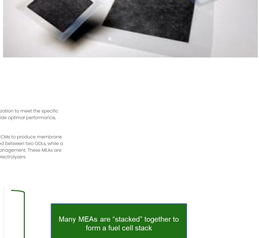
Products and Services

Membrane Electrode Assembly (MEA)

Our Membrane Electrode Assemblies (MEAs) stand at the core of our innovation, driving advancements in fuel cell and electrolyser technology. Designed to meet the needs of both automotive and stationary applications, our MEAs represent a significant advancement in the hydrogen economy.

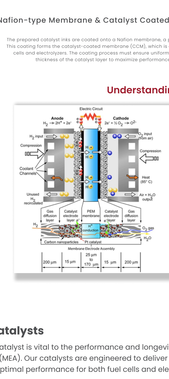
We leverage strategic partnerships with global leaders to access a wide variety of MEA components. This allows us to offer tailored solutions that meet any end customer specifications, ensuring that our MEAs integrate seamlessly into diverse systems.



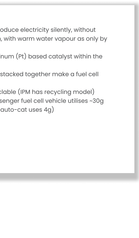
Versatile Layer Configurations of MEAs: 3-5-7

Isondo offers MEAs in 3, 5, or 7-layer configurations, allowing for precise customization to meet the specific requirements of various applications. This flexibility ensures that our MEAs provide optimal performance, longevity, and efficiency.

In this step, gas diffusion layers (GDLs) and other components are added to the CCMs to produce membrane electrode assemblies (MEAs). A 5-layer MEA typically consists of a CCM sandwiched between two GDLs, while a 7-layer MEA includes additional layers for improved gas distribution and water management. These MEAs are essential for efficient electrochemical reactions in fuel cells and electrolysers.



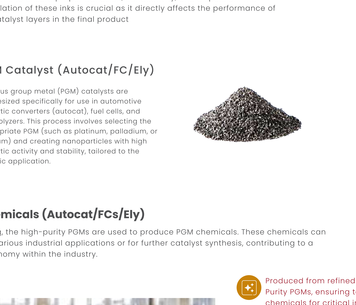
Many MEAs are "stacked" together to form a fuel cell stack



Nafion-type Membrane & Catalyst Coated Membrane (CCM)

The prepared catalyst inks are coated onto a Nafion membrane, a proton-conductive polymer. This coating forms the catalyst-coated membrane (CCM), which is a critical component of fuel cells and electrolysers. The coating process must ensure uniform distribution and optimal thickness of the catalyst layer to maximize performance and durability.

Understanding What a Fuel Cell is



- Fuel cells produce electricity silently, without combustion, with warm water vapour as only by product
- Utilises platinum (Pt) based catalyst within the MEA
- Many MEAs stacked together make a fuel cell stack
- Highly recyclable (IPM has recycling model)
- Typical passenger fuel cell vehicle utilises ~30g of Pt (cf. an auto-cat uses 4g)

PGM Catalysts

The PGM catalyst is vital to the performance and longevity of the Membrane Electrode Assembly (MEA). Our catalysts are engineered to deliver high efficiency and durability, ensuring optimal performance for both fuel cells and electrolysers.

We are continuously developing novel catalysts through partnerships with local R&D institutions and globally recognised leaders in catalyst development. This collaboration ensures that our products are always at the cutting edge of technology.

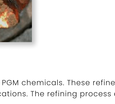
High-Performance Catalyst Ink

Developed in collaboration with local R&D institutions and global experts, our catalysts ensure superior efficiency and durability, making our MEAs a reliable choice for advanced fuel cell applications.

The synthesized PGM catalysts are then used to prepare catalyst inks. This involves dispersing the PGM catalysts in a solvent, ionomer, and other additives to ensure proper adhesion, conductivity, and dispersion. The formulation of these inks is crucial as it directly affects the performance of the catalyst layers in the final product

PGM Catalyst (Autocat/FC/Ely)

Precious group metal (PGM) catalysts are synthesized specifically for use in automotive catalytic converters (autocat), fuel cells, and electrolyzers. This process involves selecting the appropriate PGM (such as platinum, palladium, or rhodium) and creating nanoparticles with high catalytic activity and stability, tailored to the specific application.



PGM Chemicals (Autocat/FCs/Ely)

After refining, the high-purity PGMs are used to produce PGM chemicals. These chemicals can be used in various industrial applications or for further catalyst synthesis, contributing to a circular economy within the industry.

- Produced from refined High-Purity PGMs, ensuring top-quality chemicals for critical industrial uses
- Perfect for further catalyst development, providing the foundation for high-performance catalytic systems.
- Suitable for use across multiple industries, including automotive, energy, and chemical processing
- Manufactured from recycled and refined PGMs, contributing to a sustainable, circular economy

MEA/Catalyst Recycling & PGM Recovery

Used catalysts and MEAs are collected for recycling to recover valuable PGMs. This process involves disassembling the MEAs, separating the components, and using chemical and physical methods to extract the PGMs from the catalyst materials. Recycling helps reduce the demand for new PGMs and minimizes environmental impact.

Sustainability and Recycling

Designed with recyclability in mind, ensuring that components can be recovered and reused, minimizing environmental impact and contributing to a circular economy in the hydrogen industry

The project will also recycle the spent/waste MEAs and catalysts back into their constituent PGMs and finally is also installing significant State-of-the-Art laboratory facilities to analyse and test the MEAs, catalysts and PGMs.

PGM Refining

The recovered PGMs are then refined to produce high-purity PGM chemicals. These refined PGMs can be used again for catalyst synthesis or sold for other industrial applications. The refining process ensures that the recovered
metals meet the stringent quality standards required for high-performance catalytic applications.

Consulting & Business Development

Our management team and advisory board are globally recognized experts in the fuel cell and hydrogen industries with a wealth of experience and a proven track record. Leverage our extensive industry knowledge and sector-specific expertise to elevate your business and gain a competitive edge.

Global and Local Market Analysis

We provide in-depth market research to help you understand the current landscape and future trends in the fuel cell and hydrogen sectors of South Africa.

Technology Trends

Stay ahead of the curve with our detailed analysis of emerging technologies and innovations in fuel cells, hydrogen, and mobility.

ISONDO PRECIOUS METALS

Facility
SEZ - Special Economic Zone
Building 7, cnr. Cote D'Azur Avenue & Bonaero Drive
Bonaero Park, Kempton Park, 1622, Gauteng

Corporate Offices
FutureSpace
61 Katherine Street
Sandhurst, Sandton, 2149, Gauteng