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Pilot scale SAF

General presentation of the
furnace and infrastructure

Ingeborg Solheim





Outline

- Power supply
- Furnace / lining construction
- Temperature measurements
- Gas analysis
- Furnace operation
- Analysis/data collection



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Power supply

	U,V	I,A
AC	10-215 V	50-5700 A
DC	10-300 V	100-8000 A

- The power supply can be operated with different frequencies: 25, 50, 75 and 100 Hz AC
- The power supply can be operated with 2 top electrodes or 1 top/1 bottom electrode



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Furnace pot

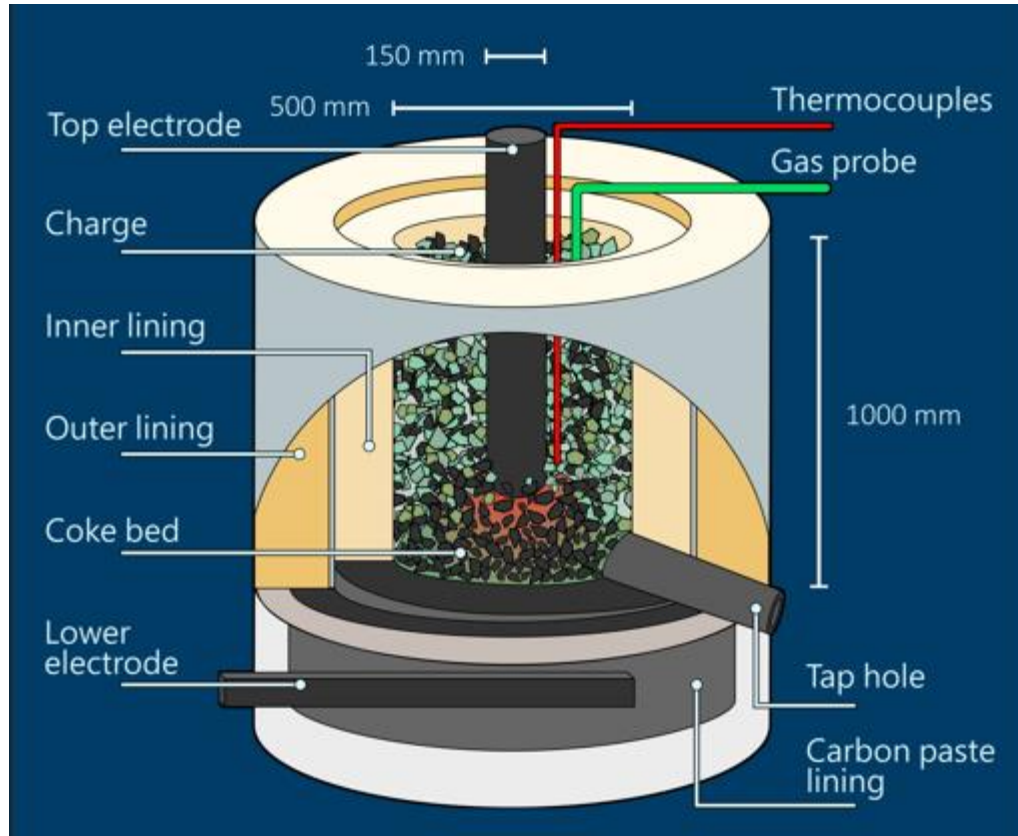


Illustration: Trygve Aarnes

This is a principal sketch of the furnace pot. The pot and hood of the furnace can be changed and adjusted/tailored for the actual purpose.

Example of projects in this equipment is:

- *Si metal
- *Miscellaneous Ferroalloys (FeSi, FeMn, SiMn, FeCr...)
- *Steel
- *Waste valorization (remelting of insulation materials, reduction of redmud...)



