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Modular system based on Molten Carbonate Fuel Cells with tailored composite membranes designed for specific flue gas compositions oriented into CCS integration with an industrial power plant

MOLCAR

„Modular system based on Molten Carbonate Fuel Cells with tailored composite members designed for specific flue gas compositions oriented into CCS integration with an industrial power plant", project contract number NOR/POLNORCCS/MOLCAR/00-17/2020-00

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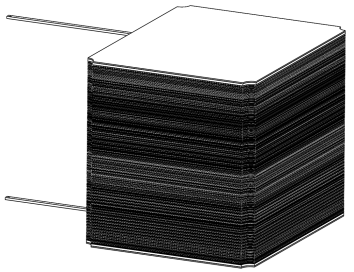
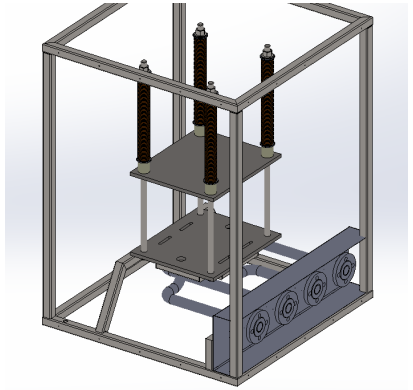
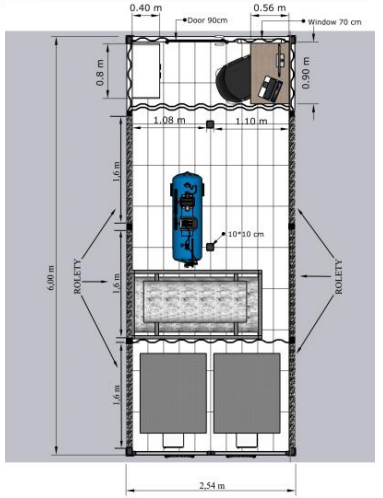
Work Package 3 (02.2021 .. 03.2023)

Goal: Development and construction of the CCS-MCFC installation with nominal power at 10 kWe

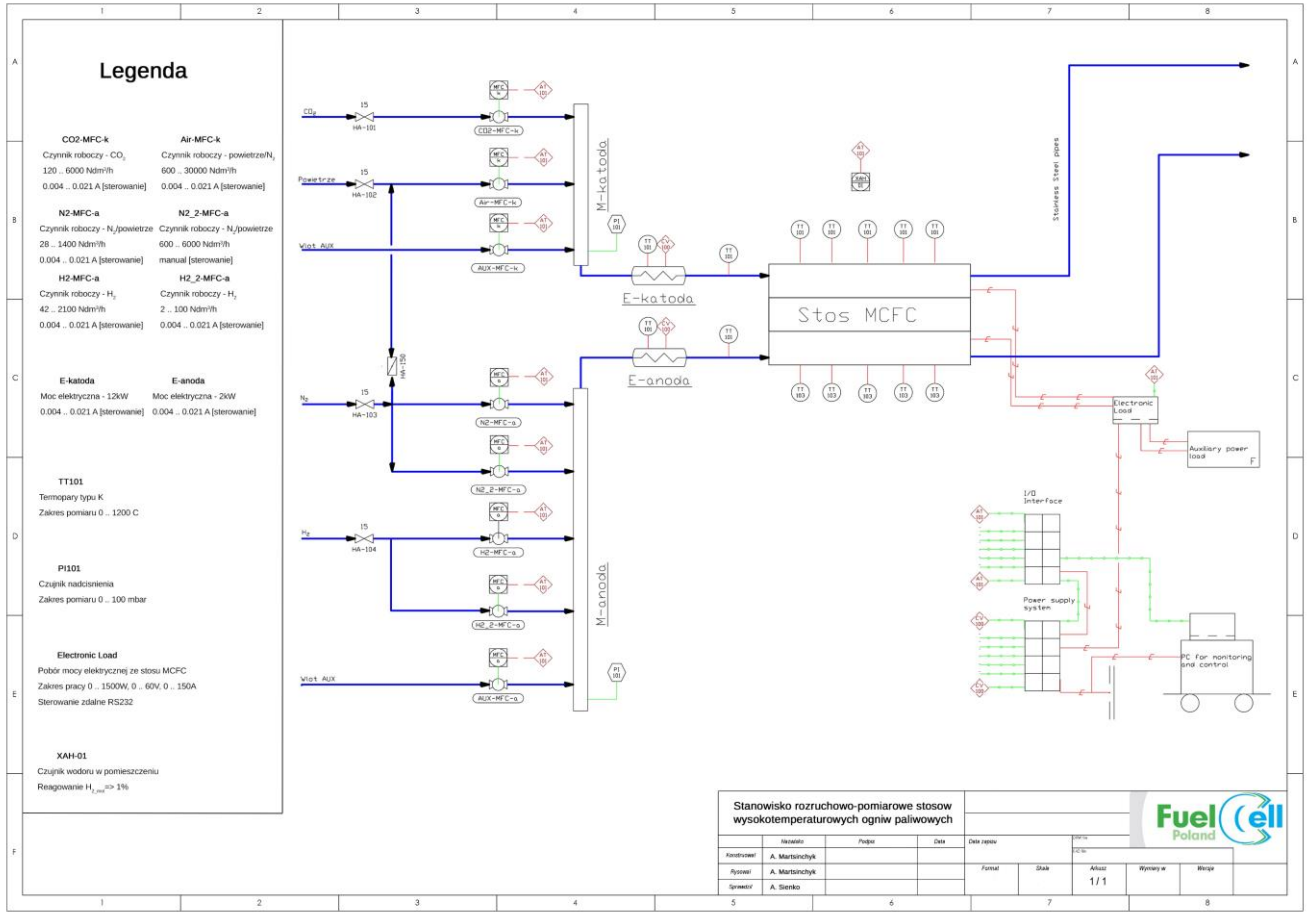






„Modular system based on Molten Carbonate Fuel Cells with tailored composite members designed for specific flue gas compositions oriented into CCS integration with an industrial power plant", project contract number NOR/POLNORCCS/MOLCAR/00-17/2020-00

Task 3.1: Technical documentation



N	Working medium	Flow rate, NL/min		I/O signal	P-in	P-out
		min	max			
1	Air	5	1800	4..21 mA	2.5	0.5
2	Air	1	300	4..21 mA	2.5	0.5
3	Air	0	33	4..21 mA	2.5	0.5
4	CO2	7.5	300	4..21 mA	2.5	0.5
5	CO2	0.1	15	4..21 mA	2.5	0.5
6	CO2	0	35	4..21 mA	2.5	0.5
7	N2	5	300	4..21 mA	2.5	0.5
8	N2	12	500	4..21 mA	2.5	0.5
9	H2	0	5	4..21 mA	2.5	0.5
10	H2	6	250	4..21 mA	2.5	0.5

N	Working medium	Power rate, kW		T_max, C deg
		min	max	
1	Cathodic main electric heater	10	15	800
2	Cathodic supporting electric heater	1.2	3	900
3	Anodic main electric heater	2	5	800
4	Anodic supporting electric heater	1.2	3	900
5	Water steam generator	1.3	3	400

