

### III. Parallel Gap Welder Electrode Selection Guide

**SW Tech Equipment** offers total 45 catalog models for electrodes. There are 5 tip head shapes and each tip shape has 9 different sizes. While these catalog models cover the most application scenarios, customer may consider to either to choose the catalog models or to design their own to obtain the optimized welding joints for his/her special application time to time. Hence, some recommendations are offered below as general guidelines.

#### 1. Electrode's Tip Shape

- **Flat :** Mainly used for gold, silver, metal ribbons and wires. It is recommended for softer base material, such as FR4 and Duroid boards. It has moderate durability.
- **Wedge:** Mainly used for gold, silver, metal ribbons and wires. It is designed for large diameter wires and bigger ribbon strips. It has good durability.
- **Round:** Mainly used for gold, silver, metal ribbons and wires. It is the most durable electrode.
- **Slanted:** Mainly used for wires and ribbons when cutting is needed at the finish.
- **Concave:** It is also known as "V" shaped electrode sometimes. It is mainly designed for capturing the round shaped wires. It has the shortest longevity among all 5 tips shapes.

#### 2. Electrode's Size

- In general, the larger the tip size, the higher power it can handle.
- The tip width shall be the same or larger than the width of the ribbons or strips to be welded.

#### 3. Electrode's Material

SW Tech Equipment employs three high quality materials for its electrodes. They are high temperature molybdenum alloy (HTM), high purity molybdenum alloy (HPM) and molybdenum tungsten alloy (MTA). The table below gives their characteristics.

Items	Crystal Size	Temperature	Hardness	Oxidization	Durability	Cost
<b>HTM</b>	Small	Moderate	Moderate	Moderate	Moderate	Low
<b>HPM</b>	Small	Low	Poor	Poor	Low	Low
<b>MTA</b>	Small	High	Good	Good	High	High

Note: Although the molybdenum tungsten alloy offers the best performance, the drawbacks of the material are it is hard to machine and production yield is low. Therefore, the cost is higher.

#### 4. Standard vs. Clean Free Electrode

- **Standard:** It requires less welding power, but can be contaminated quicker. Therefore, it has moderate durability.
- **Clean Free:** It requires higher welding power for the same work piece, but hard to be contaminated due to its closed tip configuration. Therefore, it has the highest durability.