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VALIDITY
Valid

Final statement about collimators equipped with MoGr jaws

The acceptance tests of MoGr are based on outgassing rate measurements and residual gas analysis (RGA) after bakeout at 250°C for 48 hours. The results are here summarized:

- In the measurement limit of the test set-up, the gas analysis has not shown presence of heavy molecules indicating hydrocarbon contamination.
- The outgassing of hydrogen is lower than the detection limit of the set-up.
- The residual gas is dominated by CH₄, CO and N₂, Ne, and Ar, in order of RGA signal intensity.
- The virtual leak rate is higher than the acceptance threshold by at least a factor of 2.
- The total outgassing rate is close to the acceptance limit (5×10^{-8} mbar l s⁻¹ when scaled to the whole collimator).

Conclusions:

- As well known, MoGr is porous; therefore, it can potentially trap gas at which it is exposed (atmospheric gas and Ne as venting gas in the firing furnace).
- Despite the fact that the total outgassing rate is close to the acceptance limit and dominated by methane, the effect on the beam lifetime is negligible.
- The excessive virtual leak can accelerate the NEG coating saturation. The negative effect is mitigated by installing, whenever necessary, supplementary NEG cartridges (Capacitor D400) at the position of the collimator.

Mo coating:

- The Mo coating provided by DTI complies with our standard of adherence and total outgassing rate. For this supplier, the CH₄ signal of the coated samples is not higher than the one of the uncoated samples.
- An important reduction (at least a factor of 2) of the total outgassing rate and of the CH₄ peak intensity have been recorded after a further in-situ bakeout at 400°C.

Final conclusions:

- Despite the non-conformity of the released gas composition and the virtual leak rate, we have shown that there should be no effect on the beam lifetime and that the accelerated NEG coating saturation can be mitigated by adding auxiliary pumping speed. The coating have shown acceptable adherence and limited effects on the outgassing rate.
- TE-VSC suggests that the colleagues in charge of this equipment monitor attentively the production of MoGr blocks, so that the porosity is stabilized or improved in term of vacuum characteristics.
- At present and from a vacuum requirement point of view, TE-VSC does not see any obstacle to the continuation of the production of such collimators.

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