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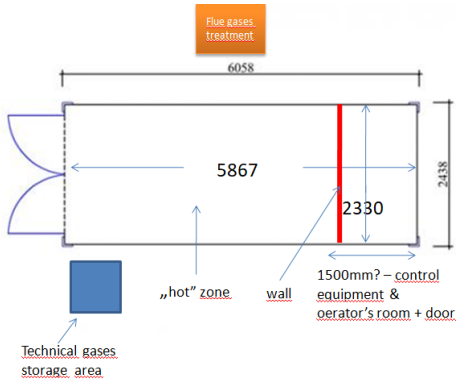
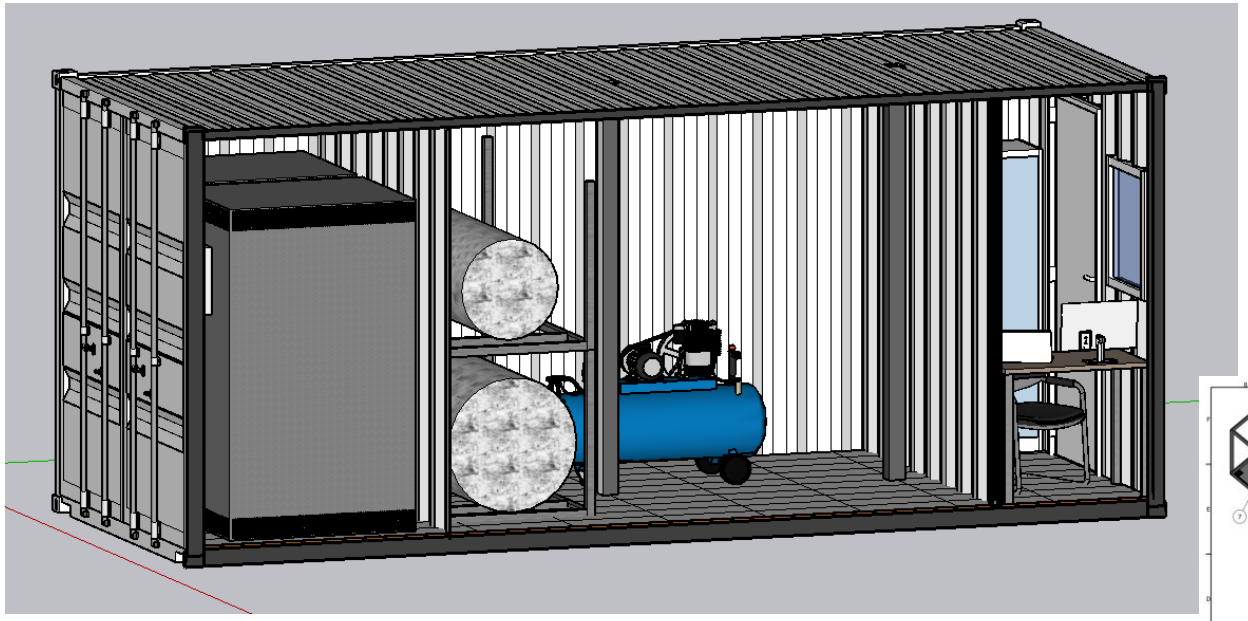
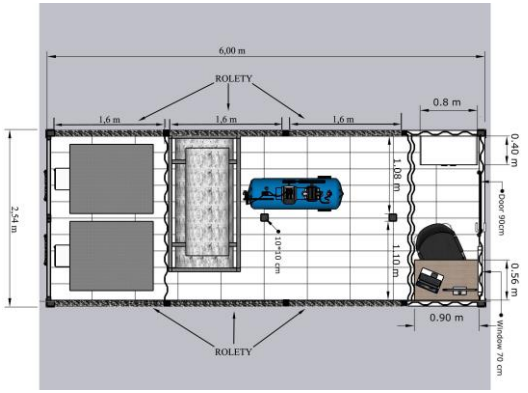
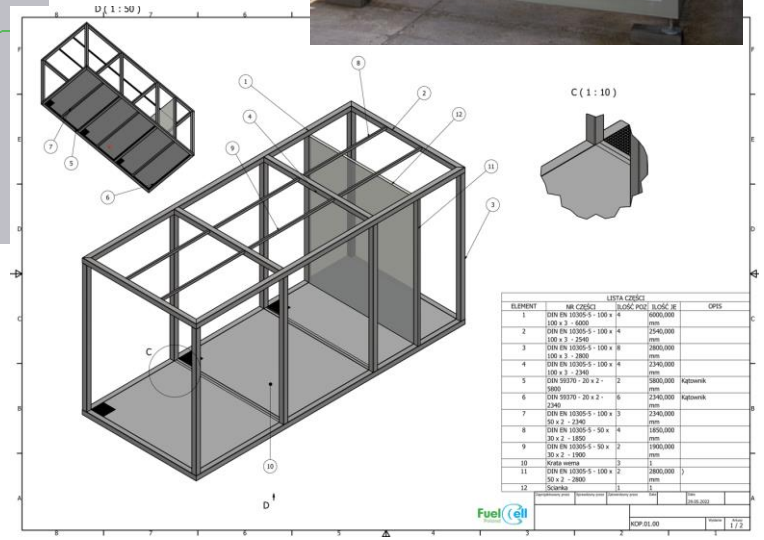
Task 3.2: Preparation of a prototype installation with MCFC









„Modular system based on Molten Carbonate Fuel Cells with tailored composite members designed for specific flue gas compositions oriented into CCS integration with an industrial power plant", project contract number NOR/POLNORCCS/MOLCAR/00-17/2020-00

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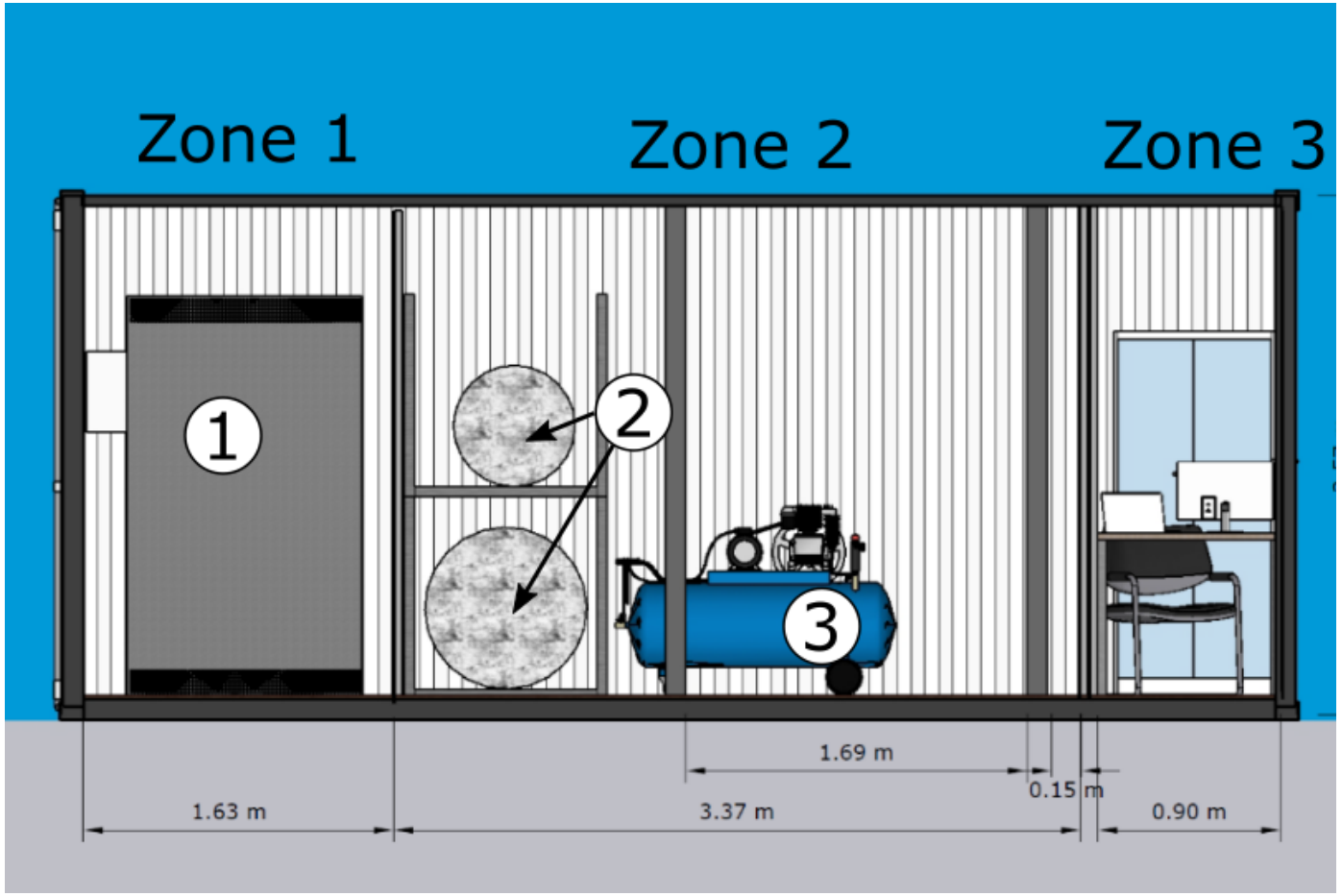

