



Innovative Technology for Primary Brine Purification by New Membrane and Anti-Reverse Current Electrolyzer

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Primary Brine Purification by New Membrane

Main Membranes Used in Primary Brine Purification



SiC membrane

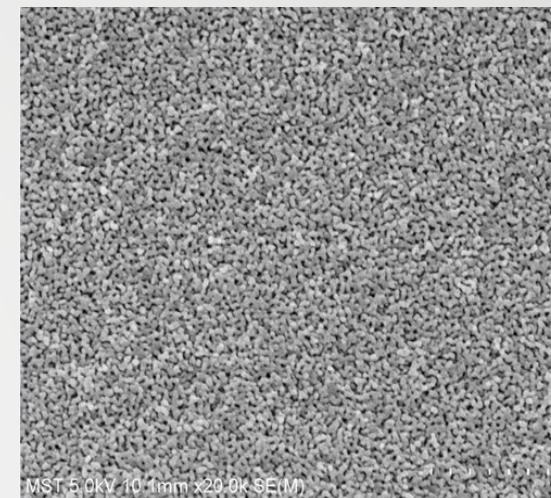
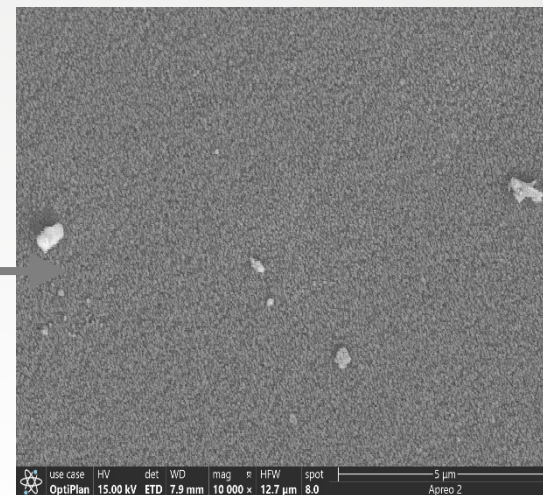
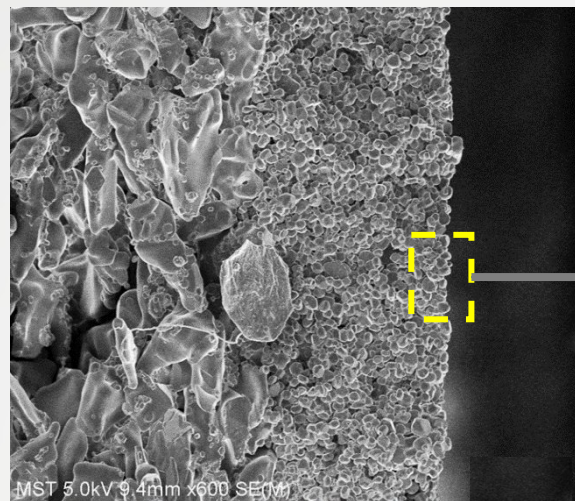


