Cold Forming Versus Machining = Cost Reduction

In the distant past, artisans called blacksmiths used the earliest "process" to generate a usable shape from metal, a hammer and anvil. Manufacturing was "one at a time" and very slow.

Approximately 140 years ago the first automatic forming machine was invented to produce a high volume component - fasteners. Benchmarks evolved - considerable quantities were required; material choices were limited and the shapes produced usually entailed some version of head on a shank.

That was then. Today the economies and multiple advantages of cold forming have expanded the processes to sophisticated technologies achieving fast and efficient manufacturing. Standard and special threaded fasteners, and custom shapes previously only machined, are now being produced by cold forming.

Cold forming is more commonly known as cold heading. As was the case in the first machines developed, a slug of wire is pushed into a die and a protruding end is upset in an outward direction; this is called heading. Forming of metal on the same axis usually involves changing a diameter from the original wire size as an extrusion. Now, movements of material are basically achieved the same way; however, advanced equipment and tooling can produce more complicated configurations.

Evolutions in the technology commonly manufactures finished or near net shapes off primary equipment with zero to minimal scrap and generate significant cost savings. Some configurations, tolerances and/or hybrid designs will always require additional operations; however, many second operation processes have been eliminated by expanded capabilities of the cold heading equipment and tooling.
There are remarkable advantages to cold forming:

* Elimination of Scrap and time, raw material savings and high-speed production.
* Greater strength during machining, bar stock grain is interrupted. Cold headed parts have a grain that follows the configuration of the part, it's not interrupted; material is not removed.
* Consistent Higher Quality. Cold formed parts have surface finishes that mirror the smooth condition and dimensions of the dies. This somewhat "burnished" condition usually eliminates the need for secondary finishing.
* Repetitious Tight Tolerances. Consistency is typical of this process. Very long production runs see dimensional variances that are only the result of die wear.
* Eliminate Parts and Labor. Opportunistic design marries function with process and combines multiple pieces into one component. This eliminates parts, labor, inspection, tolerance issues, purchases, inventory coordination and assembly time while improving strength and product output.

Material choices are very broad - virtually all commercial metals processed by machining are available as wire:

* Carbon Steels (including Boron)
* Magnetic & Non-magnetic Stainless
* Alloy Steels
* Aluminum
* Brass
* Copper
* Bronze
* Nickel Alloys
* Aerospace Alloys

It's archaic to think that cold heading is for fasteners only. Consider the wide range of metal parts created by the stamping and deep draw processes. That work is usually done by vertical punch presses; think of cold headers as horizontal punch presses that utilize raw material in wire form instead of coil stock.

Cost reduction efforts for metal parts without expensive tooling commitments make reviewing the cold heading process a worthy investment. That exploratory time is very well spent considering the potential savings and absence of risk.

There is no fixed rule, and it's not possible to compress all the possibilities here, but our recommendation is to literally view all metal parts as candidates for the cold forming process. Quantity minimums are not what they used to be - flexibility is commonplace. Quick-change tooling, improved machine design, high serviceability, etc. expands the capabilities of the process to a broader range of materials, shapes and volumes.

Cost reduction is never out of fashion in any market. Add the benefits realized via cold heading plus the fact that examining the possibility only involves the cost of a blueprint - there's nothing to lose.

Experience the savings. Send us a drawing, samples, annual quantity, any information you have regarding previous concerns and the application, and we will work to develop significant cost saving programs for you via the cold forming process. This money saving approach is not only for existing parts, but new applications as well.

For more information, visit us online:  www.thefedgroup.com or call 800-759-2658 today!