Container design side view: 1 – MCFC stack, 2 – gas heaters, 3 – Air compressor

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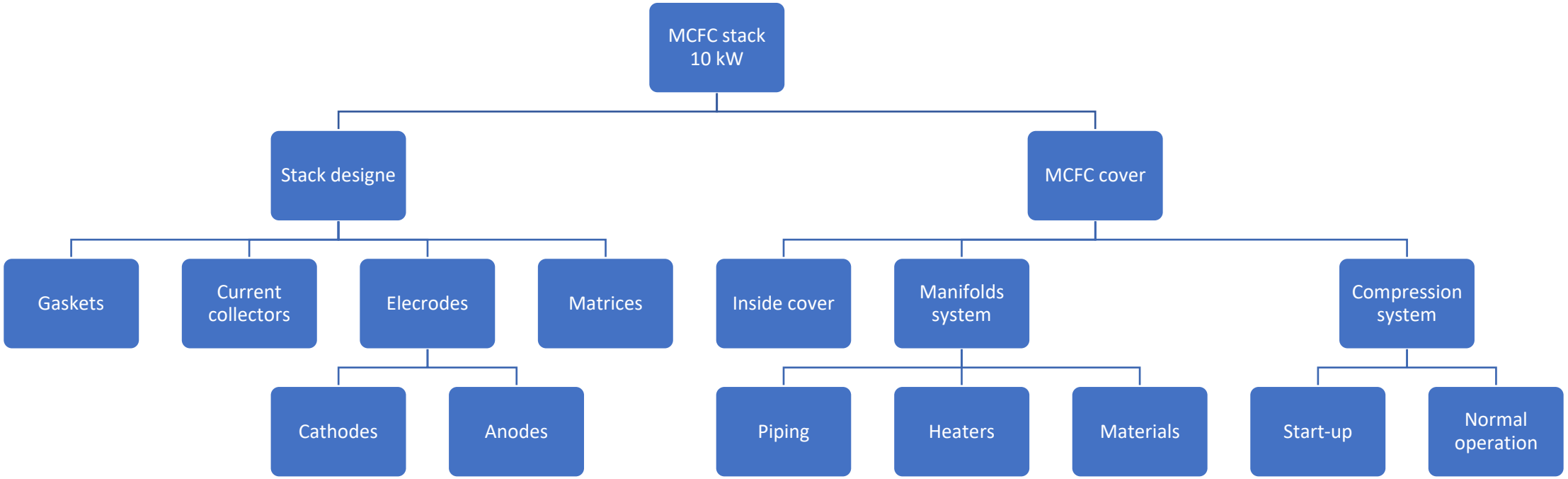
Work break down structure



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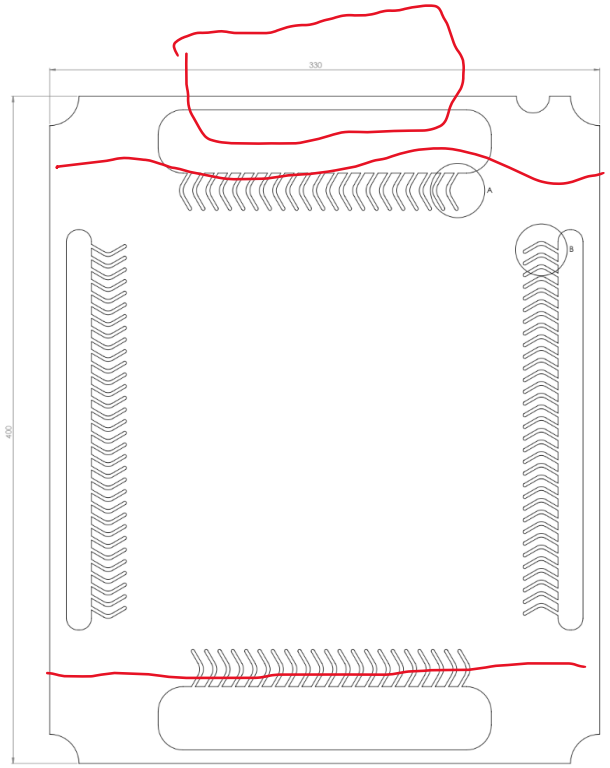

