

## GEM Foil High Voltage Testing Procedure

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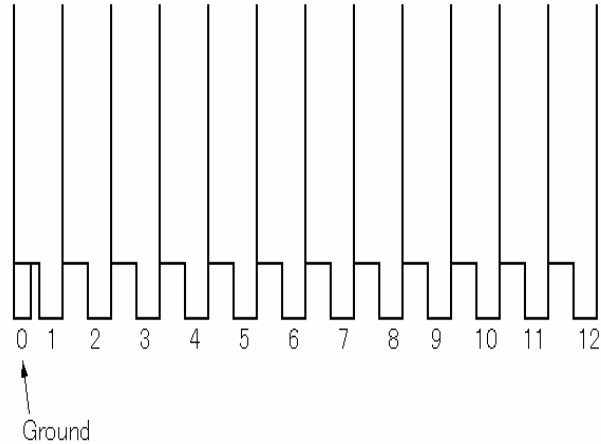
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### 1. Strips Nomenclature

- Strips of GEM Foil are named as shown in figure on the right.
- Ground Terminal (Strip 0) is located on the back side of the foil.



### 2. GEM Foil Handling

1. Keep GEM Foil away from dusts as much as possible.
2. GEM Foil is delicate material. Thin copper layers are easily folded and wrinkled. Handle it carefully not to bend it, grabbing the foil by the exposed kapton on the edge.

### 3. HV Test Procedure

1. Before the measurement, put on the basic information such as date, temperature, humidity, and ID number of GEM foil on the short term HV certification data sheet.
2. Connect one probe from High Voltage Source to the Ground terminal with a toothless alligator clip. NEVER (!!!!!) pull the clip off of the foil.
3. Connect the other probe to strip #1. After each measurement, move this probe to strip 2, strip3, and so on.
4. Before turning on the power supply, make sure voltage setting is at 0V, and circuit tripper is in “**HOLD TRIP**” position. Be sure to check the current reading before the turn-on.
5. Turn on the power supply and write down the current reading. If the current reading is non-zero, turn off the power supply and unclip the toothless alligator clips and short them for 10 seconds. Clip back on the alligator clips and turn on the HV power supply. Be sure to take the current reading again.
6. Increase the voltage gradually up to 400V, keeping the current below the 80% of the

maximum reading. If the strip takes excessively long time ( more than **40 seconds** ) to bring up to 400 V, mark the strip as “long settling time” and proceed to the next step.

7. If power supply trips, turn off the power supply, set the voltage back to 0V, then reset the circuit breaker. If it still trips after three trials, mark X on the data sheet and move onto the next strip.
8. When the voltage reaches 400V, start the clock. Then measure the current and put down the measured values on the data sheet.
9. **If the current is still high (higher than 10 nA) after 120 seconds, take extra data in 2 minutes intervals until the current settles down to a moderate value. Be sure to note the total time needed to settle down to about 10nA.**