Al₂O₃ membrane

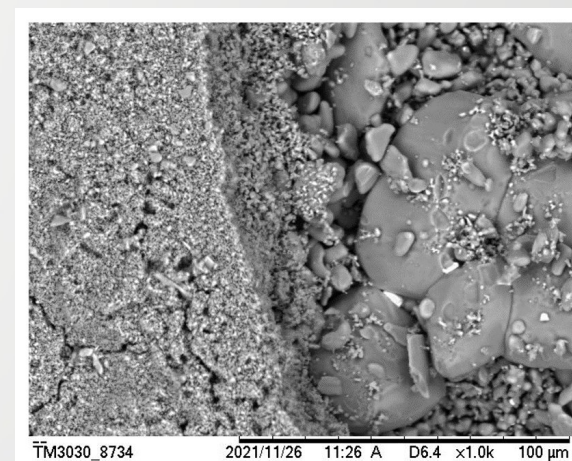
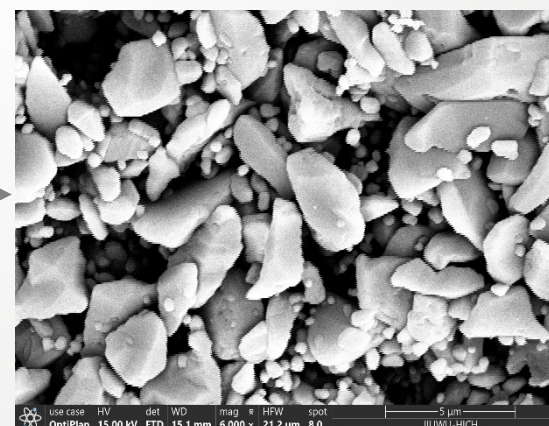
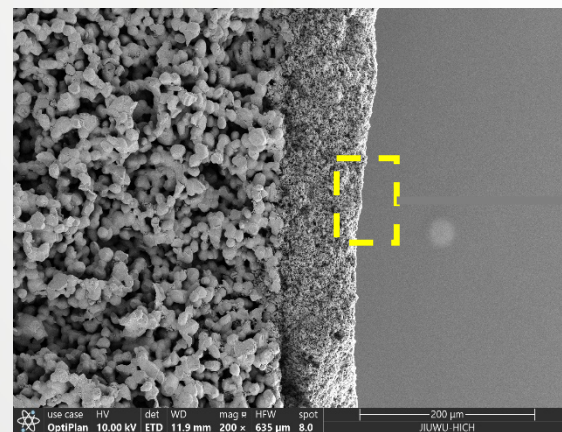


Organic membrane

SEM Photo



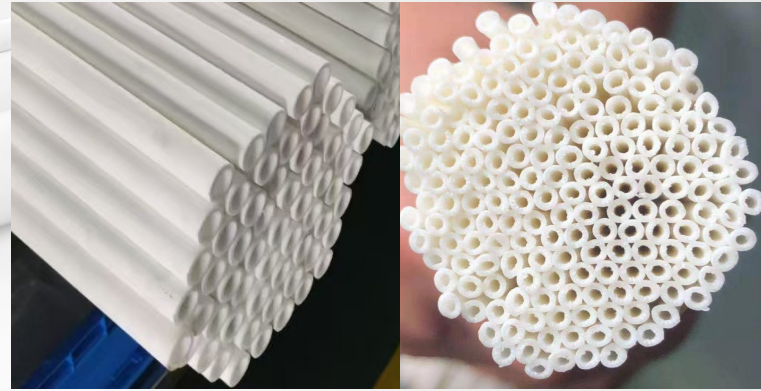
Al_2O_3 membrane



SiC membrane



Main Membranes Used in Primary Brine Purification



	SiC membrane	Al ₂ O ₃ membrane	PVDF membrane	PTFE membrane
Support MOC	SiC	Al ₂ O ₃	PE	PTFE
Membrane MOC	SiC	ZrO ₂	PVDF	PTFE
Hardness	Relatively high	High	Normal	Low
Hydrophilia	Good (contact angle 0.3°)	Normal (contact angle 27°)	Bad	Bad
Anti acid and alkali	pH 0-14	pH 0-14	pH 1-13	pH 0-14
Anti high temperature	800°C	<300°C	<45°C	<45°C
Operating pressure	1-4bar	1-4bar	1-4bar	1-3bar
DM water flux (L/(m ² ·h))	2000-6000	250-3000	1500-2500	80-120
Porosity	40-45%	30-35%	30-35%	80-90%



The advantages of SiC membrane

SiC membrane is the new membrane applied in primary brine purification with good performance.

The brine flux of this new material is higher than other membrane technologies, so total area of membrane is less than other technologies, and the Capex is reduced.