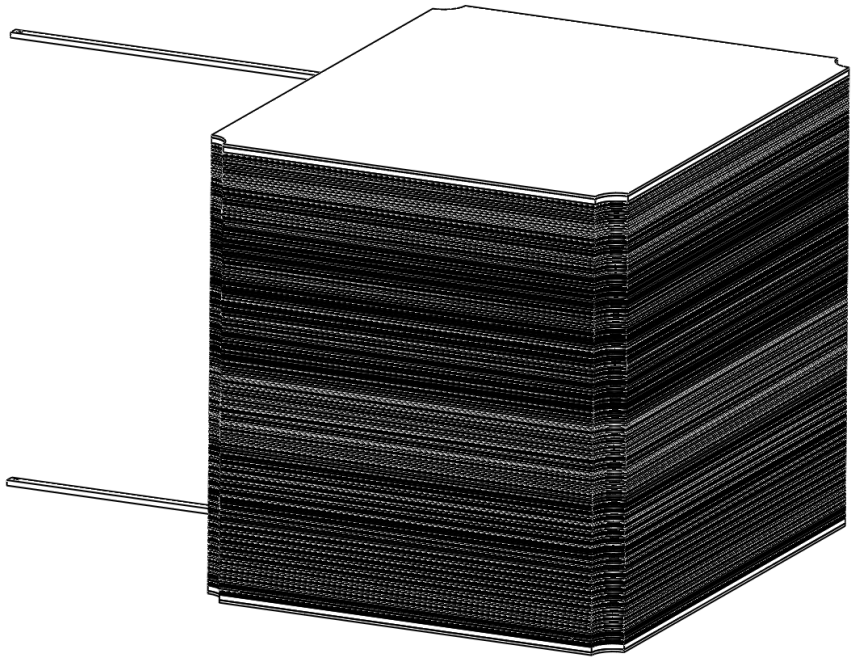

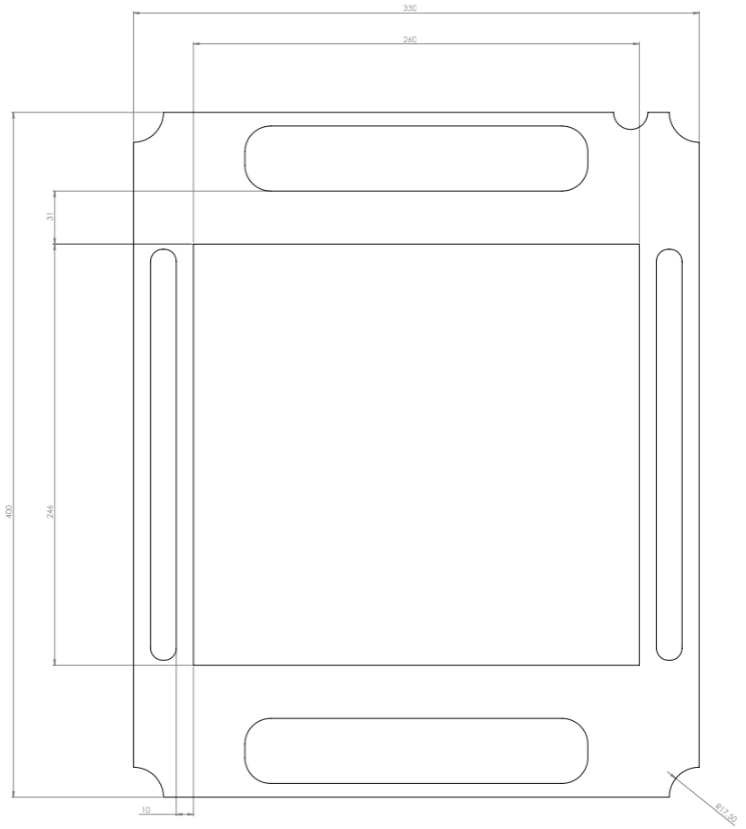

„Modular system based on Molten Carbonate Fuel Cells with tailored composite members designed for specific flue gas compositions oriented into CCS integration with an industrial power plant", project contract number NOR/POLNORCCS/MOLCAR/00-17/2020-00

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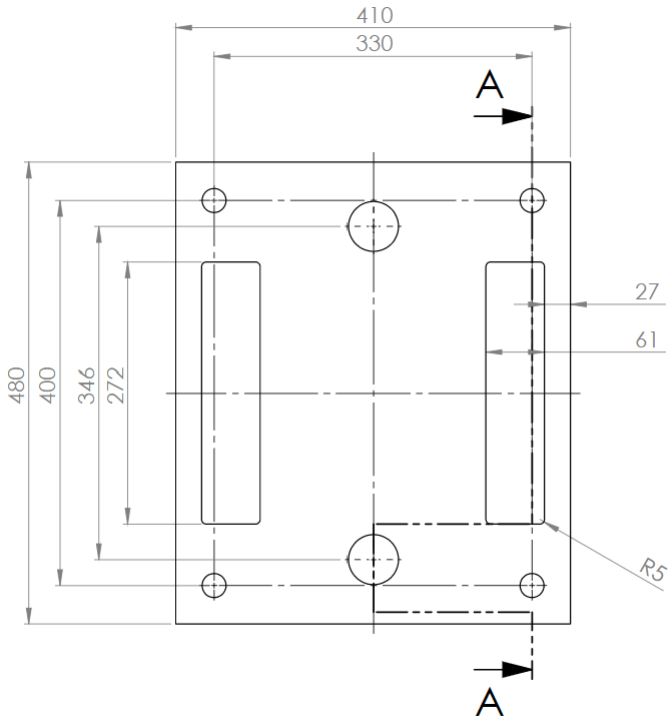
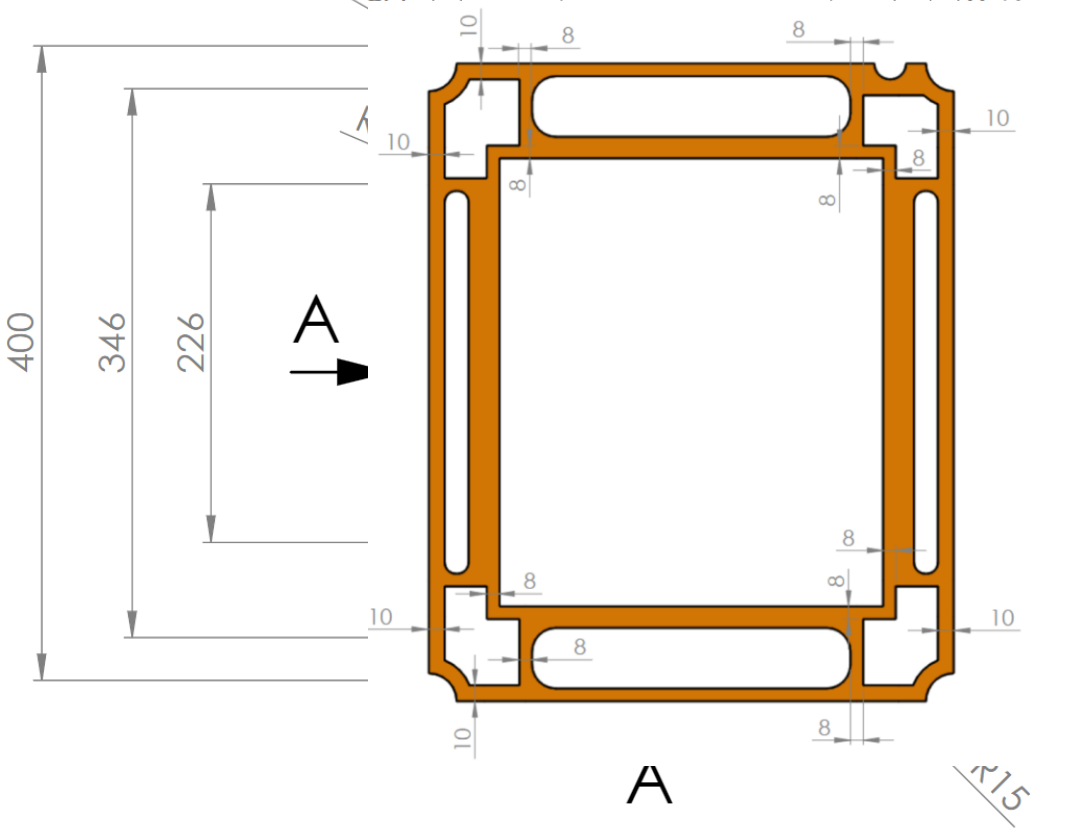
Task 3.2: Preparation of a prototype installation with MCFC

