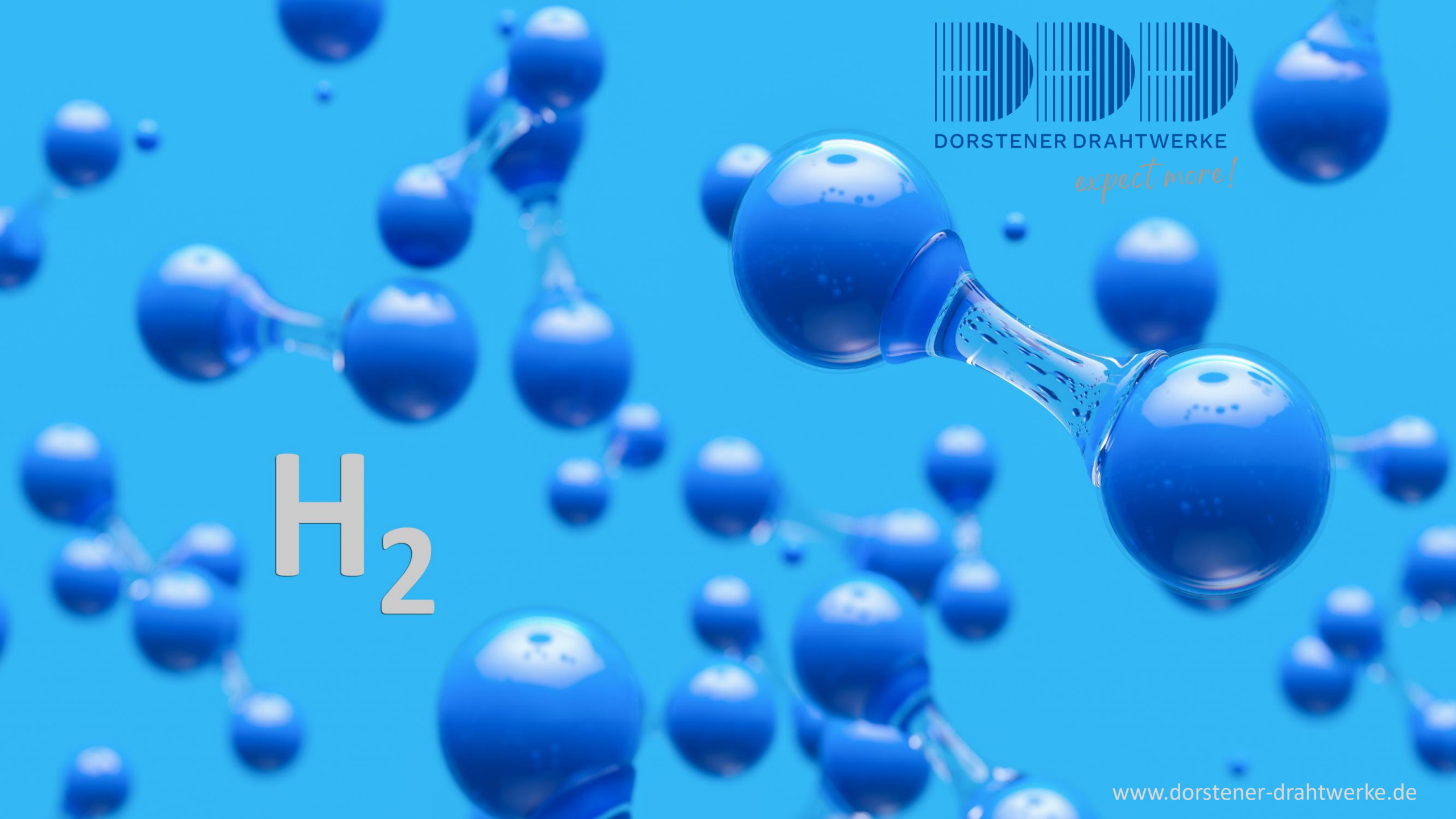
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Material solutions for the hydrogen industry

1

2 Woven wire mesh

3 Fiber felt

4 Sintered Laminate

5 Anion exchange Membrane - AEM

6 Proton Exchange Membrane - PEM

1

Material solutions for the hydrogen industry

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Our products are crucial to the effectiveness of these components:

- **electrodes**: The electrode has the surface where the chemical reaction occurs. It can be made of various materials - including platinum, stainless steel, titanium, and more. The choice of material depends on the specific requirements of the application. The electrode material must have good conductivity, stability and corrosion resistance to function properly.

