With a wide selection of mold bases to match nearly any application,

DME makes it easy to get the mold base you need. But first, it’s important to have the knowledge to make the right choice. Fortunately, you can take advantage of DME’s mold base expertise every step of the way. Here’s an overview of important considerations in choosing your next mold base.
4 Keys to Successful Mold Base Selection

Many people pay more attention to details, like the core and cavity, when developing a mold. But don’t overlook the mold base; proper attention to choosing the base itself will lead to greater profitability and cost-effectiveness.

Here are the top 4 considerations in selecting the optimal mold base for your project:

1. Mold base styles
   - A-style – 4-plate design and the most common. Accepts just about any kind of insert.
   - B-style – 2-plate, compact, economy base. Used to machine part design directly into the cavity plates.
   - X-style – 3-plate style with a stripper (“X”) plate. Best for molding round parts like cups or caps.
   - AX-style – Similar to A-Style. Used for parts requiring core detail in the cavity side of the mold.
   - T-style – 3-plate with two parting lines. Allows runners to be ejected separately from the part.

2. Steel types
   - No. 1 steel – Machines easily and permits faster, smoother cutting. Best for short-run, low-cavitation production.
   - No. 2 steel – Ideal for retaining multiple cavity and core inserts for medium to long production runs.
   - No. 3 steel – Clean, easily machined and polished. Ideal for cutting core and cavity details directly into the mold plate.
   - No. 7 steel – Best for humid environments, corrosive plastics or clean-room requirements. Stainless, easily machined and corrosion resistant.

3. Your molding machine
   - Height – Determine mold-base height based on the maximum daylight available in the press.
   - Stroke – Consider the maximum stroke required to eject the part from the mold.
   - Locating ring – Must match the platens of the machine where the mold will be running.
   - Sprue bushing – Use a copper-alloy bushing when sprue weight > part weight, with sprue pickers or to minimize scrap.
   - Clamp-slot – Must be compatible with the thickness of the top clamping plate on your mold base.

Still Unsure Which Mold Base or Material You Need?
With decades of experience in mold base building and materials, DME can help you choose your mold base with complete confidence.

Contact us at 800.626.6653 or sales_service@dme.net to discuss your application today.
4. Your supplier’s capabilities

- Off-the-shelf availability, same-day shipment or quick delivery programs help you keep your delivery dates for your customers.
- Special machining capabilities help smaller shops that don’t have a big bore mill and larger shops that need to focus their resources elsewhere.
- Contour roughing services allow moldmakers to receive bases with nearly 90 percent of the material cut out for the part saving valuable time.
- Parting-line preparation requires special tools and resources that many shops don’t have.

By taking a close look at these four areas, you’ll increase your chances of getting just the right mold base for your application. Have specific questions about your project? Don’t hesitate to contact us.

Studying up on Steel

Before you begin any tool build, it’s crucial to choose the metal or metals that are best suited to the needs of the part. Otherwise, you run the risk of serious problems down the line, such as longer cycle times, or mold repair or replacement.

Different types of steel, copper and aluminum all have different metallurgical properties. Some are more durable. Some are more thermally conductive. Some are self-lubricating. Each of these properties can provide distinct advantages, depending on your application. The key is to weigh your options based on your application and objectives.

What are you trying to accomplish?

It’s important to look at the mold both as a whole unit and as individual elements. As an entire unit, consider the following:

- What is the anticipated longevity needed in the tool (short, medium or long run)?
- How important is thermal conductivity (BTU rating)?
- What is the desired cycle time of the final part?
- How corrosive is the resin being used?
- Will the humidity of the environment pose a risk of rusting?
- How does your mold design affect your material selection (fragile cores, sliding members, cooling/heating problem areas)?
Then examine the desired function of each element of the tool and compare them against the properties of your different metal options.

There are often tradeoffs you’ll need to weigh, for example, between wear resistance and thermal conductivity. Typically, the more wear resistance a metal has, the lower its thermal conductivity, and vice versa. You have to determine and prioritize the elements that are most important for your given application.

Which metal has the properties you need?

- **H13 Steel** – One of the most common varieties of mold steel. This thermal-shock-resistant, hot-work die steel is fully annealed (200 Bhn 13-20 Rc) for easy machining. It can be heat treated with a minimum of deformation and is often used when exceptional hardness or polishability are required. It also offers an excellent combination of shock and abrasion resistance. H13 withstands rapid cooling and resists premature heat checking. It can be formed by conventional means and has good machinability, good weldability and good ductility.

- **420 Stainless Steel** – Also common tooling metal. Fully annealed to 200-400 Bhn (14-23 Rc) for easy machining, 420 is used for injection, compression or transfer molds when plastic material requires a highly corrosion-resistant cavity steel. It’s also very clean steel, so it can be polished, but it’s not nearly as tough as other steels. It’s prone to compression damage (hobbing) and has a lower thermal conductivity.

- **P20 Steel** – A good standby if you’re looking for a pre-hardened steel. Mold makers commonly use it when they want to cut out a core and cavity from a solid block of steel instead of using an insert. This practice is commonly seen when making a mold for larger parts. P20 is exceptionally clean and is pre-heat treated to 277-331 Bhn (29-36 Rc). It provides high hardness, good machinability and exceptional polishability for plastic molds. It also offers good wear resistance.

- **S7 Steel** – Air-hardening steel. It provides a good combination of toughness and stability, which makes it perfect for heat-treating processes. It comes in annealed condition with suggested hardness range from 52-56 Rc. Suitable for compression and transfer molds that need high toughness, S7 is highly shock resistant and has high compression strength. However, due to its lower wear resistance, it’s often avoided when using more abrasive resins.
• **Graphitic Steel** – Commonly found in two varieties – A10 (air hardening) and 06 (oil hardening). Graphitic steel has natural lubrication built into it, so often it’s chosen for parts of a mold that need to move. The graphite particles provide self-lubricity and also hold applied lubricants.

• **Copper Alloys** – Improve the thermal conductivity of a mold. Often beryllium or non-beryllium copper is used to speed the cooling portion of the injection molding process. This can dramatically reduce the cycle time and improve part quality by providing uniform cooling of the part, reducing warp and sink marks, etc. Specialty materials are used many times in other processes besides injection molding because of the unique properties offered by these materials.

Some manufacturers also provide copper alloy core pins, copper alloy sprue bushings and other components for the mold. Similarly, these parts also promote heat transfer for good thermal conductivity, reducing cycle times. Although often more expensive, these components can be used in limited quantities inside the mold to gain the benefits while keeping costs in line.

• **Aluminum** – Growing in popularity as a tool steel. It typically lacks the wear resistance of steel, so it usually has shorter longevity. But it’s easy to work with and is often used for prototyping or for parts with short runs.

As you can see, there are numerous options when it comes to choosing a metal. So be sure to take the time to examine your options, pick the one that will provide the results you’re looking for, and save yourself and your molders a lot of headaches down the line.