Manifolds modification



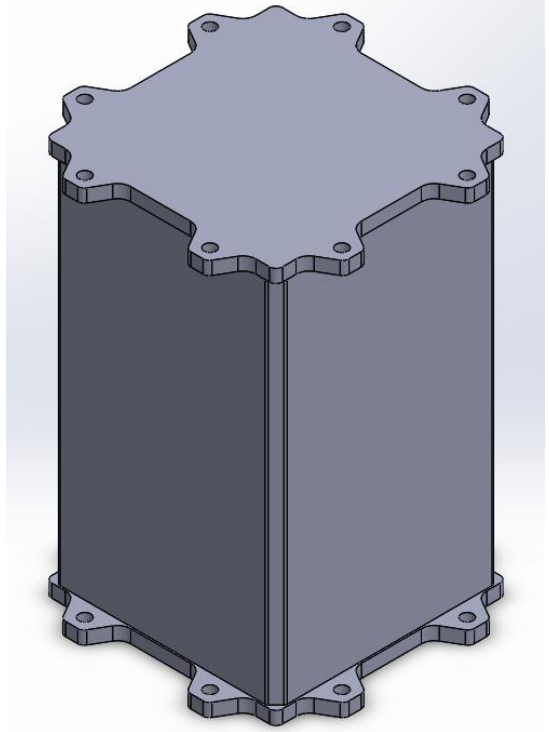


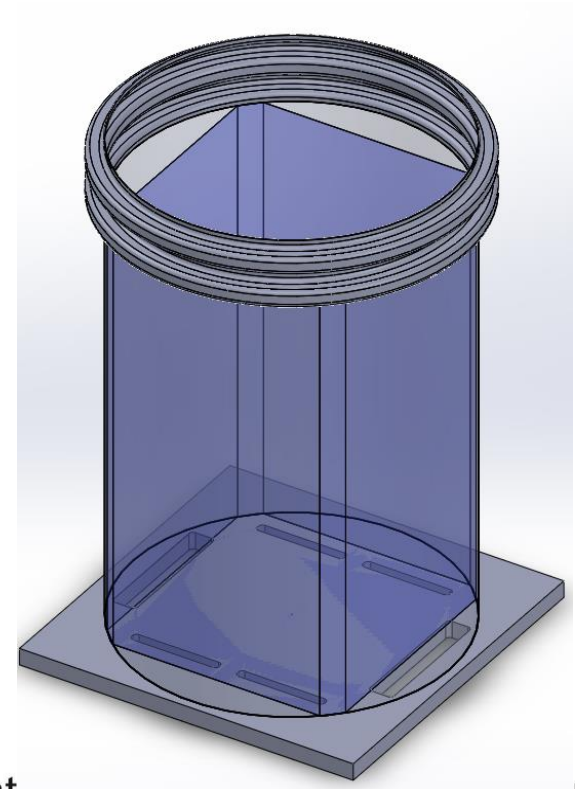
„Modular system based on Molten Carbonate Fuel
designed for specific flue gas compositions orientec
power plant", project contract number NOR/POL

Task 3.2: Preparation of a prototype installation with MCFC

Inside cover modification

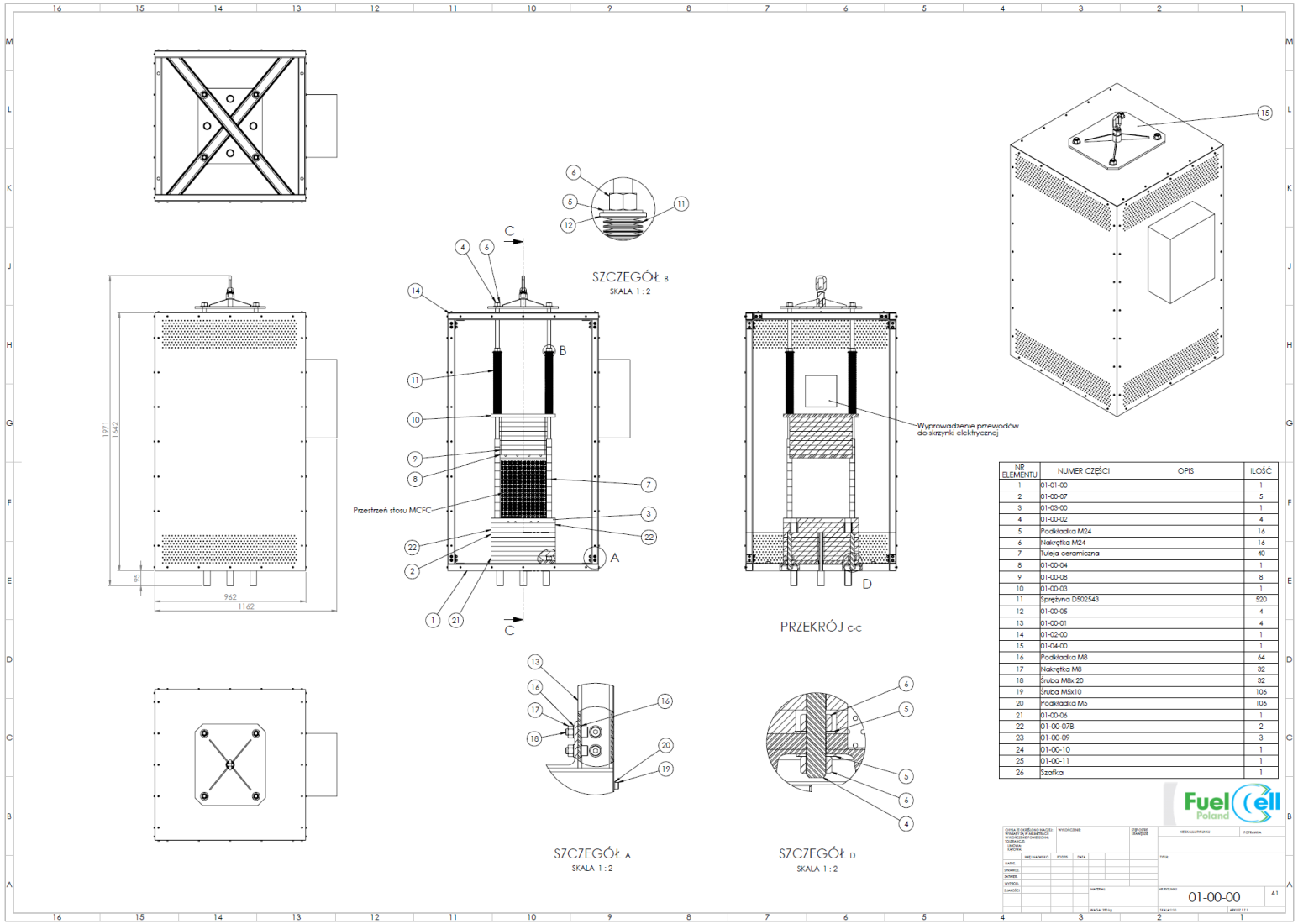
No inside cover





Final inside cover designe – to be pattented

„Modular system based on Molten Carbonat mposite members designed for specific flue gas compositions oriented into CCS integration with an industrial power plant", project contract number NOR/POLNORCCS/MOLCAR/00-17/2020-00



NR ELEMENTU	NUMER CZĘŚCI	OPIS	ILOŚĆ
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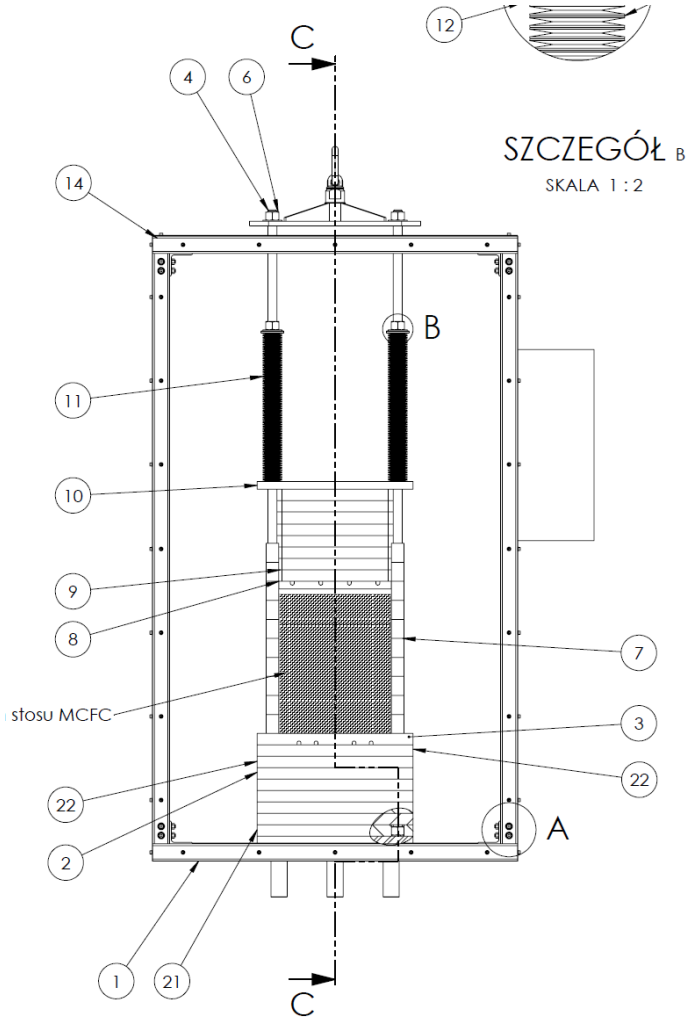
2	01-00-07		5
3	01-03-00		1
4	01-00-02		4
5	Podkładka M24		16
6	Nakrętka M24		16
7	Tuleja ceramiczna		40
8	01-00-04		1
9	01-00-08		8
10	01-00-03		1
11	Sprężyna D502543		520
12	01-00-05		4
13	01-00-01		4
14	01-02-00		1
15	01-04-00		1
16	Podkładka M8		64
17	Nakrętka M8		32
18	Śruba M8x 20		32
19	Śruba M5x10		106
20	Podkładka M5		106
21	01-00-06		1
22	01-00-07B		2
23	01-00-09		3
24	01-00-10		1
25	01-00-11		1
26	Szafka		1

