

## Notes from test with thermal evaporation source

Earlier 2 Ta-boats have been used together with 1 “big” Al pellet (diameter 1/4”, height 1/2”). We have seen problems with the deposition, mainly that the deposition rate was first really low and then suddenly very high. This have appeared since the boats needs to be really hot to melt the big pellet, and just when the pellet is melting, the dep. rate is suddenly increasing very much, leading to an unstable deposition.

### **1<sup>st</sup> test: 2 boats and 8 small pellets**

“Small” pellets (diameter 1/8”, height 1/8”): trying if this lead to fewer problems.

With 2 boats and 8 small pellets, the good values for soak power 1 and 2 are found to be 7 and 9% respectively. The depositions were done with a stable deposition rate, and the result was fine.

With 8 small pellets, 5 depositions of 20 nm could be done. After that the rate 2 Å/s was not possible to achieve (with max power 15%. If max power is set higher, there is a risk that the boats break in the center). It is possible to deposit totally 6x20nm with 8 small pellets, but the deposition rate will be lower in the end.

### **2<sup>nd</sup> test: 1 boat and 8 small pellets**

Used one boat, 8 small pellets. Set max power to 11%. Soak 1 and 2 set to 5 and 7% respectively. 1<sup>st</sup> deposition went fine, starting rate 2 Å/s and the metal was melted before the actual deposition started. The 2<sup>nd</sup> dep. looked fine during rise 2 but during soak 2 the light was suddenly gone, and no metal was deposited. Raised the max power to 13 and 15%, but there were no dep. rate. **When the chamber was opened, the boat was broken.**

### **3<sup>rd</sup> test: 1 boat and 8 small pellets**

Used 8 small pellets and one boat. Set max power to 10%, soak 1 and 2 to 4 and 7 respectively. 1<sup>st</sup>, 2<sup>nd</sup> depositions were perfect (deposition rate stable on 2 Å/s from the start). Depositions 3-5: rate a bit too low in the beginning, went later up to 2 Å/s (power about 8%). Deposition 6: rate at 1.8-1.9 Å/s, max power 10% reached. The amount of Al was enough for 6x200Å.

## Conclusions:

- Depositions are much more stable with small pellets.
- 8 small pellets are enough to deposit 6x200Å.
- In one case, the boat broke when using only 1 boat.
- We have also earlier seen that 2 boats gives stable depositions, since the lower boat gets hot (and heat the top boat), even if there if a thick layer of aluminum all over the top boat.