

# Hydrogen Generation

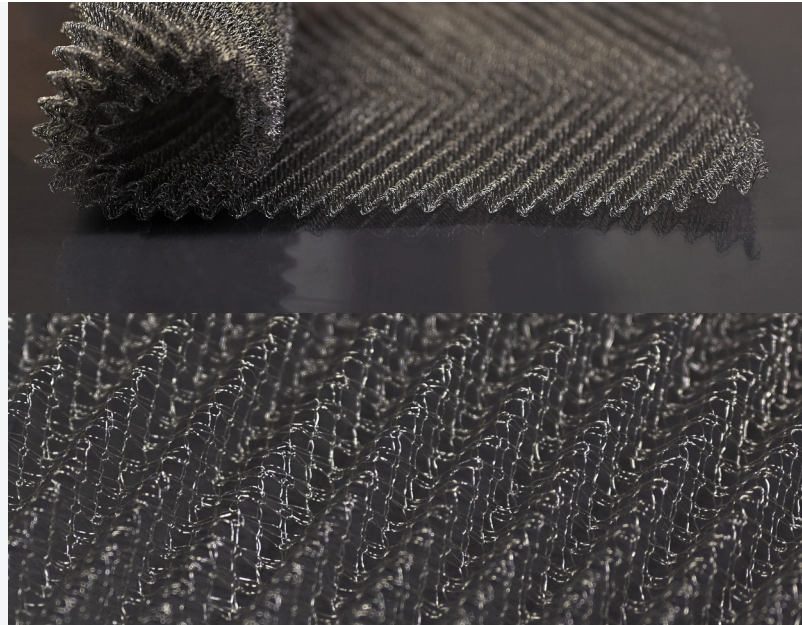
Highly compressible, conductive and resilient knitted mesh for use in electrolysis applications



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**Due to its highly compressible, conductive and resilient elastic properties, knitted mesh is often used as an electrical current carrier, conductive spacer or electrode, in the extremely harsh environments associated with electrolysis processes.**

Hydrogen can be produced from a variety of natural resources including oil, coal, gas and water, and can be stored as either a liquid or a gas. Green hydrogen is produced by a process of electrolysis that splits water into hydrogen and oxygen using electricity that has been produced from renewable sources such as wind, solar or hydro energy.



## Principles of Operation

Knitted mesh is often specified for use in Polymer Electrolyte or Proton-Exchange (PEM) or Ion Exchange (IEM) Membranes, and alkaline (non-membrane) zero-gap electrolyser cell applications, within which the processing conditions can be extremely harsh.

The mesh is available in an infinite range of widths and a variety of corrosion resistant materials including transition metals such as nickel and titanium. The mesh, which can be tailored to individual customer specifications, offers a reliable solution that reduces cell voltage and improves process efficiency. The mesh is highly corrosion resistant and able to withstand the demanding operating temperatures and pressures, and the caustic nature of any electrolyte solutions – normally potassium hydroxide (KOH).

Knitted mesh, in crimped, conductive, compressible fabric form, is used in a number of electrochemical applications including fuel cells, chlor-alkali production, power-to-gas applications, and (hydrogen-from-water) electrolysis.

The mesh is used to optimise the electrical and pressure contact between cells, divider stacker plates, and membranes or diaphragms in electrolysis cell stacks and modular cell cartridges.

This strong and flexible material is created from a web of interlocking wire loops (typically using 0.15mm diameter wire) and is ideally suited for use in a wide range of Hydrogen Generation applications.

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## Features & Benefits

- Uniform compressibility ('spring force'): ensures an even force is applied to the electrode or membrane
- Elastic properties: facilitate reduced cell voltage and energy use thus ensuring improved overall process efficiency and significant cost reductions
- High resilience: compression ratios of >50%, with no plastic deformation, facilitates the use of knitted mesh in a wide range of harsh operating environments
- Scalable: superior gap control from <1mm and up to virtually any width required in cell stacking applications
- No wire breakages: reduces risk of puncture to the membranes in PEM applications
- Open structure: allows the hydrogen gas produced to rise up to the top of the cell for easy collection
- Fail-safe: cut-ends (along only 2 sides) can be enclosed to protect the membrane
- Multi-use: mesh can be used as the current carrier, spacer or electrode
- Bespoke: can be produced from any metal including pure nickel or titanium (typical 0.15mm diameter)

## Quality Assurance

KnitMesh Technologies® is accredited to:

ISO 9001 : 2015, ISO 14001 : 2015, ISO 45001 : 2018,

PAS 99 : 2012 and IATF 16949 : 2016



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