Design of a small-scale alkaline electrolyser for large-scale production

The design of a small-scale electrolysis unit is a demand by ZEF. The company is currently developing a micro-chemical plant for zero-emission fuels by employing only solar energy and absorbing CO_2 from the atmosphere. The alkaline electrolyser is necessary for supplying high-pressure hydrogen for the methanol reaction.

However, due to the rising of hydrogen demand in the industry, such an apparatus can be employed for the sustainable production of H_2.

design goals

Cost

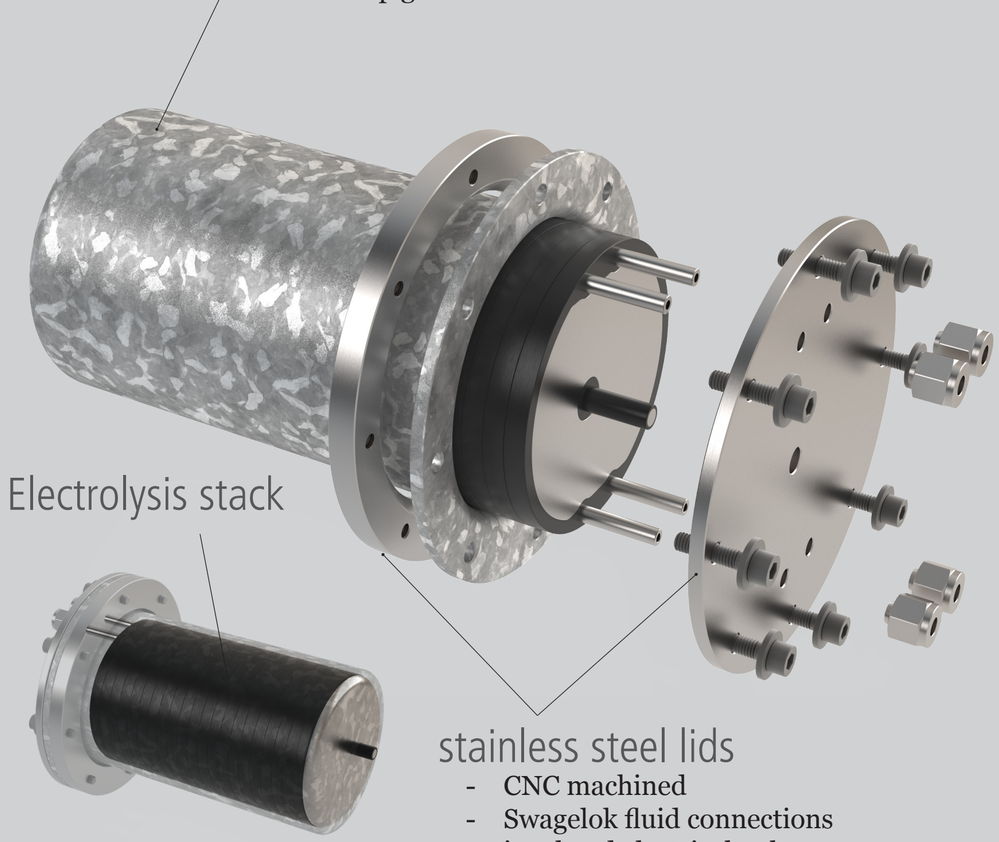
materials compatibility
manifold design
production processes
operational requirements

Safety

design focus

Pressure case

ultra-low carbon steel case
- deep drawing + ironing
- hot dip galavanisation

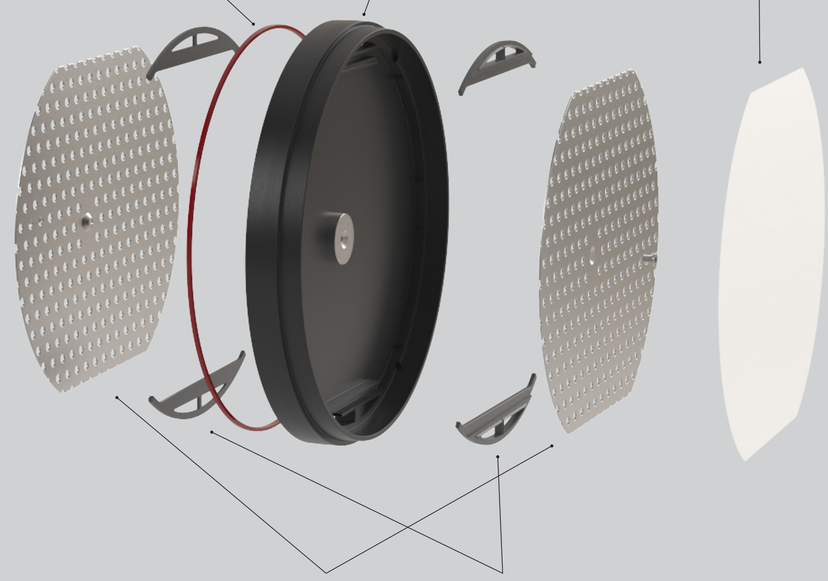


Electrolysis cell

PPS (polyphenylene sulfide)
- injection moulding
- co-moulded electrical connection

EPDM gasket
- 2-shot moulded

Zirfon Perl
- blanked



design achievements

*compared to the previous design

Cost	Power	Size	Weight
-33%	+100%	-60%	-40%

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for large-scale production
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