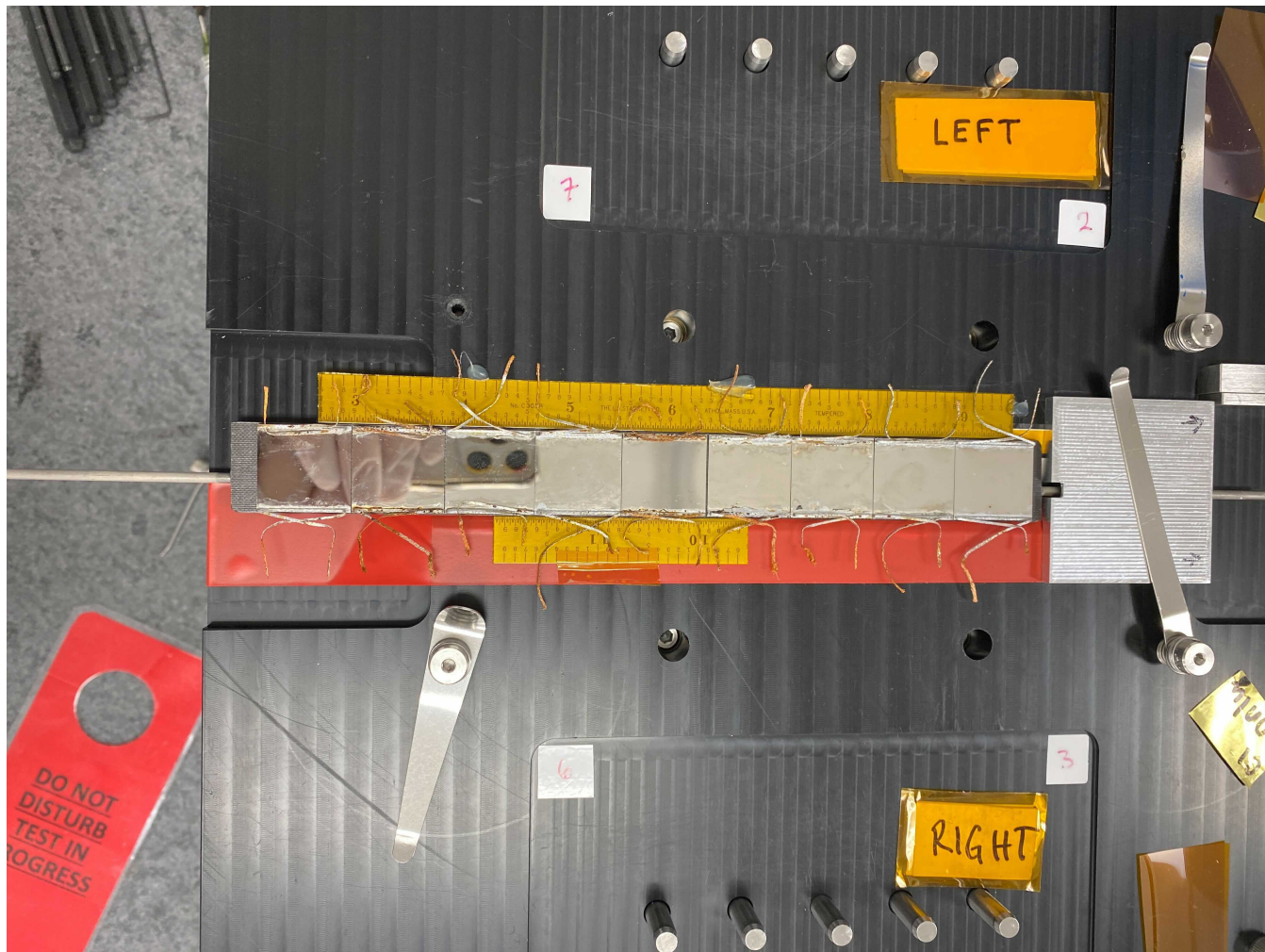


# p19-0 stave anatomy

All heaters are from batch "19-0 stave singlets" (see [Heaters.xlsx](#)). Heaters were selected to fit together. Heater soldering information is available here: [Dummy Heaters#SolderingProcedures](#). Please see the PDF attached to that page.

