

**INEOS**  
Electrochemical  
Solutions

## **BICHLOR™ Electrolyser**

State-of-the-art Chlor-alkali Production Technology



# BICHLOR delivers superior energy performance

Safety and efficiency are at the heart of the BICHLOR electrolyser. This innovative bipolar technology delivers significant energy savings and long-lasting performance over a lifetime of chlor-alkali production.

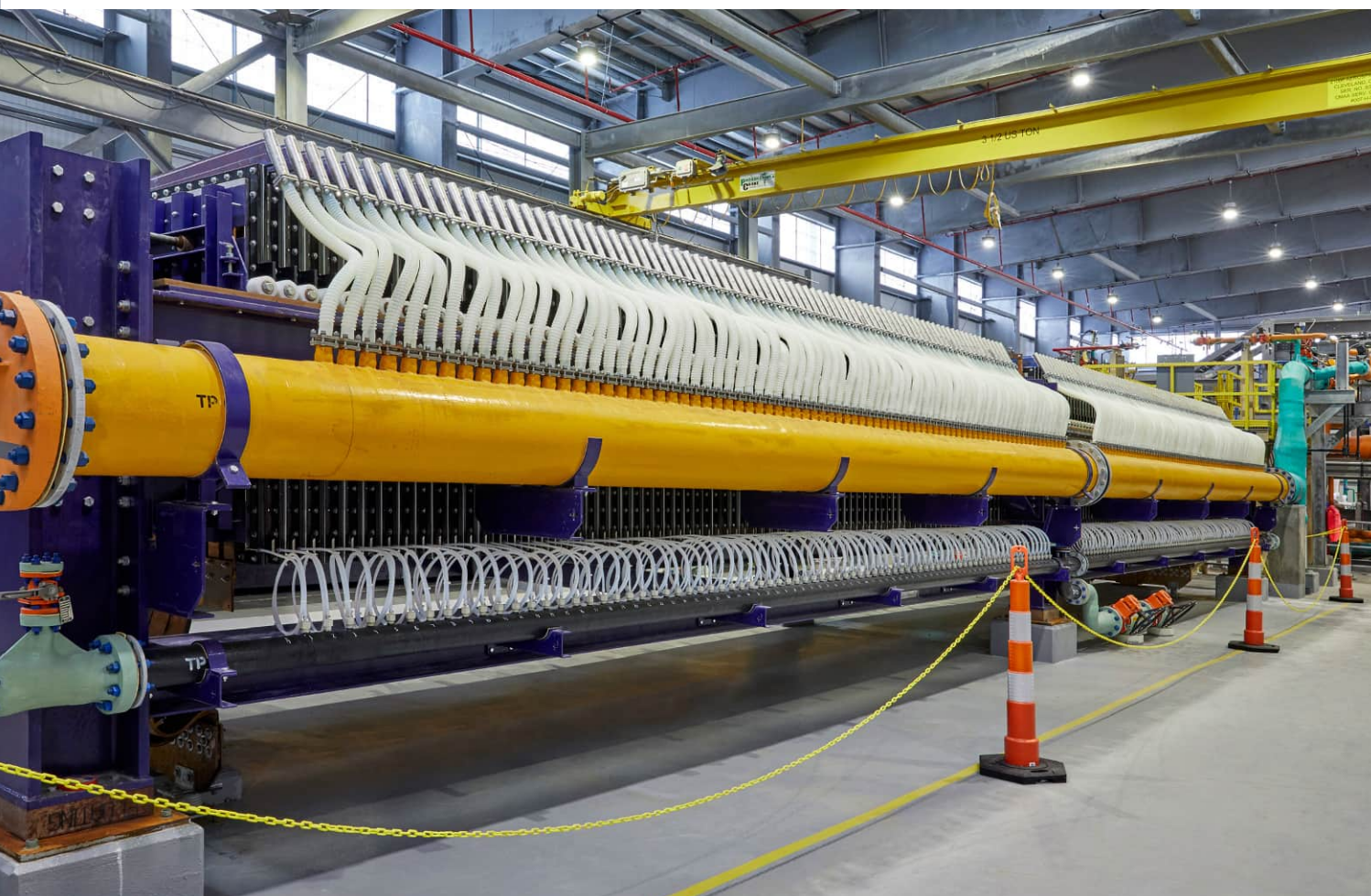
## 1941\* kWhr/te NaOH power consumption @ 6 kA/m<sup>2</sup>

BICHLOR represents a significant step forward in electrolyser design and construction, featuring a modular approach that streamlines maintenance and minimises plant downtime. Each discrete module – consisting of anode, membrane and cathode – can be removed independently, maintained in workshop-controlled conditions, and replaced without affecting the installation's operation.

