Soldering tips/bits (article)

Soldering tips are the metal points on a soldering iron that you use to melt the solder, and they are an essential part of a soldering iron. They come in different shapes and sizes and are used for various purposes.

Some soldering tips have a rounded end, while others are pointed at one end and flat at the other. The tip size will determine what kind of work you can do with it. For example, a large tip is suitable for soldering larger pieces together(such as a printed circuit board) but could be better for working on small wires(for instance, if you are working on wire jewellery).

Since the tips are essential to your soldering work, you'll need to know how to purchase the right one for the job. In this article, we'll learn more about soldering tips and how to choose them.

What are common types of soldering tips and their uses?

Soldering tips are one of the most critical parts of a soldering iron. They're what you use to apply heat to your work and are the only part of your iron that touches anything.

While there are various soldering tips, five main types exist in the market: conical, chisel, bevel, knife and needle.

The conical tip is the most common type of soldering tip because it's excellent for general use. For example, you can use it to solder wires together or make minor repairs to electronics. These series of tips derive their name from the cone-like shape. With its very rounded tip, you can solder from any angle, which makes this tip easier to use for general purposes.

The chisel tip with a flat surface makes it easier to solder wires with large amounts of surface area together (such as when you're repairing an appliance). It looks like a chisel in terms of its shape. Therefore, the tip is known as a chisel tip. Like the conical iron tips, you would use them for general-purpose soldering. Its surface area is more prominent than conical tips so that more heat can transfer from the tip to the electrical component. Pick this tip if you're trying to make a quick connection, such as soldering thick wires.

These tips come in various sizes, so choose one which is an appropriate size. If you select one too large, you might create an unexpected solder bridge. That's when the solder flows from one point to another point on a printed circuit board(PCB), creating an unwanted connection. On the other hand, a small soldering tip will mean you cannot reach all the points you want to.

The bevel tip is best for getting into tight spaces where other tips might not work. You will recognise these tips from their curved surface. Beveil tips are for drag soldering, a technique in which you drag a line of solder across the fine-pitch pins on a PCB to solder an entire row quickly. You can apply solder on the tip and even spread small amounts on various points, whether separated or nearby.

Another type of tip is the knife soldering iron tip has a slanted end and resembles a knife. You can also use it for drag solder and fixing solder bridges. It is possible to do point soldering with this tip, but it is considerably tricky compared to the other types of tips.

The fifth type of tip is the needle-type soldering iron tip. It has a pointed shape, which you can use for precise work. However, it is unsuitable for soldering large components as it transfers relatively less heat than other tips.

Finally, manufacturers also create other types of specialised tips for various projects. You might have to purchase these tips if you have a specialised task that requires it.

How is a soldering iron tip created?

Soldering iron tips comprise these elements:

- A solid copper core
- A coating of plated iron
- A layered plate of nickel (behind the working surface)
- A plated chrome layer

Copper is usually the core material since it provides good heat transfer. However, the iron layer is the critical working layer, significantly affecting the soldering iron tip's longevity.

The nickel-plated layer is a non-wetting layer. It keeps the solder from wicking away from the tip's working surface. Without it, the solder will travel up the soldering iron tip into the heat source. That makes it challenging to apply solder to a soldering joint. While on the other side, the chrome-plated layer functions as a protective layer.

How to choose the right tip for a soldering job

When you're working with electronics, soldering is an essential skill. Choosing the right tip is vital if you're looking for the best results from your soldering job. Many different soldering tips are available today, making it hard to decide which one to choose. Here are some things you should consider when deciding which type of tip will work best for your needs:

1. Determine the tip size you need

First, determine what kind of solder you'll be using, the soldering method and the type of connection you're trying to make. Knowing these will help you choose the right size of tip that is compatible with your soldering iron.

If you choose a small soldering tip that cannot transfer heat to the task you want to carry out, you will get a frustrating soldering attempt and weak solder joints. In comparison, a tip that is too big transfers too much heat, potentially damaging both the pad and the part. In certain situations, a large tip with a high heat transfer rate can also damage the circuit board, causing problems.

