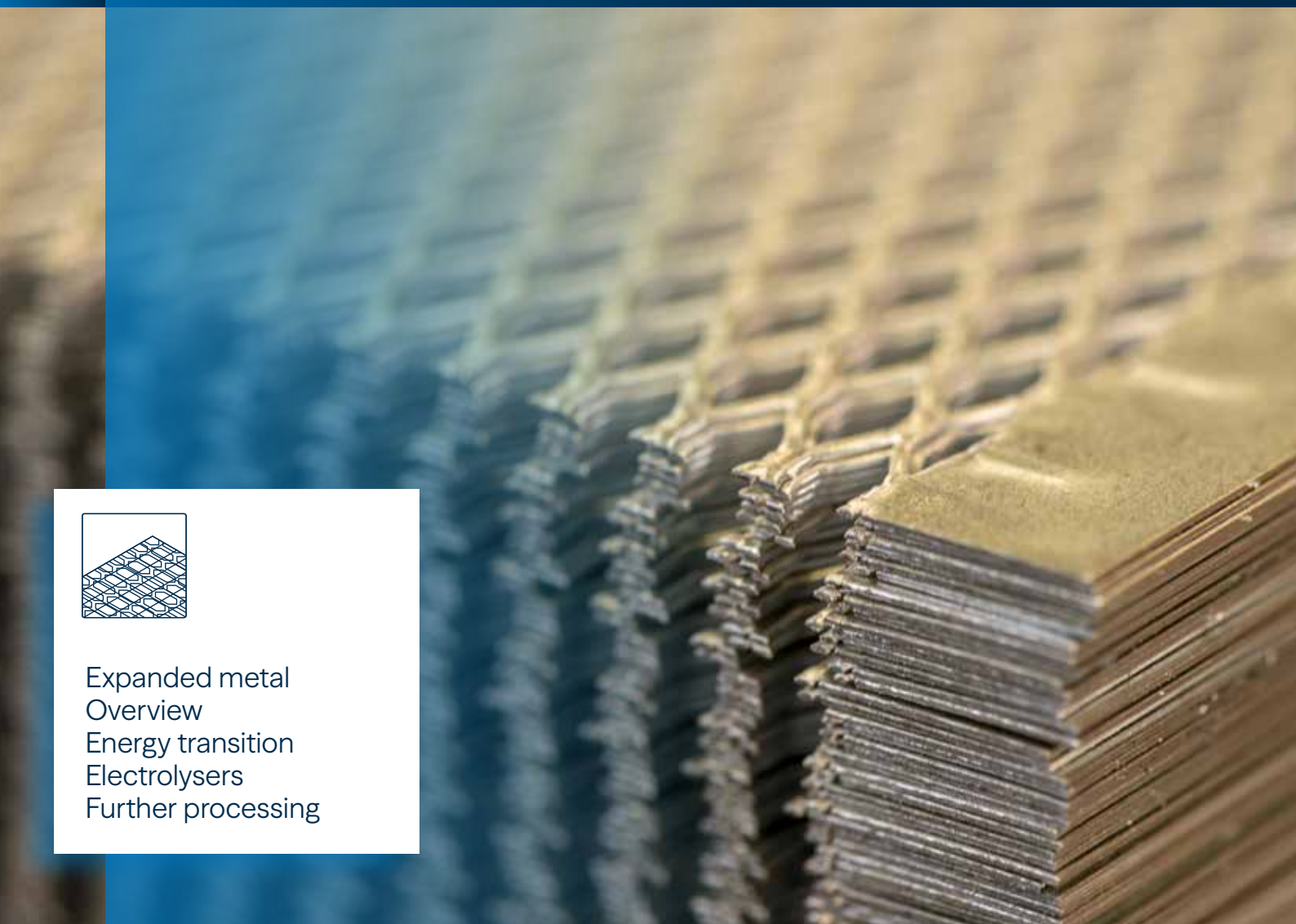
MEISER

Expanded Metal

Expanded metal for use in renewable energy



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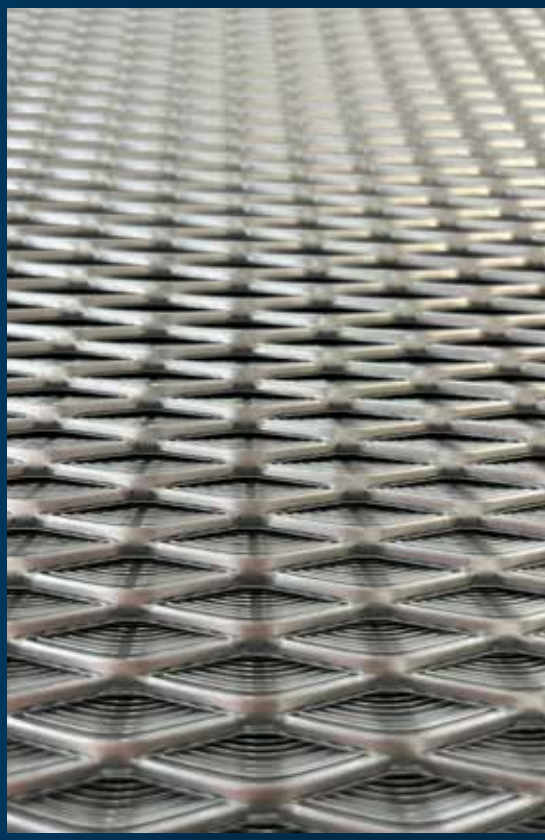

Efficiency with vision

Even after 70 years of company history, MEISER remains true to the principles that made the company strong: working reliably, thinking long term, taking responsibility and maintaining direct contact with customers. Tradition is not about looking back, but it does form the basis for the further development that extends far beyond the company's headquarters in Saarland.

Today, around 4,000 employees work for MEISER, including more than 2,800 in Germany. The two main production sites in Saarland and Saxony form the company's industrial foundation. They are complemented by production facilities in Dubai, Hungary, France, Belgium, Egypt, Brazil, Morocco, Romania, the Czech Republic, the US, Mexico and Turkey. In addition, further branches connect us with all major markets.

This creates a combination that defines MEISER: international capability and personal support on site. Customers benefit from short distances, direct communication and an understanding of regional requirements – backed by the experience of a company that has been active in different markets for decades and has a broad market presence.

As a steel-processing company, MEISER is active in the fields of gratings, sheet metal profiles, GRP, slit strip and galvanising. Further business areas, such as road safety, expanded metal, viticulture products and mounting systems for photovoltaic installations as well as scaffolding and sliding fittings, expand the portfolio and show how versatile the company's expertise can be.

Managing Directors Ulrich and Wolfgang Meiser

For us, an important factor in our quality is our high level of in-house value creation. With our own galvanising plants, slitting facilities and cold rolling mills, MEISER can control and coordinate all the central processes itself. This creates reliability – from planning through to the finished product. Modern production technology, state-of-the-art machinery and committed employees provide the foundation for stable processes and economical solutions.

Despite this growth, the focus on the customer remains decisive. For MEISER, progress means not only new technology or greater capacities, but, above all, better solutions developed through direct exchange. Many exceptional projects have emerged from this collaboration. They show what becomes possible when experience, proximity and trust come together.

We combine 70 years of company history with international presence and personal support. Customers can rely on this, today and in the future. MEISER – built for generations.

MEISER

Our business divisions are synonymous with leading solutions in steel processing.

SCAN

From the initial concept to the finished product, we support you with our expertise and innovative solutions in steel. We manufacture, finish and deliver with clearly defined responsibilities.
We operate cost-effectively and responsibly. With strong regional roots and an international presence, we provide reliable planning for your projects – from the initial consultation through to final acceptance.