## Trust technology that lasts a lifetime

As all BICHLOR components are built to last by our team at INEOS Electrochemical Solutions, you benefit from years of reliable, efficient performance backed by our unrivalled electrolysis expertise.





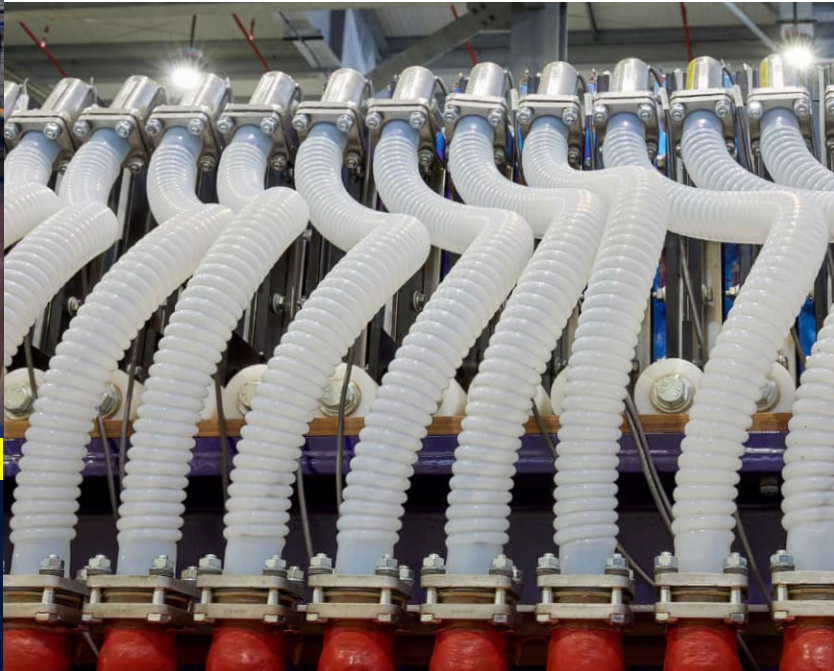
## Discover the BICHLOR advantage

BICHLOR electrolyzers out-perform the closest alternative technology on a range of key technical dimensions.

	BICHLOR	Closest alternative technology performance
Active unit area, m <sup>2</sup>	3.4	2.7 - 3.27
Pressure range, mbarg	0 - 400	0 - 400
Cathode coating life, years	8	8
Anode coating life, years	8 - 12	8 - 10
Max current density, kA/m <sup>2</sup>	7	7
Expected life of units, years	30+	20
In-Pan re-coating	Yes	Yes
Access to electrode pool	Yes	Sometimes
Pan wall thickness, mm	1	0.8