The conical tip allows you to reach into tight spaces while still getting enough heat transfer from your soldering iron so that everything melts together properly, damaging nothing else nearby during use! In addition, the conical tip concentrates heat on a small area, so it's useful for precision soldering on surface mount components and other minor tasks. If unsure, chisel tips are an excellent choice because their tapered edge can easily get between parts, making them versatile enough for various soldering tasks. It's also helpful in desoldering when paired with an extraction tool.

2. Size and shape of your project

Next, consider the size and shape of your project—will it require a large contact area? If you are using a PCB, does it have narrow grooves that need to be filled? Will you be making connections between components with small points? A standard tip will usually do the trick if you're doing general-purpose soldering. However, if you plan on doing heavy-duty work or making small repairs on delicate electronics, it's best to use conical tips designed specifically for these tasks. Conical tips are better suited for small-scale electronics work on printed circuit boards (PCBs), where you will work with thin wires and surface-mount components. These tips have a round shape that lets them focus heat quickly and evenly across their surface area, which makes them ideal for getting into tight spaces with minimal risk of damaging nearby components or tracks on the PCB itself.

3. How much heat does your project need?

Before choosing a tip, you should also consider how much heat your project needs. For example, suppose you're working with plastic or other materials that do not conduct heat well and require higher temperatures for proper melting. In that case, it's best to go with a bevel tip because it will allow more heat transfer through its larger surface area. It is also recommended that you use bevel tips for drag soldering, which is a faster way of hand soldering printed circuit boards.

4. Consider your existing solder station

If you are buying tips for an existing solder station, ensure that you purchase tips to match and operate with your equipment. For example, some tips are meant for heavy-duty use, while others are intended for light-duty and precision work.

You should only use certain soldering systems with their appropriate tips and cartridges. Using the right tips and cartridges is a way to maintain and ensure your soldering equipment works optimally.

How to take care of soldering tips?
Soldering tips are the metal points on a soldering iron that you use to melt the solder. Taking care of your soldering tips is essential because they can quickly become damaged or dull if you do not. Here's how!

To care for your soldering tips, clean them properly. Keeping your tips clean will ensure they perform correctly and extend their life. Clean them before and after use until they appear shiny and bright.

First, before you solder, use alcohol and a clean cloth to remove grease, corrosion and oxidation and other contaminants from the surface to be soldered.

Second, always clean your soldering tip after every use. If any solder remains on it after use, it may not work correctly anymore! To clean your tips, you can use brass, which is softer and less abrasive. We also recommend stainless steel wool pads, which are harder but more durable.

Do not use a wet sponge, as it will reduce the tip's heat and cause it to expand and repeatedly contract. This cycle induces metal fatigue, and eventually, the tip may spoil.

Metal cleaning wool will not reduce the tip's temperature while removing dirt and contaminants. Lightly dab your soldering tips into the wool to get rid of dirt. For more stubborn residue, grip the iron and apply pressure when rubbing it against the wool in varying strokes.

After cleaning, wet the tip with fresh solder to stop oxidation. You can use a soldering tip polishing bar if you need to carry out more thorough cleaning. Take care to use it when the tip is cold, not when the tip is hot. You can use steel wool to clean off rust spots on your soldering tip. If oxidation has happened, flush it several times with a rosin-activated, flux-cored solder to remove oxidation. Once done, protect the surface with a thick solder layer.

Apart from cleaning, do use soldering iron tips for the right job. They can also be easily damaged if you should use them to pry clinched leads. That is why pliers and screwdrivers are made of hardened steel alloys, the proper tools for such tasks. Tips will spoil if you put them up to such harsh mechanical abuse.

Lastly, if your soldering tip becomes dull or damaged, replace it! You want to avoid ruining an entire project just because one part is not working right anymore. (1757 words)