Gratings

Customised solutions for complex tasks

meiser.de/en/business-areas/gratings

Road Safety

Well-thought-out solutions for the most stringent safety requirements

meiser.de/en/business-areas/road-safety

Solar Systems

Innovative mounting technology for the energy of tomorrow

meiser.de/en/business-areas/solar-systems

Agri Solutions

Genuine expertise for growing demands

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Expanded Metal

Custom-made expanded metal designs at their best

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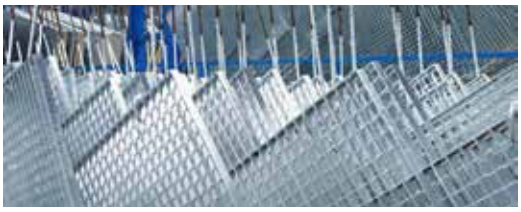


Coating

Precision coatings for reliable corrosion protection

meiser.de/en/business-areas/coating

Other Solutions

Versatile solutions for specific challenges

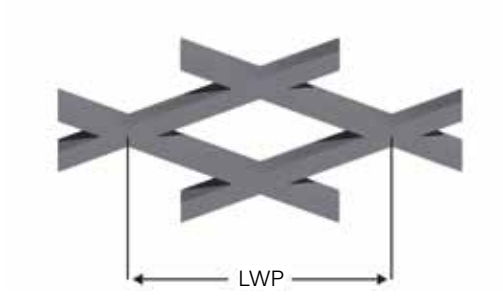
meiser.de/en/business-areas/other-solutions

Overview - Expanded metal

Expanded metal is a thin sheet of metal that is stretched using a special process to create a perforated pattern with uniform openings. The openings are created by staggered cuts without any loss of material, whilst the metal is simultaneously stretched and deformed. It is manufactured from sheets or strips. The mesh is neither woven nor welded. Expanded metal can therefore be cut to any desired size without losing its structural integrity.

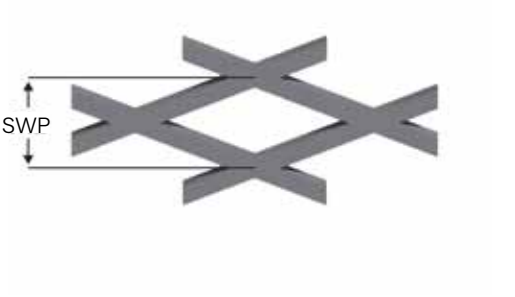
Expanded metal is manufactured from a single piece, which means that there are no stressed joints or weld seams. Consequently, nothing can come loose from expanded metal. It does not lose its structural integrity or disintegrate, as can be the case with woven or knitted mesh. Expanded metal is therefore suitable for applications where durability, elongation and dimensional stability are required, even for the smallest pieces. Expanded metal also offers advantages over perforated sheet metal. Due to its resource-efficient production, expanded metal is more cost-effective than perforated sheet metal.

Long way pitch (LWP)



The distance between two opposite nodes along the long diagonal of the mesh – an important parameter for the sizing of expanded metal.

Short way pitch (SWP)



The distance between the nodes along the short diagonal of the mesh – this affects air and light permeability as well as strength.

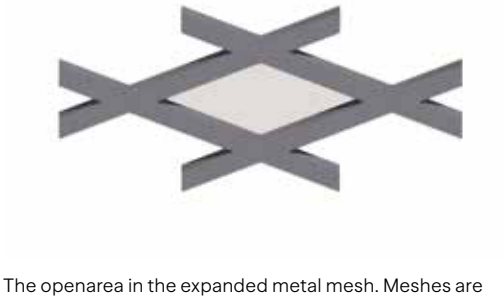
Strand width (SWDT)

The width of the metal material between the openings – this affects the stability, load-bearing capacity and appearance of the mesh.

Strand thickness (STK)

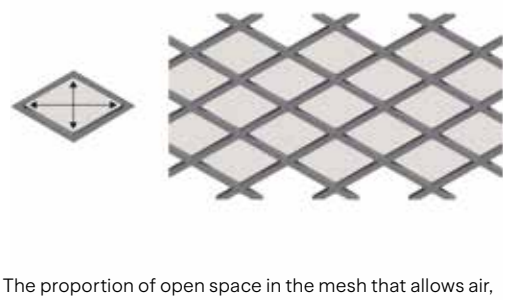
Thickness of the material used – important for load-bearing capacity, weight and finish.

Mesh aperture



The openarea in the expanded metal mesh. Meshes are classified according to their mesh length and width and are selected depending on the intended application.