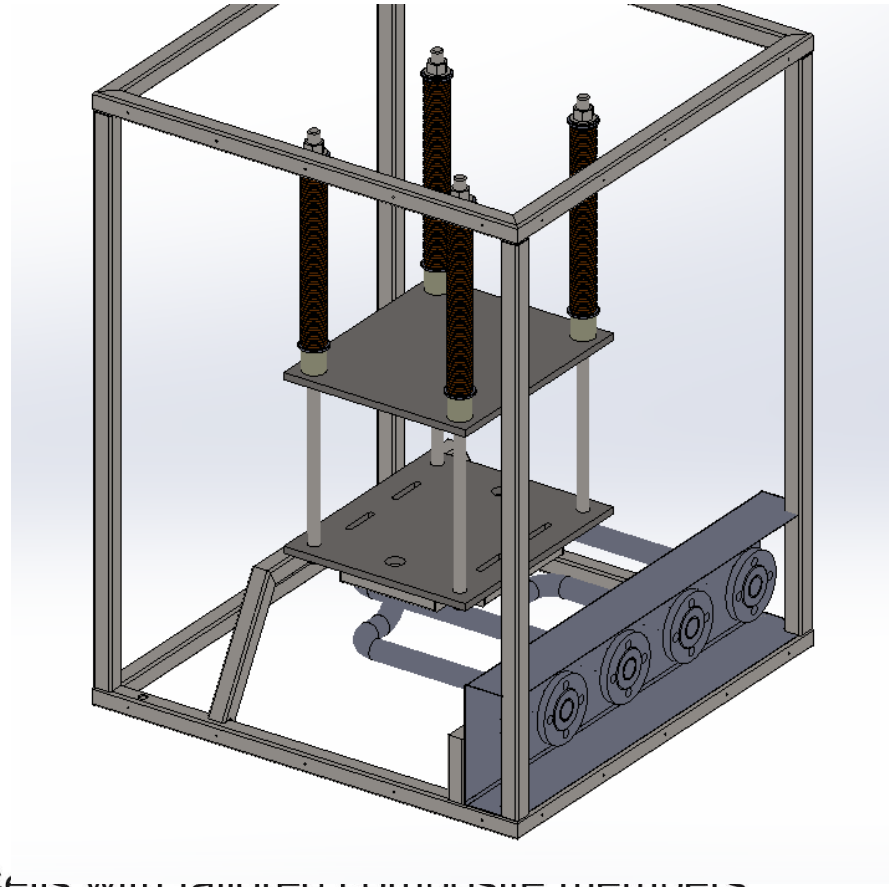
Fuel Cell Poland

01-00-00 A1

„Modular system based on Molten Carbonate Fuel Cells with tailored composite members designed for specific flue gas compositions oriented into CCS integration with an industrial power plant”, project contract number NOR/POLNORCCS/MOLCAR/00-17/2020-00

Task 3.2: Preparation of a prototype installation with MCFC





Molten Carbonate Fuel Cells with tailored composite members
s compositions oriented into CCS integration with an industrial
power plant", project contract number NOR/POLNORCCS/MOLCAR/00-17/2020-00

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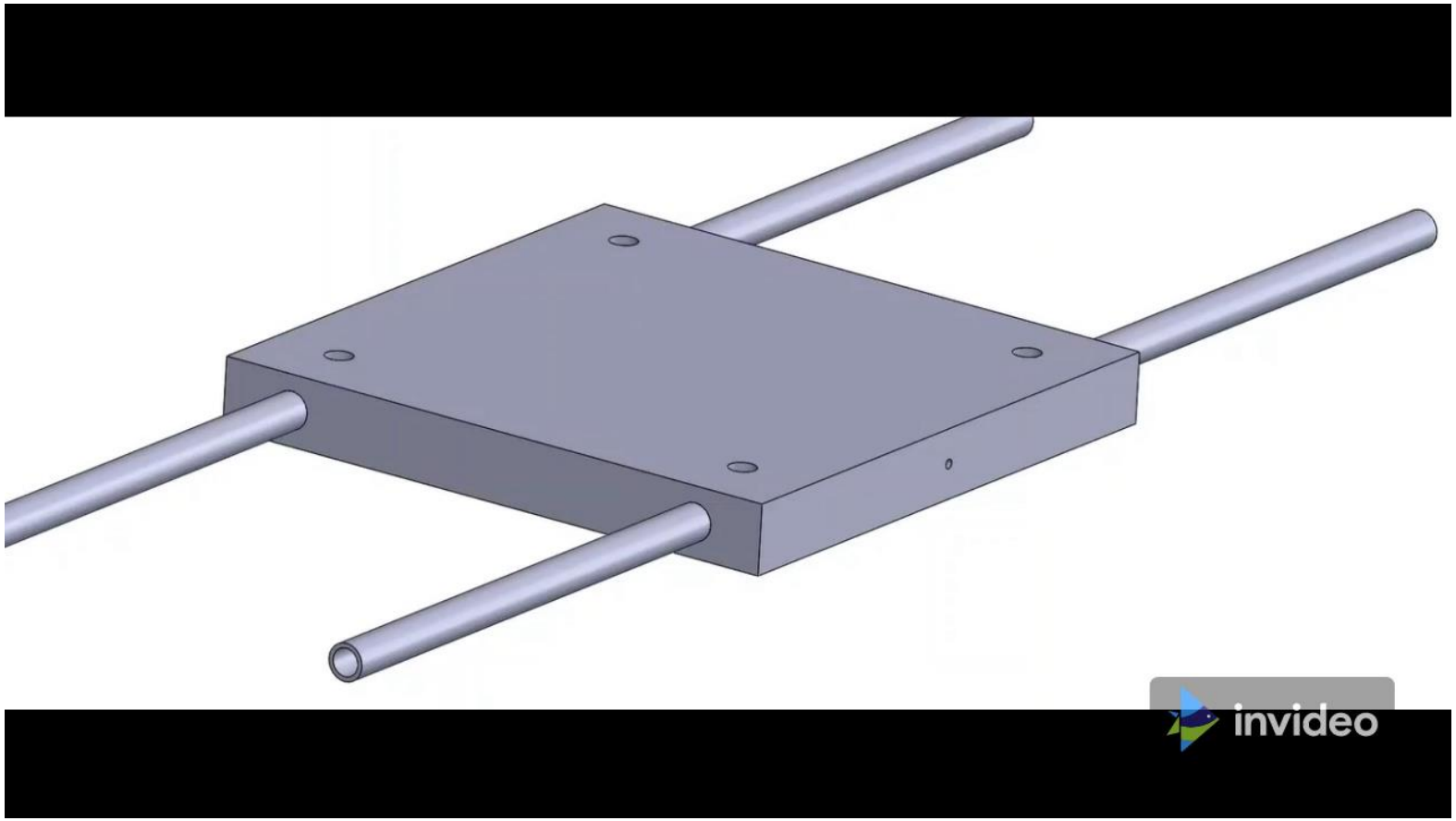
Prototyping of single MCFC cell construction