- **power distributor or spacer:** The power distributor or spacer is used to distribute the electrical current evenly across the electrode surface. It helps ensure consistent performance and prevents damage to the electrode.

- **gas Diffusion Layer (GDL):** The GDL is a layer that allows for the diffusion of gases, such as oxygen or hydrogen, in and out of the electrode. It helps to maintain a stable environment for the chemical reaction to take place.

- **porous Transport Layer (PTL):** The PTL is a layer that facilitates the transport of ions, such as protons or hydroxide ions, in and out of the electrode. Materials are customizable, enabling customers to choose a product that meets their specific needs. With various options available, the products can be adapted to various applications, such as water transport, gas transport, and transport of ions.

2

Woven wire meshes

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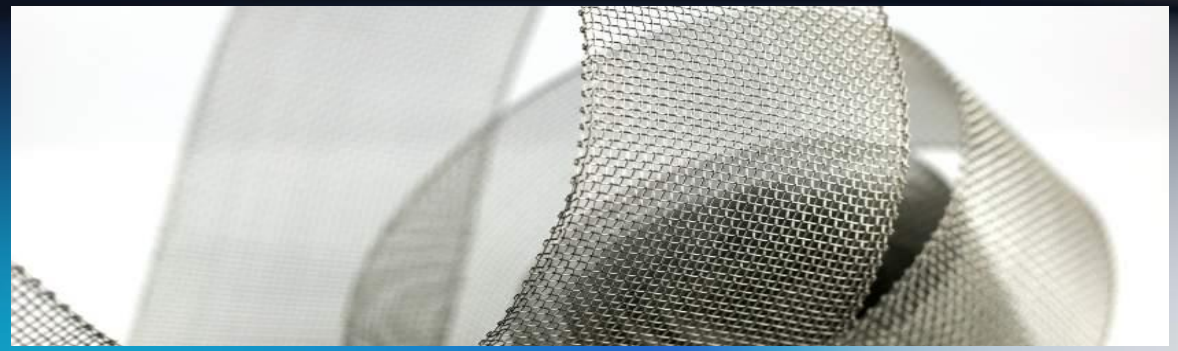
Advantages of using wire mesh for components in electrolysis

- perfect homogeneity due to repeatable openings with smallest production tolerances
- high permeability of the gas diffusion layer enables fast and efficient gas transport
- uniform power distribution through precise definition of media cross section
- the smooth contact surface reduces risk of damage of membrane and contamination
- exact tolerances of wire mesh thickness (measured in µm) allows precision in design
- mechanically durability and flexibility
- a wide range of material selection of materialfor challenging environments



3

Fiber felt

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Fiber felt material has unique characteristics

- The high porosity (> 50%) provides good flow and throughput rates
- smooth surface with different fibre thicknesses < 25 µm - lowest risk of membrane damage
- Good mechanical strength, especially when bonded to woven mesh
- Definable porosity, fibre thickness and overall thickness with tolerances in the µm-area
- Resistant material selection: Titanium Grade 1, Nickel and many more available

Diffusion bonded (sintered) Laminates

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Bonded multilayer design creates new advantages

- multilayer diffusion bonded structures can be designed with choices of woven wire meshes, fiber felts and other metallic components
- is durable with strong connection by diffusion bonding of the layers
- offers very uniform power distribution and exact definable cross-sections of media
- has a precise overall thickness with µm tolerances
- great fabricating and processing characteristics
- great conductivity and diffusion
- Wide range of materials availabale

AEM-Elektrolysis using woven wire meshes

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Cathode / Anode side:

- Wire mesh as power distributor and carrier of the catalytic active coating
- Wire mesh as electrode

- Wire mesh as spacer , conductor and diffusor (GDL)

Advantages:

- Easy coating possibilities (mechanically, galvanic)
- High distribution effect with small thickness
- Bridging of bigger gaps with little material requirement

AEM-Elektrolysis using fiber felts

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Cathode / Anode side:

- Fiber felt as power distributor and carrier of the catalytic active coating

Advantages:

- High distribution effect and small thickness
- Smooth top surface
- Large active material surface

AEM-Electrolysis

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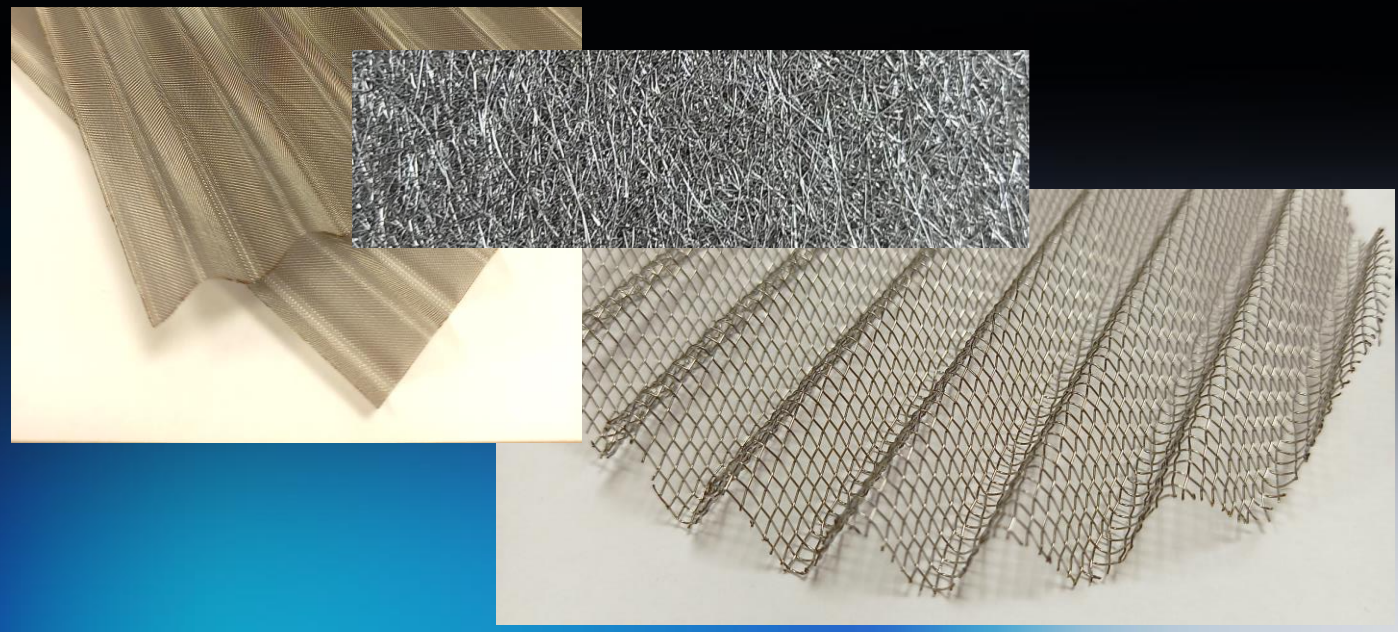
Some product ideas:

- Pleated wire meshes with good spring effect and little material volume as spacer on the anode side
- Fiber felts with small thickness and fiber thickness < 20µm
- Nickel mesh with mesh openings of 0,50 mm as carrier material

Materials:

- Nickel (Ni 99,2)
- Nickel base (various)
- Stainless Steel (316 / 316L)
- Nickel plated steel (1.0304)



PEM-Elektrolysis

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Some product ideas:

- multilayer laminates made from Titanium bonded with a Titanium sheet
- woven wire mesh and fibre felt substituting the assembly of the bipolar plate - GDL up to the membrane
- multilayer sintered laminates facilitate the handling during installation
- Fibre felts with small thicknesses (<0,4 mm) and fibre thicknesses of 22µm

Materials:

- Titanium (Grade 1)
- Stainless Steel (316/ 316L)

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Group of Companies

We are a leading material provider for the hydrogen production industry, offering woven wire mesh, fiber felt, and diffusion-bonded mesh laminate. Our team offers exceptional customer service and technical support.

We would like to discuss our products and services with you in more detail to meet your specific needs

DORSTENER DRAHTWERKE
Group of Companies

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