

# Mueller Electric: Test & Measurement

Mueller Electric has unrivaled experience in the providing test leads and accessories for electronic and electrical testing across a wide range of industrial applications. We understand the challenges of the test and measurement industry and have worked to build a wide range of test & measurement products designed to meet any testing application. Our extensive experience in this area allows us to approach these specific challenges to meet your exact needs, in fact, Mueller is the only major test & measurement manufacturer to offer a full line of both UL listed and CE approved test & measurement products. Our test leads, banana jacks, probes, plungers and alligator clips are tested for safety and compliance to UL standards. If an application exists in which electrical safety is of high concern, Mueller can fill the need.

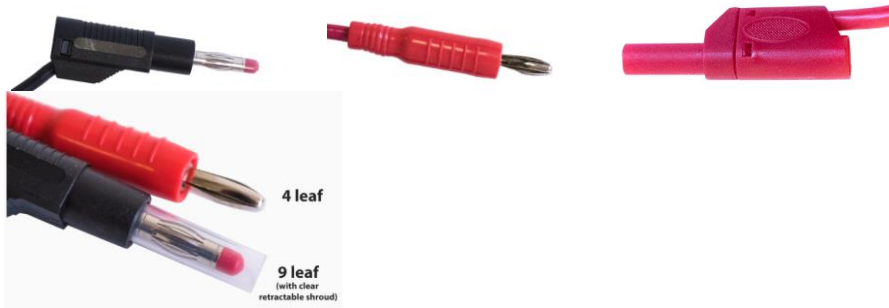
When it comes to test & measurement products Mueller carries a large, quick-ship inventory of parts and standard assemblies to mix and match your needs. Popular items include banana plugs, plungers, probes, grabbers, jacks, adapters, connectors, binding posts and many more. Mueller offers both insulated and non-insulated versions as well. As with all Mueller products, these parts are rugged, durable, reliable, and designed for daily wear and tear.

Mueller provides many direct replacement and spares for virtually all general meter applications. Mueller test leads fit all major manufacturers, including: Fluke, Amprobe, Keithley, Tektronix, Simpson and HP. Mueller's replacement test leads are guaranteed to be interchangeable and compatible with your meter. Our vast cross reference of OEM to Mueller products can be found on our website for quick item match determination. In fact, over 12,000 items cross directly to Mueller Test and measurement leads and accessories. Mueller's products provide a great value to the customer, not just in sell price but more importantly in the fact that Mueller's products are made of the highest quality providing a long lasting durable products driving customer satisfaction.

Customers in all industries have contacted Mueller for test & measurement products not just for long lasting durability but also simply because they can't find the service level that they require. In many cases Mueller is able to meet specific requirements from inventory, something other suppliers are unable to provide. Customers commonly comment on how satisfied they are with Mueller's ability to fill their immediate and long term test & measurement needs.

With regard to test & measurement products, one of the most talked about items is banana plugs and jacks. Banana plugs are a single-wire electrical connector used for joining wires to equipment. In Europe, banana plugs are sometimes called 4mm connectors, but not all bananas will connect with 4mm parts. A banana plug is a cylindrical pin/plug that has sprung metal "leaves" that bilge outward, though variations on this exist for different applications. The springs produce a snug fit and good connectivity in a socket as well as preventing the pin from falling out. The diameter of the pin is usually 4mm (which is why it's referred to as a 4 mm plug). The back of the pin is connected to a wire which is screwed, soldered, or crimped into place. Often there is insulating plastic over part of the connector. These are used at the ends of patch cords for electronic test

equipment, speaker wires, and probe leads. The wire can exit the rear at the right angle (90 Degrees). A 45 degree angle, or straight back. Banana plugs are called bananas because of the metal leaves which bulge out. Each leaf is curved like a banana. These are most commonly either 4 leaves or 9 leaves. The 9 leaf bananas have a stronger “grip” on the socket and are preferable for heavier wires or in high voltage uses where safety is a concern.



Stackable or Stacking Plugs – A stackable plug has a 4 mm hole in the back, on the side, or both to accept the pin of another 4 mm plug.



Shrouded bananas – Shrouded bananas (also called sheathed) plugs have insulation around both the male and female connectors to avoid accidental contact in high voltage situations. The shrouded plug will fit into shrouded and unshrouded jacks but not binding posts. A retractable shrouded banana has a spring-loaded shrouded cover that slides out of the way when the pin is inserted into a shrouded or unshrouded jack.



Binding Posts – The binding post is called a “5-way” or “universal” post because there are 5 ways to attach a wire to it. They are a type of wire terminal found on speakers, receivers, and amplifiers as well as test and measurement instruments, high-voltage test equipment and various hand held devices. Binding posts accept bare wire and four different types of connectors: pin connectors, spade connectors, banana plugs, and dual banana plugs. Banana plugs are inserted into a hole in the back of the binding post.



Banana Jacks – A banana jack is another word for the female connector that the banana plug is inserted into. Jacks have different kinds of pins on the front end which allow them to connect or plug into many different electrical items. A binding post is one type of jack.



Dual Plugs and Posts – Dual plugs are simply two plugs together. They are designed for use with amplifiers or speakers that use traditional binding posts. Dual plugs and posts make it safer to plug in two wires with no chance of stray wire strands creating a short across contacts.



Mini Bananas – Mini bananas are 2 mm or 3 mm banana plugs. These are less common but are still used nonetheless.



Color Coding – Banana plugs and jacks are commonly color coded. Red and black are the most common. If a Mueller part is available in a color, then the end of the part number will have a dash and a single digit. That digit corresponds to the color of the part. For example, a BU-00243-2 banana plug means the plug is red because the last digit is a 2 after the dash. This naming system has been adopted by most other banana plug manufacturers as well. Mueller provides the following colors:

Black – 0

Red – 2

Yellow – 4

Green – 5

Blue – 6

White -9

Brown (1), Orange (3), Violet (7) and Grey (8) may be available on a custom basis.