Open cross-sectional area

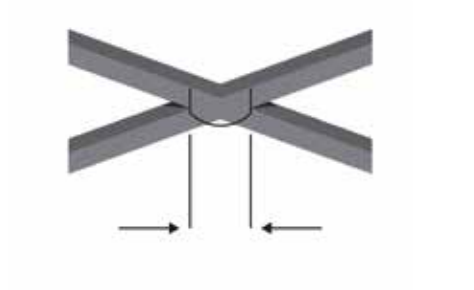


The proportion of open space in the mesh that allows air, light or liquids to pass through – important, for example, for ventilation, protection or filtration.

Knuckle

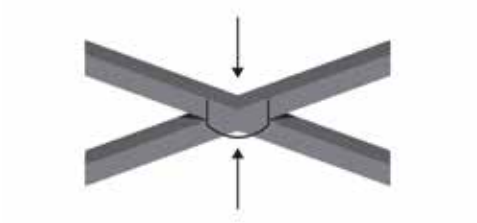
The area where four strands intersect – a structural reference point for determining mesh parameters and strength.

Knuckle length



Dimensions that describe the distance between two long diagonals and affect dimensional stability and aesthetics.

Knuckle width

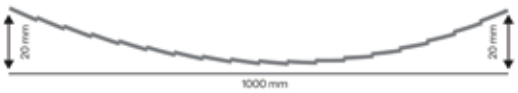


Dimensions, approximately twice the strand width (SWDT), and their impact on dimensional stability and aesthetics.

Expanded metal thickness

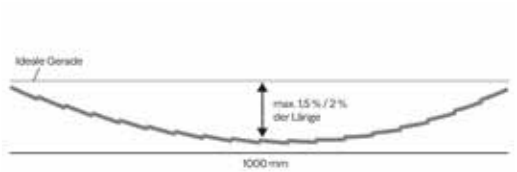
Total thickness of the expanded metal

Planarity



Expanded metal is considered flat if, when laid on a flat surface with the curvature facing upwards, the greatest distance between the sheets and that surface does not exceed 20 mm (per 1000 mm width). For heat-resistant sheets, this distance may be 40 mm.

Curvature



Expanded metal is considered to be straight along its longitudinal edge if, for sheet thicknesses up to 3 mm, the centre of curvature deviates from the straight line by no more than 1.5% of the length; for sheet thicknesses exceeding 3 mm, it deviates by no more than 2% of the length of the straight line.

Cut type

When cutting the expanded metal mesh to size, specific requirements regarding the cutting method must be observed. The following cutting methods are distinguished:

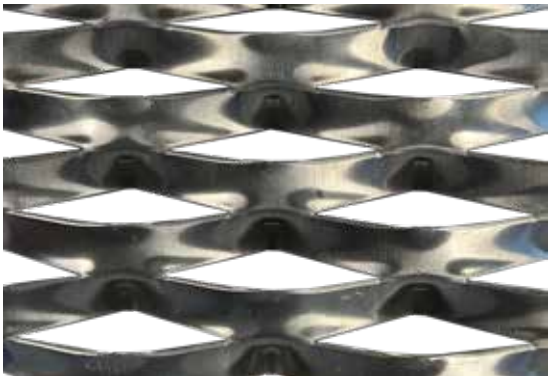
- BsLo: Width symmetrical, length open
- BgLo: Width closed, length open
- BLg: Width and length closed
- BLo: Width and length open / cut arbitrarily

Our expanded metal

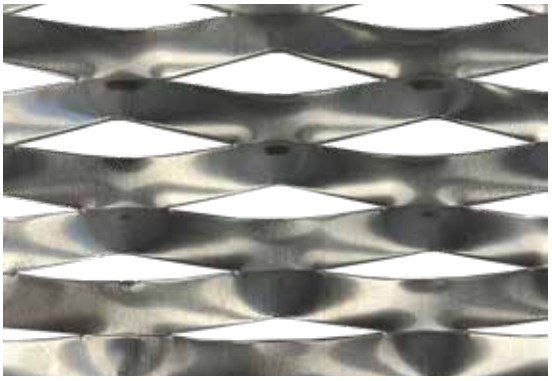
can be installed in four different directions