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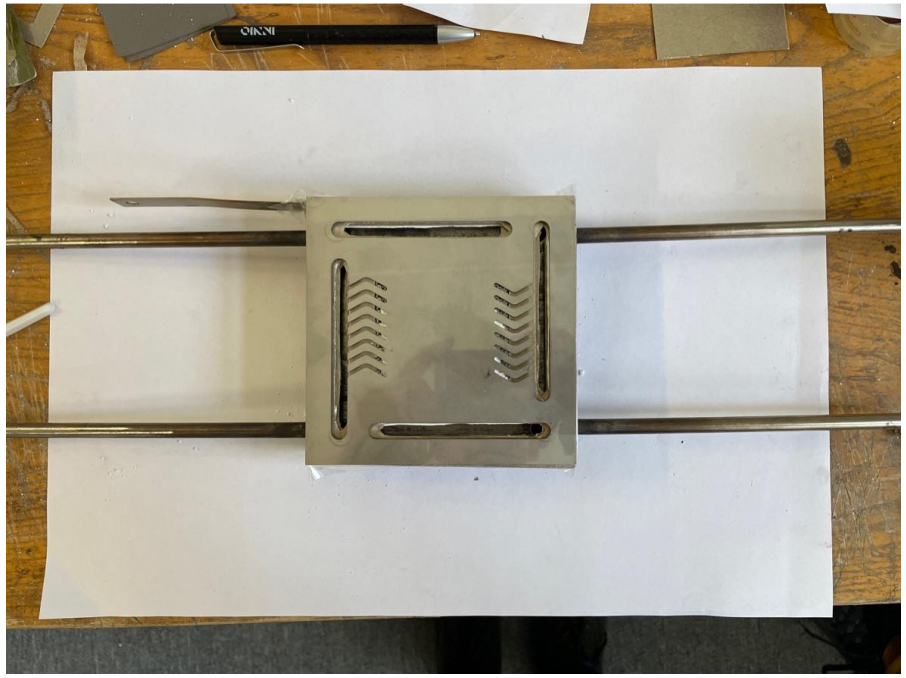
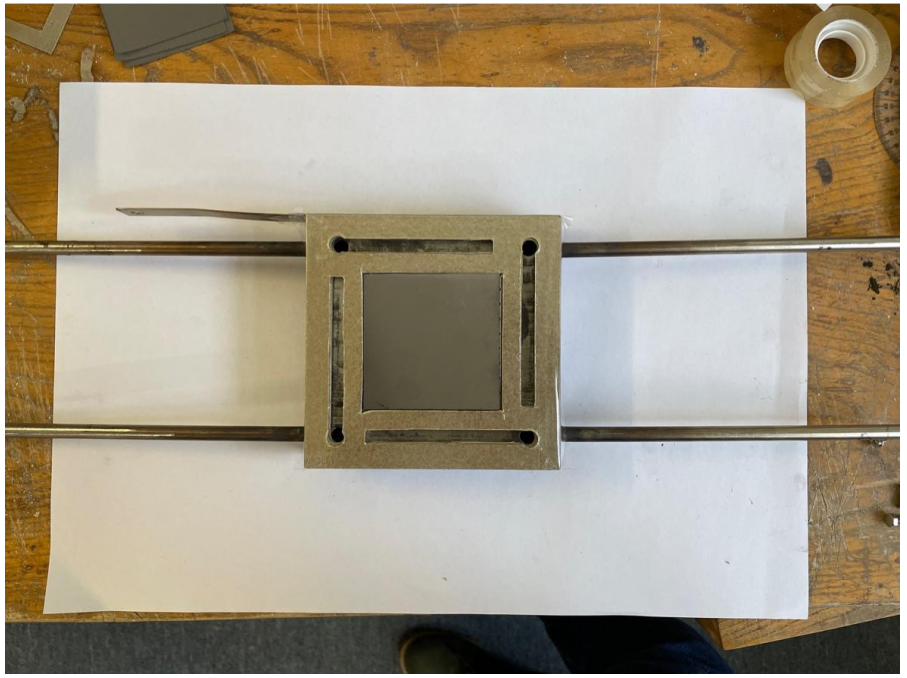
Task 3.3 Test run and verification of correct operation of components and a complete container installation with an MCFC stack





Prototyping of single MCFC cell construction

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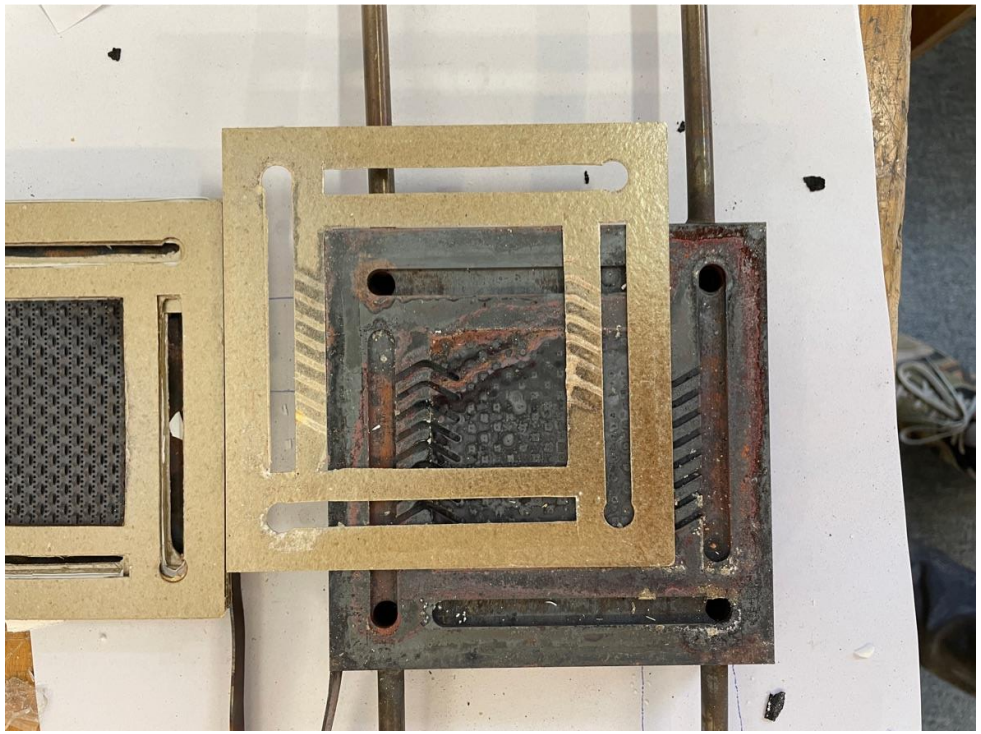