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Example of lining (for Ferroalloy purpose)

Carbonbased bottomlining



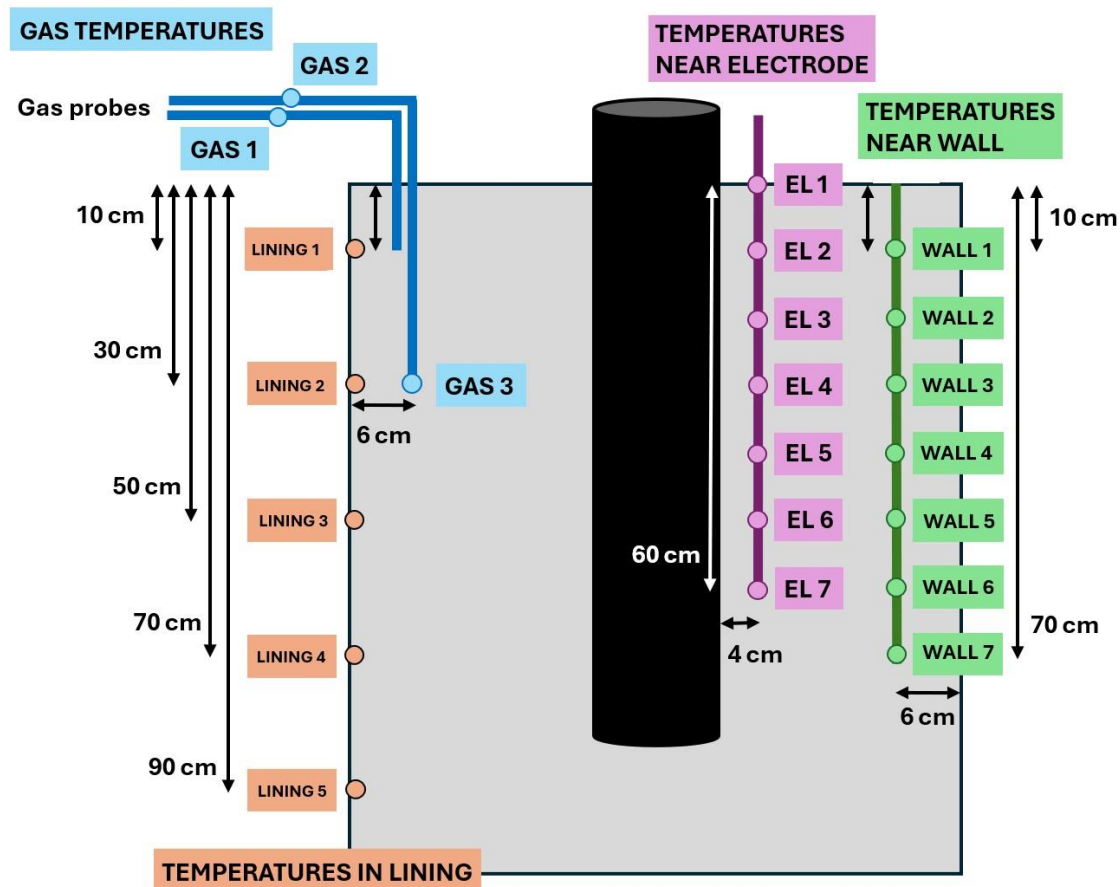
Aluminabased rammable wall-lining





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Temperature measurements





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Offgas measurement



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Micro-GC
FTIR
Testo
PAH
Dust measurement

Furnace in operation



Open furnace for FeMn-production



Semiclosed furnace for Si-production



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Furnace operation

Start cokebed	10 kg fix C (dry weight)	Piled beneath the top electrode
Preheat before charging starts	150 kWh	Follow own procedure for preheating
Charge level		Keep constant level to the rim of furnace Approximately 180 kg.
Batches	30 kg per charge	Mixed according to charge mixture sheet
First tapping	300 kWh	150 kWh after charging
Tap frequency	80 kWh	
Minimum number of tappings	12	
Shut down furnace	40 kWh	After last tapping
Power	170 kW....	Run at constant power
Electrical control		Current set point. Voltage limited
Electrode position	20 cm	From bottom lining

Post experimental studies



The furnace body is dividable vertically and horizontally.

This design makes it possible to fill the cold body with epoxy after ended experiment.

Cross-section of the cooled furnace can be sliced and samples coredrilled for further investigations i SEM and EPMA.



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Data collection

- **Electrical data**
- **Gas analysis of off-gases**
- **Temperture measurements (in lining and below the rim)**
- **Product analysis of slag and metal**
- **Analysis of samples from digout and casted coke bed /core samples from casted cross-section**
- **....**



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Technology for a
better society