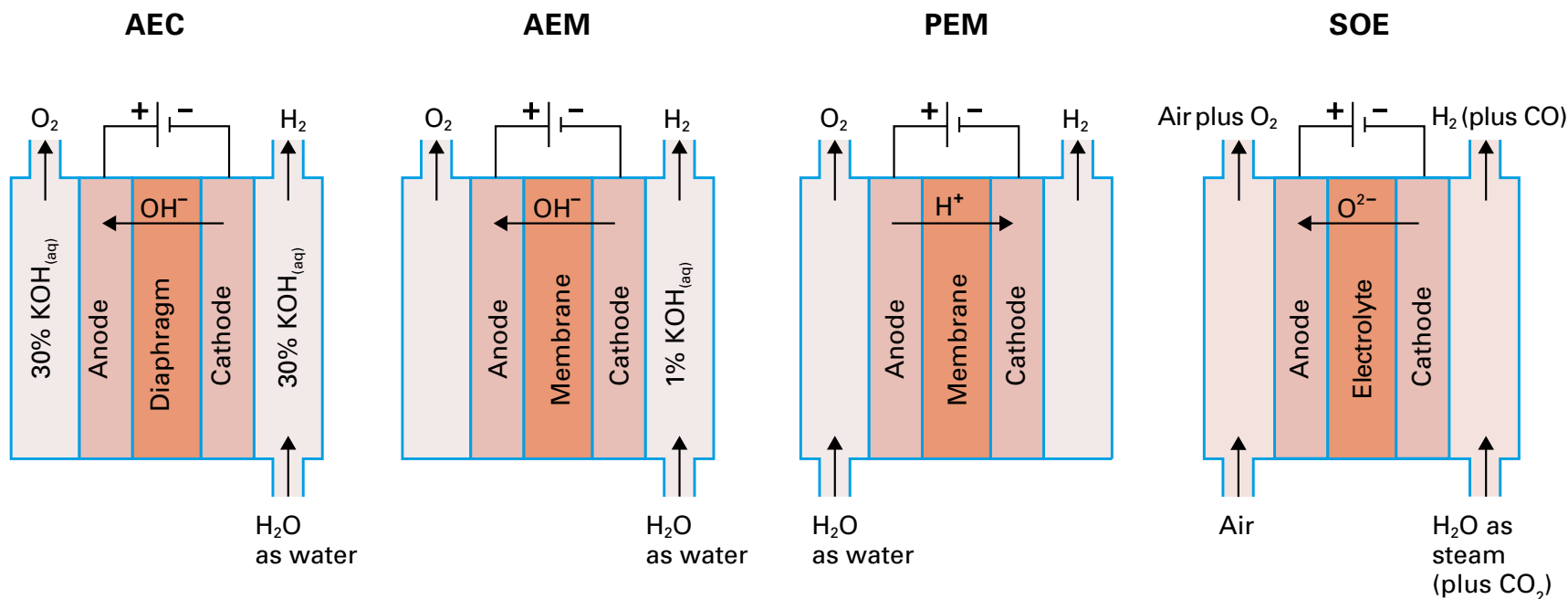


**Notes:**

- In the AEC, AEM and PEM, lye or water flow from the electrolyser cell with the oxygen and/or hydrogen gases. These liquids are mixed and recirculated to the electrolyser.
- Air is used to purge the SOE anode to avoid oxygen accumulation which may present a hazard at the high operating temperature.
- Bipolar plates made of stainless steel (titanium for PEM) are used to stack adjacent cells in each electrolyser type.



|                            | Alkaline Electrolysis Cell<br>AEC                 | Anion Exchange Membrane /<br>Alkaline Electrolyte Membrane<br>AEM | Polymer Electrolyte Membrane/<br>Proton Exchange Membrane<br>PEM/PEMEC | Solid Oxide Electrolysis Cell<br>SOE/SOEC                           |
|----------------------------|---|---|--|---|
| Electrode material         | - Cathode: Ni, Co or Fe<br>- Anode: Ni            | - Cathode: Ni / Ni alloys<br>- Anode: Fe, Ni, Co oxides           | - Cathode: Pt/Pd<br>- Anode: IrO <sub>2</sub> /RuO <sub>2</sub>        | - Cathode: Ni<br>- Anode: La/Sr/MnO (LSM)<br>or La/Sr/Co/FeO (LSCF) |
| Electrolyte                | Lye: 25-30% Potassium Hydroxide solution in water | Anion Exchange ionomer (e.g. AS-4)                                | Fluoropolymer ionomer (eg Nafion, a DuPont brand)                      | Zirconium Oxide with ~8% Yttrium Oxide                              |
| Energy source              | 100% electrical power                             | 100% electrical power   | 100% electrical power  | ~25% heat from steam,<br>~75% electrical power                      |
| Current density            | Up to 0.5 A/cm <sup>2</sup>                       | 0.2 – 1 A/cm <sup>2</sup>   | Up to 3 A/cm <sup>2</sup>  | Up to 0.5 A/cm <sup>2</sup>   |
| Hydrogen or syngas product | Hydrogen  | Hydrogen  | Hydrogen   | Hydrogen (or syngas if fed with steam and CO <sub>2</sub> )         |
| Gas outlet pressure        | Up to 40 bar                                      | Up to 35 bar H <sub>2</sub> , 1 bar O <sub>2</sub>                | Up to 40 bar   | Close to atmospheric  |
| Cell temperature           | ~80 °C  | ~60 °C  | ~60 °C   | ~750 to 850 °C  |