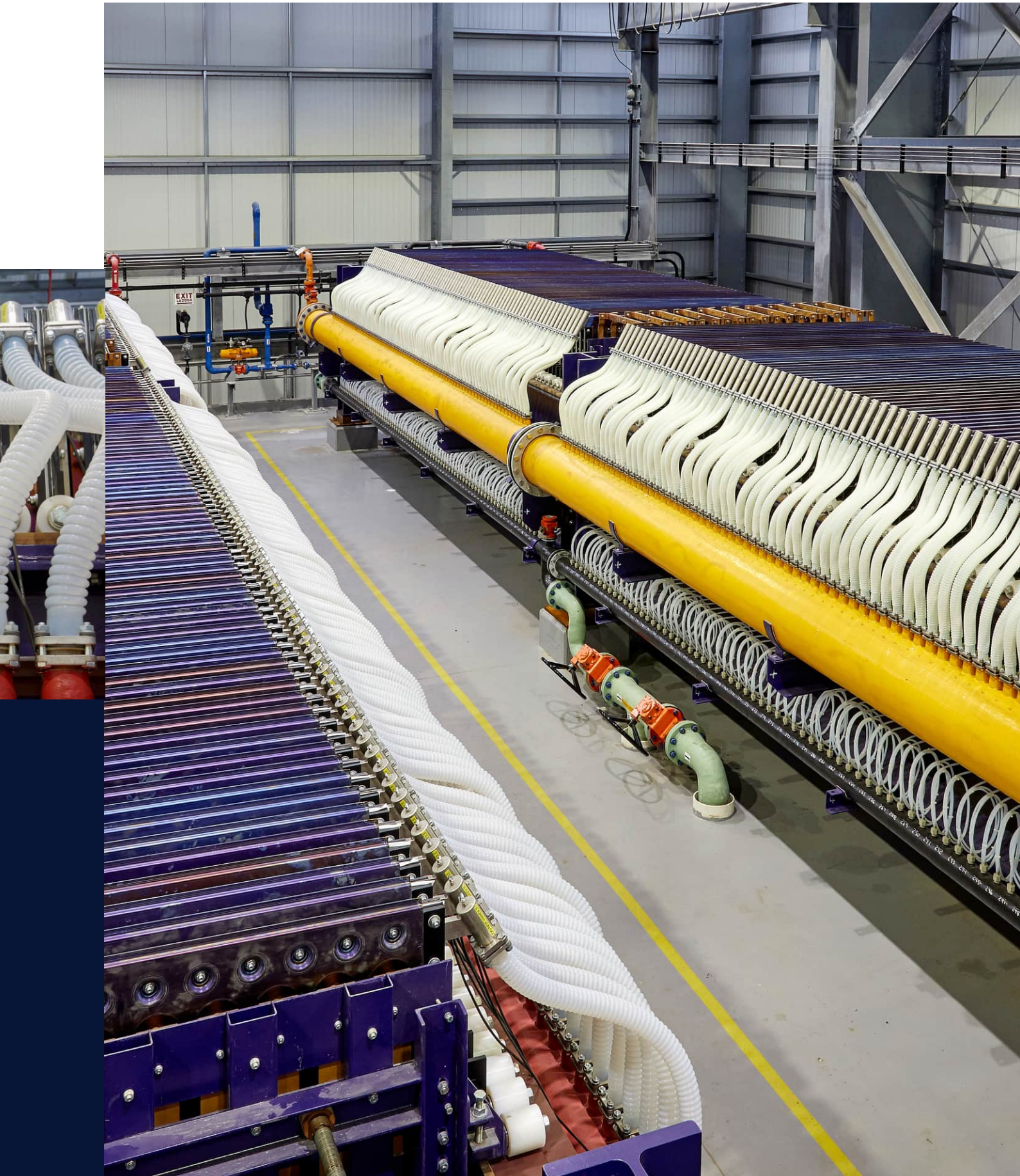
# We make every design detail count for safe, efficient and reliable daily operation



- Very low power consumption of 1941\* kWhr/te NaOH @ 6 kA/m<sup>2</sup> delivers significant energy savings
- Class leading output of 52,000 MTPA NaOH per electrolyser\*\*
- Robust, safe construction with superior strength and resistance to damage and distortion
- Large effective working area of 3.4m<sup>2</sup> per module means fewer modules are required per tonne of NaOH
- Support from our global network of expert, specialist teams
- Zero gap technology' delivers full use of the membrane area and extends the membrane's life
- With the widest operational pressure range, all operator requirements can be met
- Single or double-pack installations enable planning for future expansion
- Modular design enables pre-installation pressure testing, simpler and safer maintenance, and offline preparation for rapid electrolyser turnaround
- Fully wetted membrane design and external header helps protect against explosions and membrane damage
- Open mesh cathode structure reduces localised heating and concentration high spots that can cause membrane damage
- Advanced module sealing reduces the risk of leakage and corrosion
- Proprietary, long-life electrode coatings contribute to reduced power consumption and enhanced electrolyser performance

\*Expected value @ 385mbarg, 90°C and 32wt% NaOH, subject to coating and membrane selection. \*\*Based on 350 days operation and 7kA/m<sup>2</sup>







