

# Aluminium spot etching

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## 1 Introduction

In this note the description of the procedure of removal of an aluminium spot on a hybrid detector will be provided.

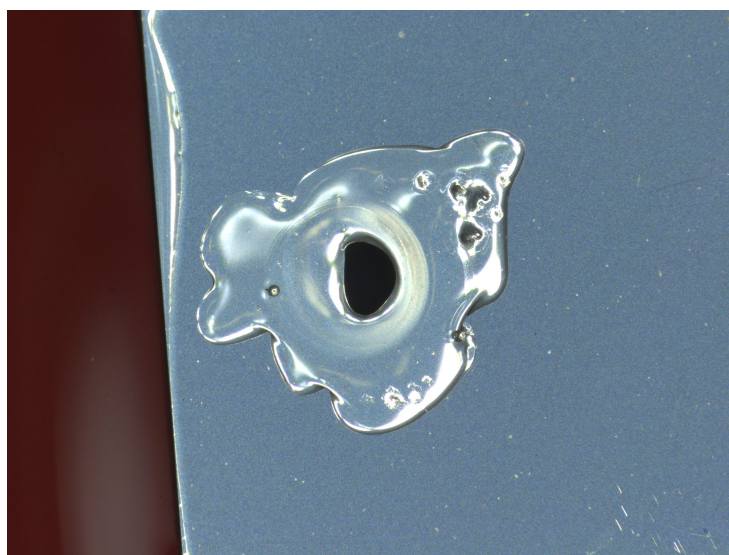


Figure 1: Removal of aluminium layer

## 2 Equipment+chemicals

- NaOH 30%
- Alcohol
- Distilled water
- Pipette

- Nail polish

### 3 Pre tasks

Make sure the detector is ready for this treatment, if possible: encapsulate wires to prohibit mechanical damage and seal the flip chip edges to avoid water getting sucked by capillary forces between the sensor and ASIC. This sealing and encapsulation is not totally hermetic. Water might still enter. The sealed edges of the detector might as well be more prominent to noise after this process. But this is done to be a bit safer towards damage.

### 4 How to do it

- Confine an area that you would like to perform the etching using nail polish or some other photo resistor
- Use a pipette to put a droplet of NaOH at the intended area
- Let it etch until you're satisfied
- Use a piece of cloth to remove the droplet.
- Use a pipette with water to flush away the NaOH
- use an air pump to blow away left over water.

### 5 Testing process

Before the real detector was etched we tried the procedure on some templates. Two times with a nail polish crater and one time with a small droplet and no crater. We observed a couple of things: it might vary the time it takes for the reaction to take place. We tried to "pick" a bit on the slow reaction in one of the craters, which resulted in the droplet to flow over the edges and etch on the wrong side of the crater the nail polish. When we didn't touch the droplet and the process took place undisturbed, only the intended area was affected.

Because of these observations did we decide to build a crater of nail polish and put a small droplet in here and let it take its time to react.

### 6 Result

After the reasonably smallest possible crater was made of nail polish using a thin brush and a droplet was placed here. It took a while before the reaction was initiated, but after the reaction had started the changes happened quickly. When we were satisfied we used a pipette to flush away the NaOH using water. Afterwards the detector was inspected using a microscope.

The size of the etched hole is estimated to be less than 256 pixels, see 2.

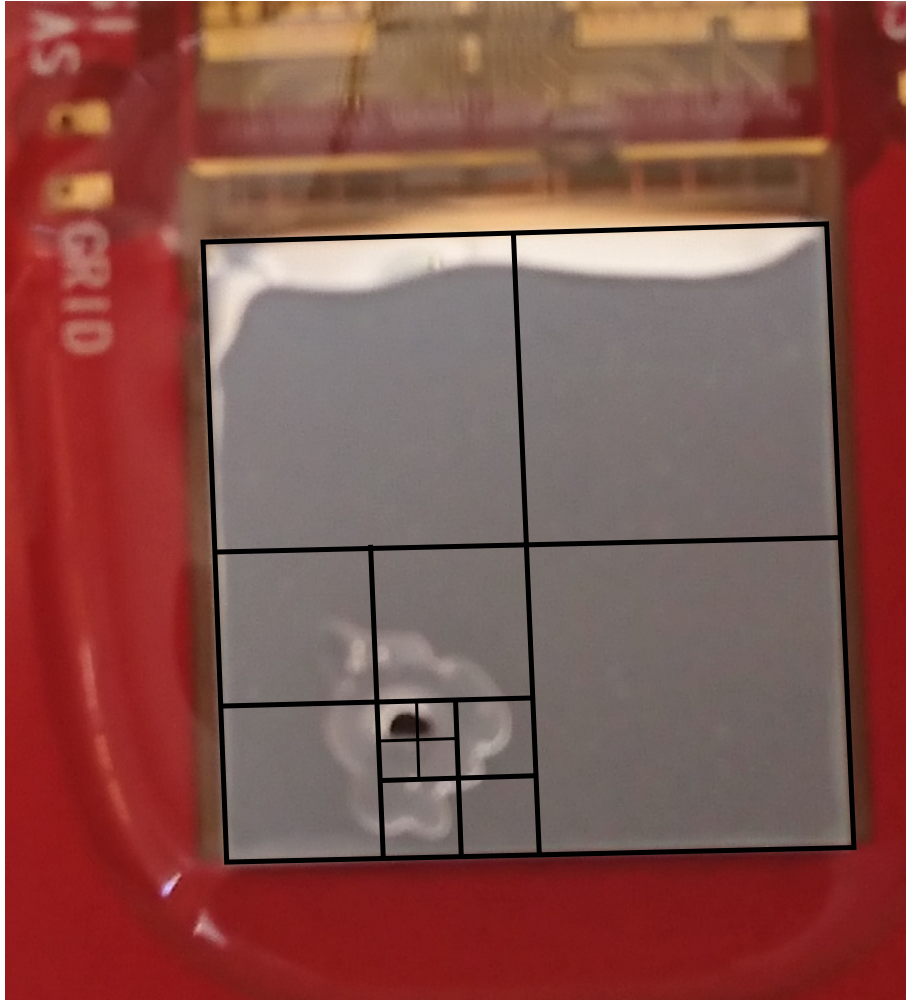


Figure 2: About  $\frac{1}{256}$  of the pixels are not any longer covered in aluminum

## **7 Remarks**

## **8 Helpful people**

Miranda van Stenis  
Florentina Manolescu  
Victor Coco  
Matteo Centis Vignali  
Michael Moll  
Heinrich Schinder  
Paula Collins  
Ian McGill  
Esteban Curras Rivera

## **References**