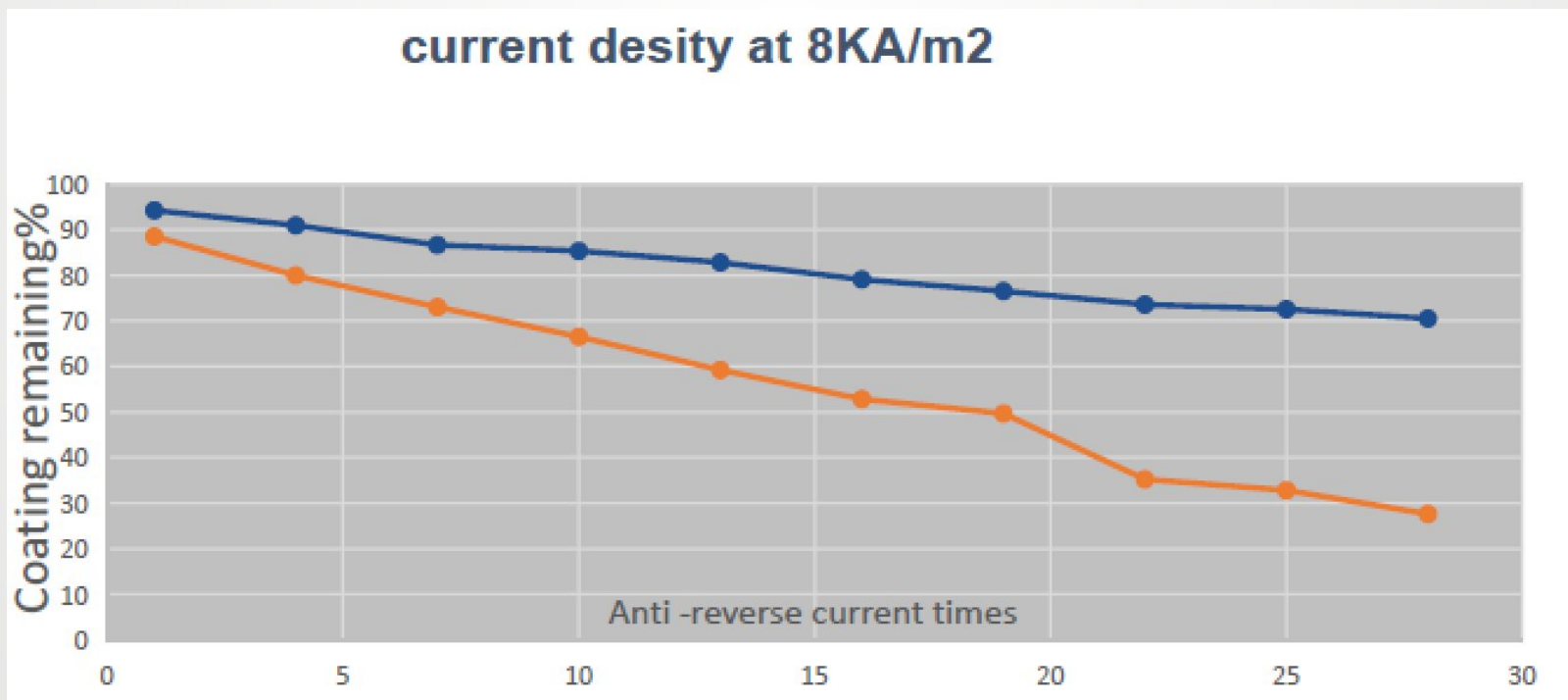
Anti-Reverse Current Electrolyzer



Anti-reverse Current Innovation

Since the year of 2020, anti-reversal current Electrolyzer was used in Chinese caustic soda plants. Currently, the technology has been applied in over 30 projects. These electrolyzers can operate smoothly without polarization rectifier.

