainless steel pipes, colored water may be generated from the steel when it rains. Tape may be dyed with this colored water and it would be difficult to recognize a color-change by a hydrogen gas leak.
- **Aluminum and galvanized metal, in wet conditions, cause color-change** on the tape even if a gas leak is not present.
- **The influence of all kinds of paints have not been evaluated.** Some paints may influence hydrogen detection sensitivity. Especially, the outgas (odor) from the paint may prevent hydrogen from entering the adhesive layer and decrease its detection sensitivity.
- The **color** of the DX-2106H **can change if exposed to other reducing gases** such as hydrogen sulfide, carbon monoxide, etc. Please do not use this tape for detecting other reducing gases, like silane. Such gases have not been tested and may react with the tape aggressively.
- In case the tape comes into direct contact with some cardboard material, a premature discoloration may occur. When the product is **removed from its original box, it is recommended to store in a polyethylene bag.**
- **Please note that high speed rewinding may cause a static discharge to occur.**
- To remove remaining tape fragments, apply a secondary off-the-shelf adhesive tape on top and peel off. For removing residues apply organic solvent such as alcohols.



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