A-side facing the direction of insertion

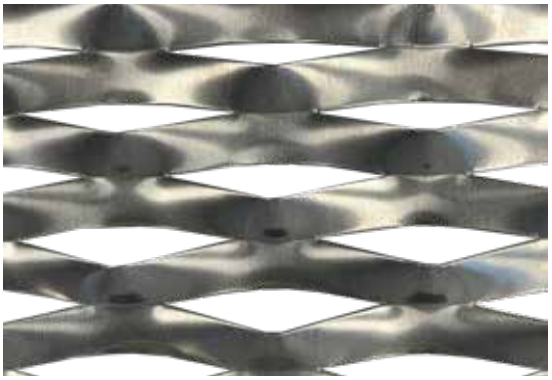
A-side facing away from the direction of insertion



B-side facing the direction of insertion



B-side facing away from the direction of insertion



Expanded metal for the energy transition

The energy transition is one of the greatest challenges of our time. Yet it is also one of the greatest opportunities.
Choosing the right materials plays a crucial role in this. Expanded metal has been used successfully for several years, particularly in the generation of renewable energy from hydrogen. It therefore helps to achieve the goals of the energy transition efficiently and sustainably.

When used in an electrolyser or a fuel cell, the following advantages of expanded metal are particularly significant:

- Good flow-through on three sides at the break-off edge (gas bubbles)
- High electrical conductivity
- Good heat dissipation
- Resource-efficient and cost-effective production
- High rigidity
- High corrosion resistance

Expanded metal plays an important role in the generation of renewable energy

Expanded metal used in electrolysers

In the production of hydrogen gas (H2), water is broken down into its constituent parts using electricity. Expanded metal is primarily used in alkaline electrolysis and proton exchange membrane (PEM) electrolysis. It is installed in the stack and is used at both the anode and the cathode. Expanded metal performs the following functions:

- It acts as a gas diffusion layer (GDL) and promotes the even distribution of hydrogen and oxygen across the electrodes. At the same time, it facilitates the release of water and gas. The open, three-dimensional structure enhances diffusion, leading to an increased reaction rate and thus improving overall efficiency.
- Expanded metal can conduct electrons from the anode and cathode and thus acts as a current collector. Its excellent conductivity and large surface area are particularly advantageous in this regard.
- Heat dissipation and cooling of the electrolysers are facilitated by the open structure of the expanded metal and the good thermal conductivity of the materials used. The good gas and water circulation contribute effectively to the cooling of the cell, thereby increasing the service life and performance of the systems.

Expanded metal is used in electrolysers for the production of hydrogen

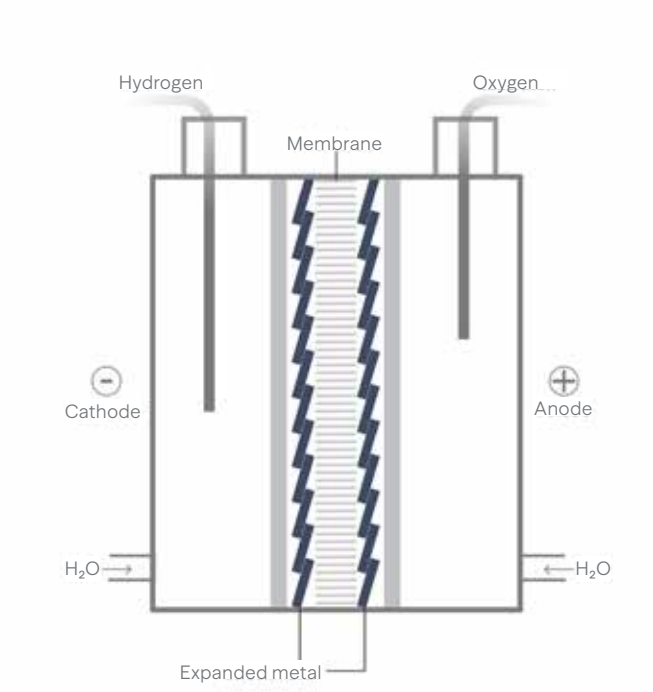
Alkaline electrolysis (AEL)