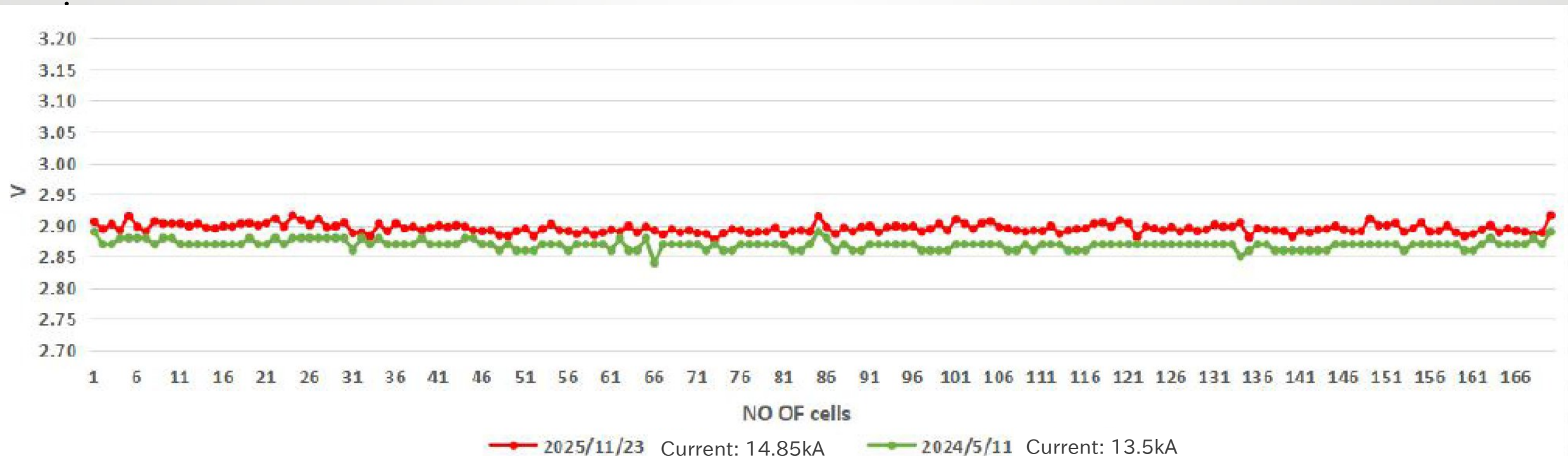
Below curve show the new type cathode electrode compare to normal electrode performance, the brown curve is the cathode mesh with normal electrode, the blue curve is the cathode mesh with new type electrode.





Reference Plant - 1

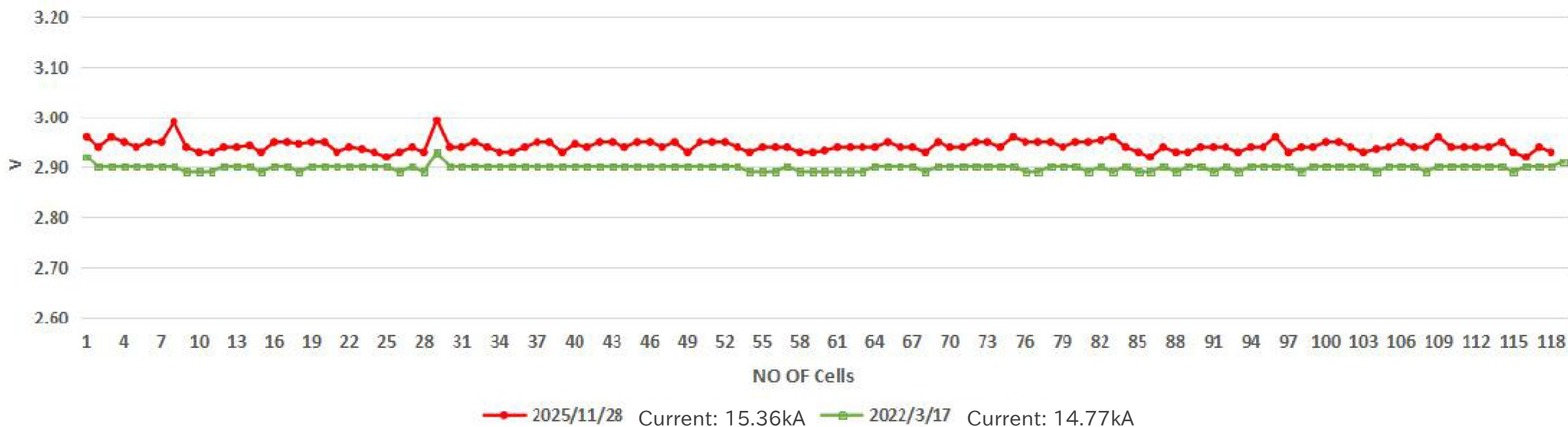
Caustic soda (as 100%) capacity is 600 TPD, applying 8 electrolyzers (effective area is 2.7 m²), each electrolyzer with around 166 cells, equipped with AKCC F-7001 membrane, commissioning began on 26 March 2024. Below are the voltage performance of one electrolyzer (Electrolyzer-A), operation temperature at around 85 °C, caustic soda concentration about 32%, the voltage data is based on measured on-





