Tooling for CBM STS module assembly*

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The CBM STS module assembly needs tooling to simplify and speed up fabrication [1]. For several assembly steps specialized assembly tools are needed.Assembly will comprise the following steps: First, 2 layers of microcables need to be bonded on to the STS-XYTER chip to form a a"chip-cable". Secondly, 8 chip-cables must be bonded to the CBM STS sensors side by side for readout of the full 1024 channels for every sensor side. Additionally, on singlemetal sensors an interstrip connecting cable must be allocated and bonded on one side of the sensor. It serves to interconnect the inclined strips that end on the sensor side to form a continuous strip over the sensor. Therefore a whole set of assembly tools must be developed and - if needed - improved. To start with simplest element, the tool for the first cable layer on the chip was design, produced and tested. This first version was already shown in[1]. In figure 1 the improved version is depicted.It has

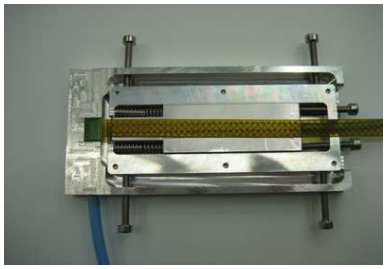

Figure 1: Tool for 1st layer on chip

small bumps to avoid crashes between the bond needle and the tool. This change increases the safety of operations and will be an advantage for the mass production by reducing the machine downtime due to such crashes. The chip and the cable in this design were still held by vacuum and manipulated via a bottom-side mechanics. Secondly, a tool for bonding of the second layer of the micro cable to the chip was designed.Because of the presence of the first layer, already bonded and glued to the chip, the second cable layer needs to be mounted from the top side. The chip is still fixed from the bottom-side, but the jig for micro cable mounting is now above it. This does increase the height of the tool, but this height is not a showstopper, because the operating range of the tab-bond needle is not above the cable but the chip. See figure 2.

To assembly the microcables with the chips to the sensor a third tool with a movable bottom-side sensor holder

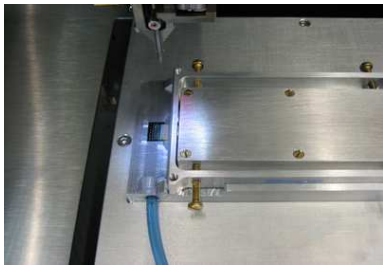

Figure 2: Tool for 2nd layer on chip

and a top-side mechanics for the microcables was designed (see figure 3). It turned out that a movable sensor holder is

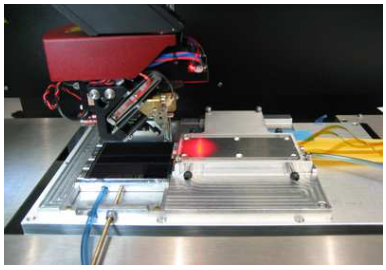

Figure 3: Tool for 1st and 2nd layer on sensor

not the best way for this assembly step, because the flimsy microcables are destroyed if they're moved too strong. An improvement of this tool is in work. Fortunately it also turned out, that this tool could be used to bond the interstrip connecting cables on the p-side of the sensor (see figure 4).

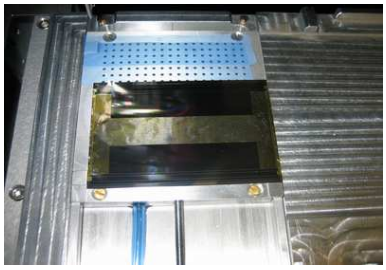

Figure 4: Insterstrip cable on sensor

References

[1] D. Soyk et al., "Development of a tool for CBM STS module assembly", editors: V. Friese and C. Sturm, CBM Progress Report 2013, Darmstadt, ISBN 978-3-9815227-1-6

* Work supported by FAIR@GSI PSP code: 1.1.1
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DOI:10.15120/GR-2015-1-MU-NQM-CBM-37