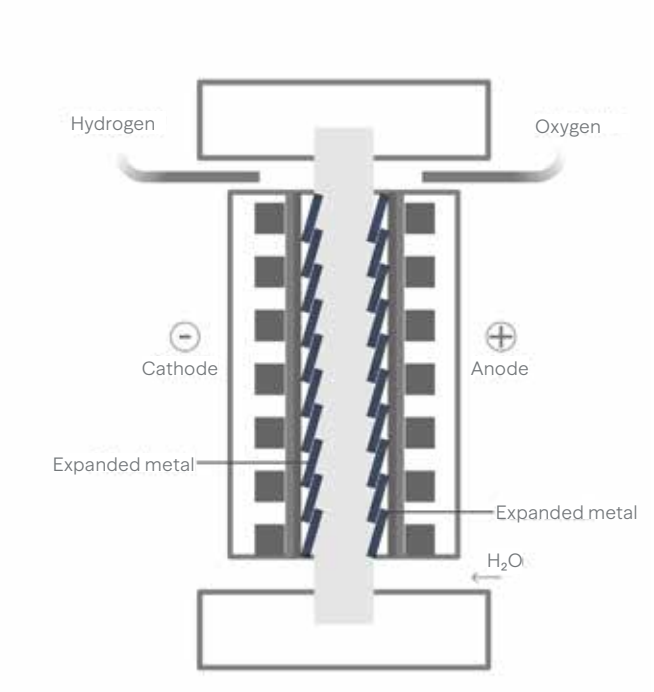
Alkaline electrolysis is the longest-established type of electrolysis. This method of electrolysis has been a common method of hydrogen production since the 1950s.

In AEL, the electrodes are immersed in an alkaline aqueous solution. The two electrodes (anode and cathode) are separated by a permeable membrane. Expanded metal is used in both the anode and the cathode. Applying a voltage causes hydrogen and oxygen to be split. Oxygen is produced at the anode and hydrogen at the cathode. In this system, expanded nickel metal is generally used.

Proton Exchange Membrane (PEM) electrolysis

In PEM electrolysis, a solid polymer electrolyte is used, which is surrounded by water. The two electrodes – the anode and the cathode, which incorporate expanded metal – are separated by a semi-permeable membrane. When a voltage is applied, oxygen is produced at the anode and hydrogen at the cathode in PEM electrolysis as well.
In this system, expanded metal grids made of titanium or stainless steel are generally used.





Other types of electrolysis

Although expanded metal is currently used primarily in alkaline and PEM electrolysis, it can also be employed in other electrolysis processes, such as the Solid Oxide Electrolyser Cell (SOEC). We also offer a comprehensive range of expanded metal products for installation in fuel cells, in which hydrogen gas is used to generate electricity, e.g. for electric drives. Regardless of the material – whether aluminium, nickel, titanium, stainless steel or copper alloys – we offer a wide range of mesh sizes and cut-to-size sheets.

Mesh
used in electrolysers

Micro mesh and fine mesh are the preferred mesh sizes in energy generation

Expanded metal with mesh sizes ranging from micro mesh to fine mesh is particularly suitable for use in electrolysers.

Micro mesh covers the range of the smallest mesh sizes, specifically from 0.5 mm to 5.9 mm. Fine mesh covers the range from 6.0 mm to 22.0 mm. In electrolysers, mesh sizes typically range from 0.5 mm to 16 mm.

The material thickness for expanded metal used in the renewable energy sector is often between 0.1 mm and 2.0 mm. We would be happy to advise you on your project.