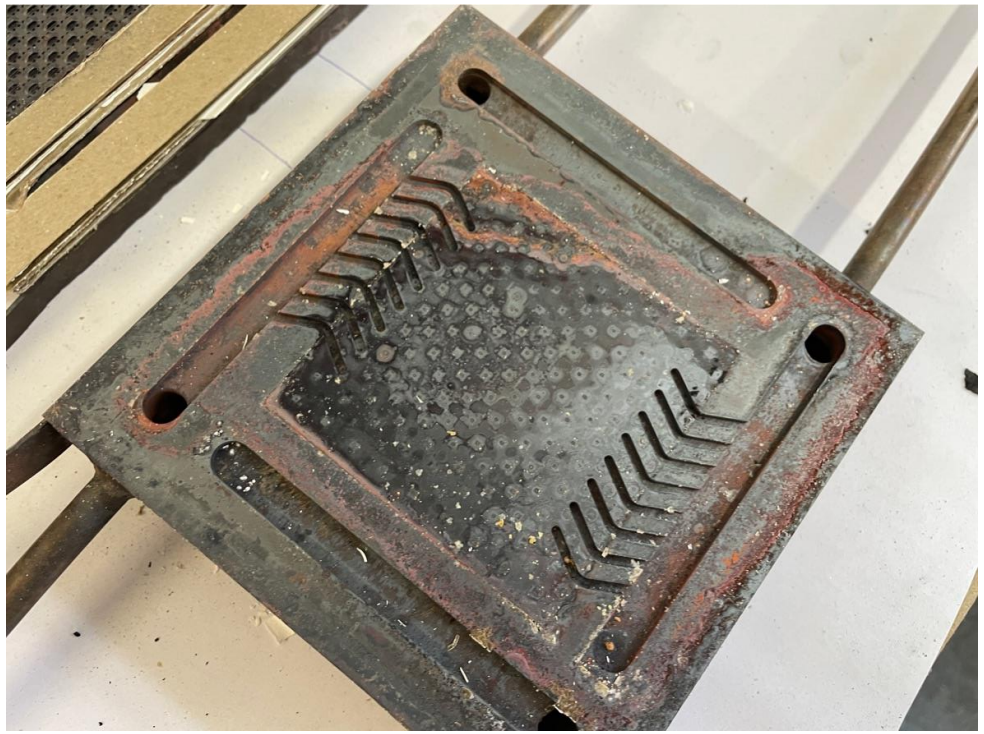

Prototyping of single MCFC cell construction

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Task 3.3 Test run and verification of correct operation of components and a complete container installation with an MCFC stack

If something works out on a small scale, then we start testing in the target size.

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Task 3.3 Test run and verification of correct operation of components and a complete container installation with an MCFC stack

Scale up: MCFC single cell in final design – assembly video

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Task 3.3 Test run and verification of correct operation of components and a complete container installation with an MCFC stack

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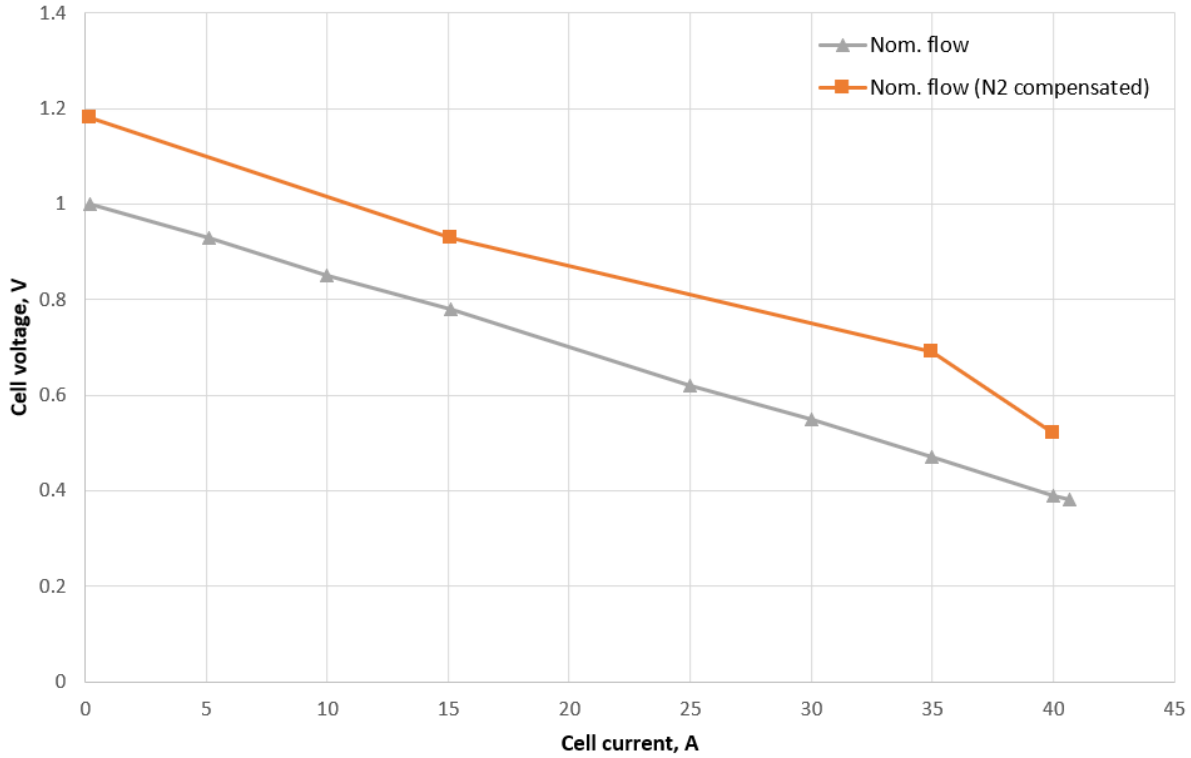

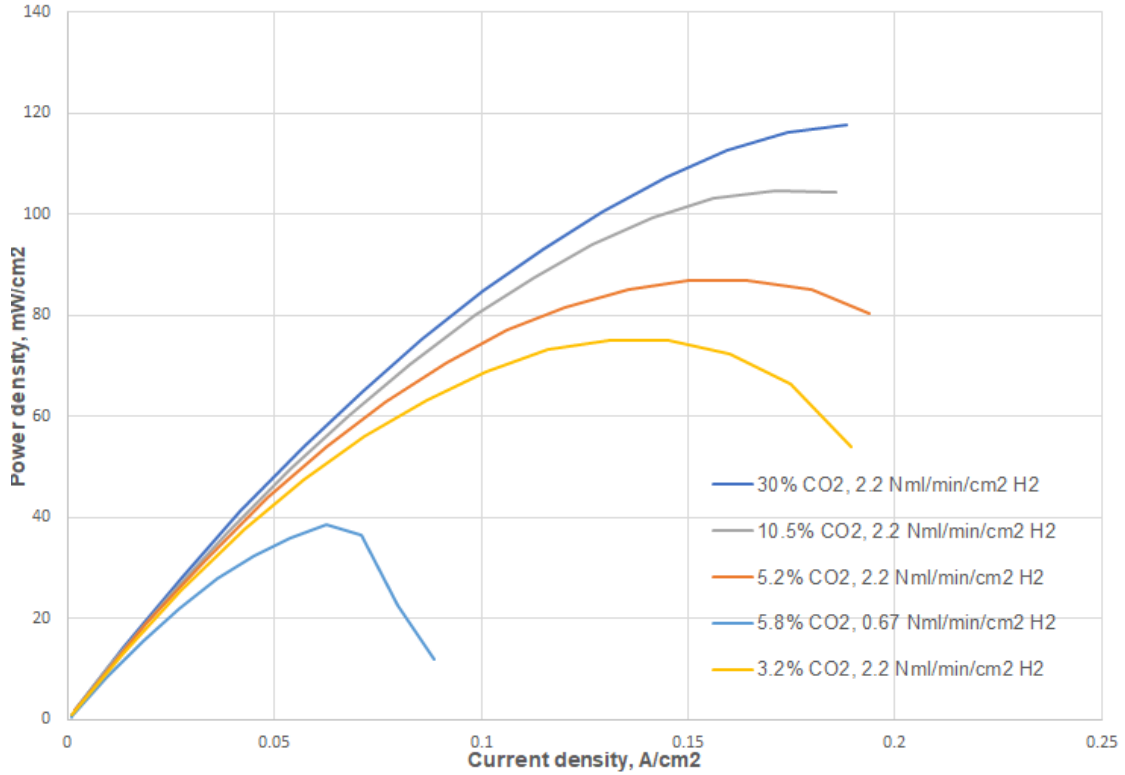

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