# CHLORCOAT™ coatings

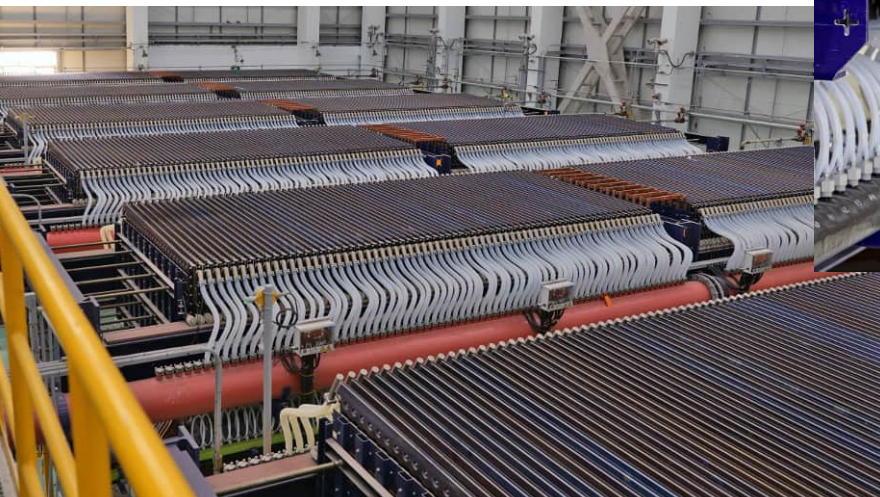
All electrode coatings are not the same, and we've developed our proprietary CHLORCOAT coatings to make sure you get the best from your electrolyser. By contributing to reduced power consumption and lower operational costs over your electrolyser's lifetime, CHLORCOAT coatings outperform alternative coatings and are backed by industry-leading warranties for long-lasting peace of mind.

## Our advanced CHLORCOAT cathode coatings provide:

- Hydrogen evolution at low voltage
- Resistance to impurity poisoning
- Over potential occurs when additional voltage is generated by the surface resistance of a coating. Trials have proven that CHLORCOAT cathode coatings demonstrate superior performance over time
- Our cathode coatings lose no catalyst when subjected to reverse current, unlike alternative coatings, making them resistant to adverse shut-down conditions
- An industry-leading coating warranty of 8 years as standard

## In trials with alternative coatings, CHLORCOAT anode coatings deliver:

- Low over potential - In trials CHLORCOAT is up to 20mV lower than alternative coatings at 6kA/m<sup>2</sup>, saving up to 14kWh/te NaOH
- Superior alkali wear performance - Tests indicate alkali wear resistance of CHLORCOAT is up to 20% better than other anode coatings
- Lower exit brine chlorate concentrations
- Warranties of 8-12 years as standard



# Our complete asset care programme

## Coating and refurbishment

All types of membrane electrolyser electrodes can benefit from our proprietary CHLORCOAT coatings, proven to deliver superior performance with operational savings. Our purpose designed facilities are a one-stop operation for fast and efficient re-coating and refurbishment – centres of specialist expertise that bring electrolyser elements and electrode structures back to life.

## Training

We know that plant commissioning is just the beginning, so get the very best from your installation with our comprehensive training packages, delivered on-site or remotely. With training and tuition in everything from fault finding and maintenance to start-up and shut-down, we'll make sure your team is able to operate your plant safely and help achieve its full potential.



## Genuine replacement parts

Our genuine replacement parts are designed to deliver outstanding performance and operational safety, with the benefit of a trusted warranty and unmatched technical support. Designed specifically to work with our products, genuine replacement parts are the best way to preserve the integrity of your installation. We put quality at the core of everything we do.

## Value adding support packages

We offer a wide range of support packages to help improve the performance of your installation, from plant health checks and pressure control modelling to plant debottlenecking and a variety of engineering studies. Our experience is your advantage.

## Technical service and support

Our technical service team is highly trained and ready to assist, wherever you are in the world. Each customer has a dedicated contact who understands precisely what it takes to keep your plant functioning efficiently all year round. We're with you all the way.

## Exchange module pool system

Minimise electrolyser shut-down time with our free-of-charge rotational exchange pool of anodes and cathodes, an efficient, optional alternative to storing additional modules on your own site. With modules built in advance and sent to you as needed – ready to be installed – it's an effective maintenance strategy that keeps your electrolysers operating for longer.





## Who we are and how we help you

At INEOS Electrochemical Solutions, we understand chlor-alkali from an operator's point of view because we've spent many decades operating electrolyser plants of our own. As Europe's largest operator of electrolysis and first-hand experience of the challenges you face each day, we create state-of-the-art products designed with safety, low-power consumption and ease of maintenance in mind.

Supported by our robust, world-leading technology and our outstanding in-house expertise, you're able to maximise your operational uptime and cut overall life-cycle costs. And with direct access to our specialist teams whenever they're needed – and wherever you are in the world – you enjoy the outstanding service you deserve.

*We're operators designing for operators – and we support customers like you for life.*

### Find out more

For more information about BICHLOR electrolyzers and CHLORCOAT coatings, visit our website at: [www.ineos.com/electrochemical](http://www.ineos.com/electrochemical)

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