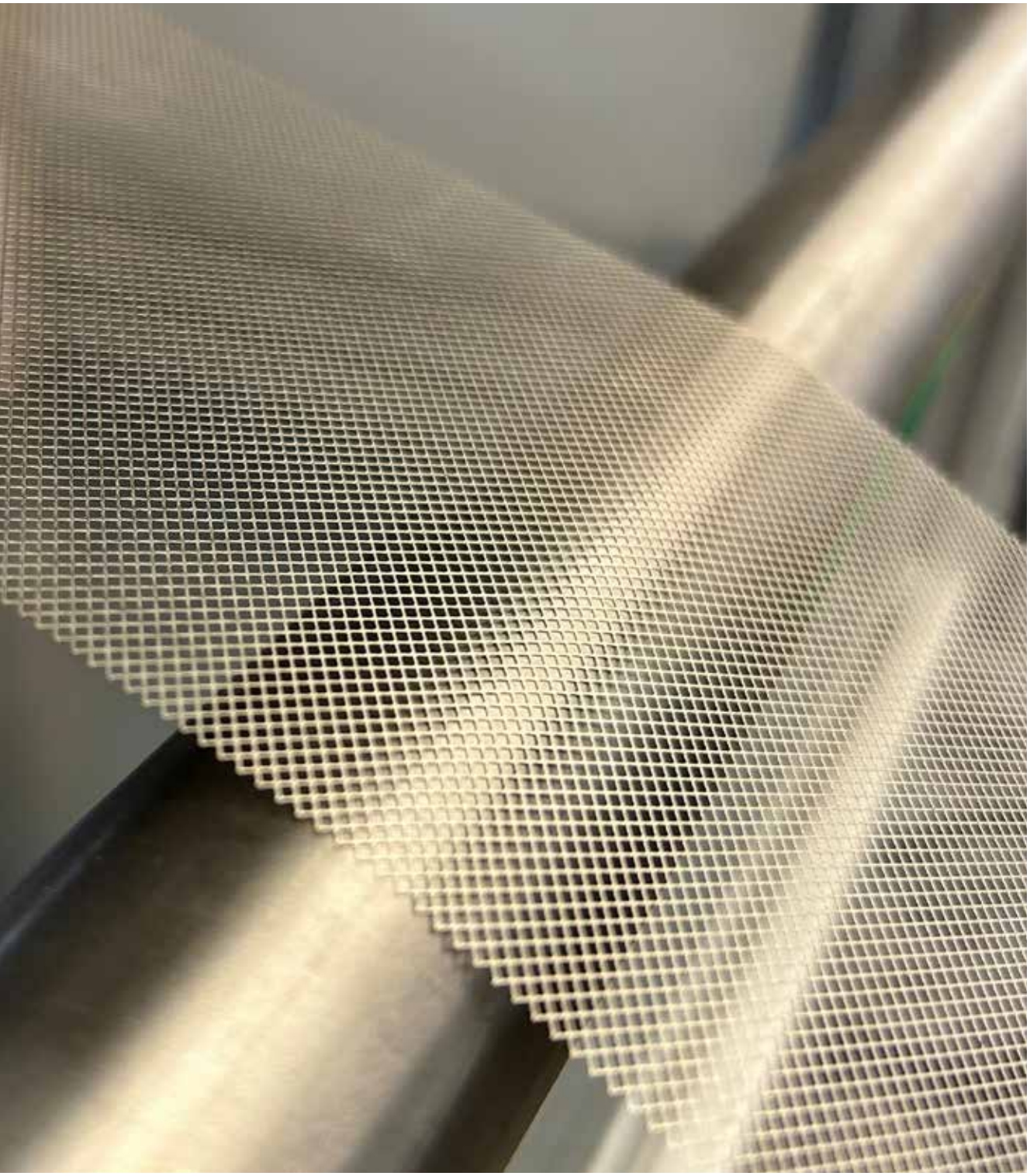
The materials commonly used in the electrolysis or fuel cell sector include:

- Aluminium
- Stainless steel
- Copper
- Nickel
- Titanium
- Special metals

Furthermore, we are always keen to develop new expanded metal variants in collaboration with our customers to achieve the best possible overall result.

Generally speaking, expanded metal is an excellent, more cost-effective alternative to woven mesh or perforated sheet metal. Whether three-dimensional or flat-rolled, expanded metal offers high economic efficiency.

Further processing - flexible thanks to expanded metal



Expanded metal in a roll

In addition to expanded metal as a semi-finished product, we also offer further processing and finishing services for metals. In this way, we aim to provide our customers with the most comprehensive service possible.