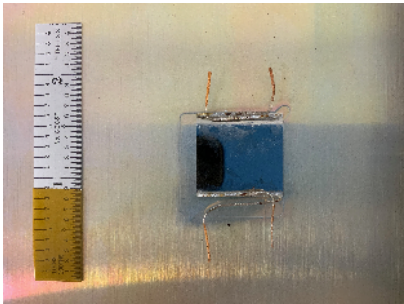
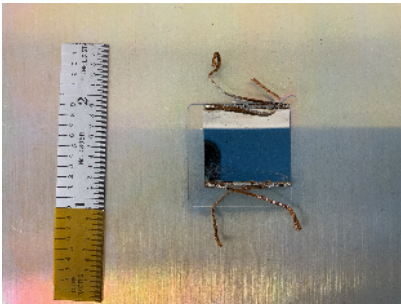
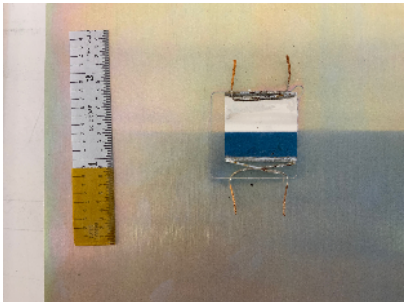
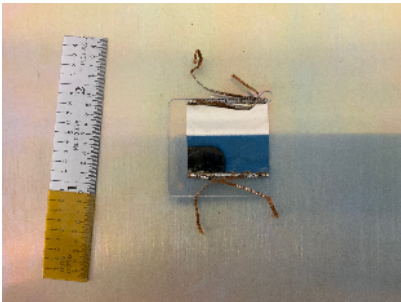
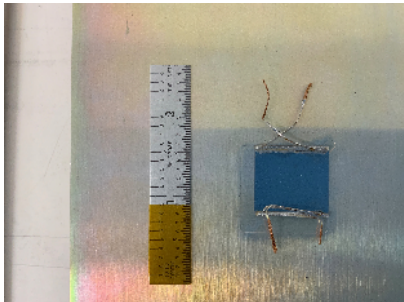
Fully loaded stave, 16 Sep 2021

Module positions: We number the modules 1-9 from left to right in this image



## Observations, properties, and measurements by loaded position

| Stave position      | 1           | 2           | 3          |
|---------------------|-------------|-------------|------------|
| Loading date        | 14 Sep 2021 |             |            |
| Configuration       | 1           |             |            |
| Syringe ID          | 2021-A-24   |             |            |
| Loading position    | C1 S1       | C1 S2       | C1 S3      |
| Heater ID           | #11         | #13         | #6         |
| Properties          | C1 S1 (#11) | C1 S2 (#13) | C1 S3 (#6) |
| Carton ID           | 2           | 2           | 1          |
| Heater ID in carton | 4           | 6           | 7          |
| Length (mm)         | 21.26       | 21.26       | 21.3       |

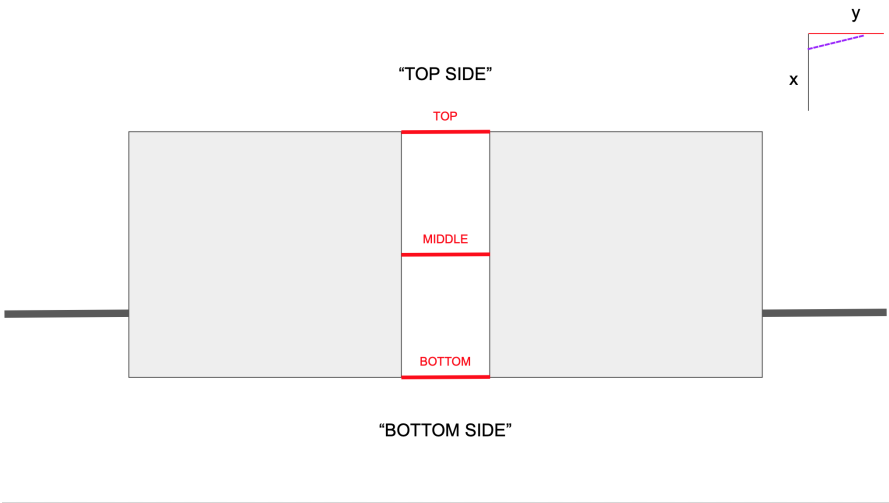
|                                                                            |                                                                                                                                                       |                                                                                      |                                                                                                                                    |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Width (mm)                                                                 | 20.48                                                                                                                                                 | 20.48                                                                                | 20.47                                                                                                                              |
| Thickness (mm)                                                             | 0.26                                                                                                                                                  | 0.26                                                                                 | 0.26                                                                                                                               |
| Mass before soldering (g)                                                  | 0.3                                                                                                                                                   | 0.3                                                                                  | 0.3                                                                                                                                |
| Mass after soldering (g)                                                   | 0.6                                                                                                                                                   | 0.6                                                                                  | 0.5                                                                                                                                |
| Resistance (Ω)<br>01 Sep 2021                                              | 1.8                                                                                                                                                   | 1.9                                                                                  | 2.0                                                                                                                                |
| Resistance (Ω)<br>13 Sep 2021                                              | 2.1                                                                                                                                                   | 1.9                                                                                  | 2.2                                                                                                                                |
| Resistance (Ω)<br>(loaded heater, top left to bottom right)<br>20 Sep 2021 | 2.4                                                                                                                                                   | 2.0                                                                                  | 2.0                                                                                                                                |
| Resistance (Ω)<br>(loaded heater, top right to bottom left)<br>20 Sep 2021 | 2.1                                                                                                                                                   | 2.0                                                                                  | 1.9                                                                                                                                |
| <b>Visual inspection</b>                                                   | <b>C1 S1 (#11)</b>                                                                                                                                    | <b>C1 S2 (#13)</b>                                                                   | <b>C1 S3 (#6)</b>                                                                                                                  |
| Before IPA wash                                                            |  <ul style="list-style-type: none"> <li>• ethanol wash!</li> </ul>   |    |                                                                                                                                    |
| After IPA wash                                                             |  <ul style="list-style-type: none"> <li>• ethanol wash!</li> </ul> |  |  <p>Wires too sensitive for more cleaning</p> |
| <b>Pre-loading checks</b>                                                  | <b>C1 S1 (#11)</b>                                                                                                                                    | <b>C1 S2 (#13)</b>                                                                   | <b>C1 S3 (#6)</b>                                                                                                                  |
| Expected glue layer thickness (m)                                          | 100-200                                                                                                                                               | 100-200                                                                              | ~200? Higher?                                                                                                                      |
| <b>Dispensing &amp; Mounting</b>                                           | <b>C1 S1 (#11)</b>                                                                                                                                    | <b>C1 S2 (#13)</b>                                                                   | <b>C1 S3 (#6)</b>                                                                                                                  |
| Dispense time                                                              | 11:59 AM                                                                                                                                              | 12:27 PM                                                                             | 12:54 PM                                                                                                                           |
| Mount time                                                                 | Noon, 12:00 PM                                                                                                                                        | 12:28 PM                                                                             | 12:55 PM                                                                                                                           |
| Estimated glue mass per star (mg)                                          | 77.5                                                                                                                                                  | 73.3                                                                                 | 75.3                                                                                                                               |
| Averaged mass tests                                                        | #6-9                                                                                                                                                  | #10-16                                                                               | #19-21                                                                                                                             |
| Time elapsed since syringe fully thawed (minutes)                          | 75                                                                                                                                                    | 103                                                                                  | 130                                                                                                                                |

