CMS RE1_1 chamber TB APRIL 2025 overview

- UMESH -

30-04-2025

Data taken for RE1_1 chamber in April 2025 TB.

- Source off (Double gap, SG-TW, SG-BOT)
- ABS 10 (Double gap)
- ABS 6.9 (Double gap)
- ABS 3.3 (Double gap, SG-TW, SG-BOT)

Efficiency vs HV_eff (Apr 2025)



	Double gap	TW	ВОТ
STD	97.5% WP: 10.04 kV	97.5% WP: 10.04 kV	61.8% WP: 11.26 kV
ECO2	94% WP: 11.46 kV	94.2% WP: 11.38 kV	55.4% WP: 12.29 kV
ECO3	96.6% WP: 10.39 kV	94.8% WP: 10.48 kV	69.1% WP: 11.68 kV

Efficiency vs HV_eff (Apr 2025)



	Double gap	TW	BOT
STD	94.6% WP: 10.83 kV	93% WP: 10.88 kV	67.8% WP: 11.88 kV
ECO2	92% WP: 12.19 kV	86.8% WP: 12.41 kV	56.7% WP: 13.23 kV
ECO3	92.2% WP: 11.39 kV	86.9% WP: 11.63 kV	59.2% WP: 12.35 kV

Efficiency vs HV_eff (June 2024 vs Apr 2025)



Fig 3a: Source_off – Efficiency- Jun 24 vs Apr 25



• Source_off: June 2024 efficiency : 98.7%, 96.8% and 97.8%. April 2025 efficiency : 97.5%, 94% and 96.6%.

- S_off HV_50%: STD: 9.39 kV \longrightarrow 9.48 kV. ECO2: 10.6 kV \longrightarrow 10.78 kV. ECO3: 9.7 kV \longrightarrow 9.81 kV.
- ABS_3.3: June 2024 efficiency: 97.4%, 94.7% and 95.4%. April 2025 efficiency: 94.6%, 92% and 92.2%.
- ABS_3.3 HV_50%: STD: 9.83 kV \longrightarrow 9.97 kV. ECO2: 11.14 kV \longrightarrow 11.25 kV. ECO3: 10.22 kV \longrightarrow 10.4 kV.

Current density vs HV_eff (June 2024 vs Apr 2025)



• Current density decreased for both source off and ABS 3.3 from June 2024 to April 2025.

Conclusions:

- In April 2025 TB, RE1_1 BOT chamber efficiency did not reach 70% (both source off and ABS 3.3), even when operated with 1000 V higher than the TW gap.
- From June 2024 to April 2025, a decrease in efficiency was observed for all gas mixtures in both source off and ABS 3.3.
- A significant decrease in current density was observed for all gas mixtures from 2024 to 2025.

Plots for Paper (2021 vs 2024)



- HV_gas plot
- $HV_eff = HV_app \times P_0/P \times T/T_0$
- HV_app, P and T values ?