We can offer you the following finishing options:

- Rolling (both vertical and flat)
- Heat treatment
- Degreasing
- Notching, drilling, laser cutting and punching
- Edging, profiling, bending
- Pleating
- Anodising
- Hot-dip galvanising and electrogalvanising
- Painting
- Powder coating

Efficient further processing for industrial requirements

Space for your notes

since 1956
in Schmelz-Limbach

since 1991
in Oelsnitz/Vogtland

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2. The Expanded Metal Company
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4. Meiser Sarl
5. Meiser Fameco S.A.
6. Distriroute SAS
7. Gebrüder Meiser GmbH
   Meiser Solar GmbH
   Meiser Road Safety GmbH
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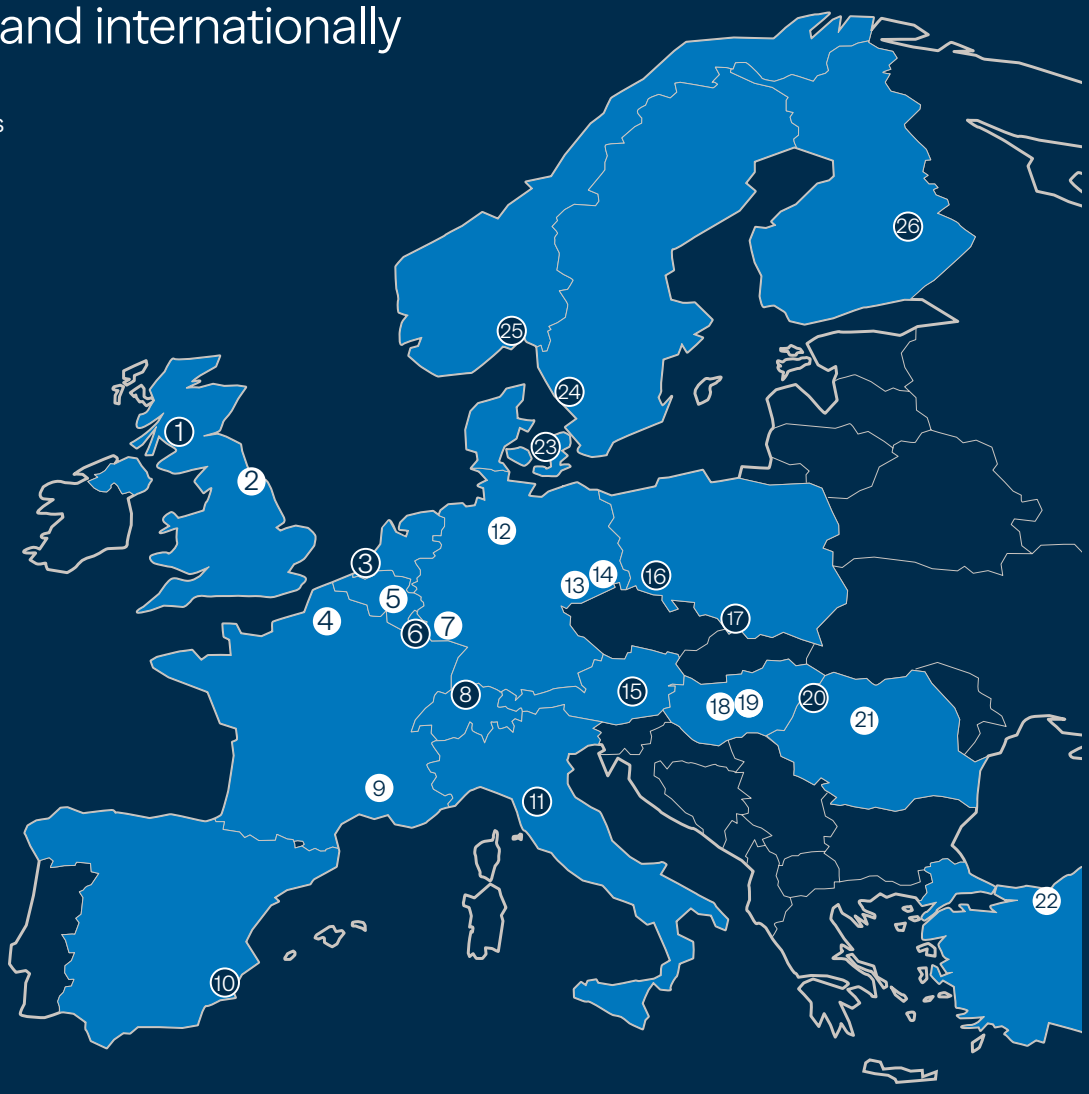
MEISER's production sites and branches. Nationally and internationally

Production sites

Offices



MEISER Worldwide

SCAN

Scan here to see all MEISER locations and other branches – worldwide

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