|                     |    |    |                                                                                                                        |
|---------------------|----|----|------------------------------------------------------------------------------------------------------------------------|
| Hold time (minutes) | 20 | 20 | 95                                                                                                                     |
| Comments            |    |    | Stave moved so there is a large gap between C1 S2 and C1 S3. S3 also seems to be very high (probably glue was too old) |

## Loading experience

| Date        | Personnel                               | Syringe ID             | Modules             | Photos                                                                                                | Records                                                                                                                                                                                                                                                                       |
|-------------|-----------------------------------------|------------------------|---------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14 Sep 2021 | Josh (loader), Hannah (robot operation) | 2021-A-24<br>2021-A-25 | All configuration 1 | <a href="https://photos.app.goo.gl/5Shzj4EU5zfVos8M8">https://photos.app.goo.gl/5Shzj4EU5zfVos8M8</a> | <a href="https://atlas.cr.slac.stanford.edu:8080/Clean+Room+Activities/91">https://atlas.cr.slac.stanford.edu:8080/Clean+Room+Activities/91</a><br><br>2021-09-14 p19-...ading day 1.pdf   |
| 15 Sep 2021 | Josh (loader), Hannah (robot operation) | 2021-A-26<br>2021-A-27 | All configuration 2 | <a href="https://photos.app.goo.gl/rSAu5qn5jbhXpMFN7">https://photos.app.goo.gl/rSAu5qn5jbhXpMFN7</a> | <a href="https://atlas.cr.slac.stanford.edu:8080/Clean+Room+Activities/92">https://atlas.cr.slac.stanford.edu:8080/Clean+Room+Activities/92</a><br><br>2021-09-15 p19-...ding day 2 .pdf |
| 20 Sep 2021 | Inspecting the loaded stave             |                        |                     | <a href="https://photos.app.goo.gl/bU55sQPxBW8Gz5DPA">https://photos.app.goo.gl/bU55sQPxBW8Gz5DPA</a> |                                                                                                                                                                                                                                                                               |
| 23 Sep 2021 | Preparing the stave for testing         |                        |                     | <a href="https://photos.app.goo.gl/fRg8cn8186zqXjuR9">https://photos.app.goo.gl/fRg8cn8186zqXjuR9</a> |                                                                                                                                                                                                                                                                               |

Metrology results with the CMM



DISTANCES (MICRONS)

| Area              | C1S1-C1S2 | C1S2-C1S3 | C1S3-C1S4       | C1S4-C1S5 | C1S5-C2S2 | C2S2-C2S3 | C2S3-C2S4 | C2S4-C2S5 |
|-------------------|-----------|-----------|-----------------|-----------|-----------|-----------|-----------|-----------|
| TOP               | 220       | 300       | 44<br>(OVERLAP) | 131       | 518       | 19        | 230       | 58        |
| TOP Y<br>(ABS)    | 219       | 294       | 14<br>(OVERLAP) | 126       | 517       | 12        | 218       | 23        |
| MIDDLE            | 215       | 284       | 50              | 134       | 477       | 83        | 173       | 76        |
| MIDDLE Y<br>(ABS) | 214       | 279       | 32              | 126       | 475       | 82        | 163       | 58        |
| BOTTOM            | 210       | 269       | 86              | 140       | 437       | 153       | 117       | 104       |
| BOTTOM Y<br>(ABS) | 209       | 265       | 78              | 125       | 432       | 152       | 108       | 93        |