Reference Plant - 2

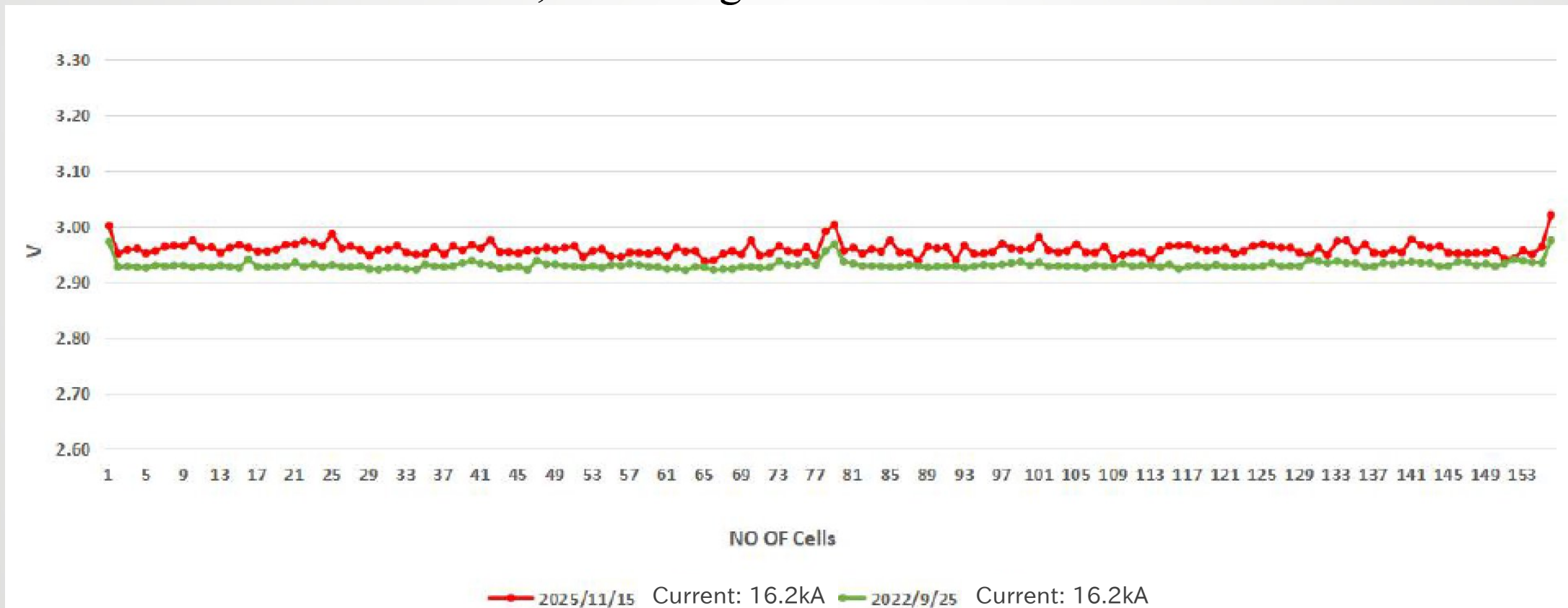
Caustic soda (as 100%) capacity is 150 TPD, applying 2 electrolyzers (effective area is 2.7 m²), each electrolyzer with around 166 cells, equipped with AKCC F-7001 membrane, commissioning began on 26 Jan. 2022. Below are the voltage performance of one electrolyzer (Electrolyzer-B), operation temperature at around 85 °C, caustic soda concentration about 32%, the voltage data is based on measured on-site.





Reference Plant

Caustic soda (as 100%) capacity is 690 TPD, applying 8 electrolyzers (effective area is 2.7 m²), each electrolyzer with around 156 cells, equipped with AGC F-9010A membrane, commissioning began on 20 Aug. 2022. Below are the voltage performance of one electrolyzer (Electrolyzer-B), operation temperature at around 85 °C, caustic soda concentration about 32%, the voltage data is based on measured on-site.





Reference Plant

Caustic soda (as 100%) capacity is 192 TPD, applying 2 electrolyzers (effective area is 3.4 m²), each electrolyzer with around 150 cells, equipped with AKCC F-7001 membrane, commissioning began on 14 Oct. 2025. Below are the voltage performance of one electrolyzer (Electrolyzer-B), operation temperature at around 85 °C, caustic soda concentration about 32%, the voltage data is based on measured on-site.





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